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Dependency Attachment and Exploration: Their Interrelationships in One-Year-Old Children

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DEPENDENCY ATTACHMENT AND EXPLORATION: THEIR
INTERRELATIONSHIPS IN ONE-YEAR-OLD CHILDREN

by

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Bachelor of Arts, University of North Dakota, 1971

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Submitted to the Graduate Faculty

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in partial fulfillment of the requirements

for the degree of

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This thesis submitted by Elizabeth S. Baraga in partial fulfillment of the requirements for the Degree of Master of Arts from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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INTERRELATIONSHIPS IN ONE-YEAR-OLD CHILDREN

Department Psychology

Degree Master of Arts

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ABSTRACT

Attachment and dependency are two important related infant-mother relationships which develop in the first year of life. Attachment has been defined as an affectional bond that one person forms to another specific individual which is both discriminating and enduring. Dependency, on the other hand, has been defined as a class of behaviors learned in the context of the infant's dependency relationship with his mother, reinforced in the course of her care of him and generalized to other caretakers. Operationally, attachment has been defined by proximity-seeking while dependency has been defined by attention-seeking. The purpose of the present study was to examine the interrelationship of dependency, attachment and exploration utilizing the laboratory strange situation procedure. This procedure was devised by Ainsworth and Wittig (1969), to explicate the relationship between attachment and exploration. It consisted of eight episodes in which infant-exploratory and attachment behaviors could be observed prior to, during and after separation from mother. For this study a further episode was added in which the mother was occupied. Attention-seeking behavior could only occur in this episode.

Specific hypotheses included: (a) There were no sex differences expected for any of the dependent variables. Groups classified according to quality of attachment were expected to (b) differ in the number and type of attention-seeking behaviors exhibited, (c) differ in the number of exploratory behaviors exhibited prior to and following mother separations, (c) correlate with maternal employment.

To test these hypotheses, 36 one-year-old infants were observed with their mothers in the modified laboratory strange situation. These observations of exploratory and attachment behaviors were coded and summed, obtaining frequencies for each episode. Also, five categories of infant-mother interaction were coded and scaled. For analysis purposes, nine episodes of the strange situation were combined into four logically consistent phases, I Mother Present, II Separation, III Reunion and IV Mother Occupied.

Analyses of variance with repeated measures of the exploratory behaviors across the phases indicated that neither sex of the infant or maternal employment were differentially associated with these exploratory measures, but that frequency of exploration differed across the experimental phases. Groups classified according to quality of attachment were not found to explore differentially at a significant level although the trend of the data indicated consistent patterns. Also, these groups were not found to be related to maternal employment.

Attention-seeking was operationally defined by two separate types, proximal and distal. These were found to be independent of each other and to show differing patterns of relationships to attachment and exploratory behaviors as well as with quality of attachment. It was proposed that proximal and distal attention-seeking may be, in fact, operational definitions for two types of dependency, emotional and instrumental, respectively. Therefore, at the age of one proximal attention-seeking is another behavioral indication of attachment while distal attention-seeking represents dependence.

CHAPTER I

ATTACHMENT, DEPENDENCY AND EXPLORATION

Introduction

The significance of the mother-child relationship in personality development has been maintained by numerous theorists, the first and foremost of these being Freud. He chose to refer to the child's ties to his mother as cathexis of object. Subsequent theorists substituted the word dependency to explain the ontogeny of this early interpersonal relationship. Bowlby (1958), in his comprehensive theoretical revision of psychoanalytic theory regarding the bond between child and mother, chose instead to call this affectional bond, attachment, a term which was free of theoretical connotations.

Historically, however, attachment and dependency, while considered independent theoretical constructs, were often defined the same operationally. Attachment is theoretically defined as an affectional bond that one person forms to another specific individual which is both discriminating and enduring. Operationally, proximity-seeking, a generic category which includes seeking contact, proximity and/or interaction has been considered the hallmark of attachment. Dependency, on the other hand, has recently been defined (Ainsworth, 1969) as a class of behaviors learned in the context of her care of him and generalized to other caretakers. The main theoretical difference,

then, is that with attachment it is the object of the infant's behaviors which is important while dependency behaviors do not necessarily discriminate among objects but become differentiated according to what is sought. Operationally, however, the distinction is not that clear. Dependency has been defined as the seeking of attention, praise and approval, as well as physical contact, proximity and resisting separation.

Maccoby and Masters (1970), in an exhaustive review of research concerning both attachment and dependency concluded that many behaviors which had been used to define dependency did not in fact correlate with each other. Furthermore, two behaviors, proximity-seeking and attention-seeking had negative correlations and thus did not seem to represent the same construct. Further evidence supported the separateness of the two behaviors. For example, there is a decline in proximity-seeking with age but attention and approval-seeking behaviors, although their object changes, remain at a constant level and sometimes increase (Heathers, 1955; Martin, 1964; Sears, Rau, and Alpert, 1965). Fear arousal increases proximity-seeking in young children, but does not affect attention-seeking (Rosenthal, 1967a, 1967b). Attention-seeking operates according to the laws of stimulus generalizations whereas proximity-seeking does not (Heathers, 1955; Rosenthal, 1967a, 1967b). Aggression has been shown to correlate positively with attention-seeking, and negatively with proximity-seeking (Hartup, 1958; Hartup and Himeno, 1959; Faigan, 1958; Sears, Rau, and Alpert, 1965; Sears, Whiting, Noweles and Sears, 1953). They concluded therefore that proximity-seeking and attention-seeking can be independent operational definitions for the constructs of attachment and dependency, respectively.

In spite of the reported differences between the two classes of behavior, proximity-seeking and attention-seeking, however, they do not appear to be completely independent of each other. Furthermore, their relationship to and interactions with other classes of behaviors, for example, exploration, also appears to be complex. To date, there has been little research comparing the two behaviors within the same subjects and looking at their relationships with other classes of behavior. It has been felt (Ainsworth, 1969; Maccoby and Masters, 1970) that future research emphasis should be placed on tracing the developmental history of the two systems. Presently there is little evidence as to whether attachment and dependency are separate behaviors from the start, under the control of different elicitors and different maintaining conditions or if they start from the same primary basis in early life and become separate through the developmental process of differentiation. Since both attachment and dependency are important dimensions of the mother-infant relationship, their relationship to each other should be further explored.

Theoretical Basis of Attachment

Bowlby (1958, 1969, 1973) has developed an extensive theoretical framework in which to view the development of attachment. Since other researchers have interpreted their findings accordingly (Ainsworth, 1973; Ainsworth, Bell and Stayton, 1971, 1972), this theoretical approach will briefly be reviewed here. Attachment behavior is regarded by Bowlby (1969, p. 179) "as a class of social behavior of an importance equivalent to that of mating behavior and parental behavior. It is held to have a biological function specific to itself." There exist innate behavioral systems such as crying, and clinging, which when activated,

have proximity to mother as a predictable outcome. Attachment is the product of the activity of these systems. That is, these behavioral systems, during the course of development, become integrated and focused on the mother to form the basis of attachment. At some stage in the development of these behavioral systems, proximity to mother becomes the "set goal."

Bowlby hypothesizes that the infant's propensity to integrate behavioral systems to reach set goals is instinctive. Attachment behavior therefore has biological roots which can be understood only within the framework of evolutionary principles. During the course of evolution, behavioral equipment which gives survival advantages to the species is genetically transmitted. The behavioral systems themselves are not inherited; rather a potential to develop certain systems is inherited. In this case, the potential to develop attachment behavior would be advantageous for the young of a species since maintaining proximity to an adult member of the species would aid in protecting the young from danger. Therefore, the biological function of attachment behavior is, as is other instinctive behavior, individual and species survival.

The biological function of a behavioral system is served by achieving its "set goal." Attachment behavior has the set goal of bringing the infant and the adult into closer proximity or into actual contact with each other. This set goal will vary from occasion to occasion, according to the intensity with which an infant's attachment behavior is elicited. Also, once attachment behavior has been elicited it is possible for the older infant to either change the current set goal and/or the behavior system being employed to reach this goal. Thus, Bowlby refers to the attachment behaviors as goal-corrected behaviors. The

thesis of what he calls his "control-systems" theory is that behavior is determined, having set goals, but that the individual through a feedback system, can be versatile and flexible in achieving these pre-determined goals. The ability to correct goals and determine new ways of achieving them requires that the organism possesses a certain degree of cognitive complexity. Means of receiving and storing instructions regarding the set-goal, of comparing the effects of performance with these instructions and of being able to change current performance as necessary are all required. Thus, an infant is not born attached but rather is born with the potential to become attached to his primary caretaker. He is, however, born with a number of species-characteristic behavior systems, relatively independent of each other which emerge at different times in congruence with the infant's developing motor and cognitive skills and become organized towards a specific person on a goal-corrected basis.

Bowlby (1969) grouped specific forms of behavior which make up attachment on the basis of their effect: those which bring the mother to the child, signalling; and those which bring the child to the mother, approach. Signalling behaviors are crying, smiling, babbling, and trying to catch and hold the mother's attention. Approach behaviors include seeking, following, calling and clinging.

The activation of attachment behavior and the type of behavioral systems employed differs within one child from day to day and across individual children. Therefore, the infant, once attached, is predisposed intermittently to seek proximity to the object of attachment, according to Bowlby's theory. These predispositions may be conceived as having an inner, structural basis whose manifestations may be accessible to observation over time. As a child develops he will learn to

use alternate behaviors which will maintain interaction with mother but do not necessitate close physical proximity (Maccoby and Masters, 1972). There are certain conditions, however, which will predictably heighten attachment behavior. These have a continuity which support the hypothetical biological function of attachment. That is, an infant promotes and maintains proximity of an attachment figure during those times which he is most vulnerable to danger, or when danger is imminent. For example, conditions which have been found to activate attachment behavior are: distance from mother (Anderson, 1972); condition of the child, such as hunger and fatigue; whereabouts of the mother, that is, if she is present or absent (Ainsworth and Bell, 1970); and alarming or fearful events occurring in the environment such as a sudden loud noise (Rosenthal, 1967b). It has also been found that once attachment behaviors have been heightened, they return to normal as a function of the intensity of activation. For some individuals, however, these attachment behaviors may remain heightened indefinitely (Ainsworth, 1970). Attachment behaviors therefore can be activated and terminated by external and internal factors, yet attachment itself is considered enduring and thus not concomitant with attachment behaviors. In sum, Bowlby's view is thoroughly interactionistic; both learning and maturation determine the kind of behavioral systems utilized by any individual infant at any particular time.

Criterion of Attachment: Separation and
Stranger Anxiety

Ainsworth (1973), reviewing the different criteria used by researchers to measure attachment, indicated that in spite of numerous differences there is agreement on the general developmental phases

traversed by the human infant. The first phase is one of undifferentiated responsiveness to those around him. This is followed by a phase of discriminatory and differential social responsiveness to his major caretakers which in turn precedes a phase in which the infant becomes more active in initiating social interaction with these figures. During this last phase, infants begin to protest and become distressed when separated from the objects of their attachment, and sometimes become anxious in the presence of strangers, even when mother is present.

This separation protest and/or stranger anxiety was felt initially to be the major criterion of attachment. Schaffer and Emerson (1964) used parental reports of protest behavior to brief mother-child separations as the criterion for attachment in their extensive longitudinal study of Glasgow infants. They found that over half of the mothers interviewed reported infants who "protested" their separation at approximately seven months of age. Schaffer (1966) in fact suggested that onset of stranger anxiety can be used as a developmental milestone. However, Rheingold and Eckerman (1973) point out that Schaffer has been one of the few investigators in this field to observe such a high percentage of infants displaying stranger anxiety. They summarized the relevant literature and reported that many infants in studies of attachment did not cry or fuss in the presence of a stranger. In fact, in the majority of cases reviewed, less than one half of the infants observed exhibited stranger anxiety. They concluded, therefore, that stranger anxiety in and of itself does not seem to be a reliable indicator of attachment.

Ainsworth (1963, 1967) came to this same conclusion early in her observations of the development of attachment in Uganda infants. She reported that children could be attached without showing

conspicuous signs of protest over everyday separations. Further observations led her to conclude that the emergence of active initiative in maintaining proximity and contact with the attachment figure was a more reliable criterion for attachment. She found the emergence of this active initiative behavior to occur concurrently with the beginnings of protest over separation (when it existed) as well as with active greeting upon reunion and the use of the attachment figure as a secure base from which to explore.

Yarrow (1963, 1967) observed one hundred infants who necessarily had to be removed from their primary caretakers when being transferred to their adoptive mothers at eight months of age. He found that all showed "overt disturbance." However, only a small number of these had previously shown marked disturbance to temporary everyday separations. It seems then that neither anxiety or stranger anxiety appear uniformly with all infants during the second half year of life even though attachment can be said to exist.

There are also discrepancies reported concerning the developmental span of separation protest. Heinicke and Westheimer (1965) found no relationship between the intensity of protest and the child's age, ranging from one year, one month to two years, eight months. However, Shirley and Poyntz (1941) reported a decline in the proportion of children who protested mothers' departure beginning at the end of the second year with the most rapid decrease between the ages of four and four and one-half. Yarrow (1964) noted that there are not only differences in intensity and type of response to separation at different ages, but there are also a wide range of environmental conditions that influence separation protest.

In light of these findings it appears that separation anxiety and stranger anxiety cannot be used as the sole criterion for attachment. Ainsworth, Bell and Stayton (1972), realizing this, stressed that there is no single criteria of attachment which is an adequate index of the presence or absence of attachment. They prefer rather to talk of the quality of attachment in terms of proximity-seeking and contact-maintaining behaviors. Within the context of the quality of attachment, Ainsworth (1970, 1973) stressed the necessity of exploring individual differences and their relationships to patterns of mother-infant interactions. These would, assumedly, include separation and stranger anxiety. Further investigations should also explore how individual differences arise and how they are related to individual differences in other behavioral systems both concurrently and developmentally.

Insecure Attachment

Numerous studies have explored the antecedents and effects of behaviors which include intense and prolonged separation protest and stranger anxiety, these being lumped together under the construct of "overdependency." This term also includes pronounced clinging behavior and reluctance to move away from the attachment figure. Bowlby (1973) suggested that a better term for these behaviors is "anxious" or "insecure" attachment. He argued that insecure attachment develops when one has little confidence that his attachment figures will be accessible and responsive to him when he wants them to be. Support for this theory comes from data collected on short and long term reactions to mother-infant separations and loss, and from research concerning child-rearing antecedents of overdependency.

Tizard and Tizard (1971) contrasted a group of two-year-olds raised without permanent mother figures to those raised normally and found that the former group protested significantly more when separated from a caretaker, would cling more and were significantly more afraid of strangers. Children 18 months to 48 months who were hospitalized from one to seven days without their mothers were more clinging upon reunion and were more upset by temporary brief separations than a matched control group who had been accompanied by their mother to the hospital (Fagin, 1966). A follow-up indicated that these adverse effects were still evident one month later. Long-term follow-up studies (Bowlby, 1953; Bowlby, Ainsworth, Boston and Rosenbluth, 1965; Provence and Coleman, 1957; Schaffer and Collender, 1959) of mother-child-separations also suggest that "overdependent" behavior can be a lasting effect. Moore (1969) found that 30% of 223 infants under three years of age who had spent periods of a week or two away from their mothers displayed clinging behavior that lasted for a matter of weeks. He reported evidence that indicated these disturbances will persist or fade depending on the stability of the home prior to separation and the attitudes of the parents to the child's behavior.

Interviewing mothers who labeled their children "overindependent" (fearful of separation), Newson and Newson (1968) found that most of the children's separation fears were reality-based and that they had in fact experienced temporary separations from their mothers. Also, Bowlby stated that threats to abandon a child can have the same effects as actual separation. In fact, it has been found that a high degree of dependency is significantly correlated with the use of this type of disciplinary measure (Sears, Maccoby and Levin, 1957). Moore (1969)

isolated another possible causal factor in the development of over-dependence; unstable daily substitute care. He hypothesized that the less stable and predictable a child's regime the more anxious his attachment will be. This was supported by Stendler's (1954) finding that children chosen by teachers as being "overdependent" (most upset by mothers' departures) had backgrounds significantly more discontinuous and unstable than the control group and Blehar's (1973) that day-care infants were more anxiously attached than controls.

Ainsworth, Bell and Stayton (1971, 1972), based upon observations made in a laboratory situation, identified infants which they viewed as being "insecure" in their attachment. The laboratory situation, which lasted a maximum of twenty minutes, was divided into eight episodes which are summarized in Table 1. The infants were classified into groups according to their responses to their mother in the reunion episodes. Reunion behavior seemed to be more concurrently valid with the infants' typical responses to mother at home than measures of separation protest. Most of the infants observed in the laboratory had also been observed in the home (Ainsworth et al., 1972). In the reunion episodes, four types of infant-mother interactions were observed and rated: (1) proximity and contact seeking, (2) contact-maintaining, (3) proximity and interaction avoiding, and (4) contact-resisting. The classifications based on these results yielded three main groups with eight sub-groups. These groups were postulated to fall along a secure-insecure dimension of attachment. Classification according to exploration at home and in the laboratory yielded congruent results. That is, the babies displayed differences in the intensity and frequency of exploring away from mother

TABLE 1
OBSERVATION EPISODES

Episode	Duration	Participants	Description of Episode
1	3 minutes	Observer, mother, baby	M and B are accompanied into room by O, who immediately leaves. M has been instructed to use the time to get B acquainted with the room in whatever way she feels appropriate.
2	3 minutes	Mother, baby	At the sound of a rap on the door, M sits down in predesignated chair and remains there throughout the episode.
3	3 minutes	Stranger, baby, mother	S enters, sits, and converses with M. The two remained seated throughout the episode.
4	3 minutes ^a	Stranger, baby	S tries to interest B in a toy if B is distressed. S responds to any initiations of interaction of B.
5	2 minutes	Mother, baby	S leaves as M enters. M pauses in doorway to give B an opportunity to mobilize a spontaneous reply to her. No specific instructions were given to M, except that at the end of the second minute she would be called out of the room, and that she should say "bye-bye" before leaving.
6	3 minutes ^a	Baby	B is left alone for the duration of the episode.
7	3 minutes	Mother, baby	M enters, pauses as she did in Episode 5. No specific instructions are given her except that at the end of three minutes O would enter the room with further instructions.
8	9 minutes	Observer, mother, baby	O enters with a test booklet, and explains the directions to M. O also brings a novel toy (toddler bike) which he sets in square B. M and B are then left alone, with M instructed to work on the test. She is seated at her previously designated chair.

^aEpisode was curtailed if the baby became too distressed.

and seeking proximity to her. The balance between these two tendencies at home was related to this balance as observed in the strange situation.

It was also observed that mothers of infants in these groups differed significantly according to ratings on "degree on sensitivity" which had been previously obtained from home observations. Ainsworth et al. (1971) using both the mother-infant interactions observed at home and in the strange situation, were able to classify the infants into three groups: securely attached, insecurely attached, and detached. It appeared that to the extent that the mother has been sensitively responsive to the infant's communications, the securely attached baby would use his mother as a secure base from which to explore. However, the infant would still respond to stress with heightened attachment behavior and during these times proximity-seeking interfered with exploration. To the extent that mother-infant interaction has been disturbed by the mother's rejection, the infant became detached; that is, he responded to stress with defensive proximity avoiding-behavior. This infant might spend most of his time in exploration and tended to seek out his mother in this context less than the other two infant-groups. An infant became insecurely attached to the extent that mother-infant interaction had been made disharmonious through the mother's psychological neglect. These infants reacted with great distress in the separation episodes and with ambivalence to their mothers in reunion episodes. Also, attachment behaviors remained heightened after separations, thus distorting the attachment-exploration balance.

In conclusion, it does not appear useful to discuss presence or absence of attachment but rather the quality of attachment. The research to date indicates that attachment can vary along a security-insecurity

dimension. Where a child falls on this dimension also seems to affect the amount of time spent in exploration, the ability to tolerate brief separations, and fear of the unknown. This in turn has important implications for the development of independence and self-reliance (Bowlby, 1973).

Attachment-Exploration Balance

It has been found that one of the conditions which facilitates approach and exploration of the novel is proximity to the object of attachment. Conversely, a condition which inhibits exploration of the novel is anxiety (Mendel, 1965). Infants use their mothers as secure bases from which to explore and in their absence will explore significantly less (Arsenian, 1943; Cox and Campbell, 1968; Ainsworth and Wittig, 1969; Ainsworth and Bell, 1970). Rheingold and Eckerman (1970) pointed out the psychological advantages of "detachment" behavior, that is, the infant's departing from the mother, and argued that it should not be viewed as a negation of a child's attachment. By departing from mother a child increases his store of new perceptions, gains new opportunities to learn what can be done with an object through manipulation and thus increases his techniques for controlling external events.

Bronson (1971) depicted the behavior of a one-year-old as being directed towards (1) maintaining proximity to mother, (2) approaching the novel, (3) avoiding the too unfamiliar and (4) obtaining the effects that are contingent on his own actions (effectance). Optimum functioning, therefore, would be a dynamic equilibrium of these motivating factors. Other researchers (Anderson, 1972; Rheingold and Eckerman, 1971) have also maintained that exploration (approaching the novel) and effectance

are not antithetical to all attachment behaviors, but rather are facilitated by them. Those attachment behaviors which interfere with exploration, and therefore effectance, are searching for the absent mother, protest and apathetic behaviors, and "heightened" attachment behaviors to the present mother, like clinging and attention-seeking. Other attachment behaviors such as looking at, maintaining proximity with, and calling to the mother do not interfere with exploration and tend to be interspersed with exploratory activities in a free play situation (Anderson, 1972; Rheingold, 1963). They are an essential part of the young infant's exploration.

Primate studies have yielded comparable findings. Harlow (1959, 1961) found that rhesus monkeys will explore more in the presence of a cloth mother-surrogate than without one. If the infant monkey was isolated for 250 days immediately after birth and then was placed with the surrogate-mother, the infant explored very little in an open field test. Even while the infant was in the presence of its mother-substitute he preferred to spend most of his time clinging and remaining close to it. Other studies (Spencer-Booth and Hinde, 1966; Kaufman and Rosenblum, 1967) found that, after reunion with mothers following short-term separations, infant monkeys clung to them more and explored less than they had prior to separation. These effects lasted for three months or more.

It appears, therefore, that secure attachment is a strong facilitator of exploration which in turn leads to the learning of effective ways of dealing with one's environment. An insecure attachment, however, leads to behaviors which inhibit this exploration and thus interfere with the learning of effectance. Hypothetically, then, the insecurely attached child would become more dependent, both instrumentally and emotionally,

on those around him while the securely attached child would show more signs of "independence" and self-reliance (Bowlby, 1973).

Statement of the Problem and Hypotheses

As the theoretical derivation of attachment from dependency is quite recent, their relationship has not been explored much experimentally. It does appear that they are related developmentally. Accepting that attachment is a biological predisposition at birth developing fully in the relationship with the primary caretaker, dependency begins as a biological necessity and also develops in the course of the relationship to this same person. Since the quality of the attachment relationship seems extremely important to the child's development in other areas, for example exploration, and even cognitive functioning (Bell, 1970) it is hypothesized that quality of attachment is also related to the development of dependency. If the child's attachment is insecure, whether as a result of separations from mother, child-rearing practices, or discontinuous caretaking, it seems to heighten dependency behaviors, one of them being attention-seeking, which in turn interferes with exploration. A secure attachment on the other hand promotes exploration and increases independence. Since attachment has been studied effectively in the strange situation, it seems that this would be a worthwhile approach to utilize in the study of the interrelationships of attachment, dependency and exploration.

Although the normative developmental trends of attachment behavior are known, comparable norms are not available for dependency behaviors, specifically attention-seeking. When attachment is fully emergent in the infant (taking the initiative to seek proximity to the mother), the extent of attention-seeking behavior is not known. One of the purposes of this

study was to operationally differentiate proximity-seeking and attention-seeking by manipulating the mother's behavior for a time so that the child, to initiate interaction with her, would first have to gain her attention. This manipulation thus made it possible to get an idea of the average amount of time an infant spends trying to gain mother's attention. Even though the strange situation is one which may arouse fear in the infant, this was not expected to affect attention-seeking behaviors (Rosenthal, 1967b); therefore, the amount of infant attention-seeking in the laboratory should be an indication of the child's normal behavior at home. However, since fear arousal has been found to heighten proximity-seeking, it was expected that this behavior would remain high for all infants and would not be correlated with attention-seeking.

This study was also designed to look at individual differences in attention-seeking, and to relate differences in dependency to exploration and attachment behaviors. Since overdependent behaviors are believed to interfere with exploration it was hypothesized that high attention-seekers would recover less easily from mother-separations and would therefore explore less than low attention-seekers. Since the recovery time from the brief separations in the strange situation has never been measured, this was, in a sense, a normative study of that also. It was hypothesized that the level of post-separation exploration would reach that of pre-separation quickly following a reassuring reunion episode with mother. High attention-seekers were predicted to deviate from this.

Since insecure attachment has been related to overdependency, it was hypothesized that criterion measures used to assess the quality of attachment would be related to the measure of dependency.

Categorizing infants according to the criteria for assessing the quality of attachment established by Ainsworth et al. (1972) was also expected to predict high and low attention-seekers. No sex differences in attachment or dependency were expected. Finally, while this study was not an attempt to isolate determinants of insecure attachment and dependency, the availability of relevant data suggested a final hypothesis. Because mother-care and short-term mother separations are possible causes of over-dependency, it was hypothesized that maternal employment during the infant's first year would be related to measures of the infant's attachment and dependency.

Specifically, the hypotheses for the present study were:

1. Groups which were formed on the basis of quality of attachment would differ in the frequency and type (proximal and distal) of attention-seeking behaviors exhibited following the strange situation procedure:

- a. Insecurely attached infants would exhibit more proximal attention-seeking behaviors than the other two groups.
- b. Detached infants would exhibit less of both types of attention-seeking behaviors than the other two groups, but within the group were predicted to use distal attention-seeking more than proximal attention-seeking.

2. These groups were predicted to differ also in the level of restoration of exploration following the strange situation procedure. The insecurely attached group would restore their level of exploration the least, and the detached group would restore their level of

exploration to preseparation levels. The securely attached group were expected to explore more than the insecurely attached group but not at preseparation levels.

3. No sex differences were expected in any of the measures of attachment, dependency or exploration.

4. Employment of mother was expected to predict insecure attachment and thus high proximal attention-seeking.

CHAPTER II

METHOD

Subjects

Subjects included 36 mothers and their infants. The names of possible subjects were acquired from the Grand Forks, North Dakota newspaper which reported all births in the community. Letters were sent to over 200 parents, who were subsequently phoned with the request that they participate in the study. Of approximately 100 of those parents who expressed a willingness to participate, 20 male and 20 female infants, between the ages of 11 and 14 months were chosen according to the following criteria: the infant was walking, the mother was able to provide her own transportation to the experimental setting, and the mother was free to participate within a specified two week period between the hours of 9:00 A.M. and 9:00 P.M. Due to illness or inability to keep scheduled appointments, four of the subjects were eliminated from the study, so that the final subjects were 19 female and 17 male infants.

Observers

Three upper-class undergraduate students majoring in psychology acted as observers. They worked in shifts of two, each putting in an equal amount of time. Research credit was earned by them for their participation. The observers were trained before hand in the technique of objective narrative recording. The training consisted of

mock mother-infant interactions in which each observer recorded the behaviors as if it were the experimental trial. An emphasis was placed on their recording of the infant's location, the direction of the infant's looking, smiling, locomotion, and vocalization. An abbreviation code was devised and they were trained to record this information using as few words as possible.

Experimental Setting

A 9' by 20' room served as the setting for the experiment (see Figure 1). Two doors open into the room. A chair was placed next to each door, one designated "mother chair" and the other "stranger chair." The room was chalked off into eight 4 1/2' by 5' squares and labelled with alphabetical letters for the observers' benefit. Initially, a number of age-appropriate toys, such as stuffed animals, dolls and educational toys that were designed to facilitate infant-manipulation were scattered in blocks A, B, C and D. There was also a six-foot air-filled clown in the far corner of E square. At the beginning of the final episode a novel toy, which was a small toddler trike, was placed in block B by the experimenter to reinterest the child in exploration.

The two observers sat behind a 4' by 7' two-way mirror adjacent to squares E and F.

Procedure

Individual appointments were set up for each mother-child pair. Upon arrival the mother was presented with written instructions (included in Appendix A) concerning her role in the strange situation. These instructions were then discussed with the mother. After the experimenter was sure the instructions were understood, the mother and her baby

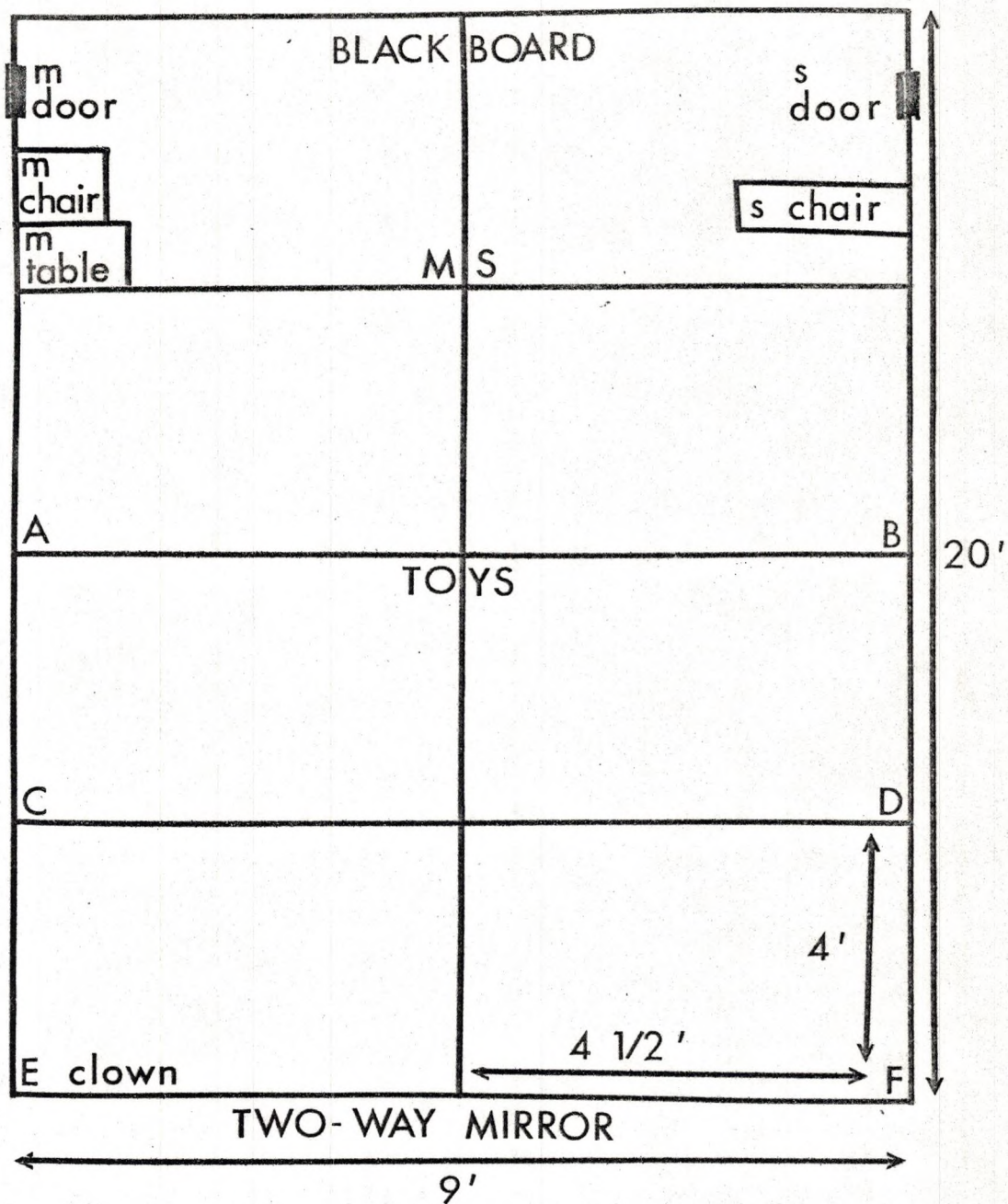


Fig. 1. Experimental Setting.

participated in the procedure outlined in Table 2. Any questions concerning the nature of the experiment were deferred until the episodes were completed.

This procedure was a slight modification of the strange situation devised by Ainsworth and Wittig (1969) (see Table 1, page 12). It included two brief separations from the mother and two subsequent reunions. A reunion with the stranger after separation from mother, which was part of Ainsworth and Wittig's procedure, did not seem necessary in the present study and was omitted. The eighth episode, however, was an addition. This episode was designed to provide an opportunity to differentiate between the infant's attachment behaviors and his attention-seeking behaviors. Its length also permitted examination of the reinstatement of exploration following its disruption.

The behaviors of the subjects were observed from an adjoining room through a two-way vision mirror. They were able to hear and record the content of any vocalizations. The mothers were informed of the presence of the observers and were told that they would be recording her infant's behavior. Reel-to-reel tape recorders were used by the observers for their narrations. Head phones were available but during the training the observers felt that they were not necessary and chose to work without them. During the actual procedure, if the mother was present, one observer concentrated on her behaviors, otherwise both recorded the infant's activities.

When all the mother-infant pairs had been observed, two independent workers, one of whom was the experimenter, transcribed each tape and blocked them into 15 second intervals with the use of a stop-

TABLE 2

STRANGE SITUATION EPISODES

Episode Number	Duration	Participants	Description of Episode
1	3 minutes	Observer, mother, baby	Observer ushers mother and baby into the room, then leaves. M uses this time to familiarize B with the room in any way she chooses.
2	3 minutes	Mother, baby	M sits down on a predesignated chair and remains there throughout the episode. B is free to explore.
3	3 minutes	Stranger, mother, baby	S enters, sits quietly for a moment, then talks with M. S approaches B gradually with a toy and M leaves.
4	3 minutes ^a	Stranger, baby	S tries to interest B in a toy if B is distressed. S responds to any initiations of interactions with B.
5	2 minutes	Mother, baby	S leaves as M enters. M pauses at door until B has mobilized a response. M comforts B if distressed and then tries to interest him in toys.
6	3 minutes ^a	Baby	M says "bye-bye" to B and leaves him alone for the duration of the episode.
7	3 minutes	Mother, baby	Same as episode 5.
8	9 minutes	Observer, baby, mother	Observer enters with a test booklet, explains the directions to M. O also brings a novel toy (toddler trike) which he sets in square B. M and B are then left alone, with M instructed to work on the test. She is seated at her previously designated chair.

^aEpisode was curtailed if the baby became too distressed.

watch. The transcriptions were then consolidated into one comprehensive narrative (a sample protocol is included in Appendix B).

Measures

The experimenter coded the narrative recordings and obtained frequencies of locomotor, manipulatory and visual exploration, crying, oral behavior, touching of mother, smiling and attention-seeking behaviors. These behavior categories are those devised by Ainsworth and Bell (1970) for coding the specific behaviors exhibited in the strange situation, with the exception of attention-seeking. Her category definitions were used in the present study.¹ Generally, the category of exploratory locomotion included locomoting in order to reach and explore objects in the environment. That is, if the infant's locomotive behavior resulted in his looking at, picking up or vocalizing to objects in the environment, excluding mother and/or stranger and objects associated with them, it was scored as exploratory locomotion. If the infant was crying or whining while locomoting it was not scored if the infant was searching for his absent mother.

Manipulatory exploration included the reaching for, picking up or manipulating objects in the environment. If the infant had picked up an object and subsequently held on to it without attending to it this touching was not considered exploratory manipulation. Any banging, pushing or pulling of an object was included in this category. Visual orientation and smiling were coded according to the object of the infant's physical environment. If the infant was attending to a

¹For complete category definitions, write: Orders NAPS Document 00762 from ASIS National Auxiliary Publications Service, c/o CMM Information Sciences, Inc., 22 West 34th Street, New York, New York 10001.

toy or other parts of the physical surroundings this was scored visual exploration. Any attending to objects associated with mother in her absence was not included in this category. Crying included long uninterrupted crying behavior as well as short intermittent cries and whining. Oral behaviors included the sucking and chewing of toys, thumbs, pacifiers and nipples.

Attention-seeking was defined as any behavior which was an attempt to initiate interaction with the mother. These behaviors were coded as attention-seeking only in the last episode since the mother was preoccupied and the infant, to gain her attention had to seek it actively. A distinction was made between proximal attention-seeking and distal attention-seeking. Proximal attention-seeking behaviors included any physical effort on the infant's part to elicit a response from the mother. This category included such behaviors as pulling on and clinging to mother as well as trying to remove the object of her attention. The category of distal attention-seeking included vocalizations of the infant or other noises and gestures were emitted in an attempt to elicit a response from mother. Therefore, these behaviors were coded as such only if the infant visually checked for the mother's response during or immediately after emitting them.

To arrive at a statistical summary, a score of one was given for each of the behaviors in each 15-second time interval in which they occurred. The maximum score for a behavior for an episode was 12 since the standard length of an episode was three minutes and the scores of the shorter episodes were prorated into three minute frequencies. Frequency measures were obtained for episodes two through eight. Product-moment reliability coefficients for two independent

coders for five randomly selected cases were as follows: exploration, .92; manipulation, .94; visual orientation, .84; crying, .99; touching, .98; oral behavior, .85; and attention-seeking, .95.

The narrative recorded also yielded a second type of measure based upon detailed coding of behaviors in an episode in which the mother's or stranger's behavior (only in the third episode) was also taken into consideration. These were scaled measures ranging from 1 to 7, which according to Ainsworth et al. (1971) reflect different degrees of intensity. There were six such classes of behavior.

Proximity- and contact-seeking behaviors. This score reflected the intensity and persistence of the infants' attempts to gain proximity to the adult. An episode was scored seven when the infant both took the initiative in gaining contact and was effective in doing so on his own account while a score of one indicates that the infant paid little attention to the adult during the episode. Proximity-seeking was scored in episodes two, three, four, five, and seven.

Contact-maintaining behaviors. This score was determined by the efforts made by the infant to maintain contact once he has gained it. This included such behaviors as clinging, embracing, clutching as well as protesting release vocally. When these behaviors resulted in contact lasting over two minutes an episode was scored seven while a score of one indicates that the child neither touched or was held by the adult during the episode. The relevant episodes for scoring this behavior were two, three, four, five, seven and eight.

Proximity and interaction-avoiding behaviors. This score reflected the intensity, persistence, duration and promptness of the infant's avoidance of proximity and interaction. Examples of these

behaviors would be turning away, averting the gaze, hiding the face or simply ignoring the adult. When these behaviors were persistent despite the adults' efforts to attract his attention the episode received a score of seven. A score of one was given for the nonoccurrence of these behaviors. The relevant episodes for the scoring of these behaviors were four, five and seven.

Contact- and interaction-resisting behaviors. This score is an indication of the intensity and persistence of angry responses elicited by the adult's attempts at interaction. Such behaviors included in the scaling were pushing away, hitting and kicking either the adult or objects in the environment as well as angry screaming or cranky fussing. An episode was scored seven when two or more such behaviors were intense and repeated while the absence of such behaviors was scored one. Episodes four, five, and seven were scored for this behavior.

Distance Interaction. The positive social behaviors of the infant to the adult which indicated that he was interested in her even though not in close proximity to her was also scaled. An episode was scored seven in which a reciprocal interaction between infant and adult occurred at a distance for 45 seconds or more or when two such briefer interactions occurred. When either the child was in close contact to the adult during the episode or when there was no tendency to interact with her the episode was scored one. The reunion episodes were coded only according to the baby's initial response to mother because the location of the mother was not standard during the result of the episode. Distance interaction was scored for episodes two, three, four, five and seven.

Search behavior. This was scored during those episodes (3 and 5) in which the mother was absent. An episode was scored seven when the infant went to the door of his mothers' departure immediately, and persistently and actively attempted to open it. When the infant neither looked at the door, at the mother's chair or at her purse, a score of one was given to the episode.

Reliability coefficients for two independent scorers for five randomly selected cases were as follows: proximity and contact seeking, .97; contact-maintaining, .99; proximity and interaction avoiding, .99; contact-resisting, .99; search, .99; and distance interaction, .98.

Finally, after the coding and scaling of the protocol was completed, each infant was classed in one of three categories. The criteria were those outlined by Ainsworth and Bell(1970) to reflect quality of infant-mother attachment. The characteristics of these groups are summarized below.

Group A infants showed little tendency to seek proximity or contact with their mothers and they manifested proximity avoiding and resisting behaviors during the reunion episodes. In spite of the mothers' efforts to attract their attention, these infants ignored the mother's return or mingled a casual greeting with clear-cut avoidance. Their treatment of the stranger was not much different from that of the mother except that they avoided the stranger somewhat less.

Group B infants responded to the mother's return in reunion episodes with tendencies to approach, seek physical contact and/or social interaction. These babies were active in initiating interactions with mother and were clearly less interested in the stranger than the mother.

Group C consisted of infants who showed maladaptive behaviors in the strange situation. They were clearly ambivalent to the mother during the reunion episodes and showed little interest or enjoyment of exploration in the pre-separation episodes. Their reactions to their mothers' departures were either quite passive or else they seemed upset at being left alone rather than at being separated from mother.

One judge, using the original protocol of mother-infant interactions either classified an infant as Securely Attached (Group B), Detached (Group A) or Insecurely Attached (Group C). The emphasis was placed on behaviors which occurred in the reunions and the last nine minutes of the protocol were ignored. There were 7 Detached, 22 Securely Attached and 7 Insecurely Attached infants. An independent judge classified a random 16% of the infants in the same manner. Inter-judge agreement was 100%.

CHAPTER III

RESULTS

The primary hypotheses of this study concerned the interrelationships among attention-seeking, exploratory and attachment behaviors as well as scaled scores for attachment behaviors which were obtained for all of the episodes. However, frequencies of attention-seeking behaviors were obtained only during the last episode, which lasted nine minutes. Since all other episodes lasted only three minutes, or the frequencies were prorated for three minutes, this last episode was subdivided into three three-minute segments. Furthermore, although the seven episodes constituted a logical behavioral sequence, they were redundant experientially. That is, the mother and infant were both present during episodes one and two; the mother was absent during episodes three and five; episodes four and six were both reunion episodes. Therefore, the episodes were combined into four phases: Phase I, mother present; Phase II, mother absent; Phase III, reunion; and Phase IV, the last episode, during which the mother was occupied. Frequencies of behaviors were averaged across the number of three-minute segments which were combined into each phase.

Appendix C contains the mean frequencies and standard deviations for all attachment and exploratory behaviors for all relevant phases. The means and standard deviations of the frequencies of distal and proximal attention-seeking behaviors for each segment and for the

average of the segments of the last episode (Phase IV) are shown in Appendix D. Finally, the numbers of mother-infant pairs falling above and below the mean scale value (3.5) for each of the scaled categories are presented in Appendix E.

A Pearson product moment correlation was used to test for the degree of association between distal attention-seeking and proximal attention-seeking ($r = -.05$; $N=36$; $p > .20$). Since these two behaviors were not associated, they were treated independently in subsequent analyses.

Relationships between attention-seeking behaviors and attachment behaviors as well as exploratory behaviors were examined. Point-biserial correlations were used to test the degree of association between attention-seeking and the infant's proximity-seeking behaviors. Median frequencies of proximity-to-mother behaviors and touching-mother behaviors were calculated for each phase (for the former: Phase I, 21.8; Phase III, 23.5; Phase IV, 34.8; and for the latter: Phase I, 0; Phase III, 5.5; Phase IV, 2.1; Phase II was omitted because the mother was absent). Infants were divided into two groups for each phase, those exhibiting more than the median frequency of each behavior and those exhibiting less. Attention-seeking was treated as the continuous variable. The resultant point biserial correlations are presented in Table 3. As hypothesized, proximity-to-mother behavior was not significantly correlated with attention seeking. However, touching-mother behavior was significantly and negatively correlated with total attention-seeking behavior in Phase III while it was positively correlated with proximal and total attention-seeking in Phase IV.

TABLE 3

POINT BISERIAL CORRELATIONS BETWEEN ATTENTION-SEEKING AND
INFANT-MOTHER BEHAVIORS

Phase	Proximal	Attention-seeking		Total
			Distal	
Proximity-to-mother				
I. Mother present	-.165		-.062	-.080
II. Reunion	-.143		-.111	-.082
IV. Mother Occupied	.046		-.337	-.167
Touching mother				
I. Mother present	.170		.073	.056
II. Reunion	.268		.164	-.432 ^a
IV. Mother Occupied	.421 ^a		.313	.479 ^a

^a_p <.01

The relationship between attention-seeking and mother-separation distress, as indicated by crying and search for mother in her absence, was also examined using point biserial correlation. Median frequencies of crying and of search behavior (Phase II only) were calculated for each phase (for the former: Phase I, 0; Phase II, 3.0; Phase III, .5; Phase IV, .4; and for the latter: Phase II only, 3.5). As before, infants were separated into two groups for each phase, those exhibiting more than the median frequency of each behavior and those exhibiting less and attention-seeking was treated as the continuous variable. The resultant correlations are presented in Table 4. It was hypothesized that separation distress behaviors would be positively correlated with attention-seeking. Crying was significantly and positively related to total attention-seeking behavior in Phase IV and approached significance in Phase I (.05 < p < .10). The relationship between proximal

TABLE 4

POINT BISERIAL CORRELATIONS BETWEEN ATTENTION-SEEKING AND
MOTHER-SEPARATION DISTRESS AND SEARCH

Phase	Attention-seeking		Total
	Proximal	Distal	
Crying			
I. Mother Present	-.016	.069	.302
II. Separation	.053	.054	.090
III. Reunion	.059	.125	.148
IV. Occupied	.244	.148	.484 ^a
Search			
II. Separation	.279	.020	.452 ^a

^a_p <.01

attention-seeking and search for mother in her absence also approached significance ($.05 < p < .10$) while the relationship between total attention-seeking behavior was positive and significant.

Point biserial correlations were also used to examine the relationship between attention-seeking and the scaled attachment behaviors. The median scaled scores of each attachment behavior for each phase in which they had a possibility of occurring were obtained. For each phase, infants were divided into two groups, those who had obtained a scaled score above the median and those whose score fell below the median. Attention-seeking was treated as the continuous variable. The median scores are shown in Table 5 while the resultant point biserial correlations are presented in Table 6. Attention-seeking was not significantly correlated with any of the scaled attachment behaviors in Phase I. None of the behaviors scaled during the reunion phase were

TABLE 5

MEDIAN FREQUENCIES OF THE SCALED ATTACHMENT BEHAVIORS

	Phase I	Phase III	Phase IV
Distance Interaction	4.5	2.5	N/A ^b
Gain Proximity	2.0	4.0	N/A ^b
Maintain Proximity	1.0	2.5	1.5
Avoid Proximity	- ^a	2.0	N/A ^b
Resist Proximity	- ^a	4.0	N/A ^b

^aAinsworth et al. (1971) found these behaviors to occur so infrequently prior to mother-infant separations that they were not computed in Phase I of the present study.

^bOnly maintaining proximity was scored for Phase IV due to definition of the experimental conditions.

TABLE 6

POINT BISERIAL CORRELATIONS BETWEEN ATTENTION-SEEKING AND ATTACHMENT BEHAVIOR

	Proximal	Attention Seeking Distal	Total
Phase I			
Distance Interaction	-.294	.183	-.097
Gain Proximity	.011	.182	.154
Maintain Proximity	.026	.175	.107
Phase III			
Distance Interaction	-.326	.063	-.240
Gain Proximity	.297	.607 ^a	.303
Maintain Proximity	.317	-.152	.164
Avoid Proximity	-.474 ^a	.036	-.341 ^b
Resist Proximity	.162	.174	.280
Phase IV			
Maintain Proximity	.444 ^a	.223	.622 ^a

^a_p <.001

^b_p <.01

significantly correlated with proximal attention-seeking. However, all of them, with the exception of resisting proximity, approached significance ($.05 < p < .10$). This type of attention-seeking was, in fact, negatively correlated to avoiding proximity at a significant level. Also, during this phase, distal attention-seeking was negatively and significantly correlated with gaining proximity. The only significant relationship found between total attention-seeking during the reunion phase was a negative one with avoiding proximity. Finally, only one scaled attachment behavior had been obtained in Phase IV, that of maintaining proximity. This behavior was found to be positively and significantly related to both proximal and total attention-seeking.

The relationship between attention-seeking behavior and exploratory behavior was examined using Pearson product moment correlations. Separate correlations were computed between proximal and distal attention-seeking and the exploratory behaviors of manipulation, locomotion and visual exploration across all four phases. The resultant correlations are presented in Table 7. It had been hypothesized that the relationship between attention-seeking and exploration would be a negative one. However, there was one positive correlation between distal attention-seeking and locomotion in the reunion phase. There were no other significant associations between either type of attention-seeking behavior and exploratory behavior in both the first phase (Mother Present) and the third (Reunion). However, in Phase II (Separation), and Phase IV (Mother Occupied), proximal attention-seeking had significant negative correlations to each of the exploratory behaviors. Distal attention-seeking was negatively correlated to visual exploration in Phase IV at a significant level. Both separation from mother and

removal of her attention appear to be conditions which inhibit exploration for the proximal attention-seeker. However, only visual exploration is negatively affected for the distal-attention-seeker and only in the condition where mother is present but not attending to the infant.

TABLE 7

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN ATTENTION-SEEKING
AND EXPLORATORY BEHAVIORS

Phase	Locomotion		Manipulation		Visual Exploration	
	Proximal	Distal	Proximal	Distal	Proximal	Distal
I	.006	.067	.015	.126	.001	-.181
II	-.302 ^a	.051	-.297 ^a	-.138	-.335 ^a	-.180
III	-.116	.307 ^a	-.163	-.040	-.140	-.168
IV	-.354 ^a	-.006	-.547 ^b	-.111	-.403 ^c	-.429 ^b

^a_p < .05

^b_p < .005

^c_p < .01

The Kruskal-Wallis one-way analysis of variance by ranks was used to test whether the three groups which had been classified according to quality of attachment differed in respect to frequency of attention-seeking behaviors. Three separate analyses were computed, ranking the infants according to emitted number of proximal, distal, and total-attention-seeking behaviors. The infants were ranked from 1-36 on each of these measures, ties receiving the median rank score. Due to the large number of ties a correction for ties was incorporated into the analyses. The resultant Kruskal-Wallis analyses are presented in Table 8. The results of the analyses warrant rejection of the null hypothesis that there were no differences between the groups with

TABLE 8

KRUSKAL-WALLIS ANALYSIS OF VARIANCE: ATTENTION-SEEKING

Groups	Sum of Ranks	Mean Ranks	H
Proximal Attention-Seeking			
Detached	81.5	11.64	
Securely Attached	422.0	19.18	30.29 ^a
Insecurely Attached	169.5	22.78	
Distal Attention-Seeking			
Detached	142.0	20.29	
Securely Attached	431.0	19.13	119.59
Insecurely Attached	117.0	16.71	120.5 ^{bc}
Total Attention-Seeking			
Detached	92	13.14	
Securely Attached	426	19.36	3.04
Insecurely Attached	139	19.83	3.14 ^c

^a_p <.001

^b_p <.01

^cCorrected for ties

respect to the median number of proximal and distal attention-seeking behaviors exhibited. Examining the mean ranks presented in Table 8, it appears the specific hypothesis that Insecurely Attached infants would exhibit more proximal attention-seeking behavior than the other two groups was supported. However, it also appears that Detached Infants exhibited more distal attention-seeking behaviors than the other groups, not less as had been hypothesized.

The sign test (Siegel, 1956) was used to determine whether there were differences between the type of attention-seeking behavior exhibited

within each group. As the direction of the differences had been predicted for the Detached and Insecurely Attached groups (the former was expected to exhibit more distal than proximal types of attention-seeking while the reverse was expected for the latter) a one-tailed test was utilized for these groups. A two-tailed test was utilized for the Securely Attached group. The resultant probabilities associated with the number of differences between proximal and distal attention-seeking behaviors for each of the groups were: Detached, $N=6$, $p=.344$; Securely Attached, $N=22$, $p=.524$; and Insecurely Attached, $N=7$, $p=.227$. The hypotheses were not supported.

A secondary purpose of this study was to examine the reinstatement of exploratory behaviors following mother-infant separations. Three three-way unweighted means analyses of variance (sex of subject, maternal employment, phase) with repeated measures on one factor (phase: I, II, III, IV) and unequal n were employed, one each for locomotion, manipulation, and visual exploration scores. The results of these analyses are summarized in Table 9. As can be seen, the main effects for sex of subject and maternal employment were not significant. However, the phase main effect was significant in all three analyses, and the mean frequency for each behavior for each phase is reported in Table 10. In addition, Newman-Keuls tests (Winer, 1971) were used to make internal comparisons among the means for each behavior. For locomotion, manipulation and visual exploration there was a significantly higher occurrence of the behavior ($p < .05$) when mother was present, Phase I than in her absence (Phase II). Also, the infants explored significantly more visually in the reunion phase and mother-occupied phase than they did in Phase II ($p < .05$). In

TABLE 9

THREE WAY ANALYSES OF VARIANCE: EXPLORATORY BEHAVIOR

Source	Sum of Squares	df	Mean Squares	F
Locomotion				
Between	6.638	1	.638	.110
Sex of Infant (A)	6.554	1		1.129
Mother Employment (B)	2.445	1		.421
AxB				
Error Between	179.914	32	5.804	
Within				
Phase (C)	62.786	3	20.929	12.172 ^a
AxC	2.519	3	.840	.488
BxC	13.352	3	4.451	2.588
AxBxC	219.013	3	3.004	1.747
Error Within	159.902	93		
Manipulation				
Between				
Sex of Infant (A)	5.388	1	5.388	.700
Mother Employment (B)	1.086	1	1.086	.141
AxB	.479	1	.479	.062
Error Between	238.731	32	7.701	
Within				
Phase (C)	181.395	3	60.465	15.537 ^a
AxC	17.750	3	5.917	1.520
BxC	14.956	3	4.985	1.281
AxBXC	16.938	3	5.666	1.456
Error Within	361.938	93	3.892	
Visual Exploration				
Between				
Sex of Infant (A)	.009	1	.009	.001
Mother Employment (B)	4.496	1	4.496	.647
AxB	.641	1	.641	.092
Error Between	215.491	32	6.951	
Within				
Phase (C)	259.375	3	86.458	24.305 ^a
AxC	4.512	3	1.504	.423
BxC	10.899	3	3.633	1.021
AxBxC	25.397	3	8.466	2.380
Error Within	330.828	93	3.557	

^ap <.001

TABLE 10

MEANS AND STANDARD DEVIATIONS OF EXPLORATORY BEHAVIOR ACROSS PHASES

Phase	Locomotion		Manipulation		Visual Exploration	
	Means	S.D.	Means	S.D.	Means	S.D.
Mother Present	3.2	2.0	6.5	2.2	9.7	1.5
Separation	1.4	1.2	3.4	2.0	6.7	2.9
Reunion	2.1	1.7	4.8	1.7	8.2	1.8
Mother Occupied	2.7	1.5	5.7	2.6	9.2	1.8

none of these behavior categories was there a significant difference between Phase I and Phase IV. Therefore, it is reasonable to conclude that the infant's exploration balance is restored to approximate pre-separation levels after being distorted by brief mother-separations. The trend of these results is illustrated in Figure 2. Exploratory behaviors are at their peak occurrence in Phase I, decline to their lowest frequency in Phase II and then gradually increase, reaching near Phase I levels.

Three further three-way unweighted means analyses of variance (sex of subject, maternal employment, phase) with repeated measures on one factor (phase: I, II, III, IV) and unequal n were computed, one each for crying, oral behavior and vocalization scores. The results of these analyses are presented in Table 11. Again, the main effects for sex of infant and maternal employment were not significant. The phase main effect was significant for vocalization, which followed the same trend across phases as that of exploratory behaviors. Mean frequency of vocalization was the highest in Phase I (2.80), the lowest in Phase II (1.23) and then gradually increased (Phase III, 1.68;

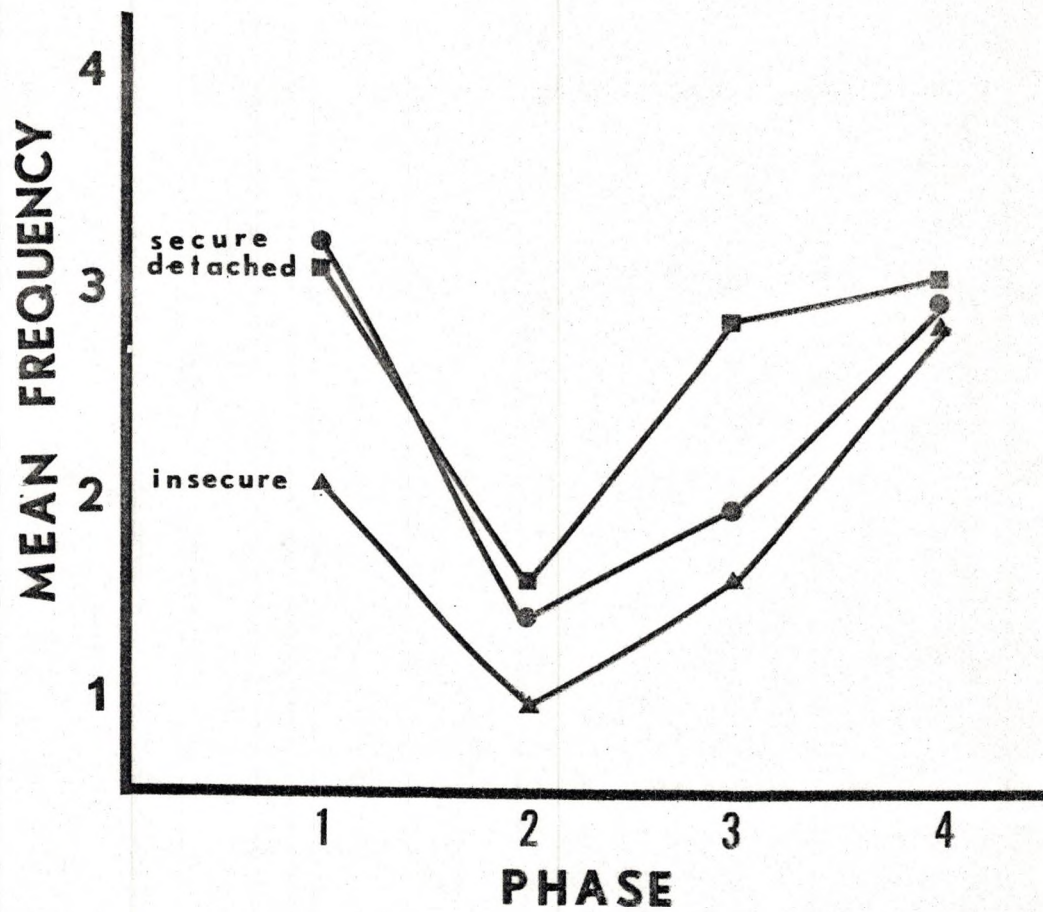


Fig. 2. Locomotion of Attachment Types in the Strange Situation.

TABLE 11

THREE WAY ANALYSES OF VARIANCE: INFANT BEHAVIOR

Source	Sum of Squares	df	Mean Squares	F
Crying				
Between				
Sex of Infant (A)	1.266	1	1.266	.622
Mother Employment (B)	1.903	1	1.903	.953
AxB	.006	1	.006	.003
Error Between	63.069	32	2.034	
Within				
Phase (C)	130.020	3	43.340	53.352 ^a
AxC	3.273	3	1.091	1.343
BxC	1.965	3	.655	.806
AxBxC	6.146	3	2.049	2.522
Error Within	75.547	93	.812	
Vocalization				
Between				
Sex of Infant (A)	16.311	1	16.311	3.707
Mother Employment (B)	1.247	1	1.247	.283
AxB	16.651	1	16.651	3.784
Error Between	136.405	32	4.400	
Within				
Phase (C)	59.413	3	19.804	9.804 ^a
AxC	12.973	3	4.331	2.144
BxC	14.830	3	4.943	2.447
AxBxC	3.180	3	1.060	.525
Error Within	187.869	93	2.020	
Oral Behaviors				
Between				
Sex of Infant (A)	33.440	1	33.440	2.560
Mother Employment (B)	46.365	1	46.365	3.549
AxB	13.430	1	13.430	1.028
Error Between	405.003	92	13.065	
Within				
Phase (C)	2.951	3	.984	.924
AxC	1.114	3	.371	.349
BxC	14.443	3	4.814	4.523 ^b
AxBxC	5.602	3	1.867	1.755
Error Within	98.979	93	1.064	

^a_p <.001^b_p <.01

Phase IV, 2.50) reaching a near Phase I level. The phase effect was also significant for crying behavior. However, the infants cried the most in Phase II, the least in Phase I (2.70, 1.17; respective mean frequencies), with mean frequencies of .62 and .97 for Phase III and IV. Although phase was not a significant main effect for oral behaviors, there was a significant interaction between the effects of phase and mother employment. The infants of the non-employed mothers exhibited higher mean frequencies of oral behaviors in phases I (1.89), II (1.64) and IV (2.16) than infants of employed mothers in the same phases (.36, .56, .75; respectively) while there was little differences between the groups in Phase III (employed, .75; nonemployed, .90).

To test for differences in amount of exploration between the three quality of attachment groups, three two-way unweighted means analyses of variance (attachment type by phase) with repeated measures on one factor (phase: I, II, III, IV) and unequal n were employed for each of the exploratory behaviors. The results of these analyses are summarized in Table 12. As was noted before, the effect of phase was significant for each of the exploratory behaviors. The main effect of attachment was only significant for visual exploration. There were no significant interactions. Figures 3, 4, and 5 illustrate that although the main effect of attachment type did not reach the level of significance for the behaviors of manipulation and locomotion as it did for visual exploration, the groups showed nearly identical patterns in the direction of their differences for each of the behaviors for each phase. Tests for significant differences between pairs of means after analysis of variance (Kolstoe, 1969) for those which had been hypothesized to

TABLE 12

TWO WAY ANALYSES OF VARIANCE: EXPLORATORY BEHAVIOR

Source	Sum of Squares	df	Mean Squares	F
Between				
Attachment (A)	4.412	2	20.706	3.22
Error Between	212.049	34	6.426	
Within				
Phase (B)	98.817	3	32.939	8.024 ^a
AxB	21.991	6	3.665	.893
Error Within	406.393	99	4.105	
Manipulation				
Between				
Attachment (A)	12.758	2	6.379	1.55
Error Between	182.304	34	5.524	
Within				
Phase (B)	43.280	3	14.427	7.970 ^a
AxB	8.226	6	1.391	.757
Error Within	406.393	99	1.810	
Visual Exploration				
Between				
Attachment (A)	59.001	2	29.500	5.570 ^b
Error Between	174.789	34	5.297	
Within				
Phase (B)	223.183	3	74.394	19.182 ^b
AxB	8.279	6	1.380	.356
Error Within	383.958	99	3.878	

^a_p <.001

^b_p <.01

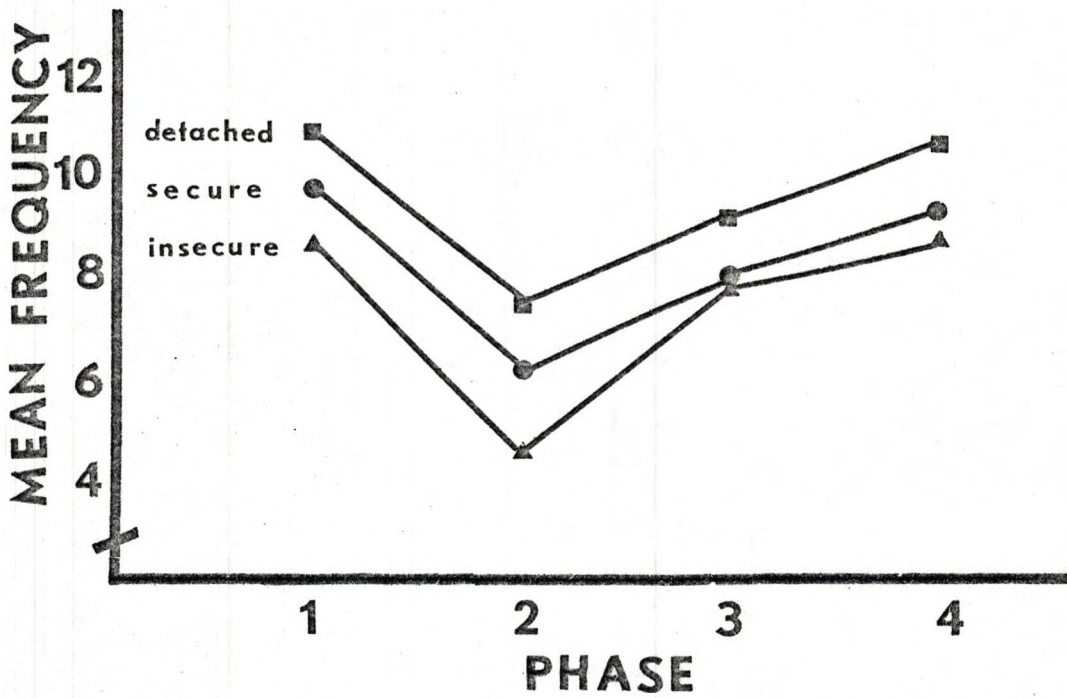


Fig. 3. Visual Exploration of Attachment Types in the Strange Situation.

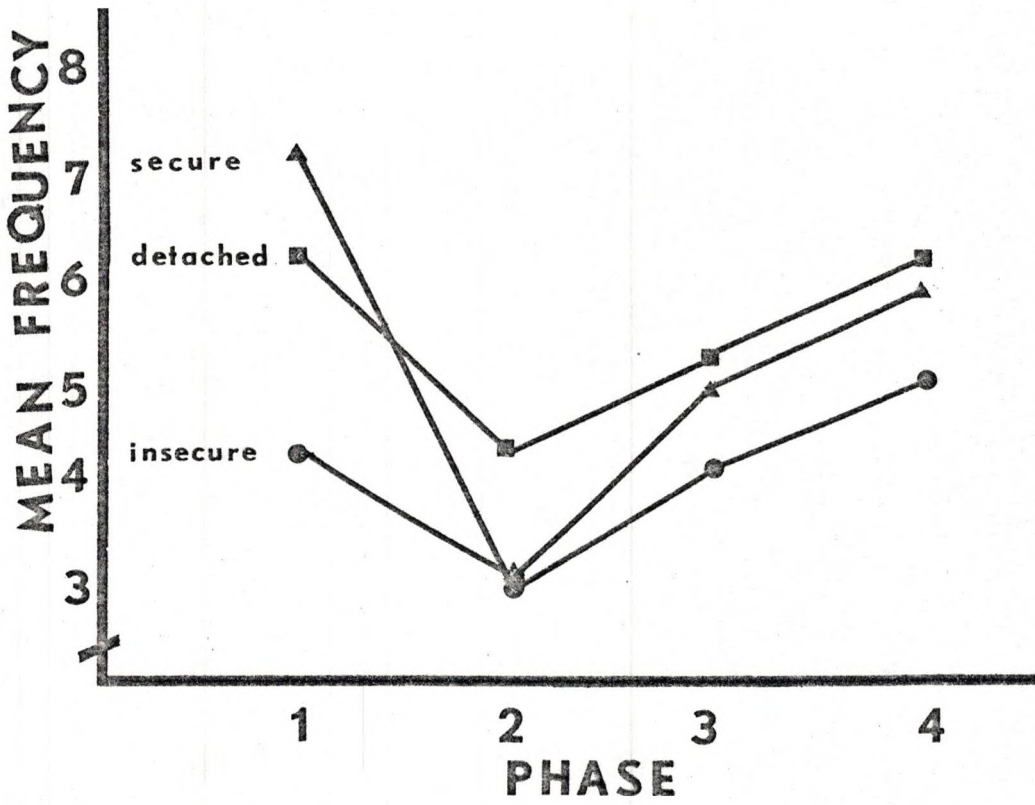


Fig. 4. Manipulation of Attachment Types in the Strange Situation.

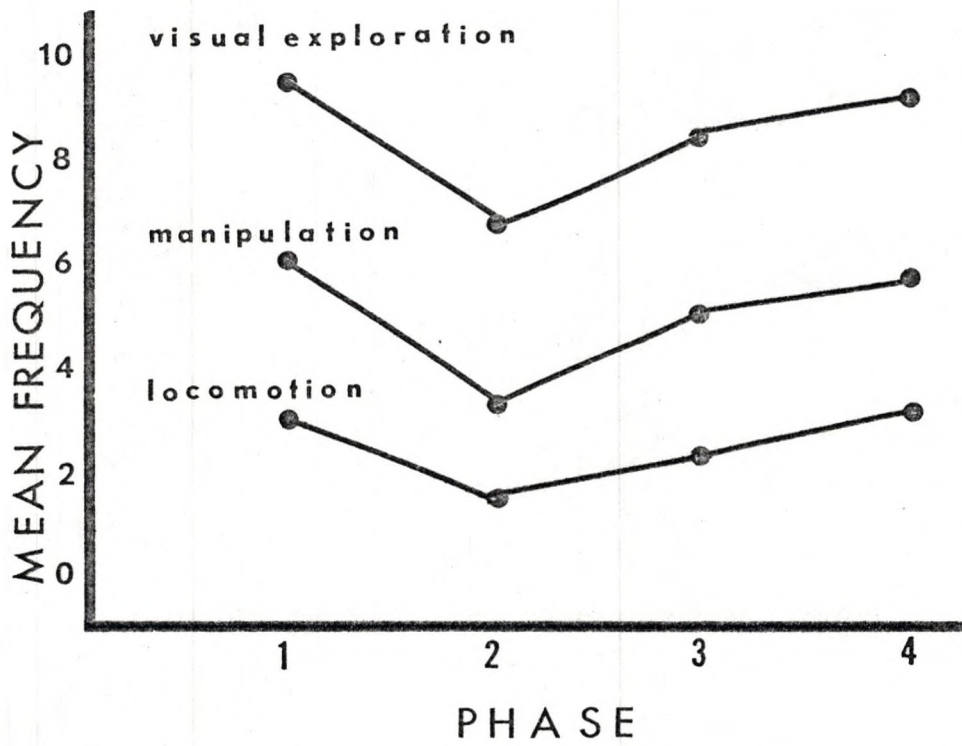


Fig. 5. Exploration in the Strange Situation.

differ were computed. It had been hypothesized that Group C would explore significantly less than the other groups in Phase IV, due to the distortion of the exploration balance. Although the differences were always in the direction expected (Group A exploring more than Group B who in turn explored more than Group C), the only difference to reach a level of significance was that between Group A and C for visual exploration ($t=3.141$, $df=99$, $p < .01$).

Also, the hypotheses concerning differences between the groups in restoration of exploration following separation from mother were not supported. Groups A and B were not expected to differ significantly from Phase I to Phase IV in the frequency of exploration behaviors emitted. However, Group C's exploratory behavior was expected to decrease significantly between Phase I and IV. Again, tests for significant differences between pairs of means after analysis of variance were computed. Except for a significant decrease in locomotion for Group B from Phase I to Phase IV ($t=2.350$, $df=99$, $p < .05$), none of the other tests were significant. In fact, the results indicate that Group C actually increased in the amount of exploratory behaviors exhibited in Phase IV. Although these differences were not significant, they were in the opposite direction of that expected.

Additional two-way unweighted means analyses of variance (attachment by phase) with repeated measures on one factor (phase: I, II, III, IV) and unequal n were employed for vocalization, crying and oral behaviors. The results of these analyses are summarized on Table 13. The main effect of phase was significant for crying and vocalization. There were no other significant main effects or interactions in the analyses. The Newman-Keuls statistic yielded

TABLE 13
TWO WAY ANALYSES OF VARIANCE: INFANT BEHAVIOR

Source	Sum of Squares	df	Mean Squares	F
Crying				
Between Attachment (A)	5.099	2	2.550	1.343
Error Between	62.664	34	1.899	
Within Phase (B)	100.794	3	33.598	39.062 ^a
AxB	5.074	6	.846	.983
Error Within	85.151	99	.860	
Vocalization				
Between Attachment (A)	15.275	2	7.637	1.565
Error Within	161.035	33	4.880	
Within Phase (B)	51.247	3	17.082	7.940 ^a
AxB	5.019	6	.837	.398
Error Within	213.006	99	2.152	
Oral Behaviors				
Between Attachment (A)	3.213	2	1.607	.110
Error Between	482.375	34	14.617	
Within Phase (B)	1.379	3	.460	
AxB	2.466	6	.411	.339
Error Within	119.942	99		

^a_p < .001

significant internal mean differences among the groups with respect to crying behavior. Group B cried significantly less than Group C in Phases I, II, and IV; and less than Group A in Phase I. However, Group A cried less than Group B and C when separated from mother (Phase II).

As was reported there were no significant sex of infant differences in amount of exploration. A chi-square was computed to test for associations between attention-seeking and infant sex. The result was nonsignificant for both proximal attention-seeking ($\chi^2=.97$, $df=1$, $p < .20$) and distal attention-seeking ($\chi^2=3.1$, $df=1$, $p < .05$).

Finally, a test of association between attachment type and employment of mother during the infant's first year of life (a Yes-No dichotomy) was computed. Because of the small number of expected values in each cell using a chi-square statistic, Groups A and C were combined into one group. The resultant chi-square yielded nonsignificant results ($\chi^2=.544$, $df=1$, $p < .5$). Employment is not associated with non-normal attachment types.

CHAPTER IV

DISCUSSION

According to the literature, dependency, as it appears in the first year of life seems to be related to both attachment and exploratory behaviors. Furthermore, while considerable effort has been made to explicate the relationship between exploration and attachment, few studies have investigated their relationships to dependency. In part this has been due to difficulty in defining the construct of dependency. In this study, it was defined as attention-seeking and a further distinction was made between proximal and distal forms of this behavior. This distinction proved to be a significant one since, although proximal and distal attention-seeking occurred equally frequently overall, these two behaviors were not correlated with each other. That is, the one-year-old who attempts to gain mother's attention in a distal manner is not necessarily the same one who does so proximally. One child may use both types equally while another may tend to seek mother's attention in one manner more frequently than another. As expected, however, there were different patterns in the relationships between the two types of attention-seeking behaviors and attachment and exploration. Furthermore, these patterns appear to be interpretable.

Briefly summarizing the patterns, none of the exploratory behaviors (locomotion, manipulation, visual exploration) were significantly

correlated with proximal attention-seeking during the first and third phases of the study (I: Mother Present; II: Separation; III: Reunion; IV: Mother Occupied). However, it was negatively correlated with all measures of exploration ($p < .05$) when the mother was absent and when she was occupied. Negative relationships were expected during the last phase since proximal attention-seeking would necessarily interfere with exploration. It is significant that proximal behaviors were also associated with lack of exploration in mother's absence. Distal attention-seeking, on the other hand, had a significant negative relationship with only one exploratory behavior in one phase, visual exploration in Phase IV. This result may be somewhat artifactual since the infant can continue manipulating and locomoting in the environment while calling to mother but he must, according to the definition used for distal attention-seeking, look at mother while calling to her.

Attachment behaviors were also differentially related to distal and proximal attention-seeking behaviors. As predicted, neither type of attention-seeking was associated with proximity-to-near mother during the first three phases. The experimental conditions were expected to be threatening enough to induce proximity behaviors for all infants. Touching-mother in Phase IV was positively correlated with proximal attention-seeking ($p < .05$) as would be expected given the operational definition of the construct. Using the scaled attachment scores, proximal attention-seeking was negatively associated with avoiding proximity ($p < .05$) and approached significance for distance interaction during Phase III. On the other hand, it tended to be positively associated with the attachment behaviors of maintaining

and gaining contact and proximity ($.05 < p < .10$). Similarly, it was positively, but not significantly related to search for mother in her absence ($.05 < p < .10$). None of the correlations between distal attention-seeking and attachment behaviors or the scaled attachment behaviors approached significance with the exception of a significant negative relationship with gaining proximity during the reunion phase.

Considering the facts that proximal and distal attention-seeking behaviors were not correlated and that there existed the differing patterns of relationships with exploration, it appears that the two types of attention-seeking are separate behaviors. Whether they can be used concomitantly to define the same construct is questionable. However, Heathers (1955) has defined two distinct types of dependency: emotional, the seeking of approval and affection; and instrumental, the seeking of assistance. Since at the age of one year an infant cannot vocalize the reasons for needing mother's attention, proximity-to-mother may be a necessary discriminative cue to the mother. Since proximity-seeking, which is a necessary part of proximal attention-seeking, it also part of the operational definition of attachment, an affectional bond, it appears that, at one year of age, proximal attention-seeking may be a behavioral definition for Heather's emotional dependency while distal attention-seeking is the behavioral counterpart for instrumental dependency.

This interpretation explains the different patterns obtained between proximal and distal attention-seeking and exploratory and attachment behaviors. According to this notion, proximal attention-seeking would be expected to correlate positively with attachment behaviors since both involve seeking emotional support and negatively

with exploration because they are incompatible behaviors. Distal attention-seeking would not be expected to correlate with attachment behaviors. Rather, this behavior is just emerging in the one-year-old as is independent exploration. Therefore, distal attention-seeking would be expected to correlate with exploration and perhaps even negatively with attachment behaviors. In fact, these were the patterns of relationships obtained.

The differences found between types of attention-seeking exhibited by groups classified according to quality of attachment can be similarly explained. It had been hypothesized that infants who were classified as being either Securely Attached (Group B), Insecurely Attached (Group C) or Detached (Group A) would show differences in the types of attention-seeking behaviors they utilized. Specifically, Group C was expected to show more proximal types of attention-seeking than the other two groups while Group A was expected to exhibit less of both types. The former hypothesis was supported. The Insecurely Attached infants did exhibit more proximal types of attention-seeking. These infants were by definition, expected to be more distressed by mother's absence, to exhibit more of the attachment behaviors of gaining and maintaining contact and to explore less because of the interference with attachment behaviors. They would also be expected, because of their insecure relationship with mother to be more demanding of overt displays of affection. This would account for their high proximal attention-seeking behavior.

The Detached infants, on the other hand, were not expected to show a high frequency of either type of attention-seeking behavior; however, they exhibited a higher number of distal attention-seeking

behavior than the other two groups. Theoretically, these infants, by definition, have given up the desire to attain a satisfactory attachment relationship with mother and have therefore directed their efforts elsewhere. While the normally attached infant is expected to intersperse exploration with attachment behaviors, detached infants were expected to explore more than the other two groups since exploratory behavior would not be disrupted by attachment behaviors. Moreover, a one-year-old may require considerable help while exploring. If this is so, and if distal attention-seeking is a behavioral definition for instrumental dependence, differences among detached infants can be explained. Since they as a group were expected to explore more they may also have needed the help of an adult. Since mother was the only adult available, they turned to her, but distally.

Securely Attached infants were not expected to differ in the types of attention-seeking employed. A normally attached group would be expected to intersperse proximal attention-seeking with distal attention-seeking as attachment behaviors are mixed with explorations. Relative to the other two groups, this appeared to be the case. Therefore, proximal attention-seeking at this age, may be an indication of an attachment relationship while distal attention-seeking is an indicator of dependency. It would be interesting to know if one of these types of attention-seeking is more generalizable to other adults. Given the application of Heather's theory, it is expected that distal attention-seeking would be. It would also be interesting to trace the developmental course of these two types of attention-seeking. It is expected that as the infant grows older and he is more able to vocalize his needs to his mother, and/or is less likely to express his emotional

needs so overtly due to learning, he would employ proximal attention-seeking behavior less often. Distal attention-seeking would then come to serve the older infant's attachment relationship as well as dependency needs. As reported earlier, Maccoby and Masters (1970) stated that proximity-seeking lessens as a child grows older and attention-seeking increases. Attachment and dependency are intricately intertwined throughout development.

Exploration is also intricately related to attachment (Ainsworth, 1969; Ainsworth and Bell, 1970; Bowlby, 1969). In the present study these findings were replicated. A fourth phase was added to Ainsworth's strange situation during which the mother was occupied. It was felt that the coding system devised by Ainsworth et al. (1972) for the strange situation procedure which was used to obtain the behavior measures from the protocols was both reliable and valid. However, it is not known how information was lost in the observing and narrating of the behaviors. Perhaps, a coding system could have been devised beforehand where the coders could observe and rate at the same time. This would at least have been more efficient.

During the last phase the measures of dependency were taken as well as additional measures of exploration and attachment. In addition, more powerful statistics were used to analyze the resulting data than had been used previously. Using analysis of variance permitted an easier and more methodologically sound way of handling the complex data. The results indicate that the strange situation procedure is a very reliable way to study the exploration/attachment balance. Prior to separations from mother, infants' mean exploratory behavior was the highest. Separation from mother induced stress for the infants

and exploration declined to its lowest point during this time. After being reunited with the infants, mother exploration increased and reached near pre-separation levels within nine minutes. The additional phase used in this study appears to be a useful way of obtaining a further assessment of the attachment/exploratory balance and its relation to dependency.

It had been hypothesized, following the initial work of Ainsworth et al. (1971), that groups delineated according to quality of attachment would show differences in the amount of exploration interacting with the particular phase of the situation. Insecurely Attached infants were expected to explore less overall than either Securely Attached or Detached infants while the latter group was expected to explore the most. The data tends to support these predictions, although the differences were significant only for the number of visual exploration responses. It is felt that differences among the groups for the other exploratory behaviors were not obtained because of the small numbers involved in Groups A and C (seven each) and the low frequencies of locomotion and manipulation of subjects.

It was also hypothesized that the three groups would differ in the restoration of exploration following reunion with the mother after separation. Insecurely Attached infants were expected to explore significantly less in post separation episodes than during pre-separation episodes. The other two groups were not expected to differ much; that is, exploration was expected to quickly reach pre-separation levels. The latter hypothesis was supported while the former was not. It appears that the Insecurely Attached infants explored more following separation, although they still explored

less than the other two groups in Phase IV. This suggests that it is important, therefore, in studies concerning the effects of separations on exploration to obtain pre-separation measures. Without these measures, it is not possible to tell whether exploration decreased following mother-separation or if, as in the present study, separation itself had little or no effect on already low frequencies of exploratory behaviors.

A further hypothesis of this study was that frequent mother-separations during the infant's first year of life, as indicated by employment of the mother, would be negatively related to secure attachment development. This was not supported by the data although past research has indicated this relationship (Blehar, 1973, Stendler, 1954). The present investigation is one of the first studies relating mother employment to infant attachment at such a young age. It was expected, however, that attachment would be formed by age one and that, if anything, it would be stronger at this younger age. One of the variables which may be responsible for the incongruence between the results of this study and earlier studies could be the age of the infant when mother began working. It may be that if attachment forms while mother is out of the infant's presence on a frequent basis the child learns at an early age that when the mother departs she will return. If, however, a secure attachment has developed with child and mother constantly together, and then the mother departs, the child's expectations are disrupted and a secure attachment could consequently become insecure.

There may be an alternative explanation of the results concerning the effect of maternal employment. In the past maternal

employment has been generally looked upon with disfavor. Usually, a woman with an infant at home would work only if necessary. Thus, other variables associated with working mothers which may in fact be more powerful determinants of the earlier results than separation from infant include economic strain, dissatisfaction with their present situation and a feeling of guilt for leaving the children. More women are working today to achieve a personal fulfillment rather than out of necessity. It is hypothesized that further research relating maternal employment, controlling for attitudes toward employment of the mother, to the development of non-normal attachment relationships will also be nonsignificant.

Finally, no sex differences were expected and this hypothesis was supported. Still further research will be needed to see whether this finding can be replicated. Furthermore, it would be interesting to look for progressive differentiation by sex between types of attachment and dependency behaviors utilized with increasing age.

APPENDIX A
INSTRUCTIONS TO MOTHERS

INSTRUCTIONS TO MOTHERS

This will consist of a series of episodes that are timed, so it is important that we follow these directions without interruption. Initially you will be taken into the main room with your baby and will be left there for awhile so that you both can become accustomed to the room. In the first episode a young woman will enter, talk with you for awhile, and give you a cue to leave the room. After a few minutes, you will re-enter, pause at the doorway so your baby sees you, and then get him/her interested in the toys again. Shortly afterwards you'll be called out of the room again. At this point, if the baby is making too much of a fuss, you can return. Otherwise, you'll remain outside and the baby will be alone for a few minutes. Then you will re-enter, and that essentially will be the end of the session. At that time a questionnaire will be brought into the room for you to fill out. The questionnaire should not last much more than 30 minutes.

Many thanks for your cooperation.

APPENDIX B
SAMPLE PROTOCOL

SAMPLE PROTOCOL

- I. 1a. M has b in arms, puts b down in b sq. facing away from m, picks up doll shows it to b, looks at b, m is smiling at b.
- b. B grabs doll and hugs it, turns away from m, b looking at toys on floor, reaches for turtle, m is looking at toys, sitting in sq. b, m picks up tbear, shows it to b.
- c. B looks at tbear, takes it from m, m says something to b, b looks to bozo at other side of room, m looks at bozo, says "look over there," b gurgles, points to bozo and looks at m.
- d. B looks at wall, floor, b gurgles, m picks up toy, squeezes it in front of b, b looks at the toy, m puts it back down.
- 2a. B looks at bear, at doll, m is talking to b, looks around, picks up pullapart toy.
- b. B gurgles, looks at toy on the floor, m shows pullapart toy to b, she turns the sides of it, b goes ohhh and points to pull-apart toy.
- c. M sets toys down in front of b, b looks at bozo and then at the toy that m puts in front of her, m picks up turtle, moves closer to b, m puts turtle down, m smiles at b, b looks at the turtle.
- d. B gurgles, looks at the turtle, m takes the bear and standards it up near b, puts it down besides b, m looking at b, b looks at bear, at s door, at bozo, b gurgles, moves to sq. a.
- 3a. M picks up cow, squeezes it and pulls it up to b, m smiling at b, b looks at cow, b smiles, m moves the cow back and forth, squeezes it and pulls it up to b, m laughing, m moves the cow back again, b smiles.
- b. M pulls the cow up to b, squeezes it, m laughs, b laughs, b looks at m when she squeezes it.
- c. M squeezes the cow again, m laughing, m looking at b, b looks at cow, laughs, b looks at m, b smiles, gurgles, pats the bear on the head, m picks up clock.
- d. B looks at bozo, gurgles, m brings the clock and puts it in front of b, m pulls the string on the clock, b watches the clock, m smiling at b, b stands in m sq. and then sits down.
- II. 1a. M is sitting down, smiling at b, pointing to the cow, talking to b, b watches m.
- b. B stretches out hand and gurgles, m gets up, gets her purse on s chair, goes back to chair, b picks up car, shows it to m.

- c. B starts to rock back and forth, m smiles at b, says something, b looks at clock and gurgles, looks at m, gurgles at m.
 - d. M smiling at b, laughing, looks at b, b looks at m, b points to the clock and gurgles.
 - 2a. B picks up a little toy, b says "baby" and bends over and hugs the bear, m smiles at b.
 - b. M points to the board, looking at b, b points to me and says "baby," b points to board, b hugs bear.
 - c. B rocks back and forth with bear and gurgles, m smiling at b, b picks up doboy and moves it, b picks up little man, b moves the cow, m says "Michelle, can you squeeze that cow?"
 - d. B looks at m as m is speaking, b picks up little toy and holds it to m, m says "baby, what's that?"
 - 3a. B looks back at the cow, gurgles, picks up the cow, m looks at b.
 - b. B pulls the cord and makes the cow go moo, b looks at m, m is looking at the wall, m looks at b and smiles, b looks at the wall.
 - c. M says, "Michelle, where's raggedy andy?" B looks at m, gurgles, points to pullapart toy, m says "no" and laughs, b picks up piece of puzzle and shows it to m.
 - d. M is looking at the toys, smiling at b, says something, b reaches over picks up piece of the puzzle, looking at the floor, b picks up the turtle, looks at m, looks at turtle, looks at m.
- III.
- 1a. S enters, b looks at s, looking at s, points to something, gurgles, looks at m, gurgles, looks at s.
 - b. B looks at wall, looks at s.
 - c. B looks at s, b plays with cow, looks at s, puts cow down, grabs bear and hugs it, pats bear on the head.
 - d. B looks at s, looks back at bear, puts bear down and grabs cord of cow.
 - 2a. B looks at the cow, reaches for the tail, looks at s, back at the tail, looks at m.
 - b. B looks at s, b reaches for turtle, looking at turtle, picks up turtle and shakes it, holds it out to m and looks at s.
 - c. B holds turtle out to s, looking at s, looks at m shakes turtle, looks at m, b smiles as m looks at b.

- d. B turns around and puts turtle on the floor, looks at clock, gurgles, looks at m, looks at s.
 - 3a. B looks at clock, smiling, pointing at clock, looks at s.
 - b. B leans over and hugs bear, looks at s, brings bear closer to her, points to bear's eyes.
 - c. B brings turtle to s, shakes it, moves to s, turns around, puts turtle on the floor.
 - d. B grabs for clock, m gets up and leaves.
- IV.
- 1a. B looks at s, gurgles at s, lifts her hand up, looks at clock.
 - b. B leans over and hugs bear, smiles, points to clock, looks at s.
 - c. B gurgles, looks at s, points to s door.
 - d. B looks out window, points to bozo, looks at wall away from s, reaches for turtle, turns around.
 - 2a. B shows turtle to s, gurgles, hands it to s, s shakes it, s puts it down, b reaches for cow.
 - b. S takes cow from b, b looks at cow, s sholds cow to b.
 - c. B reaches for puzzle piece instead, looks at s, holds out puzzle piece for s, gurgles, s takes it, b picks up another piece.
 - d. B looks at the wall, gets up, brings piece to s, b picks up another piece.
 - 3a. B takes the piece back from s, looks at the clock, gives the piece back to s.
 - b. S gives the piece to b, b gives it back to s, b smiles, b reaches for the cup, b gives it to s, b smiling.
 - c. S gives cup back to b, b gives it back to s, s returns it, b takes it, b points to the cup, drops it, gurgles, looks around the room.
 - d. B looks at the walls, gets up, grabs a piece of a block, gives it to s, b looks at the pullapart toy, reaches for it, s stands up, b watches s as s leaves.
- V.
- 1a. M walks in the door, says "Hi," b looks at m, holds piece of puzzle up to m, m walks toward b, m is in sq. b with b.
 - b. M turns puzzle around, shows it to b, b puts her hand on the puzzle, m offers it to b, b takes it from m.

- c. B points to tractor, m picks it up and puts it in front of b, m sits down again, bends over, picks up the top, hands it to b, m works it for b.
 - d. M is smiling at b, b looks at the top, tries to make it work, b picks up the top, m says "What's that?" B puts the top on the bear's head and drops it, m says "You're having fun, aren't you?"
- 2a. B crawls across the bear, tries to pick up a little toy, knocks over the clock, drops the little toy on top of the clock, looking away from m, picks up another little man from the back of the truck, m watches b, m talks to b.
- b. B is looking at the truck, takes a little car and stretches her hand out to give it to m, m takes the car from b, puts it down, puts the car back by the truck and says "Can mommy have that?"
 - c. B grabs another car and drops it in m's hand, m takes it from b, b takes it back from m, drops it, goes over to the tractor, m watches b at play.
 - d. B picks the tractor up and drops it, m moves the tractor away, b picks up a little car and holds it out to m, drops it in m's hand, m says "bye-bye," leaves.
- VI. 1a. B looks at s door, looks around the room, looks at window, wall, at toys in her hands, reaches for the bear.
- b. B drops a toy out of her hand, picks up another one, puts it in the back of the truck, picks up another toy.
 - c. B puts it in the back of the truck, sets the truck up again, picks up a little toy, holds it up in the air, puts the toy down.
 - d. B moves the little toys in front of her, picks up one, puts it on the clock, looks at bozo, at the clock, plays with the bee in the clock, looks at the truck.
- 2a. B reaches for the back of the truck, picks the people off the truck, sets them in front of her, picks up another toy, puts it in the truck, picks up a toy, puts it in the truck.
- b. B picks up another toy, puts it in the truck, and another, picks up a toy and puts it on the truck.
 - c. B rubs her eyes and nose, looks at the toys, crawls to sq. d., sits down, picks up a toy and puts it in the truck.
 - d. B moves the pieces around in the back of the truck, picking them up and putting them down, picks up a piece and looks at it.

- 3a. B looks around the room, picks a toy off of the floor, looks at the bear, picks it up.
- b. B puts bear in her lap, puts it down, plays with toys in back of truck, puts bear back on her lap.
- c. B plays with toys in back of the truck while holding bear with her left hand, takes a toy out of the truck, drops it back, lifts the truck up.
- d. B takes the people out, moves the bear back and forth on her lap, lifts up the truck, shakes the truck, drops it in sq. c.
- VII. 1a. M enters, b looks at m, m smiles at b, m walks to sq. d and squats in front of b, b holds toy up to m, m hands b the clock.
- b. M shows b a car, m looks and talks to b, b looking at the car, takes it from m, b looks at the wall, b looks at bozo.
- c. M walks to sq. e and picks up bozo, m takes bozo to sq. d, says "oh," b looks at mirror and says "Oh."
- d. M takes bear from b and picks up b and they both look at the mirror, b gurgles, b looks away from the mirror and drops toy, m puts b down in sq. d.
- 2a. B is sitting with face away from m, rocking back and forth, m is sitting in sq. e, m hands b the bear, b has arm over bear, b reaches for the pullapart toy.
- b. M pulls b's pants up and checks them, m kneeling behind b, moves to sq. b, picks up doll, holds it in front of m, b looks at the doll.
- c. B says "baby" and drops toy, b pulls doll closer to her, has bear in right arm and doll in left, rocks back and forth, m says "nice baby" and watches b.
- d. M picks up top, works it for b, b holds cup to m, then holds bear out to m, then reaches for the top and tries to make it go, b looks at m, at top, m takes it and works it for b.
- VIII. (Unless otherwise indicated, mother is working at test in this episode. Only deviations from that behavior are recorded).
- 1a. B is in sq. d, looking at m, looks at top.
- b. B starts to play with top, tries to make it go, looks at toys, drops top, picks up cup, drops it.
- c. B returns to top again, looks at it, takes it, looks at wall, at bozo, drops top, picks up tractor, m looks at b.

- d. B looks at m, at wall, at m.
- 2a. B looks at top, tries to make it go around, holds bear in left hand, m looks at b and smiles.
- b. B throws top away, picks up car, drops it, looks at wall, at floor.
- c. B grabs truck, moves it with the cord, has it wrapped around her neck, looks at m.
- d. B moves truck aside, tips it over, looks at wall.
- 3a. B looks at bear, at wall, at window, reaches over to pick up toys.
- b. B moves to sq. c, reaches for cup, holds bear in left arm, looks at dishes.
- c. B puts bear in her lap, puts hands on bozo, gurgles, m looks at b and smiles.
- d. B throws truck down, plays with a dish.
- 4a. B crawls to sq. a with bear, to m sq., close to m.
- b. B holds on to m's knees, reaches for table, pulls herself up on table, watches m, m says "no, no" and moves ashtray away as b grabs for it.
- c. B tries to bring bear up to table, falls, plays with bear, looks at m, looks under the table, gets on knees, pulls herself up to table.
- d. B gurgles, reaches for test, m moves test and says "Michelle, go play. Where's raggedy anne?" B looks for doll. M says "She's waiting over there for you."
- 5a. B falls down with her bear, crawls to sq. a.
- b. B kicks the cow with her foot, looks at the cow, crawls to tv, plays with it.
- c. B moves to sq. c, picks up tv, carries it to a sq., looks at b.
- d. B looks at and plays with tv.
- 6a. B picks up dish, drops it on tv, looks at wall, m looks at b.
- b. B moves bear on her lap, lets go of it, pulls herself on to the radiator.
- c. B grabs on to another pipe, falls over, touches radiator, hits it with her hand.

- d. B crawls to sq. e, rolls on bozo, looks back at wall.
- 7a. B pounds on the radiator, tries to get up on it, looks out of the window, m says "What's the matter?" M smiles at b, b hits the radiator while looks at m.
- b. B looks back at bozo, tries to reach it while standing by the radiator, moves to sq. c.
- c. B still banging on the radiator, looks at the mirror, sits on the floor, crawls to corner of e sq.
- d. B moves to f sq., reaches for a toy in e sq., goes to c sq., m looks at b.
- 8a. B looking at toys in front of her.
- b. B still looking at toys in front of her.
- c. B now playing with toys in front of her.
- d. B reaching for tractor, takes the wheel from it and drops it.
- 9a. B moves from f to d sq., picks up the toy, looks at the wall, drops the toy, goes to the wall and hits it, goes back to f sq.
- b. B hits the wall, still hitting the wall, puts a toy in her mouth.
- c. M looks at b and watches b, says "What's in your mouth?" Goes over and takes it out of b's mouth, m winds up tv for b.
- d. B looks at m as she winds up the tv, b still looking at m as m sits and does her test, b bends over and picks up a little toy.

APPENDIX C

MEANS AND STANDARD DEVIATIONS FOR ATTACHMENT
AND EXPLORATORY BEHAVIORS ACROSS PHASES

TABLE 14

MEANS AND STANDARD DEVIATIONS FOR ATTACHMENT AND EXPLORATORY BEHAVIORS ACROSS PHASES

Attachment and Exploratory Behaviors	Phase I		Phase II		Phase III		Phase IV	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Locomotion	3.15	2.00	1.38	1.30	1.99	1.67	2.78	1.46
Manipulation	6.47	2.38	3.12	1.99	4.82	1.67	5.72	2.59
Visual Orientation	9.78	1.55	6.06	2.86	8.15	1.80	9.25	1.80
Vocalization	2.88	2.13	1.22	1.27	1.61	1.23	2.43	1.85
Crying	.13	.33	2.74	1.48	.60	.67	.93	1.26
Oral Behaviors	1.01	2.03	.96	2.24	.79	1.75	1.13	2.17
Regarding Mother	4.64	1.66	N/A		6.52	2.68	3.51	1.78
Smiling at Mother	.67	.68	N/A		.81	.74	.29	.38
Proximity near Mother	10.23	2.41	N/A		11.83	1.98	10.53	2.03
Touching Mother	1.41	2.4	N/A		4.72	2.23	1.42	2.2

NOTE: Due to mother's absence, in Phase II, occurrence of behaviors involving mother-infant interactions are not possible and are designated by N/A.

APPENDIX D
MEANS AND STANDARD DEVIATIONS FOR
ATTENTION SEEKING

TABLE 15
MEANS AND STANDARD DEVIATIONS FOR ATTENTION SEEKING

Phase IV	Proximal		Distal	
	Mean	S.D.	Mean	S.D.
Segment 1	1.58	1.8	1.35	1.35
Segment 2	1.14	1.35	1.50	1.7
Segment 3	1.14	2.04	1.25	1.48
Total	4.22	3.7	4.25	3.22

APPENDIX E

FREQUENCY OF MOTHER-INFANT-PAIRS FALLING ABOVE OR
BELOW THE MEAN SCORE (3.5) OF THE SCALED CATEGORIES

TABLE 16
 FREQUENCY OF MOTHER INFANT PAIRS FALLING ABOVE OR BELOW THE
 MEAN SCORE (3.5) OF THE SCALED CATEGORIES

	Phase I		Phase II		Phase III	
	Above	Below	Above	Below	Above	Below
Distance Interaction	23	11	N/A		12	22
Gain Proximity	7	26	N/A		19	14
Maintain Proximity	1	34	N/A		11	25
Avoid Proximity		- ^a	N/A		10	25
Resist Proximity		- ^a	N/A		6	30
Search		N/A ^b	23	2		N/A

^aAinsworth et al. (1971) found these behaviors to be so infrequent prior to mother-infant separations that they were not computed for Phase I of the present study.

^bIt was not possible for some behaviors to occur due to mother's presence or absence. These are designated by N/A.

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