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INFANT-CAREGIVER ATTACHMENT AND SEPARATION:
SINGLE VS. MULTIPLE CAREGIVERS

THESIS

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This study investigates (1) whether infants cared for by a single caregiver exhibit more attachment behaviors than do infants cared for by multiple caregivers and (2) whether sex differences are found in these behaviors. Twenty-six Black infants, nine to twenty-three months of age, in a day-care center, were observed during one brief low-stress separation from a caregiver. Data were taken using six indices of attachment: maintaining proximity, visual regard, touching, protesting, seeking proximity, and greeting. Where subjected to a two-way analysis of variance, the obtained results showed no significant differences in the effects of the two types of care. However, visual regard and greeting behaviors were observed significantly more frequently in females than in males.

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Introduction

The growth of nurseries and day-care centers has placed a large number of children and infants in the care of non-parents for a major portion of their waking hours. It is important to know if these children develop in the same or similar ways to children reared totally by their parents. One extremely important phenomenon which occurs in infants is the development of attachment, which has been defined by Ainsworth (1969) as an affectional tie that one person forms to another specific individual, and is an essential condition of subsequent satisfactory interpersonal relations. These behaviors have been studied by a variety of experiments (e.g., Bowlby, 1969; Caldwell, 1970; Robson, 1967; and Yarrow, 1972) and have been found in children in day-care settings (e.g., Hakansson, Horneman, & Liedholm, 1973; Riccuiti & Poresky, 1973). Beller (1971) stated that consistent personalized care by a stable person enables the infant to gain certain skills needed for future development.

Questions examined by the present study concern the manifestation of attachment behaviors in a day-care setting in which some infants receive care from one specific caretaker and other infants receive care from several caretakers.

Review of the Literature

In the formation of the object concept, Freud (1965) described three stages culminating in the stage of object constancy, which enables the infant to maintain a positive inner image of an object. The discrimination between self and non-self is then clear, and, for instance, when the mother leaves, she is not forgotten. When the object concept has been formed, the infant may then begin to form what Bowlby (1958) described as attachment. The infant must go through four stages in forming attachments, including the maintenance of proximity to a discriminated figure by means of locomotion as well as signals, and the formation of a reciprocal relationship with the discriminated figure (Bowlby, 1969). Some indices of attachment that have been described by Bowlby (1958) include clinging, sucking, following, crying, babbling, calling, and smiling.

Ainsworth (1969) stated that attachment refers to an affectional tie that one person forms to another specific individual and she described sixteen different behaviors including greeting, approach through locomotion, and crying (1967). Durfee (1972) used postural reactions, manipulation, and facial expression. However, Ainsworth and Bell (1970) stated that the behavioral hallmark of attachment is seeking to gain and to maintain a certain degree of proximity to the object of attachment.

Much of the research into attachment (e.g., Kagan, 1971; Coates, Anderson, & Hartup, 1972; Cohen, 1974; Leifer, Ledierman, Barnett, & Williams, 1972) has utilized a separation of the infant from the object of attachment, and then an examination of the resulting protest. Researchers have used several variations, such as a major separation from object of attachment (e.g., Heinicke & Westheimer, 1965), minor separations in a familiar setting (e.g., Ainsworth, 1967; Schaffer & Emerson, 1964), minor separations in an unfamiliar setting (e.g., Fleener & Cairns, 1970; Kagan, 1971), and familiar and unfamiliar exists (Littenbert, Tulkin, & Kagan, 1971). The phenomenon of disturbance following separation is one of the most striking selective behaviors and one that seems to be characteristic of attachment at all levels of development except early infancy (Cohen, 1974). Although attachment behavior was observed by Ainsworth (1967) as early as fifteen weeks, observations of separation prior to age six months indicate little evidence of the anxiety so characteristic at later ages (Sears, 1972). Fleener and Cairns (1970) observed that the tendency to become disrupted on separation from the mother was observed only in children who were twelve lunar months of age or older.

Schaffer and Emerson (1964) utilized separation distress as their primary criterion for attachment

contending that the intensity of separation protest is a valid measure of intensity of attachment. Ainsworth (1967) disagreed, stating that children who were more distressed were just more insecure, not more attached. Yarrow (1972) expressed a similar view when he stated that the conditions that influence the strength of attachment behaviors differ from the factors determining the strength and character of responses to separation. Spelke, Zalazo, Kagan, & Kotelchuck (1973) also argued that separation anxiety is not a sensitive index of intensity of attachment. They reported that separation anxiety may be influenced more by the child's ability to understand a discrepant event.

The onset of attachment behavior has been reported by various researchers as within the third quarter of the first year (Schaffer & Emerson, 1964). This is in agreement with Bowlby (1969), Ainsworth (1967), and Rheingold (1956). Most of the research into attachment and separation concerns infant-mother relations. Little has been done with the attachment behaviors found in infants for non-parents. Ricciuti and Poresky (1973) however, noticed that a more positive reaction to a familiar caregiver than to a stranger becomes quite clearly differentiated shortly after seven months of age. David and Appell (1961) dealt with infant-nurser relations over a

three-month period in which they found a great deal of difference between the attachment behaviors exhibited by the infants cared for by six to ten nurses and those attended by as many as thirty nurses. They reported that the infants who had fewer nurses expressed greater enjoyment and smiled more at them than at occasional nurses. But it was not reported if the results were related to the quality or quantity of care given.

The quality of interaction has been discussed by Brody (1956), who stated that research by Spitz and Wolfe (1946) implied that it is more difficult to substitute for a satisfactory love object than for an unsatisfactory one. Kagan's study (1971) implied that frequency and quality of interactions with the mother form a basis of an attachment. Ainsworth (1967) recognized the importance of quantity of care when she stated that amount of care is related to the development of security and attachment. Schaffer and Emerson (1964) found that the choice of attachment objects was based on the amount and nature of the interaction the infant experiences with the attachment figure candidates. Moss (1967) found that the quantity and quality of maternal behavior is affected by the behavior of the infant, which seems to agree with other researchers who state that attachment is a reciprocal process (e.g., Ainsworth, 1964; Cairns,

1972). Attachments may be formed in different ways (Gerwirtz, 1972) but tend to be the most environmentally stable behavioral systems across species (Ainsworth, 1969; Cairns, 1966).

The benefits of attachment in infants were reported by Rivinus and Katz (1971), who stated that social attachment provides not only nourishment but also in humans, better attention, perception, learning ability, and emotional adeptness. Burns, Sander, Stechler, and Julia (1972) seemed to agree by stating that sensitivity in infants is increased by individual specific care. Ainsworth (1967) believed that attachment is an essential condition of subsequent satisfactory interpersonal relations and Yarrow (1972) concluded that a strong attachment may facilitate the child's autonomy.

When non-parents are involved in infant care, questions may arise concerning the amount as well as the quality of care the child receives and its effect on attachment. We have seen that infants need good attachment figures who provide the infant with his physical and emotional needs. Caretakers who are responsible for several children may be insensitive to the signals of all and consequently may not time their interventions in synchrony with the individual needs and rhythms of each child (Bowlby, 1951). Robertson and Robertson (1972)

seemed to agree with Bowlby when they stated that a separated child under the care of a substitute mother would react with anxiety to the absence of the mother, but it would be a manageable anxiety, in contrast to the anxiety shown in a child put in the care of a number of people. However, Hakansson et al. (1973) found nothing in their study to indicate that exposure to several caregivers would arrest an infant's ability to form an attachment to his mother. In fact, Bell and Ainsworth (1972) concluded that the identity of the caretaker is not important because attachment behaviors will develop in much the same way, and that multiple attachments were a common occurrence. Multiple attachments were also found in studies by Ainsworth (1964), Schaffer and Emerson (1964), and Schaffer (1963). Mead commented (1961) that multiple mother figures serve as a catastrophe insurance and that the loss of a mother is less disastrous for a child who has been used to other caretakers than for one who has had an exclusive pair-relationship with his mother. Yarrow (1972) reported inconclusive results between attachment and amount of experience with multiple caretakers, but Burns et al. (1972) found that multiple caretakers increased distress among infants during feeding. The evidence seems to be summed up by Caldwell, Wright, Honig, and Tannenbaum (1970) who concluded that one can

have infants in quality day care without having jeopardized the child's primary emotional attachment to his mother. Evidence of the familiar caregiver as a significant attachment figure for the infant in day care is provided by the observations of distress reactions to separation from the caregiver, which follows a developmental pattern very similar to that of maternal separation reactions when the infant is left with a stranger.

In a study by Fleener (1973) to experimentally produce attachment in infants to a previously unknown person, results showed that the infants consistently approached the person with whom they had interacted and cried when separated from her. It thus appears that attachment takes place in infant-caretaker dyads.

The purpose of the present study is to determine if there are differences in infant attachment behavior according to sex of the infant or type of care (single or multiple caregivers). It was hypothesized that there would be a significantly greater frequency of attachment behaviors exhibited by infants in a situation in which each infant is cared for by only one caregiver than in infants in a situation in which each infant is cared for by five different caregivers. It was also hypothesized that there would not be a significantly greater frequency of attachment behaviors in male infants than in female infants.

Definitions

1. "Attachment behaviors" (Bowlby, 1958; Ainsworth, 1967) are behaviors which promote proximity or contact. In the human infant these include active proximity- and contact-seeking behaviors such as approaching, following, and clinging, as well as signaling behaviors such as smiling, crying, and calling. The behaviors used in this study are defined as follows:

A. "Visual regard" includes visual behavior directed at the caregiver or her locus of exit, including visual following, staring, eye-contact, or visual search.

B. "Protest" involves holding the mouth open or opening and closing the mouth accompanied by a frown-like facial expression or drawing-up of the face, with or without tears. This also includes extending and contracting the arms repeatedly either simultaneously or alternately. It does not include protest which results from an aggressive encounter with a peer.

C. To "seek proximity" the infant must locomote toward the caregiver or her locus of exit, including following to the door, touching or hitting the door, trying to open the door, or staying at the door for all of the ten second interval.

D. To "maintain proximity" the infant must stay the same distance or less from the caregiver all of the ten second interval.

E. To "touch" includes all touching of the caregiver initiated by the infant including clinging, hugging, kissing, as well as touching the caregiver with an object or touching an object the caregiver is holding (if child initiated).

2. The Zale Learning Center is a facility in Dallas, Texas, designed for day care of infants from ages six weeks to two years. Eligible babies include those whose mothers are currently receiving financial aid (e.g., A.F.D.C.) or are in a low income bracket (HEW guidelines). Babies are accepted from anywhere, but because of transportation realities, most babies live in the immediate vicinity of the Center. The Center is located on the campus of a high school near a large housing project. Many of the mothers attend this high school. Care is available at the Center from 7 am until 5:30 pm. The building is divided into two nearly identical classrooms joined by a common kitchen and workroom. There also is a small reception room and several small offices. The Center employs ten caregivers and several substitutes to work when needed along with a cook, two social workers, an executive secretary, several research assistants, an assistant director who is also a registered nurse, and the director. The Center is partially funded by Title IV-A money (70%) administered by the Texas Department of Public Welfare, with the remaining funds (30%) coming from the Zale foundation. The Center provides a total program of day care, including the nutrition

and health needs of the infants, training for the para-professional staff, parent education, and the generation of new knowledge in infant care through research.

3. A caregiver is one of ten persons employed full-time by the Zale Learning Center (ZLC) to give continuous attention to the total emotional, physical, and intellectual needs of the infants. (This study did not deal with substitutes or volunteers, who were also involved in the daily routine of the infants.) All of the regular caregivers are adult Black females and were trained by ZLC professional staff in basic child care, psychology, nutrition, and education. They keep written records on each baby's feeding time and amount, sleeping time and length, etc. Of the original ten caregivers who were hired in July 1973, eight have remained for the entire twenty-three months that the Center has been in operation. This has provided a stable caregiving staff, so critical for quality day care.

4. Classroom 1 (single caregiver) is a small group care classroom, arranged so that there is open space for all infants to interact, plus five individual cubicles for the four cribs assigned to each caregiver. This situation allows each caregiver to get to know her infants very well. The caretakers share the diaper changing tables and toys and work cooperatively to clean the room. This caretaking situation

approximates the smaller "day care home" or substitute mothering approach to day care. This room arrangement facilitates each of the five primary caretakers in getting to know and care for four individual infants.

5. Classroom 2 (multiple caregivers) is a large group care classroom, arranged as a single open space. There are twenty infants and five primary caregivers in this room. The open space arrangement allows all of the caregivers to be alert to and aware of the total group situation. This insures the safety of all the infants. All five of the caregivers attempt to spend some time each day with all twenty infants and they are encouraged to communicate and share with each other their observations and learnings about each of the infants.

Method

1. Subjects.--From Classroom 1 (with single caregivers), thirteen infants, ranging in age from nine to twenty-three months (mean age: 18.18 months), were selected. From Classroom 2 (with multiple caregivers), thirteen infants ranging in age from ten to twenty-three months (mean age: 19.08 months), were selected. All of the infants lived in the immediate vicinity of the Center, were from a low income background, and were Negro. Other characteristics of the sample are shown in Table I.

TABLE I
CHARACTERISTICS OF THE SAMPLE*

Percent males	46.2
Percent females	53.8
Mean age in months	18.6
males only	21.1
females only	18.9
Mean length of stay (months)	17.3
males only	20.0
females only	15.1
Mean no. persons in household	4.5**
Mean age of mother	21.0**
No. of mothers in school	14.0**
Last grade completed (mean)	10.0**
No. of mothers who work	9.0**
No. of abnormal pregnancies	11.0**

*N=26; total sample

**N=20; information obtained from a year-old questionnaire, and six of the infants used in the present study were not enrolled at the Center at the time of the questionnaire.

2. Experimental setting.--The observation sessions were conducted in the infants' classrooms at the Center, each of which was approximately 7.3 x 13.4 meters in size. At the shorter end of each classroom was a large observation window and the door which was used for the caregivers' exits. During the experimental sessions, the caregiver sat on the floor with the infant, a short distance away from the door, making sure that each infant was facing the door and the windows, so accurate observations of the infant could be made.

3. Procedure.--Each infant was observed before, during, and after a brief separation from a caregiver, each phase lasting sixty seconds, for a total of three minutes observation of each infant. For the "before" observation, the infant was placed on the floor facing the door. The caregiver then interacted with the child in the same fashion in which she normally does with the infants every day. No other specific instructions were given on what to do with the child during this time. The toy used for all sessions was a plastic milk carton with six plastic milk bottles. This situation was maintained for sixty seconds, at the end of which time, upon a signal from the experimenter, the caregiver stood up and walked out the door. The "during separation" observation then began, in which the caregiver stayed out of the room and the sight of the infant for sixty seconds. The "after separation" observation was made upon the return of the caregiver through the same door and as she sat down at the same place on the floor. During this time she was to continue playing with the milk bottle toy and refrain from calling to the child. All sessions took place at the same location in the classroom, to standardize the procedure and to facilitate filming.

The infants selected for the study in Classroom 1 were observed interacting with their previously assigned individual caregiver. The infants in Classroom 2 were observed with a caregiver who had been randomly selected by the experimenter.

4. Response measures--The sessions were filmed by means of a Sony Videocorder over a three-week period. A tape recorded sound fed onto the videotape provided a signal every ten seconds. Since filming was done through a window, vocalizations in the classrooms could not be recorded. At a later time, the twenty-six videotaped sessions were viewed by two observers who recorded the occurrence of each behavior: maintain proximity, visual regard, touches, protest, seek proximity, and greet (see definitions). These behavioral categories were established after observing the infants for several hours. Also, the exact operational procedure was refined from these earlier trial procedures. Recording was done on photocopied sheets by placing checkmarks in columns corresponding to each ten-second interval. This interval was chosen because it was short enough to provide accurate observation of several categories, long enough to enable the behaviors to occur during the time period, and because of its frequent use in the literature.

Observer agreement was determined by a formula reported in Coates et al. (1972):

$$\text{Agreement} = \frac{\text{no. agreements}}{\text{no. agreements} + \text{no. disagreements}}$$

This agreement, based on simultaneous observation by two observers of each of the videotaped sessions ranged from .79 to 1.00 for the six behaviors with a mean of .87. Interrater correlations for the several behaviors ranged from .97 to 1.00.

Results

The mean frequencies of the six attachment behaviors observed during the sessions for the two classrooms are presented in Table II. An analysis of variance was employed to investigate the difference in attachment behaviors

TABLE II

MEAN FREQUENCIES AND STANDARD DEVIATIONS FOR ALL INFANTS IN SIX CATEGORIES OF BEHAVIOR

BEHAVIORS	Classroom 1 Single caregiver		Classroom 2 Multiple caregivers					
	Male N=5		Female N=8		Male N=7		Female N=6	
	M	SD	M	SD	M	SD	M	SD
Maintain proximity	12.00	0.00	10.25	2.71	10.86	1.46	11.67	0.82
Visual regard	7.60	1.82	9.25	3.01	5.14	2.27	8.67	2.58
Touch	0.00	0.00	0.63	1.41	0.71	1.89	0.00	0.00
Protest	0.40	0.89	0.50	0.92	0.00	0.00	0.17	0.41
Seek proximity	0.00	0.00	1.00	1.51	0.29	0.49	0.33	0.82
Greet	0.20	0.45	0.25	0.46	0.00	0.00	0.67	0.52
*N=26; total sample								

between the two classrooms for each index. Results shown in Table III show no significant differences between infants in

TABLE III

SUMMARY OF ANALYSIS OF VARIANCE FOR ALL INFANTS IN SIX CATEGORIES OF BEHAVIOR

Source of Variation	Ss	df	VE	F	P
Maintain proximity					
Sex	1.394	1	1.394	0.453	0.508
Classroom	0.118	1	0.118	0.038	0.846
Sex X Classroom	10.325	1	10.325	3.356	0.081
Within	67.690	22	3.077		
Visual regard					
Sex	42.186	1	42.186	6.587	0.018*
Classroom	14.570	1	14.570	2.275	0.146
Sex X Classroom	5.534	1	5.534	0.864	0.363
Within	140.890	22	6.404		
Touch					
Sex	0.013	1	0.013	0.008	0.930
Classroom	0.013	1	0.013	0.008	0.930
Sex X Classroom	2.827	1	2.827	1.762	0.198
Within	35.304	22	1.605		
Protest					
Sex	0.112	1	0.112	0.246	0.625
Classroom	0.848	1	0.848	1.858	0.187
Sex X Classroom	0.007	1	0.007	0.015	0.903
Within	10.033	22	0.456		
Seek Proximity					
Sex	1.730	1	1.730	1.833	0.190
Classroom	0.229	1	0.229	0.242	0.627
Sex X Classroom	1.429	1	1.429	1.515	0.231
Within	20.762	22	0.944		
Greet					
Sex	0.809	1	0.809	4.901	0.038*
Classroom	0.074	1	0.074	0.448	0.510
Sex X Classroom	0.599	1	0.599	3.629	0.070
Within	3.633	22	0.165		
*significant at .05 level.					

the two classrooms. An analysis of variance was also employed to determine the difference between male and female infants. Results show a significant difference between males and females in two categories of behavior. Females exhibited more visual regard and greeting behaviors than did males.

The analyses were performed on the IBM 360, Model 50 computer at North Texas State University. The formula used was reported by Yamane (1964).

Discussion

Certain assumptions were made in the course of carrying out the present study. Only one observation of each infant was made, but it was assumed that making more than one observation of each infant would not have changed the results. All observations were made in the morning, between 8:30 and 10:30 am, but it was assumed that observations at other times of the day would not have affected the results. It was also assumed that personalities of the caregivers did not play a part in the results.

As in Coates et al. (1972), no attempt was made in the present study to demonstrate that every infant was, in fact, specifically attached to his caregiver. Other researchers (Schaffer & Emerson, 1964), have found that most infants developed an attachment to another person in addition to the mother by the age of eighteen months, or even earlier

(Moreno, 1973). Only eight subjects in the present study were under eighteen months of age; therefore, one can assume that the infants were capable of making additional attachments.

The hypothesis that attachment behaviors would occur more frequently in infants who had single caregivers than in those who had multiple caregivers was not confirmed, which supports the results of previous research at the Yale Learning Center (Wilcox, 1975). Stayton (1971) reported that infants who cry most frequently in minor everyday separation situations are those whose mothers had been relatively unresponsive to cries, either delaying in responding to them or ignoring them altogether. The caregivers in the present study were trained to respond to the infants and this could help explain the fact that very little protest was exhibited by the infants studied.

Familiarity of the setting could also have played a part in the results. Bowlby (1969) stated that when an infant is left in a familiar setting, as in the present study, he will be relatively content, whereas if left in an unfamiliar one, the infant is certain to cry or to attempt to follow.

Finally, Stayton et al. (1973) reported that infants when left totally alone were more likely to exhibit separation-related behaviors than when left with companions. In the present study, the infant was left in his classroom, in the vicinity of fifteen or more playmates.

The hypothesis that there would be no sex differences in attachment behaviors also was not confirmed. These results are in conflict with results obtained by Coates et al. (1972). However, part of their procedure placed the infant in a stressful situation, which tends to reduce sex differences (Brooks & Lewis, 1974). Their situation thus evoked more protest than did the present study, which utilized a low-stress situation to examine attachment behaviors. The importance of sex differences is heavily emphasized in contemporary developmental theory (Moss, 1967), and so the finding of sex differences in attachment behaviors in the present study is believed to be an interesting addition to the literature.

A limitation of the present study is that the sample selected was not representative of a normal distribution of young children for the following reasons (1) the age distribution of nine to twenty-three months (average age = 18.6 months) included a few younger age children (2) the setting chosen for the study did not include children of other ethnic groups or income levels.

A better experimental procedure might involve a comparison of "before separation" sessions across classrooms and to make the same comparisons with "during separation" and "after separation" sessions. This could not be done in the present study. In examining the data on the behaviors across the

three sessions, it was noted that some behaviors could not occur during some sessions (e.g., "touch" could not occur when the caregiver was out of the room) and that other behaviors occurred infrequently. Because of the small sample size, it is not possible to conclude that these behaviors would not occur under other conditions.

The present study has evaluated the attachment behavior of infants to their caregiver in a day-care setting. The finding of significant sex differences in visual regard and greeting behaviors is believed to be an interesting addition to current research. The finding of no significant differences regarding number of caretakers might be due to limitations on the research design or limitations due to size and nature of the sample. Further research on attachment behavior of infants should take into account the above mentioned variables.

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