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ABSTRACT

The stability of eight attachment behaviors was investigated in two samples of infants. One sample observed at 10 and 14 months of age, the other sample at 14 and 18 months. For each testing period, the infants were observed during two sessions: (a) in the presence of the mother; and (b) before, during, and after a brief separation experience. Correlational analyses were performed to assess within-session stability, day-to-day stability, and stability across a 4-month period. There was little stability of any kind for visual regard and vocalizing to the mother or in crying and three behaviors indicating orientation to the locus of the mother's disappearance. In contrast, both short- and long-term stability were found for touching and proximity to the mother. The results point to the hypothesis that attachment behaviors do not form a uniformly stable system in 10-, 14-, and 18-month-old infants. (Author/MG)

Developmental Psychology, 1972, in press.

The Stability of Attachment Behaviors in the Human Infant[1]

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The concept of attachment refers to seeking proximity with some specific person and to seeking attentive and nurturant behaviors from that same individual (Maccoby & Masters, 1970). With respect to infant behavior, attachments are thought to be relatively enduring once they become focussed on specific objects such as the mother. They neither wax nor wane in association with short-term conditions of fatigue or stress but, under normal circumstances, remain constant for long periods. At the same time, it is commonly recognized that the specific behaviors by which attachment is indicated occur with frequencies that fluctuate widely, even within relatively short periods of time. Both changes in setting and changes in the infant's repertoire appear to be associated with these fluctuations.

Bowlby (1969) has stated that, in most cases, the pattern of mother-infant interaction acquires stable characteristics by the end of the first year. He believes that this stability derives from the mutual satisfactions experienced by both mother and child in their interactions with each other. Individual differences are to be expected, however, because the same behaviors do not lead to satisfaction in every case. The formulation thus emphasizes that patterns

of interaction only persist across time for "most" cases.

From a social learning point of view (e.g., Gewirtz, 1969; Mischel, 1968), one might also expect stability in attachment behaviors. This expectation would be based on the assumption that mothers are consistent in the reinforcement contingencies they employ for attachment behaviors. Yet, the stability might well be less than perfect, depending on the extent to which changing contingencies or disruptions of the mother-infant relationship occur in a given sample of mothers and infants.

Bowlby (1969) does not comment on the possibility that variation may exist in the stability of different infant attachment behaviors (e.g., visual regard of the mother versus seeking proximity versus manifesting distress in her absence); his comments pertain to the stability of the overall "attachment pattern." Recent research shows, however, that the feedback supplied by the environment, particularly feedback provided by caretakers or their surrogates, influences the occurence of most attachment behaviors (e.g., Wahler, 1967). Thus, whether some behaviors are more stable than others depends on the uniformity of caretaker reaction to the various kinds of attachment activity. Very little is known about the extent to which such feedback actually is uniform.

Two previous reports provide limited data concerning the stability of infant attachment. Schaffer and Emerson (1964) computed rank-order correlations, based on the intensity of the infant's protesting when separated from the mother, between successive months following attachment onset. Of the correlations based on six

successive months, four of five were significant (median rho = .49). The correlation between the first and sixth month, however, was not (rho = .31).

Cox and Campbell (1968) provided evidence concerning the stability of the infant's touching of the mother. They observed 13- to 15-month-old infants with their mothers during two 12-minute sessions in a strange room. During the first session, the mothers of half the infants were present throughout, while the mothers of the other half were absent for four minutes in the middle of the session. Three weeks later, the infants and their mothers were seen again, but this time all of the mothers were present for the entire 12 minutes. The rank-order correlation between the infant's touching and holding of the mother in Session I and in Session II was .48 ($p < .05$). It is noteworthy that the stability of the response did not vary significantly as a function of the mother's presence or absence during the first session.

To date, then, there is evidence that individual differences in both contact-seeking and separation-induced protest are moderately stable for three- to four-week periods. The published literature contains little information concerning the extent to which fluctuations in attachment behavior occur with the passage of very brief periods (e.g., a few minutes) as a function of increasing fatigue, familiarity with the setting, and the like. Also, information on day-to-day stability is lacking.

The purpose of the present investigation was to augment the available evidence concerning the stability of attachment behaviors in infancy. A number of different attachment indicators were observed in infants who ranged in age from 10 to 18 months. Three

aspects of stability were assessed: within-session stability, day-to-day stability, and stability across a four-month period. This information was sought for two main reasons: (a) to supplement current descriptions of behavioral development in infancy; and (b) to contribute information needed by those investigators who seek to predict aspects of later development from information about social responsiveness in the first two years of life.

Method

The study procedure has been described fully elsewhere (Coates, 1970; Coates, Anderson, & Hartup, 1972). Only a summary will be presented here.

Subjects

Sample 1, 14 boys and 14 girls, was first tested when the subjects' mean age was 10.7 months. Sample 2, including the same number of boys and girls, had a mean age of 14.6 months at this time. Forty-six of the original subjects were tested a second time approximately four months later. At this point, the 23 subjects who were available from Sample 1 included 10 boys and 13 girls with a mean age of 14.8 months; the 23 subjects from Sample 2 included 13 boys and 10 girls with a mean age of 18.7 months.

Although the subjects were obtained from several sources (Coates, 1970), the samples were quite homogenous. All but 11 of the subjects' fathers were university students. Their average age was 26.1 years and that of their wives was 24.6 years. There were no appreciable differences between the samples with respect to several demographic variables (e.g., the number of mothers who

worked).

Experimental Design

At the time of the first testing all subjects were observed in two assessment situations. During one observation, the infant was watched in the presence of the mother (Nonseparation). The other observation was conducted before, during, and after a brief separation experience (Separation). Half of the subjects in each age and sex group were observed in the Nonseparation Condition on the first testing day while the other half experienced Separation. On the following day, each subject was observed in the condition not employed with him initially. The ordering of the two sessions during the follow-up testing (four months later) was the same as used previously.

Experimental Setting

The testing was conducted in a mobile laboratory parked near the family housing area of the University of Minnesota. The floor of the testing room measured 2.29 m. X 3.96 m., and when the mother was in the room she sat in a chair against one of the longer walls. Several toys were placed on the floor 1 m. to the front and to the left of the mother. Observations were conducted from behind one-way mirrors.

Procedure

The mother was instructed not to initiate interaction with the subject during the testing session but, rather, to respond "in kind" to his overtures. She was told, for example, to smile at the infant if he smiled at her. She was also told not to pick up

the infant at any time.

Each session began with the mother placing her baby on the floor in front but facing away from her. The Nonseparation Condition consisted of maintaining the conditions described above for 10 minutes. The Separation Condition, also 10 minutes in length, consisted of four parts: (1) a three-minute baseline period identical to the Nonseparation Condition; (b) a two-minute period of separation beginning when the mother rose from her chair, said goodby to the subject, and left the room; (c) a two-minute post-separation phase during which Nonseparation Conditions were once more maintained; (d) a three-minute nonseparation period following a break for the purpose of calming the infant. The final phase will not be considered in this report.

Response Measures

Records of these sessions were compiled by two observers who dictated descriptions of the subject's behavior at regular intervals into two tape recorders. The observers wore earphones so that they could hear the vocalizations of the subject but could not hear each other. A time-sampling procedure was used, such that every six seconds the observers recorded the presence or absence of five different types of activity: visual regard, vocalizing, smiling, touching, and crying. The object toward which each action was directed was also recorded except in the case of crying and, lastly, the position of the subject was noted with reference to a 4 X 2 matrix of cells on the floor.

Correlation coefficients were used to estimate the degree of

observer reliability for frequencies[3] obtained in each of eight behavior categories. The reliability estimates were based on simultaneous observations of 30 sessions from the first testing period and 21 from the second. These estimates follow, with the two coefficients in each case representing the results from the two different testing period: visual regard of the mother (.97, .96); vocalizing to the mother (.96, .88); touching the mother (.99, .99); proximity to the mother (.99, .99); crying (.95, .98); looking at the door through which the mother left the room (.97, .95); touching the door (.99, .97); and proximity to the door (.97, .99). Proximity to the mother or the door refers to the subject being in the cell in which the object was located.

Correlation coefficients were also used to estimate the stability of the various measures over time, following a test-retest paradigm. Smiling occurred too infrequently to be included in the analysis.

Results

Within-Session Stability

There was considerable variation among the measures in the magnitude of within-session stability (Table 1). First, visual regard possessed very little stability of this kind. A larger number of significant correlations, however, was found for the 10- and 14-month-olds than for the 18-month-olds. Next, virtually no stability within these sessions was shown in vocalizing to the mother, although low positive coefficients were found for the 18-month-olds (two of the four were significant). Touching the

mother and remaining close to her had greater within-session stability than visual regard or vocalizing. In most instances, the coefficients were somewhat higher for 14-month-olds than for 10- or 18-month-olds.

Insert Table 1 about here

Session-to-Session Stability

Coefficients showing the stability of the attachment behaviors over a one-day period are shown in Table 2.[4] First, individual differences in neither visual regard nor vocalizing possessed noticeable stability over this period. Significant stability coefficients were found at both testing periods for vocalizing in Sample 2 only, but at neither period for Sample 1. Next, there was little evidence of general day-to-day stability in touching of the mother. In contrast, however, proximity-seeking was moderately stable across this span of time among both 14- and 18-month-olds.

Insert Table 2 about here

Long-Term Stability

The data reported in Table 3 show the stability coefficients for eight attachment measures as computed across a four-month period for the two samples separately. The findings based on the low stress, nonseparation session rather convincingly show that individual differences in visual regard of the mother possessed very little

long-term stability for either sample, while touching the mother and remaining close to her were moderately stable across a period of 4 months. For vocalizing, a significant coefficient was obtained from 10 to 14 months (Sample 1) but not from 14 to 18 months (Sample 2).

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Insert Table 3 about here

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For both samples, stability coefficients were also computed for each of the four responses to the mother for the 3-minute baseline phase of the Separation Session. Each of the coefficients was not significant (range was -.18 to .27, median r = .04).

There was little stability in the infants' crying or in their looking, touching, and proximity to the door when the mothers left them alone (Table 3). Only the correlation for looking at the door from 14 to 18 months was significant.

Discussion

The most striking outcome of the study is that some of the attachment behaviors were found to be more stable than others. Also, those having the greatest short-term stability were the most stable across longer periods; there was no instance in which a particular attachment activity showed high stability within sessions and low stability across the four-month interval.

On the basis of social learning theory, one would assume that the stability of the infants' attachment behavior reflects the stability of the mothers' behavior. Given this assumption, the

present results suggest the hypothesis that mothers are stable in their child-rearing practices for some attachment behaviors (e.g., proximity-seeking), but not for other behaviors (e.g., visual regard). This hypothesis should be tested by careful observation of mother-infant interaction.

Since the stability of a measure determines its efficacy as a behavioral predictor (e.g., Nunnally, 1967), the present data suggest that proximity-seeking and touching may be useful indices for longitudinal research on social development. This assurance is particularly important since numerous investigators have argued that touching and proximity to the mother are the "hallmarks" of attachment.

Proximity-seeking was clearly the most stable measure obtained from these observations. The stability of this response did not vary appreciably from sample to sample, although it increased with age. Specifically, there was an increase in the short-term stability of this activity at about the point when these infants began to walk. It should not be assumed, however, that proximity-seeking possessed no predictive value when observed prior to the onset of walking. On the contrary, at least modest stability was present from the pre-walking to the walking period (i.e., from 10 to 14 months).

Touching the mother presented a generally similar stability pattern. This outcome is not surprising since touching and proximity-seeking are positively correlated (Coates et al., 1972). It should also be noted that the long-term stability coefficients

obtained with this measure are similar to those reported earlier by Cox and Campbell (1968).

There was a general lack of stability in the measures of visual regard of the mother and vocalizing to her although there was some evidence of a sampling difference. Elsewhere in the literature Moss and Robson (1968) have reported that mutual visual regard by the infant and its mother ("vis-a-vis") is moderately stable from one to three months of age. Considering the present indications that the infant's regard of the mother, by itself, is not stable, we suggest that stability in "vis-a-vis" probably emanates from the mother rather than the infant. This suggestion, however, must be tempered by the fact that different age groups were used in the two studies.

Before concluding that visual regard and vocalizing are completely labile systems, one might question the adequacy of the present observational procedure. Did this procedure provide sufficiently long periods to demonstrate the "true" stability of these behaviors? Is it possible, for example, that greater stability would have been found with longer observations? This possibility should be explored since, using the present procedure, the visual regard and vocalising scores were less variable than were the proximity and touching scores (see Coates et al., 1972). Such differences in variability could well be related to the differences found in the magnitude of the stability coefficients.

Individual differences in reaction to separation (crying and orienting to the door) were not stable across the four-month

test-retest period. Although these findings are reminiscent of the nonsignificant stability coefficients reported by Schaffer and Emerson (1964) for a five-month interval, they also stand in sharp contrast to the stability data for touching and proximity-seeking. Once again, however, it should be noted that the observations of separation reactions were extremely brief.

While further effort should be made to increase the stability of the measures, the data point to the hypothesis that attachment behaviors do not form a uniformly stable system. Proximity-seeking, when measured by brief observations, has relatively high stability over time and this information should be useful to future investigators. With respect to certain other behaviors that also promote contact between mother and infant, it may be necessary to turn to other modes of analysis in order to study the stability problem. Perhaps some form of profile analysis, an approach implicit in Bowlby's (1969) conceptualization, should be tried.

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Footnotes

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2. Reprint requests should be sent to Brian Coates who is now at the Department of Psychology, University of North Carolina, Chapel Hill, North Carolina 27514.
3. Mean frequencies for the various categories listed here are reported in Coates et al. (1972). The reader is also referred to this paper for data on the effects of several independent variables (e.g., order of the sessions) on the frequency of occurrence of the behaviors and the correlations among the behaviors.
4. Similar results were obtained for stability coefficients between the first 3 minutes of the Nonseparation Session and the pre-separation phase of the Separation Session.

Table 1

Within-session Stability Coefficients for Four

Measures of Approach to the Mother

	Nonseparation Session			Separation Session
	1st 3 Minutes	1st 3 Minutes	2nd 3 Minutes	Pre-Separation
	vs.	vs.	vs.	vs.
Measure	2nd 3 Minutes	Last 4 Minutes	Last 4 Minutes	Post-Separation
Visual regard				
Sample 1				
10 months	.06	-.09	.36*	.49**
14 months	.53**	.05	.26	.58**
Sample 2				
14 months	.64**	.06	.40*	.09
18 months	.22	.14	.22	.04

Table 1--Continued

Measure	Nonseparation Session: 1st 3 Minutes vs. 2nd 3 Minutes	Nonseparation Session: 1st 3 Minutes vs. Last 4 Minutes	Nonseparation Session: 2nd 3 Minutes vs. Last 4 Minutes	Separation Session: Pre-Separation vs. Post-Separation
Vocalizing				
Sample 1				
10 months	.02	-.11	.07	-.09
14 months	.21	.00	.28	.13
Sample 2				
14 months	.06	.21	.39*	.01
18 months	.36*	.37*	.22	.31
Touching				
Sample 1				
10 months	.36*	.26	.35*	.44**
14 months	.79**	.01	.22	.39*
Sample 2				
14 months	.73**	.77**	.80**	.56**
18 months	.26	.64**	.65**	.30

Table 1--Continued

Measure	Nonseparation Session: 1st 3 Minutes vs. 2nd 3 Minutes	Nonseparation Session: 1st 3 Minutes vs. Last 4 Minutes	Nonseparation Session: 2nd 3 Minutes vs. Last 4 Minutes	Separation Session: Pre-Separation vs. Post-Separation
Proximity				
Sample 1				
10 months	.23	.33*	.34*	.17
14 months	.85**	.14	.31	.68**
Sample 2				
14 months	.65**	.77**	.67**	.69**
18 months	.74**	.52**	.33	.46*

*$p < .05$, one-tailed.

**$p < .01$, one-tailed.

Table 2

Session-to-session Stability Coefficients for Four Approach Measures: Nonseparation (Entire) vs. Pre-separation

Measure	First vs. Second Session
Visual regard	
Sample 1	
10 months	.18
14 months	.02
Sample 2	
14 months	.21
18 months	.09
Vocalizing	
Sample 1	
10 months	.04
14 months	.06
Sample 2	
14 months	.54**
18 months	.58**

Table 2--Continued

Measure	First vs. Second Session
Touching	
Sample 1	
10 months	.22
14 months	.20
Sample 2	
14 months	.52**
18 months	.14
Proximity	
Sample 1	
10 months	.25
14 months	.43*
Sample 2	
14 months	.66**
18 months	.39*

Note.--Nonseparation session = 10 minutes; Pre-separation phase = 3 minutes.

*$p < .05$, one-tailed.

**$p < .01$, one-tailed.

Table 3

Long-term Stability Coefficients for Eight Attachment Measures

Measure	First vs. Second Testing Period
Nonseparation Session:	
Visual regard	
10 to 14 months	.13
14 to 18 months	.10
Vocalizing	
10 to 14 months	.71**
14 to 18 months	.25
Touching	
10 to 14 months	.36*
14 to 18 months	.69**
Proximity	
10 to 14 months	.43*
14 to 18 months	.67**

Table 3--Continued

Measure	First vs. Second Testing Period
Separation Session:	
Crying	
10 to 14 months	.08
14 to 18 months	.34
Looking at Door	
10 to 14 months	.10
14 to 18 months	.64**
Touching Door	
10 to 14 months	.10
14 to 18 months	-.22
Proximity to Door	
10 to 14 months	.05
14 to 18 months	.29

*p < .05, one-tailed.

**p < .01, one-tailed.