

Continuity of Adaptation in the Second Year: The Relationship Between Quality of Attachment and Later Competence

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A perspective on continuity in development and adaptation was proposed and examined in light of data from the second year of life. Within this perspective it is assumed that despite discontinuous advances in developmental level and despite dramatic changes in the behavioral repertoire, there is continuity in the quality of individual adaptation. Such quality is assessed by examining the child's functioning with respect to issues salient for the particular developmental period. In this study the link between quality of attachment in infancy (the organization of attachment behavior) and quality of play and problem-solving behavior at age 2 years was examined in 48 infants. Based on completely independent assessments, infants assessed as securely attached at 18 months were predicted and found to be more enthusiastic, persistent, cooperative, and, in general, more effective than insecurely attached infants in the 2-year assessment. All measures were in the predicted direction; in some cases there was virtually no overlap between groups. The differences apparently were not due to development quotient (DQ) or temperament. The earlier infant behavior also predicted mother's behavior in the 2-year assessment. Implications for developmental theory and research are discussed.

Theoretical formulations of emotional development in childhood (e.g., Erikson 1950; Escalona 1968; Loevinger 1976; Mahler 1975) and early intervention efforts rest on the assumption of continuity in adaptation. It is assumed that there is coherence in personality development over time, that early assessments predict the presence of later developmental difficulties, and that particular difficulties are linked to the quality of early adaptation in a logical manner.

This study was designed to test the power of a particular perspective on continuity in early development. Within this perspective it is assumed that despite qualitative advances in developmental level and despite dramatic changes in the behavioral repertoire, there is continuity in the quality of adaptation or the way in which behavior is organized

(Sroufe & Mitchell, in press; Sroufe & Waters 1977). The quality of adaptation is assessed by examining the child's functioning with respect to issues salient for the particular developmental period.

From a variety of theoretical perspectives, for example, the well-functioning or competent 12-18-month-old is one who has formed an attachment relationship which effectively supports active exploration and mastery of the inanimate and social environment. Such mastery is a central task for this age period (Ainsworth 1973; Erikson 1950; Mahler 1975; Piaget 1952). From this viewpoint, difficulty separating from the attachment figure to explore novel aspects of the environment or difficulty deriving comfort from the caregiver when distressed (and readily returning to play/exploration) are maladaptive.

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Similarly, the well-functioning 2-year-old has made great strides toward autonomous functioning and further progress in the separation-individuation process (e.g., Erikson 1950; Mahler 1975). For example, in a problem-solving situation, movement toward autonomy would be indicated by flexibility, resourcefulness, and ability to use adult assistance - without being overly dependent on it. The competent toddler becomes readily and eagerly involved in a task, shows pleasure in task solution, and, in the face of frustration, remains involved and examines alternative strategies before giving up all efforts at solving the problem.

From infancy to early childhood, then, the prediction is that the child with a secure, effective attachment relationship will later exhibit competent, more autonomous functioning, in terms of both affective involvement and problem-solving style. Such a prediction is made both from the assumption of coherence in personal adaptation and because adaptation at the earlier developmental phase can be seen to lay the groundwork for later adaptation. The child whose early exploration of the environment is supported by a positive attachment relationship will gain not only object-mastery skills, but also a sense of effectance (see White 1959). He or she will be confident of emotional support when exploratory activities lead to stress and will experience an amplification of his/her involvement through affective sharing of mastery-play activities. The greater ability to invest oneself in the world is seen as leading to greater competence (Ainsworth & Bell 1974).

Ainsworth has provided a method for assessing attachment that is well suited to the research problem at hand (e.g., Ainsworth, Bell, & Stayton 1971; Ainsworth, Blehar, Waters, & Wall, 1978). In this system, which is based on

Bowlby's (1969) ethological theory of attachment as affective bond, individual differences in the quality of attachment are explicitly defined in terms of attachment/ exploration balance, use of the caregiver as a base for exploration, and ability to derive comfort from the caregiver's presence, interaction, or contact. Ainsworth's strange-situation procedure is a cumulative-stress situation which taxes the in-

fant's capacity for coordinating adaptive response and thus represents an appropriate, broad-band assessment of competence. The emphasis is on the way in which attachment behavior is organized by the individual across contexts and with respect to other behavioral systems (Sroufe & Waters 1977). Moreover, her classification system has been shown to be highly reliable, to yield stable individual differences, and to have a variety of external correlates, including home behavior (see Ainsworth et al. [in press]; Sroufe & Waters [1977] for reviews).¹

The recent demonstration of striking stability of strange-situation attachment classification from 12 to 18 months in a middle-class sample (Waters 1978) attests to the reliability of Ainsworth's system and supports the assumption of continuity in adaptation. It also lays the groundwork for a short-term longitudinal study bridging the gap from infancy to early childhood by supporting use of the Ainsworth method with infants as old as 18 months. Forty-eight of the 50 infants in the Waters (1978) study received the same major attachment classification at 18 months as they did at 12 months, suggesting that the 18-month data continue to capture the earlier individual differences.

Given this well-developed and validated system for assessing secure attachment as an important indication of successful adaptation in late infancy, the remaining task was to develop comparable assessments of adaptation for the early toddler period and to determine the strength of the link from early to later behavior. We elected to use a tool-using, problem-solving situation.² Some of the problems were readily solved and some were well beyond the capacity of the 2-year-old, but the child's mother was available for assistance. Thus, like the Ainsworth paradigm, this situation taxed the capacity of the child for coordinating affect, cognition, and behavior and for drawing upon personal and environmental resources. By focusing on task involvement, persistence, ability to use adult resources, and other aspects of problem-solving style, it was felt that the quality of the toddler's adaptation could be captured in this situation.

1 Others who have suggested that Ainsworth's system is not valid or does not work (e.g., Feldman & Ingham 1975) have not attempted to classify their subjects in terms of quality of attachment, have not given the same emphasis to the avoidant and resistant behavior categories, and/or have used the system with age groups for whom it was not developed. Instead such critics commonly report frequencies of behaviors occurring in the strange-situation episodes. Thus they have not employed and therefore have not tested Ainsworth's method. The strange situation is a format for applying a method which may or may not be valid, but the strange situation itself can neither be valid nor invalid.

2 The problems were adapted from those used by Charlesworth and Fitzpatrick at the University of Minnesota.

In this study infants were classified as to the quality of their attachment relationship based on 18-month strange-situation behavior. A measure of cognitive competence (Bayley Mental Developmental Scales) was administered at 23 months. Finally, at 24 months the child's play behavior and problem-solving behavior were assessed. In this latter situation, maternal support and assistance also were evaluated. While the age span studied is narrow, the period in question marks an important transition in every developmental stage theory (e.g., Erikson 1950; Mahler 1975; Piaget 1952). It marks the transition between in-fancy and childhood, from prerepresentational to representational thought. Moreover, it is a period in which developmental discontinuity (rapid change; failure of early assessments of developmental level to predict later assessments strongly) has been amply demonstrated (e.g., McCall, Note 1). Therefore, a demonstration of continuity in personal adaptation across this age span is of some significance.

Method

Subjects

The sample consisted of 25 male and 23 female white, middle-class infants and their mothers, recruited by telephone from a volunteer card file kept at the Institute of Child Development, University of Minnesota. Thirty-seven of the subjects were randomly selected; 11 were selected because they were in the nonnormative attachment groups (see below) of another larger sample. Half of the subjects were first-born; half had at least one older sibling.

Procedure

Assessment of attachment.-Eighteen-month-old infants and their mothers were observed in a standard laboratory setting. Quality of attachment was assessed using the Ainsworth paradigm (Ainsworth & Wittig 1969; Sroufe & Waters 1977). This is a cumulative-stress situation with two separations and re-unions, the latter involving the infant's being left alone briefly. While there are eight specific categories, infants are classified into three main groups: securely attached (group B, approximately 70%), avoidant (group A, approximately 18%), and ambivalent (group C, approximately 12%). The classifications reflect the pattern of behavior across the eight episodes of the strange situation but are heavily determined by reunion behavior. Securely attached babies are active in seeking physical contact or interaction on reunion, and this contact is effective in terminating distress and promoting a return to absorbed play. Avoidant infants avoid the caregiver

upon reunion, especially the second reunion when distress is presumed to be greater. Ambivalent babies have difficulty becoming settled upon reunion and may mix contact seeking with squirming to get down, pushing away, batting toys, and other signs of contact resistance. (For complete descriptions of the various patterns of behavior, see Ainsworth et al. [in press] or Sroufe & Waters [1977]). All codings were done from videotape. Intercoder reliability for the threefold classification (percentage of agreements over agreements and disagreements) was .88.

Assessment of free play and cleanup.-At 24 months the toddlers returned to the laboratory for a 10-min free-play period, a 6-min cleanup period, and the problem-solving tasks. Within the free-play period, naturally occurring bouts of symbolic play were coded. Symbolic play bouts consisted of behaviors clearly showing pretending and imagination, for example, placing a small wooden person in a tractor seat and having him "drive" around, placing the animals in the barn, "pouring" a cup of tea and offering it to the mother. To qualify as a bout the play had to last 5 sec or more. If the child switched his attention from its original activity, or if the original play bout was interrupted by 5 or more seconds of in-activity or inattention, this was designated as the end of the original bout and initiation of the next bout if appropriate. Further, although mothers were requested to refrain from initiating play, if they did so the mother-initiated instance of imaginative play was not coded as a symbolic play bout.

Tapes of the free-play sessions were available for 45 subjects. Coders of the play bouts were unaware of the subjects' attachment classification or tool-using behavior. Intercoder reliability (product-moment correlation) was .86, based on 28 subjects.

Following free play the mother initiated the cleanup period. This allowed observation of the child when an ongoing, pleasant activity was interrupted. The following behaviors were coded in the cleanup task by means of frequency counts made from the videotapes- (1) oppositional behavior: child says "no" in response to mother's request or does the opposite to what he is told; and (2) angry behavior: child engages in any of the following behaviors-foot stomping, hitting, whining or crying, temper tantrums, leaving the task, physical struggles with the mother.

Assessment of problem-solving style.-Following the 10-min free-play period and the 6-min cleanup period, the subjects were presented with four problem-solving tasks. The experimenter explained the

problems to the mother and presented the apparatus to the child, but then withdrew to the far corner of the room. Mother was told to let the child first work on the problem independently, then to give "any help you think he/she needs." The first two problems were simple: removing a lure from a space between two closely spaced wooden panels or from a tube using a stick. The other two problems were increasingly difficult: putting two sticks end to end in order to get a lure from a long tube and weighting down the end of a lever with a block to raise candy through a hole in a Plexiglas box. Two-year-olds cannot solve the latter task without the help of an adult.

The following rationally derived measures were scored from videotape recordings of the tool-using situation and were coded without knowledge of the attachment assessments or of play behavior. Only the final two problems were coded, the initial two problems being readily solved and viewed as warm-up tasks. For those subjects taking longer than 6 min to solve a given problem, the first 33 and last 22 min were coded. A number of measures were based on frequency counts (converted to percentage of maternal directives for the first four variables) - (1) compliance: child complies with mother's suggestion; (2) attempted compliance: child attempts to comply with suggestion but does not fully carry it out; (3) active noncompliance: child's behavior is almost exactly contrary to mother's suggestion; (4) ignoring: child ignores mother's suggestion; (5) verbal negativism: "no" in response to mother's suggestion; (6) frustration behavior: hitting, kicking, foot stomping, scratching, or biting; (7) aggressive behavior: hitting, kicking, pushing, scratching, or biting directed at mother; (8) whining or crying; (9) help seeking: instance of seeking help from mother coded and timed; and (10) time away from task: nontask behavior, timed in seconds.

Reliabilities were computed on a sub-sample of 12 children in terms of percent agreement by two independent raters. This involved the conservative estimate of computing the percentage of events recorded by either observer that were also independently recorded by the second observer. Percent agreement ranged from 80% for active noncompliance to 100% for aggressive behavior.

In addition, rating scales were used to assess enthusiasm (seven-point scale), positive affect (three-point scale), and negative affect (four-point scale) during tools three and four. Pearson product-moment correlations between independent raters of

these measures, computed on a random subsample of 15, were .91, .82, and .97, respectively.

Maternal measures.-During the problem-solving tasks, maternal behavior was assessed by means of two seven-point scales. The first assessed "supportive presence," that is, the extent to which the mother appeared attentive and available to the child and supportive of his efforts. The second assessed "quality of assistance."

A high score on supportive presence involved meeting two major criteria-(a) providing a "secure base" by helping the child feel comfortable with working at the task, and (b) being involved, as manifested by the mother's attentiveness to the child and the task-as well as several minor criteria (e.g., focusing the child on the task as needed, mood setting for a problem-solving situation, sharing in the joy of problem solution, being physically present when needed, helping the child achieve a sense of having solved the problem himself). Lower scores were given according to the number of these criteria that were not met.³

A high score on quality of assistance involved meeting the major criteria of helping the child see the relationship between actions required to solve the problem and giving minimal assistance needed to keep the child working and directed at problem solution without solving it for him, as well as several minor criteria (e.g., giving space initially, timing and pacing of cues, giving cues the child could understand, having control of the situation, cooperating with the child). Again, lower scores on this scale were given according to the number of criteria that were not met (see n.3).

Ratings were done by two independent raters and discrepancies were resolved on conference. Pearson product-moment reliabilities of these scales were .93 and .89, respectively.

Assessment of developmental level.-At 23 months the Bayley Mental Developmental Scales were administered to the first group of 37 subjects by a trained tester in another room at the Institute of Child Development. The mother remained with the child throughout the testing session.

Results

Findings Descriptive of This Sample

Sixty-two percent of the sample randomly selected for this study were classified as securely attached, which is in approximate agreement to previ-

³ Criteria for determining mothers' scores on these two scales as well as definitions of the scale points are available from the authors.

ous findings (e.g., Ainsworth et al., in press; Waters 1978). Including the 11 avoidant and ambivalent infants from a previous study, there were 23 securely attached, 15 avoidant, and 10 ambivalent babies. (Fourteen babies assessed at 12 and 18 months had the same attachment classification at both ages, so only predictive relationships from 18 months are presented below.) The average developmental quotient (DQ) of the total sample was 115.25, reflecting the middle-class status of the sample. While means favored the securely attached subjects their DQs were not significantly higher than either the avoidant or the ambivalent groups (table 1).

As also can be seen by inspection of table 1, our 24-month-olds tended to comply with only a small percentage of the caregiver's suggestions, regardless of attachment classification. Even the securely attached infants complied or attempted to comply with only 57% of the mother's suggestions during the tool using. This tendency toward minimal com-

pliance along with a relatively high rate of ignoring is consistent with theoretical assumptions about the "terrible twos." It should be noted that blatant negativism, that is, either refusal to cooperate (saying "no") or doing the opposite of what the child is told to do (active non-compliance), is not a very common reaction pattern in the intrinsically reinforcing tool-using tasks. For example, there was an average of only 1.04 instances of negativism in the approximately 12 min of tool using. However, in the clean-up task, which lasted 6 min, there was an average of 2.05 instances of negativism. This task, which interrupted 10 min of free play, seems to be the type of situation where more typical oppositional behavior (though rarely temper outbursts) is noted. Most interesting, the securely attached infants showed more oppositional (though less angry) behavior in the clean-up period but dramatically (significantly; see below) less during the problem solving, where compliance with the mother has clear adaptive advantage (see table 1).

TABLE 1
MEANS AND STANDARD DEVIATIONS FOR DEPENDENT VARIABLES

| MEASURES | SAMPLE | | GROUP B | | GROUP A | | GROUP C | |
|--|--------|-------|---------|-------|---------|-------|---------|-------|
| | X | SD | X | SD | X | SD | X | SD |
| 1. Bayley Mental Development Index | 115.25 | 18.31 | 118.96 | 17.52 | 108.89 | 18.95 | 108.25 | 20.27 |
| 2. % comply | .28 | .15 | .36 | .17 | .22 | .08 | .20 | .08 |
| 3. % comply or attempt comply | .45 | .19 | .57 | .22 | .39 | .12 | .40 | .12 |
| 4. % active noncompliance | .05 | .06 | .04 | .08 | .07 | .04 | .05 | .04 |
| 5. % ignoring | .36 | .18 | .26 | .18 | .44 | .13 | .46 | .11 |
| 6. % time away from task | .17 | .15 | .12 | .12 | .24 | .17 | .17 | .14 |
| 7. No. help seeking | 6.15 | 6.06 | 4.48 | 3.50 | 7.60 | 7.52 | 7.80 | 7.74 |
| 8. Enthusiasm rating (both tools) | 7.96 | 2.95 | 9.22 | 2.63 | 6.08 | 2.92 | 7.70 | 2.36 |
| 9. Proportion saying "no" | .35 | .14 | .22 | .14 | .60 | .14 | .30 | .14 |
| 10. No. frustration behavior | 1.50 | 2.79 | .65 | .98 | 2.67 | 4.29 | 1.70 | 2.36 |
| 11. Proportion engaging in aggressive behavior | .13 | .09 | .00 | .09 | .33 | .09 | .10 | .09 |
| 12. Proportion cry or whine | .65 | .14 | .52 | .14 | .72 | .14 | .80 | .14 |
| 13. Proportion help seeking within 30 secs. | .44 | .18 | .30 | .18 | .53 | .18 | .60 | .18 |
| 14. Proportion= "3" on positive affect | .15 | .10 | .26 | .10 | .07 | .10 | .00 | .10 |
| 15. Proportion= "3" or "4" on negative affect | .23 | .12 | .13 | .12 | .43 | .12 | .20 | .12 |
| 16. Mother's supportive presence (two tools) | 7.82 | 3.43 | 10.04 | 2.51 | 5.53 | 2.67 | 6.20 | 3.26 |
| 17. Mother's quality of assistance (two tools) | 7.56 | 3.47 | 10.04 | 2.64 | 5.00 | 2.59 | 5.70 | 2.21 |
| 18. Cleanup: oppositional behavior | 3.21 | 3.72 | 3.81 | 4.75 | 3.00 | 2.63 | 2.11 | 2.09 |
| 19. Cleanup: angry behavior | 2.11 | 4.15 | 1.71 | 2.87 | 2.00 | 4.13 | 3.22 | 6.52 |
| 20. Bouts of symbolic play | 2.26 | 2.27 | 3.40 | 2.47 | 1.35 | 1.66 | .12 | 1.38 |

Attachment Classification and Symbolic Play

Means and standard deviations for each attachment group on frequency of symbolic play are found at the bottom of table 1. Analysis of variance and subsequent t tests (two-tailed) indicated that securely attached infants engaged in more imaginative, symbolic play than both avoidant ($p < .02$) and ambivalent ($p < .02$) infants.

Attachment Classification and Adaptive Behavior in the Tool-using Situation

Analyses of variance and subsequent orthogonal linear contrasts for the continuously distributed variables (items 2-8 and 10 in table 1) revealed that the securely attached (group B) infants were more enthusiastic ($p < .005$) and complied with maternal requests more frequently ($p < .0001$) than non-B babies; they ignored the mother less ($p < .0001$), spent less time away from the task ($p < .06$), and exhibited fewer frustration behaviors ($p < .039$). One-tailed tests of proportions on the dichotomous or trichotomous variables indicated that infants classified as securely attached at 18 months were also higher on positive affect ($p < .01$) and lower on saying "no,"

crying or whining, negative affect (all $p < .05$), and engaging in aggression toward mother ($p < .01$). Since, as will be discussed below, comparisons of the securely attached infants with the avoidant subgroup are of special theoretical importance, seven measures selected a priori were also considered for these two groups separately (active noncompliance, ignoring, time away, "no," enthusiasm, positive affect, aggression). Significant differences favoring the securely attached infants (.05 and beyond) were found for each of these comparisons with the exceptions of active noncompliance and "no," which were also in the predicted direction.

Maternal variables.-As table 1 shows, the two assessments of maternal behavior-the supportive presence and quality of assistance scales -significantly differentiated securely attached from insecurely attached infants during the tool-use problems ($p < .001$).

Factor structure.-In order to determine whether the various measures reflected a common underlying competence factor that was not simply redundant with DQ, a principal components factor analy-

TABLE 2
VARIMAX ROTATED FACTOR MATRIX

| | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Bayley MDI | .27 | -.02 | .76 | -.05 | .12 |
| Comply | .80 | -.16 | .11 | .13 | .23 |
| Comply/attempt comply | .73 | -.32 | .08 | .14 | .37 |
| Ignoring | -.83 | .00 | -.20 | .36 | -.17 |
| Active noncompliance | -.16 | .26 | .21 | -.54 | -.40 |
| Time away from task | -.40 | .43 | -.48 | -.30 | .07 |
| Help seeking | -.14 | -.09 | -.16 | -.81 | -.07 |
| "No".... | -.10 | .86 | .08 | .09 | .02 |
| Frustration | -.23 | .80 | -.33 | -.06 | .09 |
| Aggression | -.08 | .10 | -.78 | -.07 | .00 |
| Crying | -.15 | .80 | -.23 | -.18 | -.00 |
| Help-seek within 30 min | .03 | -.07 | .10 | .10 | .87 |
| Negative affect | -.31 | .81 | .09 | .06 | -.10 |
| Positive affect | .70 | -.08 | -.07 | .32 | -.16 |
| Enthusiasm | .69 | -.34 | .22 | .33 | -.20 |
| Supportive presence | .74 | -.30 | .25 | .08 | -.07 |
| Quality of assistance | .72 | -.18 | .19 | .08 | -.02 |
| Variance accounted for | 38.2% | 11.8% | 8.5% | 7.6% | 6.3% |

sis was done on all tool-using variables and Bayley scores. Results of the factor analysis are presented in table 2.

The first factor explains 38.2% of the common variance and is found to have its highest loadings on ignoring of mother (-), compliance and attempting compliance (+), positive affect (+), enthusiasm (-F), mother's supportive presence (+), and quality of mother's assistance (+). There is a moderate loading (-) for time away from task. These variables can be seen as reflecting the dimension of competence as defined in the present study. It should be noted that the correlation of this factor with Bayley DQ was only .270.

The second factor, explaining 11.8% of the common variance, is comprised mainly of negativism, negative affect, frustration behavior, and crying. This factor was interpreted to represent temperament contributions to negative behavior during the tool tasks.

Finally, the third factor explained 8.5% of the common variance and appears to reflect primarily the dimension of intelligence or DQ. Aggression directed toward the mother, although a very low frequency behavior, loaded (negatively) on this factor. Time away from task also had a modest loading on this factor.

The underlying factors in the correlation matrix answer a number of important questions. First, it should be noted that the factor accounting for the largest portion of the variance could in fact be considered a "competence" factor. Second, this factor is probably not simply a measure of temperament, since the latter appears to be captured in the second factor. Moreover, the competence dimension as assessed here cannot be identified with intelligence as measured by the Bayley Scales. Analyses of variance and orthogonal contrasts on these factor scores revealed a significant advantage for the securely attached infants on both the competence and the DQ factors ($p < .0001$), but no difference between the groups on the temperament factor.

Discussion

White (1959) defined competence in terms of an organism's capacity to interact effectively with its environment. In attempting to adapt this definition to an understanding of competence in infancy, Ainsworth and Bell (1974) viewed an infant as competent "to the extent that he can, through his own activity, control the effect that his environment will have on him." This definition of competence characterizes the competent mother-infant pair as "an in-

fant who is competent in his pre-adapted function and a mother who is competent in the reciprocal role to which the infant's behavior is preadapted."

The tasks of the present study were the redefinition of competence in terms of second-year adaptation and the demonstration of continuity between adaptive functioning in infancy and adaptive functioning at 24 months. The variables investigated at 24 months reflect a broad range of characteristics that enter into the child's interaction with his environment in both social and cognitive domains. Although the dimensions of adaptive functioning assessed at age 2 were not of central concern in the earlier developmental period, they were nevertheless predictable from the assessments of adaptive functioning at 18 months.

Subjects classified as securely attached in infancy subsequently showed a significantly greater amount of symbolic play, even though they did not differ on DQ. In the tool-using tasks they were significantly more enthusiastic, affectively positive, and persistent; they exhibited less nontask behavior, ignoring of mother, and noncompliance. While separate analyses also suggested securely attached infants to be less actively oppositional and less easily frustrated, and to exhibit less crying and negative affect, the factor on which these behaviors loaded did not distinguish the groups. Therefore, confirmation of these latter findings awaits further research. In general, however, the two groups of infants whose insecurity in their primary attachment relationship was manifested by avoidant and ambivalent behavior at 18 months showed a poorer quality adaptation at 2 years. All relationships were in the predicted direction, and in many cases there was virtually no overlap in the scores of securely and insecurely attached children. Support is thus provided for a developmental perspective that would predict continuity between earlier and later adaptive functioning even in the absence of behavioral isomorphism. These results are in agreement with those of Waters (1978) and those of Main (Note 2), who also found securely attached infants to be more socially and cognitively competent as toddlers. In each of these studies the continuity has been shown for middle-class samples where relative stability of the environment can be assumed.

The predicted continuity is perhaps most striking in the case of the avoidant babies. Whereas the maladaptation of the ambivalent babies is readily apparent from their inordinate intolerance of separation, their difficulty being comforted, and their poverty of exploration, the maladaptation of the avoidant ba-

bies in the strange situation is not self-evident. In the 18-month strange situation these avoidant babies spent a lot of time with the toys, engaged the stranger, tended to cry only when left alone, and stopped crying when the stranger returned prior to reunion with the mother. They did not tantrum and were not petulant. Indeed, to some they would appear precociously independent. But the absence of greeting and the failure to initiate contact or interaction upon reunion with the caregiver, especially subsequent to a distress experience, suggested maladaptation. Interference with expectable attachment behavior by an underlying affective process (anger or anxiety), or perhaps, more parsimoniously, an approach-avoidance conflict, was inferred (see Main [1977] for a more extensive discussion). It is on the basis of this inferred process, reflected in avoidant behavior, that later aggression, noncompliance, and lack of persistence and affective involvement were predicted, though this had not been the pattern of behavior observed at 18 months.

An understanding of continuity in development requires a theoretically based appreciation for qualitative changes in development, their precursors, and their correlates. Relationships in this study were powerful. According to the theoretical position adopted here, the continuity observed is based not only on the assumption that the attachment relationship provides a secure base for exploration of the environment, but also on the organizational significance of affective dimensions of behavior (Sroufe & Mitchell, in press). In the second year, with the emergence of more symbolic (particularly verbal) aspects of cognitive development, one would not expect that intellectual competence and earlier exploration would be closely related or that there would be a direct relationship between quality of attachment and cognitive competence.

The dependent variables in the present study were not, therefore, primarily related to "skill"; rather, they were related to the child's style or approach to problem solving. These latter dimensions were seen as associated with the attachment relationship in that this relationship is an important aspect of infant emotional development, the secure base serving as a context within which the infant develops its first reciprocal relationship with another individual, its rudimentary sense of self, and its first sense of the emotional availability and sensitivity of others. It was expected that children whose primary attachment relationship provided a secure base, in this broader sense, would be freer to involve themselves in new objects and to invest themselves in problem solving and would not be preoccupied with gaining

the mother's attention or with frustrating her efforts to help them.

Competence in the 2-Year-Old

The ability to function effectively in the face of frustration, to utilize external assistance appropriately, and to refrain from excessively self-defeating behavior are typically seen as hallmarks of ego development (Loevinger [976]). The child who is capable of such behavior is one who is beginning to develop an appropriate, realistic, and secure sense of self. "From a sense of self-control without loss of self-esteem comes a lasting sense of good will and pride" (Erikson 1950, p. 255).

The competent 2-year-old as seen in the present study is not the child who automatically complies with whatever the mother tells him/her. Rather, it is the child who shows a certain amount of noncompliance when re-requested to stop playing and clean up the toys, but who gradually cooperates with the mother. When, however, cooperation has clear adaptive advantage, as in the tool-using situation, these children become readily involved in the task, sharing their enthusiasm with the mother and frequently with the experimenter. They work hard, independently at first, then request help from the mother when they get stuck. They tend to cooperate, or attempt to cooperate, with many of the mother's suggestions for solving the problem.

The differing patterns of oppositional behavior across contexts illustrate the difference between the construct of secure attachment and a negative temperament construct. As toddlers, securely attached infants can be oppositional; in fact, they tended to be more so when asked to stop doing something they wanted to do. But they are not so oppositional when they need and are seeking the caregiver's help. Toddlers who were ambivalent and avoidant babies, on the other hand, despite their seemingly opposite features at 18 months (much crying and contact seeking vs. contact avoiding and little crying), are similar in showing much noncompliance during the tool-using problems. Moreover, results from the factor analysis suggested a temperament factor (which did not differentiate the groups) to be orthogonal to the competence factor.

It also is clear that the relationship between attachment and later problem-solving style is not simply a reflection of general intelligence, as indicated by the fact that the DQ factor was independent of most of these measures of competence. The finding that the DQ factor differentiated the groups, whereas the group differences on Bayley scores did

not reach significance, is probably a function of the extent to which affective dimensions (e.g., problem-solving approach) were included in the DQ factor (Main, Note 2). That is, it should be noted that such variables as time away from task and aggression loaded on this third factor. This suggests that securely attached toddlers do differ from insecurely attached toddlers in DQ, but these differences (a) do not explain the differences between these groups on the competence dimension, and (h) may to some extent be a function of affective variables. This explanation is consistent with Main's (Note 2) finding that securely attached toddlers were significantly higher on cooperation and "gamelike spirit" during administration of the Bayley Scales as well as on Bayley scores. In addition to the operation of this affective dimension, DQ differences may also be expected on the basis of the securely attached toddlers' presumed greater involvement with the environment.

Continuity in Maternal Behavior

The issue of continuity of maternal variables is at least as important as continuity of infant variables. Although the strange-situation classifications were based on the child's behavior at 18 months (mother's behavior not entering into the classifications at all), they also were presumed to reflect maternal sensitivity to infant signals during the first year (Ainsworth 1973; Blehar, Lieberman, & Ainsworth 1977; Waters 1978). The effectiveness of the pair is being captured even in assessing infant behavior. Thus, it was expected that mothers of securely attached infants (presumed to be more sensitive) would be more sensitive when the infant was 2, as measured by the scales of supportive presence and quality of assistance. This prediction was confirmed. Although the behaviors through which sensitive maternal care manifests itself at 2 years are different from those during the first year of life, continuity of maternal care is revealed through a consideration of developmentally appropriate parental patterns.

The aspect of maternal sensitivity tapped by the supportive presence scale appears to be continuous with sensitive maternal care in infancy. It involves responsiveness to the child's signals on an emotional level and providing the child with a secure base for exploration.

The mother's quality of assistance relates more specifically to the cognitive aspect of second-year adaptation. To obtain a high score on this scale, the mother must be well able to provide her child with the information he/she needs, in a way that the child

can understand it and at a time when he/she can use it. This requires sensitivity to the child's cognitive, perceptual-motor, and information-processing skills-aspects of more autonomous behavior that were not salient dimensions in infancy. Simply telling the child what to do, or overly controlling him, was not seen as good quality assistance. The mother of a 2-year-old demonstrates her sensitivity along this dimension by giving the minimal assistance needed to keep the child working and directed at the problem solution without solving it for him and by helping her child see the relationship between actions required to solve the problem.

The two variables coincide with important interactional dimensions in emotional development during the second year of life. Mahler (1975) discusses these dimensions in terms of two simultaneous processes during the rapprochement subphase of the separation-individuation period. In this subphase individuation proceeds very rapidly, and the child exercises it to the limit. He also becomes increasingly aware of his separateness and employs various mechanisms to resist and undo his actual separateness from mother. During this time the continued emotional availability of the caregiver is essential if the child's autonomous ego is to attain optimal functional capacity, while his reliance on magic omnipotence recedes. This quiet availability of the mother is basic to the scale of supportive presence. On the other hand, the mother's "emotional willingness to let go of the toddler -to give him a gentle push, an encouragement toward independence" (Mahler 1975, p. 79) may be a *sine qua non* of normal individuation. The mother's facilitation of the child's striving for independence is seen as the basis for the second, quality-of-assistance scale. This second dimension reflects the mother's willingness to facilitate the child's autonomous functioning and help him achieve a sense of his own competence.

Conclusion

The demonstration of continuity in adaptive behavior between 18 and 24 months is important for construct validation of the secure attachment concept and for illustrating the role of theory in developmental research. Assessments of quality of attachment strongly predicted later aspects of more autonomous functioning, as required by the integration of Bowlby/ Ainsworth attachment theory and neoanalytic developmental theory (e.g., Erikson 1950; Mahler 1975) adopted here. Although the assessment of competence at the two time periods in-

volved different procedures, the underlying issue in each case was the competence of the mother-child pair. In some instances child behaviors were assessed and in others mother behaviors, but assumptions of continuity implied continuity in the relationship rather than stability of discrete behaviors of either member of the pair.

Given the constraints of the experimental situation, one might argue that the observed continuity was due to the presence or behavior of the mother in both situations. Since many of the competence measures used were non-interactive (e.g., enthusiasm for the task), such an interpretation does not seem likely. However, it will be important for future re-search to investigate continuity in competence-using situations where the mother is not present. For example, one may predict that securely attached infants would demonstrate their greater competence with peers as well as with other adults by the pre-school period. Research investigating this hypothesis is in progress.

Reference Notes

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