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# Maternal Representations of Attachment during Pregnancy Predict the Organization of Infant-Mother Attachment at One Year of Age

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FONAGY, PETER; STEELE, HOWARD; and STEELE, MIRIAM. *Maternal Representations of Attachment during Pregnancy Predict the Organization of Infant-Mother Attachment at One Year of Age.* CHILD DEVELOPMENT, 1991, **62**, 891–905. While strong retrospective and concurrent associations between maternal and infant patterns of attachment have been noted, this is one of the first reports of a prospective investigation of such associations. The Adult Attachment Interview was administered to 100 mothers expecting their first child, and, at 1-year follow-up, 96 of these were seen with their infants at 12 months in the Strange Situation. Maternal representations of attachment (autonomous vs. dismissing or preoccupied) predicted subsequent infant-mother attachment patterns (secure vs. insecure) 75% of the time. These observed concordances, as well as the discordances, are discussed in terms of the uniquely powerful contribution the Adult Attachment Interview makes to the study of representational and intergenerational influences on the development of the infant-mother attachment.

There is increasing evidence of an association between the way in which a mother recalls her own childhood experience and the quality of the relationship existing between her and her child (Grossmann, Fremmer-Bombik, Rudolph, & Grossmann, 1988; Main & Goldwyn, 1984, in press–a; Main, Kaplan, & Cassidy, 1985; Morris, 1981; Ricks, 1985). The notion of intergenerational concordance in relationship patterns has a distinguished history in the psychoanalytic literature (Bowlby, 1973, 1988; Emde, 1988; Fraiberg, Adelson, & Shapiro, 1975; Freud, 1940/1964) as well as in epidemiological research (Frommer & O'Shea, 1973; Rutter & Madge, 1976; Rutter, Quinton, & Liddle, 1983). More recently, developmental psychologists, in searching for the roots of individual differences in infant patterns of attachment, have begun to explore the influence of the mother's childhood experience and personality structure on the child-mother relationship (Belsky & Isabella, 1988; Grossmann et al., 1988; Haft & Slade, 1989; Main et al., 1985; Ricks, 1985; Spieker & Booth, 1988; Sroufe, 1985).

John Bowlby's attachment theory provides a plausible explanation for the social transmission of relationship patterns across generations. Child-caregiver interaction patterns are internalized early in life and guide

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[*Child Development*, 1991, **62**, 891–905. © 1991 by the Society for Research in Child Development, Inc. All rights reserved. 0009-3920/91/6205-0021$01.00]

the infant's expectations, and evaluations, of relationship experiences. While these internal representations can be modified by current experience, they are considered resistant to change. They continue to influence relationships throughout childhood, across the lifespan, and even into the next generation (Bowlby, 1973, 1988). This article addresses the issue of how expectant mothers' mental representations of attachment may be seen to influence the subsequent quality of the infant-mother relationship.

Attachment research was substantially advanced by the development of a structured interview for classifying an adult's mental representations concerning relationships. The Adult Attachment Interview (George, Kaplan, & Main, 1985) consists of a series of questions and probes designed to elicit as full a story as possible about the individual's childhood attachment experiences and evaluations of the effects of those experiences on present functioning. The manner in which these experiences are conveyed, rather than the nature of the experiences themselves, yields an overall classification of the adult's current state of mind with respect to attachment. It has been suggested that these classifications—Dismissing (D), Preoccupied (E), or Autonomous (F)—bear a systematic association to the Strange Situation classifications of infant patterns of attachment—Avoidant (A), Resistant (C), or Secure (B), respectively (Ainsworth & Eichberg, in press; Main & Goldwyn, in press–a; Main et al., 1985).

Mothers whose interviews are classified Autonomous show objectivity and balance in discussing their childhood experiences, whether favorable or unfavorable, and present a narrative picture that is both coherent and believable. Mothers whose interviews are rated as Dismissing seem cut off from the emotional nature of childhood attachment experiences. Their current state of mind with respect to attachment is variously characterized by idealization, derogation, insistence on the inability to recall, and cognitive formulations divorced from affect. Mothers whose interviews are classified Preoccupied are over involved with their sometimes traumatic childhood experiences at the time of the interview. These experiences appear often to have involved role reversal in which they have assumed the role of parenting the parent(s). Their mind appears overwhelmed and confused by the topic of attachment, evidenced in the interview context by incoherence and preoccupying anger or passivity.

We may understand the relation between mothers' state of mind with respect to attachment and the possible influence of this on maternal behavior and infant security in the following way. Interviews classified Autonomous point to mothers whose minds are not taken up with unresolved concerns regarding their childhood experience and are therefore free to respond to their child's attachment cues. Interviews classified Dismissing indicate a reluctance to acknowledge attachment needs that may make such mothers—who often seem to share a history of rejection by their own mothers—insensitive and unresponsive to their infants' signals. Interviews classified Preoccupied suggest that mothers are likely to provide an inconsistent, confused picture for their infants, giving rise to an anxiously resistant pattern where infants' attempts to deal with their attachment needs are easily frustrated.

Main and Goldwyn (in press–a) report a concordance coefficient of .61 (kappa) between mother and child attachment classification. The figure is particularly impressive since these interviews were conducted with parents of 6-year olds and then correlated with their child's security of attachment as measured 5 years previously (Main et al., 1985). These results have been confirmed by an independent group of investigators (Grossmann et al., 1988). However, the retrospective nature of both these studies permits no control for the possibility that mothers' recollections may have been moderated by their evolving relationship with their children. As Sroufe (1985) suggested, a prospective study is the ideal method for assessing the significance of mothers' relationship histories. The attachment theory model of intergenerational concordance predicts that there should be an association between a prenatal assessment of maternal representations of relationships and the subsequent quality of the infant-mother attachment. This article presents findings of a prospective study that examined the association between primiparous mothers' Adult Attachment Interviews, assessed during pregnancy, and Strange Situation assessments of the infant-mother attachment relationship assessed at 1 year.

## Method

*Subjects.*—One hundred pregnant women were recruited for the London Parent-Child Project. Recruitment for "a study aimed at better understanding how one's own experience of childhood influ-

ences the parenting of the next generation" took place during prenatal classes at the obstetrics and gynecology department of University College Hospital. Selection criteria included primiparous status, current cohabitation with the father of the child, fluency in the English language, and age above 20. About 50% of those to whom the study was described agreed to participate. Of the group who declined participation, some did not meet the selection criteria, while others could not obtain agreement from their husbands/partners, despite their interest in participating. A sizable minority were simply not responsive to the idea of participation in the research.

The expectant mothers' ($N$ = 100) median age was 31 (range, 22–42). Eighty-two of the women were married to the expectant father at the time of recruitment or married subsequently. At prenatal assessment, median length of residence together was 5 years (range, 1–19). The sample turned out to be a well-educated, white, middle-class group with 70 of the women holding university degrees; all 100 were high school graduates. Twenty-one of the women represented social class I (professional and managerial), 65 social class II (intermediate occupations), nine social class III (skilled occupations), and five social class IV (partly skilled occupations), according to the criteria of the Office of Population Censuses and Surveys (1980). The Registrar General's classification includes a separate 12-point coding of subjects' occupation, allowing for further coding into lower, middle, and upper income groups. Sixty-five of the women were in the middle income group, 21 were in the upper income group, and 14 were in the lower income group. Seventy-five of the expectant mothers were from England, 10 from Scotland or Ireland, and 15 were born outside the United Kingdom. This latter group was primarily Anglo-Saxon or European with only a few from genuinely different cultures.

Between prenatal and 1-year assessments, attrition was low. One mother was excluded from the study because she had twins. Data from one subject were eliminated because she was recently bereaved. Strange Situation data were unavailable for a further two cases because of technical difficulties. Of the 96 children seen in the laboratory, 46 were girls and 50 were boys. No child had significant auditory or visual handicap. One child (classified secure with mother in the Strange Situation) was born with a cystic hygroma and received considerable medical attention with multiple hospitalizations.

*Design.*—During the last trimester of a first pregnancy, the Adult Attachment Interview (George et al., 1985) was administered to 100 women; 98 were interviewed in their homes, and two were interviewed in the laboratory. While the laboratory setting is normally to be preferred in AAI research, in the present study interviews in the home were favored for the added degree of personal contact involved. To maintain continuity with the sample, all subjects were contacted by telephone and by post at 3 months postpartum. At 12 months postpartum, all the families were invited to the laboratory for the first time, where 96 children were assessed with mother in the Strange Situation.

*Adult Attachment Interview procedure.*—The interview administered to all subjects closely followed the schedule outlined by George et al. (1985). The Adult Attachment Interview is a structured interview consisting of 18 questions. All interviews were conducted by the same female interviewer and lasted from 30 min to 2 hours, with most lasting approximately 45 min. The interviewer, while trying to put the interviewee at ease, asked only the questions and the relevant probes without looking at the interview text. The interviews were audiorecorded and later transcribed verbatim.

The Adult Attachment Interview is structured entirely around the topic of attachment, principally, the individual's relationship to mother and to father (and/or to alternative caregivers) during childhood. Subjects are asked both to describe their relationship with their parents during childhood and to provide specific biographical episodes to support global evaluations. Ultimate classification depends on the goodness of fit between semantic evaluations and episodic memories.

The interviewer asks directly about childhood experiences of rejection; being upset, ill, and hurt; as well as loss, abuse, and separations. In addition, the subject is asked to offer explanations for the parents' behavior and to describe the current relationship with their parents and the influence they consider their childhood experiences to have on current behavior and, in the present study, future parenting style.

All 100 interviews were independently rated by four judges (Miriam Steele, Howard Steele, and Peter Fonagy, who had received

training from Mary Main, and Anna Higgitt, who received training from MS, HS, and PF). The rating procedure followed the established guidelines (see Main & Goldwyn, in press–b), and all raters independently studied and rated all interviews. Reliability coefficients were calculated by computing agreements between each possible pair of raters (six estimates) and choosing the median as indicator of reliability. Levels of agreement among the four raters' readings of the interviews were consistently high: On the three-way classifications, median kappa = .90 (range, .72–.92) as well as on the scales for Probable Past Experience, median $r$ = .84 (range, .69–.97) and Present State of Mind, median $r$ = .81 (range, .68–.94).

Each interview was rated on a series of 9-point scales according to criteria specified by Main and Goldwyn (in press–b) where every second point had specific operational definitions. Three of these scales concerned the adult's probable childhood experience of having been parented in a (1) loving, (2) rejecting, or (3) role-reversing manner. The adult's probable experience with each parent was rated separately. A further five scales pertained to subjects' current state of mind with respect to attachment: (4) idealization, (5) preoccupying anger, (6) derogation, (7) insistence on the inability to recall, and (8) the overall coherence of the interview. Notably, preoccupying anger is to be distinguished from derogation. The anger scale is thought to be most relevant to the Preoccupied classification in its actively resentful (E2) rather than passive form (E1). Derogation, by contrast, is regarded as indicative of the Dismissing classification, derogation or devaluing of attachment being an attempt to distance oneself from attachment-related feelings including anger. Furthermore, maternal anger is expected to correlate with infant resistance in its active, angry form (C1), while maternal derogation is expected to correlate with infant avoidance.

After assigning Probable Experience and State of Mind scale ratings to an interview transcript, the judge then assigned each interview to one of three categories reflecting the individual's overall organization of thought concerning attachment: (1) Dismissing of attachment "D," (2) Preoccupied with or entangled by past attachments "E," or (3) Freely valuing, secure, or autonomous with respect to attachment "F." It is to be noted that in addition to assigning a D/E/F classification, the judge also decided on the appropriateness of an alternative classification of Unresolved (U) with respect to past trauma or loss. This is consistent with the observed associations between the U interview status and the recently discovered "disorganized" pattern of infant attachment (Main & Hesse, in press). In this article we report only the major D/E/F classifications and not the alternative U classification as this latter issue is peripheral to the major question under investigation, that is, can the previously reported retrospective patterns be observed prospectively?

The AAI ratings by the four raters were averaged. The associations between the AAI scales were examined by computing product-moment correlations across the 100 interviews. Table 1 displays these correlations. In light of the relatively high correlations between scales, a multivariate approach was adopted in all further analyses involving the AAI scale scores.

A discriminant function analysis was performed to identify which of the AAI scales made the most important contributions to the categorization of the interviews. Two significant canonical variables were extracted (canonical correlations = .809 and .617, $p \leq .001$, respectively). The first variable appeared to distinguish the Autonomous (F) group from the other two groups (D, E), while the second differentiated between the Preoccupied (E) and Dismissing (D) groups. Correlations between AAI scale scores and canonical variables indicated that coherence of discourse, a loving past relationship with mother and father, and the absence of role reversal contributed highly to the first canonical variable. Present anger, good recall, and the absence of derogation made the most important contribution to the second canonical variable. The complete discriminant function accurately classified 89 of the 100 cases.

*Strange Situation procedure.*—It is already well established that the Strange Situation is a reliable and valid instrument with which to assess the quality of child-mother attachments (Ainsworth, Blehar, Waters, & Wall, 1978). This 20-min laboratory-based assessment involves two brief separations and two 3-min reunions with the parent. Focus is on the infant's behavior, especially during the reunions, where individual differences are measured in terms of the strategies employed to cope with this stressful situation (i.e., introduction to an unfamiliar

TABLE 1

PRODUCT-MOMENT CORRELATION MATRIX OF THE RATING-SCALE SCORES OF 100 ADULT ATTACHMENT INTERVIEWS

| | LOVING | | REJECTING | | ROLE REVERSING | |
|---|---|---|---|---|---|---|
| | Mother | Father | Mother | Father | Mother | Father |
| Loving$^{F}$ | .67** | | | | | |
| Rejecting$^{M}$ | −.84** | −.57** | | | | |
| Rejecting$^{F}$ | −.43** | −.81** | .48** | | | |
| Reversal$^{M}$ | −.27* | −.46** | .24 | .39** | | |
| Reversal$^{F}$ | −.25 | −.13 | .23 | .11 | .42** | |
| Coherence | .55** | .49** | −.44** | −.31* | −.32* | −.29* |
| Poor recall | −.38** | −.48** | .21 | .35** | .15 | .12 |
| Idealization$^{M}$ | −.03 | −.25 | −.02 | .23 | .07 | .15 |
| Idealization$^{F}$ | −.21 | .07 | .22 | −.13 | −.20 | .18 |
| Anger$^{M}$ | −.54** | −.31* | .62** | .13 | .13 | .25 |
| Anger$^{F}$ | −.28* | −.45** | .34** | .45** | .35** | .34** |
| Derogation$^{M}$ | −.67** | −.40** | .68** | .28* | .12 | .17 |
| Derogation$^{F}$ | −.27* | −.58** | .23 | .60** | .23 | .17 |

| | | | IDEALIZATION | | CURRENT ANGER | | |
|---|---|---|---|---|---|---|---|
| | Coherence | Inability to Recall | Mother | Father | Mother | Father | Derogation |
| Poor Recall | −.45** | | | | | | |
| Idealization$^{M}$ | −.38** | .31* | | | | | |
| Idealization$^{F}$ | −.25 | .14 | .37** | | | | |
| Anger$^{M}$ | −.48** | .08 | −.11 | .19 | | | |
| Anger$^{F}$ | −.26 | .12 | .00 | −.13 | .58** | | |
| Derogation$^{M}$ | −.39** | .22 | −.16 | .20 | .48** | .31* | |
| Derogation$^{F}$ | −.28* | .27* | .19 | −.13 | .21 | .63** | .48** |

NOTE.—$^{M}$ = mother-probable experience with or state of mind concerning; $^{F}$ = father-probable experience with or state of mind concerning.

* $p \leq .01$, two-tailed.

** $p \leq .001$, two-tailed.

place and person, and two brief separations from mother). Of the three major patterns of response, two are thought to reflect an anxious attachment to the parent (either avoidant or resistant) and one is understood to indicate a secure attachment to the parent. Infants whose attachment is coded avoidant tend to appear undistressed during separation and to avoid proximity to the parent upon reunion. Infants whose attachment is coded resistant tend to be distressed by separation and to seek contact during reunion, but rather than being settled by the parent's return, they resist the contact they also seek and are unable to be comforted. Infants whose attachment is coded secure may or may not be distressed by separation, but upon reunion are pleased to see the parent and, if distressed, are easily comforted. Strange Situation assessments, videotaped and audiotaped when the infants were between 12 and 13 months, were subsequently coded by raters blind to the mothers' interview data. Proximity seeking, contact maintenance, resistance, and avoidance during each of the two reunions were coded on the seven-point scales developed by Ainsworth et al. (1978). In addition, all infants were assigned to one of three classifications: secure, avoidant, or resistant. Mary J. Ward coded 35 of the tapes in the context of training three independent coders to high levels of major category agreement, median $r$ = .88 (range, .84–.92). On the remaining 61 tapes, median interrater reliability was .91 (range, .88–.94), and on interactive behavior ratings, median interrater reliability was .88 (range, .85–.91). All Strange Situation tapes were coded by at least two independent coders, both blind to mothers' interview classification, and assigned to one of the three major categories. Disagreements between the two primary raters were conferenced in discussions with a third trained rater, also blind to mothers' interview classification.

Following the Strange Situation procedure, both parents were independently in-

terviewed using a semistructured interview with two major components. The first concerned the presence of major life events or difficulties, including deaths, separations, or changes in employment or financial circumstances. The second aspect of the interview concerned a more detailed inquiry into the individual's experience of the transition to parenthood. Interviews were transcribed; the analysis of the experience of parenthood, however, is not yet complete.

## Results

The results are presented in three sections. The first examines the concordance between mothers' Adult Attachment Interview classifications, assessed prenatally, and infants' security of attachment to mother, assessed in the Strange Situation at 12 months. The second examines the particular characteristics of mothers whose interviews were classified secure but whose children were classified insecurely attached in the Strange Situation. The third section considers the distinguishing features of mothers whose prenatal interviews were classified insecure but whose children were classified securely attached in the Strange Situation. For all results reported, analyses were repeated excluding those mothers ($N = 15$) born outside the United Kingdom or Ireland in order to control for the possible influence of cultural factors. Mention is made only where the analyses on the homogeneously U.K./Irish group ($N = 81$) differ from those attained for the larger London sample ($N = 96$).

1. *The intergenerational concordance.*—Of those adult attachment interviews for which Strange Situation data were available ($N = 96$), 59 were classified Autonomous, 22 Dismissing, and 15 Preoccupied with respect to attachment. The prediction that a mother's organization of thought concerning relationships, assessed prior to the birth of her child, is associated to her child's security of attachment at 1 year was impressively confirmed. Seventy-five percent of secure mothers had securely attached children; 73% of mothers Dismissing or Preoccupied with respect to attachment had insecurely attached children. The overall two-way (secure-insecure) match between mothers' prenatal interviews and children's security of attachment was 75% (kappa = .48, $p \leq .001$, 52% expected by chance alone). The three-way match was 66% (kappa = .38, $p \leq .001$, 44% expected). Table 2 shows the observed and expected frequencies for the three-way comparisons between mothers' classification on the Adult Attachment Interview and the infants' Strange Situation classification.

Examination of the observed and expected frequencies in Table 2 clarifies which AAI classifications were found to have particular value for predicting Strange Situation results from prenatal assessments. Autonomous adult classification increases the likelihood of secure infant classification while reducing that of anxious avoidant. Dismissing classification substantially increases the likelihood of anxious avoidant classification while reducing the probability of observing a secure infant pattern of attachment. The Preoccupied classification was of some help in predicting insecure infant status but failed to distinguish anxious-avoidant and anxious-resistant groups. Infants classified insecure resistant could not be predicted on the basis of the classifications of the prenatal AAIs shown in Table 2.

Because of colinearity among the scales, the following transformations were performed. Scores on the loving and the reflexed rejection scales were combined separately with respect to the subject's experience with her mother and father. Reversal, idealization, derogation, and anger scores were combined for the two parents. The means and standard deviations of the AAI scale scores grouped according to the child's Strange Situation classification are shown in Table 3. The eight variables were submitted to one-way multivariate analyses of variance which yielded a significant Wilks's lambda (lambda = .746, approximate $F = 1.72$, $df = 16,172$, $p \leq .05$). Univariate $F$ tests were performed to examine which of the variables contributed to these group differences. Anxious-resistant and secure children had mothers who recalled their relationship with their mothers as significantly more loving and less rejecting. Idealization was highest among mothers of avoidant and resistant children. Inability to recall was particularly marked among mothers of avoidant children. Coherence was highest among mothers of securely attached infants, significantly distinguishing them from mothers of avoidantly attached infants.

Table 4 portrays the association between prenatal Adult Attachment Interview classification and mean interactive behavior ratings for first and second reunions in the Strange Situation at 1 year. A multivariate analysis of variance was performed which yielded a significant Wilks's lambda (lambda

TABLE 2

ASSOCIATIONS BETWEEN 96 MOTHERS' PRENATAL ADULT ATTACHMENT INTERVIEW CLASSIFICATIONS AND THE STRANGE SITUATION CLASSIFICATIONS OF THEIR INFANTS AT 12 MONTHS

| INFANTS' STRANGE SITUATION CLASSIFICATIONS | MOTHERS' ADULT ATTACHMENT INTERVIEW CLASSIFICATIONS | | |
|---|---|---|---|
| | Dismissing ($N$ = 22) | Autonomous ($N$ = 59) | Preoccupied ($N$ = 15) |
| Avoidant ($N$ = 30) ... | 15 (6.9) | 8 (18.4) | 7 (4.7) |
| Secure ($N$ = 55) ..... | 5 (12.6) | 45 (33.8) | 5 (8.6) |
| Resistant ($N$ = 11) ... | 2 (2.5) | 6 (6.8) | 3 (1.7) |
| | D/E/F → A/C/B Three-Way | | F/non-F → B/non-B Two-Way |
| Observed match ... | 66% | | 75% |
| Expected match .... | 44% | | 52% |
| Kappa ..... | .38 | | .48 |
| Chi$^2$ ..... | 27.6 ($df$ = 4), $p \leq .001$ | | 22.54 ($df$ = 1), $p \leq .001$ |

NOTE.—Expected frequencies appear in parentheses. Predicted cells are underscored.

= .701, approximate $F$ = 2.12, $df$ = 16,172, $p \leq .01$), indicating that the child's reunion behavior, particularly during the second reunion, was well predicted by the mother's Adult Attachment Interview classification. Univariate ANOVAs performed to explore this association provided strong evidence for the hypothesis that contact maintenance in both Strange Situation reunions would be most marked in infants of mothers whose prenatal interviews were judged Autonomous, while avoidance, as predicted, was most apparent in children of mothers whose interviews were classified Dismissing. Notably, children of mothers whose interviews were classified Preoccupied showed a significantly elevated level of resistance to contact in the second reunion, but not in the first. Similarly, avoidance ratings significantly distinguished Dismissing from Autonomous interviews, but only in the second reunion. This underscores the importance of using two reunions in the assessment of the child's security of attachment.

2. *Maternal attachment security and insecurely attached children.*—Fourteen (24%) of the mothers whose interviews were classified Autonomous had insecurely attached infants, eight avoidant and six resistant. Exploration of this difference initially focused on the incidence of major life events over the year intervening between pregnancy and 1-year assessments. One of the 45 and two of the 14, both mothers of avoidantly attached infants, reported having experienced stressful life events (e.g., loss of a loved one, marital strife) during the first year of the child's life. Subsequent analyses of the maternal security/infant insecurity issue were performed with these individuals excluded, as it was felt that the incidence of life events could obscure the picture of the predictive value of the AAI. We also considered the possibility that some of these Autonomous mothers of anxiously attached children may not have been mainstream *F*'s (i.e., F3) in the AAI system of subclassification. Exploration of this possibility led to a counterintuitive finding. Seventy-five percent of Autonomous mothers with anxiously attached children had prototypical Autonomous interviews (F3a or F3b), whereas only 36% of Autonomous mothers with securely attached children had interviews so classified, $\chi^2(1) = 4.24$, $p \leq .05$. Multivariate analysis of variance was then performed to test the hypotheses that the two Autonomous groups could be differentiated on the basis of their AAI scale scores. The analysis yielded a marginally significant Wilks's lambda (lambda = .80, approximate $F$ = 2.53, $df$ = 8,47). Table 5 shows the results of the comparisons between the AAI scale scores assigned to the interviews of each of these interview groups. Individual $F$ tests revealed that the group with insecurely attached infants were consistently rated as somewhat more positive, both in terms of the Probable Experience and the State of Mind scales. They were rated lower in terms of role-reversing experiences with their parents ($p \leq .05$). In terms of their present state of mind, this group was also distinguished

TABLE 3

MEAN SCALE-SCORE RATINGS OF MOTHERS' ATTACHMENT INTERVIEWS GROUPED BY INFANTS' CHILD-MOTHER STRANGE SITUATION CLASSIFICATIONS ($N$ = 96)

| AAI SCALES | AVOIDANT (A) ($N$ = 30) | RESISTANT (C) ($N$ = 11) | SECURE (B) ($N$ = 55) | ANOVA $F$ ($df$ = 2,93) | PAIR-WISE COMPARISONS | | |
|---|---|---|---|---|---|---|---|
| | | | | | A vs. C | A vs. B | C vs. B |
| Probable experience: | | | | | | | |
| Loving/nonrejecting[M] ... | 5.82 (1.64) | 7.21 (1.11) | 6.54 (1.83) | 3.20* | 3.26** | 2.12* | N.S. |
| Loving/nonrejecting[F] .... | 5.52 (1.87) | 6.60 (1.88) | 6.34 (1.61) | 2.71 | N.S. | N.S. | N.S. |
| Role reversing[B] ..... | 2.06 (1.12) | 2.01 (1.01) | 1.87 (1.14) | < 1 | N.S. | N.S. | N.S. |
| State of mind: | | | | | | | |
| Idealization of[B] ..... | 3.31 (1.23) | 3.57 (1.18) | 2.79 (.91) | 4.01* | N.S. | 2.11* | N.S. |
| Derogation of[B] ..... | 2.21 (1.22) | 1.52 (.88) | 1.83 (.79) | 2.73 | N.S. | N.S. | N.S. |
| Current anger at[B] ..... | 2.32 (1.42) | 1.84 (1.27) | 2.28 (1.30) | < 1 | N.S. | N.S. | N.S. |
| Poor recall[G] ..... | 3.90 (1.44) | 3.36 (1.26) | 3.21 (1.19) | 3.10* | N.S. | 2.23* | N.S. |
| Coherence[G] ..... | 4.83 (1.34) | 5.57 (1.36) | 5.96 (1.22) | 7.76*** | N.S. | 3.05*** | N.S. |

NOTE.—Standard deviations appear in parentheses. Results of pair-wise comparisons by separate variance analysis are expressed as $t$ values with Bonferronized significance levels. [M] = mother, [F] = father, [B] = both parents, [G] = global state of mind.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

TABLE 4

MEAN SCORES FOR REUNION BEHAVIOR DURING THE STRANGE SITUATION AT 12 MONTHS BY MOTHERS' PRENATAL ADULT ATTACHMENT INTERVIEW CLASSIFICATION

| | DISMISSING (D) ($N$ = 22) | PREOCCUPIED (E) ($N$ = 15) | AUTONOMOUS (F) ($N$ = 59) | OVERALL $F$ ($df$ = 2,93) | PAIR-WISE COMPARISONS | | |
|---|---|---|---|---|---|---|---|
| | | | | | D vs. E | D vs. F | E vs. F |
| First reunion: | | | | | | | |
| Proximity and contact seeking | 1.95 (1.05) | 2.74 (2.12) | 2.84 (1.62) | 2.50 | N.S. | N.S. | N.S. |
| Contact maintenance | 1.23 (.53) | 2.00 (1.56) | 2.49 (1.98) | 4.40** | 1.73 | 4.38*** | N.S. |
| Resistance to contact | 1.14 (.35) | 1.54 (1.12) | 1.62 (1.19) | N.S. | N.S. | N.S. | N.S. |
| Avoidance of proximity | 4.32 (1.43) | 3.80 (1.70) | 3.22 (1.79) | 2.51 | N.S. | N.S. | N.S. |
| Second reunion: | | | | | | | |
| Proximity and contact seeking | 2.82 (1.33) | 3.17 (1.90) | 3.93 (1.69) | 2.51 | N.S. | N.S. | N.S. |
| Contact maintenance | 2.32 (1.91) | 3.40 (2.33) | 3.91 (2.35) | 4.05* | N.S. | 3.13** | N.S. |
| Resistance to contact | 1.96 (1.70) | 3.27 (1.94) | 1.97 (1.28) | 4.83** | 1.94 | N.S. | 2.19* |
| Avoidance of proximity | 4.00 (1.48) | 3.13 (1.73) | 2.63 (1.72) | 5.44** | N.S. | 3.50*** | N.S. |

NOTE.—Standard deviations appear in parentheses. Pair-wise comparisons are expressed as $t$ values for separate variance with Bonferronized significance levels.
* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

TABLE 5

MEAN AAI SCALE SCORES FOR AUTONOMOUS MOTHERS WITH SECURELY AND INSECURELY ATTACHED CHILDREN

| | Autonomous Mothers with Securely Attached Infants ($N$ = 44) | Autonomous Mothers with Insecurely Attached Infants ($N$ = 12) | ANOVA $F$ ($df$ = 1,54) |
|---|---|---|---|
| Probable experience scales: | | | |
| Loving/Nonrejecting[M] | 6.94 (1.68) | 7.16 (1.00) | 1.77 |
| Loving/Nonrejecting[F] | 6.70 (1.42) | 6.96 (.94) | 2.91 |
| Role reversing[B] | 1.68 (.76) | 1.31 (.52) | 4.51* |
| State-of-mind scales: | | | |
| Idealization[B] | 2.50 (.84) | 3.13 (.92) | 3.46* |
| Derogation[B] | 1.72 (.82) | 1.37 (.34) | 2.14 |
| Anger[B] | 2.45 (.99) | 1.48 (.75) | 4.32* |
| Coherence | 6.36 (.94) | 6.42 (.57) | < 1 |
| Poor recall | 2.95 (.99) | 3.04 (.95) | < 1 |

NOTE.—Standard deviations appear in parentheses. [M] = mother, [F] = father, [B] = both parents.
* $p \leq .05$.

by their significantly lower rating on the scale for current anger ($p \leq .05$).

Of the 11 infants classified anxious resistant in the sample, four were assigned to the passive-resistant (C2) subclass, and all four of these infants belonged to mothers whose prenatal interviews had been classified Autonomous. This is noteworthy because it puts in perspective the significantly lower ratings for preoccupying anger among these mothers. Indeed, *low* maternal anger is an expected correlate of the C2 infant subclassification (Main & Goldwyn, in press–b).

A further comparison was made in order to consider whether these mothers whose interviews were rated so positively and classified Autonomous, but whose infants were observed to be anxiously attached, were more prone to have avoidant or resistant infants. Here it was revealed that the presence of the resistant infant pattern was beyond that which would be expected by chance: six, or 55%, of the 11 children classified resistant belonged to this group of Autonomous mothers, while of the 30 children classified avoidant only six, or 20%, belonged to this group (Fisher exact $p \leq .05$).

3. *Maternal attachment insecurity and securely attached children.*—Of those mothers whose prenatal interviews were classified as Dismissing of attachment ($N$ = 22), five (23%) had securely attached infants. Of the 15 mothers classified as Preoccupied, five (33%) had securely attached infants. Thus, 27% of mothers whose interviews were classified as Dismissing or Preoccupied had securely attached children. In post-hoc exploration of this anomaly, it was noted that maternal interview classifications appeared to be associated with the country and culture of upbringing of the mother. While only 27 (33%) of the 81 U.K./Irish-born mothers were classified insecure, 11 (73%) of the 15 subjects born outside the United Kingdom and Ireland were so classified (Fisher exact $p \leq .01$). However, this possible overextension of the insecure classification in the case of non-U.K./Irish subjects could not account for the insecure-mother/secure-child form of discordance. Of the 27 U.K./Irish mothers who were classified Dismissing or Preoccupied, 82% had infants coded insecurely attached; of the 11 non-U.K./Irish mothers in the same group, 55% of the infants were coded insecure (Fisher exact N.S.).

Consideration was also given to the possibility that the maternal insecurity/infant insecurity type of discordance may have been due to the insecure attachment classification being overextended to those subjects belonging to the lower social classes and/or income groups. There was, however, no association between a mother's demographic characteristics and either her or her infant's attachment classification.

## Discussion

Based on prenatal administration of the Adult Attachment Interview to 96 primiparous mothers, we were able, in 75% of the cases, to successfully predict whether an in-

fant would be coded securely or insecurely attached (B/non-B) to mother at 1 year in the Strange Situation. These figures are consistent with those obtained in retrospective (Main & Goldwyn, in press–a, 75% [A/B/C]; Grossmann et al., 1988, 77% [B/non-B]) and concurrent (Ainsworth & Eichberg, in press, 80% [A/B/C/D]) administrations of these instruments. Other ongoing research involving prenatal administration of the AAI also suggests that it is possible to predict infant-mother patterns of attachment from pregnancy assessments (e.g., Ward, Botyanski, Plunket, & Carlson, 1991). Unlike past retrospective and concurrent investigations, we did not find the Preoccupied classification to be singularly predictive of the resistant infant classification. The Autonomous and Dismissing interview classifications were powerfully predictive of the secure and avoidant infant classifications, respectively.

The reported accuracy of prediction is impressive when compared with past attempts at identifying determinants of infants' security of attachment in prospective investigations. Previous reports have failed to provide strong evidence of a predictive association between expectant mothers' developmental history and infants' security of attachment (e.g., Belsky & Isabella, 1988). The significance of mothers' developmental history is unlikely to be fully captured unless we are clear about what in an individual's developmental history is of importance for facilitating infants' security of attachment. Predictive power resides, it seems, not in the quality of past experience but in the overall organization of mental structures underlying relationships and attachment-related issues.

The present investigation has additional importance in that it originates in London, where Adult Attachment Interview research has not previously been reported. The frequency distribution of AAI categories as well as Strange Situations, however, matched closely the reports of middle-class samples from North American cities. This reflects the ubiquity of the Bowlby-Ainsworth attachment paradigm and the generalizability of Main's approach to its assessment in adulthood.

Our results indicate that the mother of the securely attached child is able to fluently convey a global representation (whether favorable or unfavorable) of what her relationship to each parent was like during her childhood. At the same time, she is able to provide specific memories that support and elaborate on the global representation of her parents. In presenting to the interviewer her account of her development within her family of origin, she demonstrates an understanding of her own personal development that includes an awareness of the multiple motives (conscious and perhaps unconscious) that guided her parents' behavior toward her. Upon reading the transcript, one is not inclined to derive conclusions different from those being presented by the subject. In other words, there is little idealization of the past, no insistence on an inability to recall, and, overall, there are no significantly distorting mental processes at work. The subject clearly has access to, and is able to express, her feelings without being overwhelmed by them; she is autonomous and freely valuing of attachment—and therefore the prediction, which the present study confirms, that such a woman was substantially more likely to bring to the Strange Situation assessment at 1 year a child who would be classified securely attached to mother. The likely pathways for this effect involve sensitive and responsive patterns of mother-child behavior observed more frequently in women classified as Secure-Autonomous on the Adult Attachment Interview (Crowell & Feldman, 1988; Haft & Slade, 1989). Conversely, mothers classified Dismissing on the Adult Attachment Interview have been shown to manifest a lack of attunement in mother-infant interactions (Haft & Slade, 1989) and restricted patterns of communication between child and parent (Grossmann, 1989).

While mothers of infants who would develop a secure or anxious-avoidant attachment were distinguishable before the child was born, the present study could not easily identify mothers of children who would develop an anxious-resistant attachment. Exploration of the results did, however, reveal two significant associations between infant resistance and maternal interview status. Ratings of infant resistance during the second reunion in the Strange Situation were predictable on the basis of the Preoccupied interview classification. The second observed association between infant resistance and maternal interview status involved the apparent discordance between Autonomous interviews and anxious Strange Situation patterns. The anxious-resistant pattern was significantly associated with a particular type of maternal interview response. This was a response likely to be rated as sugges-

tive of a supportive attachment history, a state of mind typified by low preoccupying anger, some idealization, and an overall impression of security. This was a picture derived from the pregnancy assessment. On the basis of what we subsequently observed in the Strange Situation, we would suggest that there was something fragile about the prenatal interview not detected in our initial ratings of these interviews, which foreshadowed difficulties in adjustment to the caregiving role. This suggestion is consistent with previous findings from prospective longitudinal investigations. Spieker and Booth (1988) found that mothers of resistant infants (unlike mothers of avoidant infants) differed little prenatally from mothers whose infants were classified secure. But a certain fragility, unseen before the child was born, appeared postnatally: they expressed satisfaction with their life and with their infants' temperament despite having higher scores on the Beck Depression Inventory and less confidence in themselves as mothers. This same paradoxical pattern emerged in the present sample where those mothers whose interviews were classified as Autonomous during pregnancy but had insecurely attached children were revealed as presenting a particularly positive picture of their childhood during their prenatal interview. We informally observed in the interview conducted at the time of the Strange Situation, consistent with Spieker and Booth's findings, that these were mothers for whom the maternal experience involved considerable disillusionment, but this requires further systematic investigation. Perhaps the antecedents of the resistant coding are best understood as part of an evolving pattern of a less than successful adaptation to motherhood. This is in accord with the view that mothers of anxiously resistant children have a sensitive set of attachment-related beliefs, but are unable to act consistently on these beliefs (Ainsworth et al., 1978). In other words, it may be worth exploring the hypothesis that there seems to be a certain attachment-related state of mind, perhaps particular to pregnancy, characterized by a somewhat exaggerated secure pattern, which is subsequently associated with infant insecurity. This infant insecurity is perhaps especially prone to take the form of passive resistance and may be mediated by maternal difficulties in adjustment to the caregiving role.

The quality of prediction in any prospective investigation will be moderated by possibilities of change in the mother. The likelihood of change may be substantially increased over the year in which a woman becomes a mother (Benedek, 1959). We cannot be certain at this point in time to what extent the mismatch between apparently heightened security in pregnancy and infants' insecurity at 1 year is due to long-lasting alterations in mental structure (perhaps induced by the transition to motherhood) and to what extent it is due more to transitory shifts (e.g., postpartum depression or lack of support from spouse). A readministration of the Adult Attachment Interview to this group and a matched control group of mothers would yield information as to the extent and nature of possible changes in mental representations of attachment relationships and attachment-related concerns.

Just as the transition to parenthood may occasion disappointment and an inability to consistently employ an appropriate mothering repertoire, so too may entry into the parental role lead to positive alterations in mental structure. This was perhaps operative in those mothers whose prenatal interviews were classified insecure but whose children were later classified as securely attached. We are not proposing that internal working models necessarily change as a function of the initial parenting experience. Yet the accessibility or level of activation of aspects of these mental models may be heightened or attenuated as a function of expectations or events. Particular representations active at any one time exerting control over attachment-related cognitions and behaviors may perhaps be best conceived of as "attachment states." These attachment states are to be distinguished from the underlying organization and structure of the internal working model, which may be thought of as predisposing the individual to particular types of behaviors, analogous to the function of personality traits. Comprehensive models of attachment will need to increasingly focus on the processes by which changes may occur in the representational processes influencing attachment-related feelings, cognitions and behaviors. There are a number of clinical service approaches that have begun to incorporate the systematic consideration of these representational processes on the quality of parent-child relationships (Aber & Baker, 1990; Greenspan & Lieberman, 1988; Nezworski, Tolan, & Belsky, 1988; Stern-Bruschweiler & Stern, 1989). The further development and refinement of these clinical/service approaches may be facilitated by careful use of

the Adult Attachment Interview along with the delineation of pertinent situational, person-based, and interactional influences (Sameroff & Chandler, 1975).

In assessing the origins of observed discordances between maternal working models of relationships and infants' security of attachment, we need to distinguish possible errors of measurement from the likelihood of alterations in mental structure. A general, possibly limiting factor that awaits confirmation is the test-retest reliability of the instrument. Another measurement issue, which emerges from the current findings, concerns mothers' place of birth. When this does not coincide with the mainstream culture, it may lead to an underestimation of the extent of mothers' security/autonomy. Also, certain methodological limitations arise from pregnancy administrations of the Adult Attachment Interview. In the present study, the mothers were not probed specifically for fear of loss of the child, an expected correlate of avoidance in infancy (Main & Goldwyn, in press–b), which when present in significant measure automatically leads the AAI judge to assign the Insecure-Dismissing classification. One disadvantage, then, of using this measure prospectively is that attachment states that are activated by the presence of an infant cannot be assessed and may lead to inaccurate classification.

It is worth noting that the present report does not include consideration of forthcoming pieces of data that may help to elucidate the current portrait of family relationship patterns. It may be that some of the reported discordances will become more comprehensible when data pertaining to the expected match between maternal lack of resolution of mourning and infant disorganization are taken into consideration (Main & Hesse, 1990). It is also likely that consideration of the Adult Attachment classification of the father may provide information pertinent to the origins of discordance. Past studies have shown that a good marriage with attendant social support is capable of mitigating the influence of institutional background on child rearing (Quinton & Rutter, 1988) and to also permit a break from the cycle of abuse (Egeland, Jacobvitz, & Sroufe, 1988). It may therefore be necessary to take into account both parents' mental representations not only of their respective attachment histories but also their representations of one another and of the child (Aber, Slade, Berger, & Kaplan, 1985; Bretherton, Biringen, Ridgeway, Maslin, & Sherman, 1989) if a comprehensive account of the influence of past relationships on present and future relationships is to be provided (Stevenson-Hinde, 1988, 1990).

In summary, the present study provides evidence for lawful continuities in the nature and quality of parent-child relationships across generations. The Adult Attachment interview was shown to be capable of identifying prenatally infants whose attachment to mother is more likely to assume an anxious as opposed to secure form. Many previous studies have shown how these infant patterns of attachment make certain, less than adaptive, developmental pathways more likely (Sroufe, 1988). The availability of an instrument capable of identifying mothers at high risk of evolving such patterns of relationships with their children calls for replication and extension. In addition, it creates new possibilities for preventive work addressed at both attachment-related behaviors and mental representations.

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