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Associations among Attachment Classifications of Mothers, Fathers, and Their Infants

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STEELE, HOWARD; STEELE, MIRIAM; and FONAGY, PETER. *Associations among Attachment Classifications of Mothers, Fathers, and Their Infants*. CHILD DEVELOPMENT, 1996, 67, 541-555. Associations are reported among classifications of Adult Attachment Interviews (AAIs) obtained from expectant parents and subsequent classifications of their infants in the Strange Situation Procedure (SSP). Mothers' AAIs predicted infant-mother SSPs ($\chi^2 = 41.87, N = 96, df = 9, p \leq .0001$), and fathers' AAIs predicted infant-father SSPs ($\chi^2 = 18.94, N = 90, df = 6, p \leq .005$). Associations between parents' AAIs and infant-parent SSPs were lessened by the failure to predict the insecure-resistant pattern with mother and the absence of this pattern with father. Counter to expectation, infant-father SSPs were associated with infant-mother SSPs ($\chi^2 = 3.78, N = 90, df = 1, p \leq .05$), which could not be accounted for in terms of an overlap between parental AAIs. A secondary analysis of the data suggested that this dependency effect of SSPs may be explained by the influence of maternal AAIs upon child-father SSPs. Results are discussed in terms of intergenerational and relationship-specific influences upon attachment during infancy, the possible influence of infant temperament, and the relative influence of mother and father upon the child's evolving representations of attachments within the family.

Since the development of the Adult Attachment Interview (George, Kaplan, & Main, 1985; Main & Goldwyn, 1984; Main & Goldwyn, in press), a growing number of longitudinal studies, spanning different linguistic, cultural, and economic contexts are elucidating the social transmission of attachment patterns across generations (e.g., Ainsworth & Eichberg, 1991; Benoit & Parker, 1994; Fonagy, Steele, & Steele, 1991; Grossmann, Fremmer-Bombik, Rudolph, & Gross-

mann, 1988; Main, Kaplan, & Cassidy, 1985; Slade, Director, Grunebaum, Haganir, & Reeves, 1991; van IJzendoorn, Bakermans-Kranenburg, Zwart-Woudstra, Van Busschbach, & Lambermon, 1991; Ward & Carlson, 1995; Zeanah et al., 1993). In their pioneering study, Main et al. (1985) observed a powerful association between mothers' AAI classifications (dismissing/preoccupied/autonomous) and previously assessed Strange Situation infant-mother classifications

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(avoidant/resistant/secure). A significant but somewhat weaker match was found for fathers and the infant-father relationship. The intergenerational match between mothers' interview responses and the infant-mother attachment has been extensively replicated and is highly robust regardless of whether the interviews are collected years after the infancy data with which they are being compared (e.g., Grossmann et al., 1988), roughly concurrent in time with the infancy data (e.g., Ainsworth & Eichberg, 1991; van IJzendoorn et al., 1991; Zeanah et al., 1993), or even prior to the birth of the infants whose attachment patterns are being predicted (Benoit & Parker, 1994; Fonagy, Steele, & Steele, 1991; Ward & Carlson, 1995). To date, however, a replication of the intergenerational match for fathers observed by Main et al. (1985) has not been reported. The present study explored this and a range of related intergenerational questions in the context of comparing independently obtained classifications of AAIs from mothers and fathers, and SSPs of their infants with each of them.

The psychometric qualities of the Adult Attachment Interview as an index of adults' internal working model(s) of attachment have been the focus of a number of recent investigations which have established the instrument's test-retest reliability (Bakermans-Kranenburg & van IJzendoorn, 1993; Benoit & Parker, 1994; Steele, 1991), discriminant validity (Bakermans-Kranenburg & van IJzendoorn, 1993; Crowell & Waters, 1993; Steele, 1991), and convergent validity (Dozier & Kobak, 1992). Notably, adult attachment classifications based upon AAI-responses cannot be equated with self-report measures of current "romantic attachment style" (Hazan & Shaver, 1987) or of the extent to which one's parents displayed "care and overprotection" during one's childhood (Epstein, 1983; Parker, Tupling, & Brown, 1979). In studies comparing AAI with these self-report measures, little or no concordance has been found (Crowell & Waters, 1993); moreover, recent investigations have failed to replicate Ricks's (1985) report of convergence between the Strange Situation and Epstein's (1983) Mother-Father-Peer Scale, emphasizing what seems to be the singular predictive power of the AAI in relation to the Strange Situation (H. Steele, 1991; M. Steele, 1990; van IJzendoorn et al., 1991; Zeanah et al., 1993).

What is perhaps most exciting about the development of the Adult Attachment Inter-

view are the fresh opportunities such a measure presents for exploring unresolved issues concerning determinants of infant patterns of attachment. A crucial question for the attachment field, as well as for the wider study of self and emotional development, concerns the extent to which infant-mother/infant-father attachment classifications are dependent upon one another. The majority of studies report that secure versus insecure classification of the infant-mother attachment is independent of the infant-father attachment (e.g., Belsky & Rovine, 1987; Grossmann, Grossmann, Huber, & Wartner, 1981; Main & Weston, 1981; Sagi et al., 1985) and thus underscore the relationship-specific nature of attachments during infancy. Another group of studies have shown that attachment classification to one parent is predicted by classification of infant behavior with the other parent (Easterbrooks, 1989; Goosens & van IJzendoorn, 1990). These latter findings move the spotlight from the study of specific characteristics of a relationship to broader temperamental and cultural determinants of attachment security. In their meta-analytic review of the area, Fox, Kimmerly, and Schafer (1991) combine findings from 11 studies, together comprising 710 children observed in the Strange Situation with both mother and father. They found a significant association between a child's security of attachment with mother and father, and attributed this to the combined influences of the child's temperament and the parents' shared behaviors and values. This meta-analytic result, and the interpretation Fox et al. provide, fuels longstanding critiques of the attachment construct, such as those highlighting the possibly determining influence of infant temperament (Goldsmith & Alansky, 1987; Kagan, 1984, 1989) or the notion that the persistence of attachment patterns across time is due only to the consistency of environmental context (Lamb, 1987).

The investigation of intergenerational patterns of attachment, using combined AAI and SSP assessments of mother, father, and infant provides a number of unique cross-generational perspectives on the issue of dependency in infant-parent classifications in the Strange Situation. From the empirically based perspective that the organization of attachment during infancy is predicted by parental representations of attachment, the extent of agreement between infant-mother and infant-father attachment patterns may be expected to mirror the extent of agreement

between parental attachment classifications. Further, a highly secure (or insecure) parent may be expected to positively (or negatively) influence the nature of the relationship the child has with the other parent leading to apparent dependency of infant classification. The systematic investigation of these possibilities requires comparisons based on both parents' AAI and their child's SSP classification with each of them, which have not yet been reported. Further, the influence of the internal working model of attachment of one parent on the infant's developing relationship with the other has not yet been the subject of systematic investigation.

This article examines these issues empirically by studying our data from 90 infants, tested in the Strange Situation with both mother and father, for whom we have independently obtained AAI classifications, derived from interviews collected prior to the child's birth. The primary influence upon the development of the infant-mother attachment was expected to be mother's attachment classification, while father's AAI classification was expected to be the dominant influence upon the infant-father attachment. We did not expect concordance between infant-parent SSP classifications, but to the extent that this would be observable, we thought such dependence would be more likely if the parents' AAI classifications were also concordant, an effect which we believed would be secondary to the mother-to-infant-with-mother and father-to-infant-with-father intergenerational effects. Thus, we predicted that the association of infant-mother and infant-father attachment classifications would be fully accounted for by the independent contributions of mother and father AAI classifications and their interactions with each other. In addition, we sought to explore the potentially facilitative or disruptive influence of one parent upon the child's relationship with the other parent. We considered the possibility that facilitative (or disruptive) effects may take the form of one parent's internal working model of attachment directly affecting the child's attachment to the other parent (e.g., mother → child-with-father), or the more complicated form of one parent mediating the influence of the other parent's attachment status upon the child's evolving representations of attachment (e.g., mother → father → child-with-father). To the extent that these effects were observable in the data, we expected additional two-way or three-way interactions between one or both of the parent classifications and one of the child-parent classifications.

Method

Subjects

One hundred pregnant women and their husbands/partners were recruited for the London Parent-Child Project. Recruitment for "a study aimed at better understanding how one's own experience of childhood may influence the parenting of the next generation" took place during prenatal classes at a major London teaching hospital. Selection criteria included primiparous status, current cohabitation with the father of the child, age above 20, and fluency in the English language—established by completion of the short form of the Mill Hill Vocabulary Scale (Raven, Court, & Raven, 1986) with no one scoring less than the equivalent of the fortieth percentile. 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, others could not obtain agreement from their husbands/partners despite their interest in participating, with the remainder being nonresponsive 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); 9 social class III (skilled occupations); and 5 social class IV (partly skilled occupations), according to the criteria of the *Classification of occupations and coding index* (1980). This 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 in the upper-income group, and 14 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 Western and Anglo-Saxon; six from the British Commonwealth countries of Australia, New Zealand, and Canada, two from the United States, one from South Africa, four European (two Western, and two Eastern European) with only

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the remaining two from non-Western cultures.

Like their female partners, the sample of expectant fathers ($N = 100$) constituted a highly homogeneous educated middle- and upper-middle class group. Seventy-one were university educated, and only one had failed to graduate from high school. Their median age was 33 (range 20–57). Twenty-five of the men represented social class I (professional and managerial); 57 social class II (intermediate occupations); 16 social class III (skilled occupations); and 2 social class IV (partly skilled occupations), according to the above-mentioned classification index. In terms of income group, 60 of the men were in the middle-income group, 24 in the upper-income group, and 16 in the lower-income group. Eighty-seven of the expectant fathers were from England, five were from Scotland or Ireland, and eight were born outside the United Kingdom, though none of these countries being markedly different cultures.

Between prenatal and later Strange Situation assessments, attrition was low: 4% at 12 months, leaving 96 infants for whom there is Strange Situation data with mother, 50 boys and 46 girls. There was a further 6% attrition at 18 months, leaving 90 children for whom there is Strange Situation data with both mother and father. Of these, 47 are boys and 43 are girls.

Design

During the last trimester of a first pregnancy, the Adult Attachment Interview (George et al., 1985) was administered to 100 women and their husbands/partners; 98 couples 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. The men and women were visited by two researchers, the first author who interviewed all the men, and the second author who interviewed all the women. Interviews were conducted concurrently in different rooms of the house, ensuring independence of response.

Procedures

The Adult Attachment Interview.—The interview administered to all subjects closely followed the schedule outlined by George et al. (1985). The Adult Attachment Interview is structured entirely around the topic of attachment, principally the individ-

ual'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 memories to support global evaluations. The interviewer asks directly about childhood experiences of rejection and being upset, ill, and hurt as well as about 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 had upon their adult personality. Ultimate classification of the interview into the secure or one of the insecure groups depends largely on the extent to which the narrative is judged to satisfy four criteria of coherence: (i) a good fit between memories and evaluations concerning attachment; (ii) a succinct yet complete picture; (iii) the provision of relevant details; (iv) clarity and orderliness (Main & Goldwyn, in press). The basic classification system assigns interviews to one of three groups, two insecure and one secure: (i) insecure-dismissing, designated D for an interview that is brief but incomplete, marked by a lack of fit between memories and evaluations; (ii) insecure-preoccupied, designated E for an interview that is neither succinct nor complete and contains many irrelevant details, together with much passive speech or high current anger; and (iii) autonomous-secure, designated F for an interview that robustly fulfills all or most of the criteria of coherence. In addition, alongside the best-fitting D, E, or F classification, some interviews are also classified U for unresolved with respect to past trauma or loss. All 200 interviews were independently rated by four trained judges. The rating procedure followed the established guidelines (see Main & Goldwyn, in press), and all raters independently studied and rated all interviews. Reliability coefficients for the four-way classifications 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' classifications of the interviews were consistently high on the four-way classifications, median kappa .85 (range .72–.90) for the women's interviews and median kappa .88 (range .75–.93) for the men's interviews. In over 80% of cases, all four judges agreed as to which of the four major classifications best fit a given interview. Majority agreement decided the issue in 10%

of cases, with conferencing required in the remaining 10% where the four judges were in an initially split decision.

A single overall four-way classification, D/E/F/U, of each interview was thus obtained. Additionally, those interviews classified U also received a best-fitting D/E/F classification relevant to some analyses reported below; and this forced D/E/F grouping was further reduced by collapsing the D and E "non-F" groups for comparison with the F group in some analyses reported below. Of eight women whose interviews were classified U, four of these were forced to E, the preoccupied group, three to F, the secure group, and only one to D, the dismissing group. Of three men whose interviews were classified U, or unresolved with respect to past loss, two were forced to F and one to E, none to D.

The interview-classification process was completed prior to the collection of Strange Situation data. The AAI judges were therefore blind to judgments concerning SSP assessments, while classifications of the SSPs were made by individuals who had no knowledge of the AAI data.

The Strange Situation.—The Strange Situation is widely regarded for its reliability and validity, and extensively employed as an assessment of the quality of child-parent 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 upon 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 place and person, and two brief separations from the parent).

Of the three originally identified major patterns of response, two are thought to reflect an insecure attachment to the parent (either avoidant or resistant) and one is understood to indicate a secure attachment to the parent (Ainsworth et al., 1978). Infants whose attachment is classified insecure-avoidant or A tend to appear undistressed during separation and to avoid proximity to the parent upon reunion. Infants whose attachment is classified secure or B may or may not be distressed by separation, but upon reunion are pleased to see the parent and, if distressed, are easily comforted. Infants whose attachment is classified insecure-resistant or C tend to be distressed by

separation and to seek contact during reunion but, rather than being settled by the parent's return, appear inconsolable. This report also employed the criteria used to assess infant disorganization in the Strange Situation which apply to those children who do not fit easily into the traditional A, B, or C patterns because of their atypical response to the situation (Main & Solomon, 1990), probably motivated by fear of the attachment figure (Main & Hesse, 1990).

Strange Situation assessments of the infant-mother attachment ($N = 96$) were made when the child was 1 year of age and of the infant-father attachment ($N = 90$) when the child was 1½ years of age. To insure as close a comparison as possible to the Main et al. (1985) findings, we followed their lead in choosing to first assess the infant-mother attachment and only 6 months later assess the infant-father attachment. A benefit of this type of design is that comparisons within groups of infant-parent data sets are then made from observations obtained at the same point in time, though this gain is made at the expense of being able to directly compare the infant-mother and infant-father attachment. The video films of the Strange Situations were classified by a team of raters who were blind both to the parents' interview data and also to the child's attachment status with the other parent. Mary J. Ward coded 35 of the infant-mother tapes in the context of training three independent coders to levels in excess of 85% major category agreement; median kappa for interrater agreement was .89 (range .83–.92). On the remaining infant-mother and infant-father tapes, median kappa for interrater agreement was .88 (range .84–.90). Conferencing was required in less than 10% of cases, made up almost entirely of those children thought to have a disorganized attachment.

All infants were assigned one of four infant-parent classifications: secure, avoidant, resistant, or disorganized; with those in the disorganized group also receiving a best-fitting A/B/C classification relevant to some analyses reported below; this forced A/B/C grouping was further reduced by collapsing insecure groups A and C for comparison with the secure B group in some analyses reported below. Of nine children classified disorganized with mother, five of these were forced to C, the resistant group, and four to A, the avoidant group, with none forced to B, the secure group. Of four children observed to be disorganized with father, three were forced to A and one to B.

TABLE 1
ATTACHMENT TO FATHER AT 18 MONTHS BY ATTACHMENT TO MOTHER
AT 12 MONTHS

ATTACHMENT TO MOTHER	ATTACHMENT TO FATHER		
	Avoidant	Secure	Disorganized
Avoidant	10 (7)	14 (17)	1 (1)
Secure	10 (14)	40 (35)	2 (2)
Resistant	1 (1)	3 (3)	1 (0)
Disorganized	4 (2)	4 (5)	0 (0)
	A/C/B/D → A/C/B/D		B/non-B → B/non-B
Observed match	56%		63%
Expected match	47%		51%
kappa17		.22
	$\chi^2 = 8.94$ ($df = 6$, $p = .18$)		3.78 ($df = 1$, $p \leq .05$)

NOTE.—Expected frequencies appear in parentheses; predicted cells are underscored.

Results

Results are presented in four sections. The first section reports on the associations observed between the infant-mother attachment at 12 months and the infant-father attachment at 18 months, at the level of four-way, three-way, and two-way classification. The second section of results compares the classifications of interviews obtained from the mothers with those obtained from the fathers. The third section of results presents the intergenerational data, showing the associations observed between mothers' and fathers' AAIs and the infant-mother and infant-father attachment data, respectively. The fourth and final section of results reports on log-linear modeling to arrive at the best possible fit of the data deriving from the four distinct parent and child attachment variables studied: mothers' and fathers' AAI classifications, child-mother and child-father SSP classifications. For each of these initially four-way classified variables, the three forms of insecure attachment classifications were collapsed in order to increase cell sizes and permit log-linear analyses. Because of the potential cultural diversity of the sample, all analyses reported below were repeated without the subjects whose first language was not English. The pattern of associations which emerged was indistinguishable from those derived from the full sample; therefore, only the analysis of the latter is reported below.¹

Infant-Mother and Infant-Father Data

The association between the child's pattern of attachment to mother and to father is shown in Table 1, where the four-way classifications of children's attachments to each of their parents is portrayed, insecure-avoidant (A), secure (B), insecure-resistant (C), and insecure-disorganized (D). The possibility of observing dependence of one infant-parent attachment pattern upon the other is diminished by the absence of children classified C with father. A dependency effect may be further occluded by the observation that, while eight children with mother and four children with father appeared insecure-disorganized, no child was found to have an insecure-disorganized attachment to both parents. It is also probable that the possibility of observing dependency effects may have been diminished by the length of time (6 months) between observations made of the infant-mother and the infant-father attachment. The 4×3 comparison of A/B/C/D with mother by A/B/D with father failed to reach significance, $\chi^2(df = 6, N = 90) = 8.94, p \leq .18$. However, when the insecure attachment groups (A, C, and D) were collapsed into one 2×2 matrix, a significant dependency was observed, $\chi^2(df = 1, N = 90) = 3.78, p \leq .05$.

Mothers' and Fathers' AAI Classifications

The association between the classifications of mothers' as compared to fathers' AAI

¹ Because of limitations of space, raw data are presented only where statistically significant associations were found. Tables not included in the text are available from the authors on request.

TABLE 2

PRENATAL CLASSIFICATIONS OF 96 MOTHERS' AAIs BY INFANT-MOTHER ATTACHMENT AT 12 MONTHS

INFANT-MOTHER ATTACHMENT	AAIs OF MOTHERS			
	D	E	F	U
Avoidant	<u>14</u> (6)	5 (3)	6 (15)	1 (2)
Resistant	1 (1)	<u>0</u> (1)	4 (4)	1 (1)
Secure	4 (12)	4 (6)	<u>44</u> (32)	3 (5)
Disorganized	2 (2)	2 (1)	2 (5)	<u>3</u> (1)
	D/E/F/U → A/C/B/D		F/non-F → B/non-B	
Observed match	64%		76%	
Expected match	42%		51%	
kappa39		.51	
	$\chi^2 = 41.87$ ($df = 9, p \leq .0001$)		22.83 ($df = 1, p \leq .0001$)	

NOTE.—D = Insecure-Dismissing, E = Insecure-Preoccupied, F = Secure-Autonomous, U = Unresolved with respect to Past Trauma or Loss. Expected frequencies appear in parentheses. Predicted cells are underscored.

transcripts was computed for the 90 couples where Strange Situation data was available for the child with both parents. Of the 90 interviews from the mothers, 21 were classified insecure-dismissing (D), 11 insecure-entangled (E), 51 secure-autonomous (F), and seven unresolved (U). For the 90 interviews from the fathers, 17 were classified insecure-dismissing (D), 11 insecure-preoccupied (E), 59 secure-autonomous (F), and three unresolved (U). The cross-tabulation of mothers' and fathers' interviews indicated that no statistically significant association existed between the marital partners' attachment classifications, either for a four-way, $\chi^2(df = 9, N = 90) = 6.6, p \leq 1, N.S.$, or two-way (autonomous/nonautonomous) classification, $\chi^2(df = 1, N = 90) = .17, p \leq 1, N.S.$

Maternal and Infant-Mother, Paternal and Infant-Father Attachment Security

Table 2 displays the association between mothers' patterns of attachment based on their AAI transcripts and the children's security of attachment to mother at 12 months, $\chi^2(df = 9, N = 96) = 41.87, p \leq .0001$. This highly significant result derives from the observations that 79% of mothers whose AAIs were classified secure before the birth of the child had securely attached children at 12 months; 67% of mothers whose AAIs were classified insecure-dismissing (D) had infants who at 12 months showed an insecure-avoidant attachment; and 38% of mothers whose interviews were classified insecure-unresolved (U) had in-

fant demonstrating an insecure-disorganized attachment. This intergenerational match between attachment classifications of mothers' and infant-mother attachment patterns is weakened by the lack of a specific association between the insecure-entangled type of interview in the mothers and the insecure-resistant infant-mother pattern. Of the 11 mothers whose interviews were classified insecure-entangled, none had infants classified insecure-resistant, although seven had insecurely attached infants (five avoidant and two disorganized). When the four-way classification of mothers' interviews was compared with the four-way classification of infant-mother data, a 64% match was observed, $kappa = .39$. The kappa is unaltered for the three-way forced-choice (D, E, F → A, B, C) match of mothers with infant-mother pairs. However, when the insecure groups are collapsed together (non-F vs. F → non-B vs. B), the resulting two-way (secure vs. insecure) match of mothers with infants is 76%, $kappa = .51$.

Table 3 portrays the association between fathers' AAI classifications and the classification of the infant-father attachment at 18 months, $\chi^2(df = 6, N = 90) = 18.94, p \leq .005$. This significant result derives from the observations that 80% of fathers whose AAIs were classified secure before the birth of the child had securely attached children at 18 months; and 59% of fathers whose AAIs were classified insecure-dismissing (D) had infants who at 18 months showed an insecure-avoidant attachment. This latter obser-

TABLE 3

PRENATAL CLASSIFICATIONS OF 90 FATHERS' AAIs BY INFANT-FATHER ATTACHMENT AT 18 MONTHS

INFANT-FATHER ATTACHMENT	AAIs OF FATHERS			
	D	E	F	U
Avoidant	10 (5)	5 (3)	10 (16)	0 (1)
Secure	5 (12)	6 (8)	47 (40)	3 (2)
Disorganized	2 (1)	0 (1)	2 (3)	0 (1)
	D/E/F/U → A/C/B/D		F/non-F → B/non-B	
Observed match	63%		71%	
Expected match	44%		56%	
kappa27		.35	
	$\chi^2 = 18.94 (df = 6, p \leq .005)$		$9.55(df = 1, p \leq .002)$	

NOTE.—D = Insecure-Dismissing, E = Insecure-Preoccupied, F = Secure-Autonomous, U = Unresolved with respect to Past Trauma or Loss. Expected frequencies appear in parentheses. Predicted cells are underscored.

vation of an association between fathers' whose AAIs were classified dismissing and infant-father avoidance is twice what one would expect by chance alone, making a powerful contribution to the overall intergenerational father/infant-father match. Fathers' whose AAIs were classified secure-autonomous also contributed to the intergenerational match, making a secure infant-father pattern highly probable. The AAI-based paternal insecurity of the preoccupied or unresolved type was not predictive of insecurity in the infant-father relationship. Eleven fathers had interviews classified insecure-preoccupied, yet no infants were classified resistant with father. Similarly, three father interviews were classified unresolved, and none of their infants were classified disorganized. When the four-way classification of fathers' interviews was compared with the four-way classification of infant-father data (which had no observations of the insecure-resistant pattern), a 63% match was observed, kappa = .27. The kappa is slightly increased to .31 for the forced three-way paternal (D, E, F) to two-way classification (A, B) of infant-father pairs. The kappa is further increased to .35 when the insecure paternal and infant-father groups are collapsed together (non-F vs. F → non-B vs. B) and the observed match is 71%.

Log-linear Modeling

We applied log-linear modeling to the data in order to test our hypothesis that the association of infant-mother and infant-father attachment classifications would be fully accounted for by the observed contributions of mother and father AAI classifica-

tions to child-mother and child-father attachment patterns, respectively. Secondly, log-linear analysis provided a vehicle to examine the range of possible evidence for facilitative or disruptive intergenerational effects as considered in the introduction. The data consisted of a 2 × 2 × 2 × 2 contingency table (see Table 4 below), representing the associations among the dichotomized (secure vs. insecure) assessments of the mothers' security of attachment, the fathers' security of attachment, the child-mother attachment quality, and the child-father attachment quality. In contrast to the previous sections of these results where a significant χ^2 indicated that the data fit the model being proposed (e.g., cross-generational prediction), in log-linear modeling it is the absence of a significant χ^2 which indicates that the model fits the data. Still, specific contributions to a proposed model are reported as $\Delta \chi^2$ to be read in the conventional way, with significance indicating that the association should not be excluded from the model being considered.

In order to examine the hypothesis that the observed association between infant-mother Strange Situation and infant-father Strange Situation could be accounted for by the Adult Attachment Interview classifications of the parents, we considered for the model the interaction terms relevant to the testing of this hypothesis: namely, to control for (1) the association of father's AAI and child-father Strange Situation, (2) the association of mother's AAI and child-mother Strange Situation, (3) the association of mothers' AAIs and fathers' AAIs. This last

TABLE 4

CROSS-TABULATION OF PARENT AND INFANT ATTACHMENT PATTERNS (Secure vs. Insecure) BASED ON PRENATAL AAI CLASSIFICATIONS OF 90 MOTHERS, 90 FATHERS AND STRANGE SITUATION CLASSIFICATIONS OF THEIR INFANTS WITH MOTHER (at 12 Months) AND WITH FATHER (at 18 Months)

INFANTS' SSN STATUS	PARENTS' ADULT ATTACHMENT INTERVIEW (AAI) STATUS			
	Mother Insecure		Mother Secure	
	Father Insecure	Father Secure	Father Insecure	Father Secure
Insecure with mother:				
Insecure with father	8 (1.8)	7 (3.5)	2 (2.4)	0 (4.5)
Secure with father	2 (3.8)	11 (7.3)	2 (5.0)	6 (9.6)
Secure with mother:				
Insecure with father	0 (2.5)	2 (4.8)	7 (3.3)	3 (6.2)
Secure with father	2 (5.3)	7 (10)	8 (6.9)	23 (13.1)

NOTE.—Expected frequencies appear in parentheses. For this table, and the log-linear results based on it, SSPs classified D and AAI's classified U were treated as belonging to the insecure group.

term made a nonsignificant contribution and was removed. This model accounted for a very substantial portion of the variance, $\chi^2(df = 9) = 15.48, p \leq .08$, but the marginally significant chi-square indicated that a better model might be found. When the association of the Strange Situation with mother and the Strange Situation with father was also entered, the model was significantly enhanced, $\chi^2(df = 8) = 10.78, p \leq .21$. When the association of the child's behavior in the two Strange Situations was dropped from the model, there was a significant reduction in the quality of the fit, $\chi^2(df = 1) = 4.70, p \leq .04$. Thus, the data did not support our hypothesis that the predicted association of parental AAI's and child-parent attachment classifications would fully account for the concordance of Strange Situation assessments with mother and with father.

We next considered the extent to which the data could be found to illustrate broad family processes (e.g., via a four-way interaction among all attachment variables studied) or, as hypothesized in the introduction, facilitative or disruptive effects of one or other parent upon the child's attachment status with the other parent, via the other parent (three-way interactions) or directly upon the child's attachment classification with the other parent (two-way interactions). We first eliminated the possibility that three- or four-way interactions were present in the data by sequentially dropping from the model first the four-way interaction and then the three-

way interactions. Thus the model with only two-way interactions provided a model that was an adequate fit, $\chi^2(df = 5) = 7.27, N.S.$ Two-way interactions, however, made a significant contribution to the model and could not be dropped, $\Delta \chi^2(df = 6) = 44.76, p \leq .001$. Against this background, we considered the possibility that the concordance between the two Strange Situations could be accounted for by the direct influence of one of the parents' attachment classifications upon the child's attachment classification with the other parent. We included in the model the intergenerational associations of (1) mother's AAI upon the child-mother SSP and (2) father's AAI upon the child-father SSP; together with the associations of (3) mother's AAI upon the child-father SSP. The father's AAI upon the child-mother SSP was nonsignificant and could not be included. This model also provided a relatively good fit, $\chi^2(df = 8) = 11.42, p \leq .18$. When the term relating to the influence of the mother's attachment security upon the child's attachment behavior with father was dropped from the model, there was a significant reduction in the quality of the model, $\Delta \chi^2(df = 1) = 4.06, p \leq .05$. While this model provided a comparable fit to the previous one including the dependency effect of Strange Situations, we sought to discover whether the inclusion of the interaction term pertaining to the dependency of SSP assessments would now enhance the fit of this model, and it did not, $\Delta \chi^2(df = 1) = 1.73, N.S.$ Thus, it seems that an alternative account of the association between child-

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mother and child-father SSP assessments may be provided by the consideration of the direct influence of mother's attachment security upon the quality of the child's attachment to father. However, as this effect emerged from a secondary analysis of the data, it should not be considered as equivalent to the finding reported above, that is, that the dependency of SSPs effect—potentially related to the child's temperament—remained significant even after taking account of the significant associations of maternal AAI status upon the child-mother SSP and of paternal AAI status upon the child-father SSP.

Discussion

Previous studies have reported significant associations between AAIs collected from parents of 6-year-olds and the infant-mother attachment previously assessed at 12 months (Grossmann et al., 1988; Main et al., 1985) and the infant-father attachment previously assessed at 18 months (Main et al., 1985). Testing this cross-generational link in a prospective design has been the focus of this and other recent attachment research programs (e.g., Benoit & Parker, 1994; Slade et al., 1991; Ward & Carlson, 1995; Zeanah et al., 1993).

In discussing our results of the association of SSP assessments and AAI classifications, we refer to the correspondence between these measures as intergenerational transmission. In fact, the correspondence observed is between discernible patterns in how expectant parents talk about their childhood attachment experiences in the AAI context and observable differences in the ways their infants subsequently behave toward them in SSP assessments. This correspondence is highly statistically significant irrespective of whether the AAI material is collected prior to, concurrent with, or years following the SSP observations (see van IJzendoorn, 1995).

We found not only a number of statistically significant associations between parent and child attachment patterns but also some notable exceptions to these cross-generational patterns. With both mothers and fathers, a dismissing pattern of response to the AAI greatly enhanced the likelihood of an insecure-avoidant pattern of infant-parent response in the SSP. Similarly, for both mothers and fathers, an autonomous-secure pattern of response to the AAI predicted secure infant-parent patterns of attachment. Consistent with previous reports

on the link between lack of resolution of mourning in mothers and disorganized attachment responses in their infants (e.g., Ainsworth & Eichberg, 1991; Main & Hesse, 1990), we found that mothers whose AAIs were classified unresolved (U) with respect to past loss or trauma were likely to have infants who showed a disorganized pattern of attachment to mother in the SSP. However, this association was not observed for those fathers whose AAIs were classified U, but only three fathers presented interviews judged U (based on moderate as opposed to high scores for lack of resolution of mourning), and only four infants appeared disorganized with father. In contrast with Main et al. (1985), we did not find that parents whose AAIs were classified preoccupied were more likely to have infants classified insecure-resistant in the SSP. Similar failure to predict infant resistance from maternal preoccupation was observed by Zeanah and his colleagues (Zeanah et al., 1993). For the current sample of mothers, preoccupation most commonly prefigured infant avoidance (Fonagy, Steele, & Steele, 1991), while in Zeanah et al. (1993) preoccupation tended to be associated with secure infant attachment. It would seem that, for parents providing an AAI judged preoccupied, there are a range of outcomes possible, not all of them leading to infant resistance. Given the relatively small numbers of infants classified resistant in any one study, meta-analytic studies are clearly needed to clarify the mixed results concerning the proposed link between parental preoccupation with attachment and infant resistance. Interestingly, this issue has recently been addressed by van IJzendoorn (1995) in his meta-analytic review of 18 studies involving AAI and SSP data, including both the present sample and that studied by Zeanah et al. (1993). Van IJzendoorn reports a significant link between parental preoccupation and infant resistance but notes that this effect is smaller if the parents are older and if they come from non-American populations studied (i.e., The Netherlands, Great Britain, and Australia).

The relatively low frequency of insecure-resistant infant responses in the current study probably reduced the strength of the intergenerational associations reported. In two other Northern European samples (Grossmann et al., 1981; van IJzendoorn et al., 1991), a similar paucity of anxious-resistant patterns relative to the presence of anxious-avoidant patterns have been observed. These findings contrast with the inflated levels of anxious-resistance, and rela-

tive absence of anxious-avoidant patterns, among Israeli (Sagi et al., 1985) and Japanese samples (Miyake, Chen, & Campos, 1985). Whereas the overall ratio of secure versus insecure infant attachment patterns does not seem to vary significantly across cultures (van IJzendoorn & Kroonenberg, 1988), the type of insecurity observed seems to reflect culture-specific values (Hinde & Stevenson-Hinde, 1991).

The results were not conclusive with regard to the possible influence of infant temperament on attachment classification. We found evidence consistent with the conclusions of Fox et al. (1991) that infant-father attachment is to some degree dependent upon the quality of infant-mother attachment. Further, this observed similarity of the infant's attachment classifications with the two parents could not, as we hypothesized, be accounted for in terms of a concordance between the parents' AAIs. The independent influence of temperamental factors was suggested by the fact that the log-linear model which included the association of the two SSPs together with the influences of mothers' AAIs upon the child-mother SSPs and fathers' AAIs upon the child-father SSPs was a significantly better model than the one which included the two AAI-to-SSP associations on their own.

Somewhat more tentative conclusions about the possible influence of temperament upon infant-parent attachment classifications were suggested by the second log-linear analysis, exploring the influence of one parent's AAI upon the child's attachment to the other parent. This analysis produced some evidence for what may be seen as a primary caregiver effect of mother. Specifically, the association between the mothers' attachment classifications and the child-father SSPs was significant and appeared to overlap with the observed significant association of the two SSPs with mother and with father. This was evident from the analysis which we began by entering the robust associations between mothers' AAIs and the child-mother attachment patterns and fathers' AAIs and the child-father attachment patterns. When we then entered the association between maternal AAI status and the child's attachment to father, the fit of the model was significantly enhanced and could not be further enhanced by adding the association between the two Strange Situations.

Thus, the results leave open the possibility that the observed similarity in the child's attachment to the two parents may be

attributable to the overarching influence of the mother's attachment-related state of mind upon the child which influences the child's behaviors in interactions with others beyond the infant-mother relationship. This is, of course, the fundamental position of Bowlby (e.g., 1958) and the implicit claim of so much previous attachment research considering the developmental sequelae of infant-mother attachment (e.g., Pastor, 1981; Suess, Grossmann, & Sroufe, 1992). Not inconsistent with this view of the primary influence of mother upon the child's attachments within and beyond the family is an interpretation of our data framed in terms of the likelihood that parents, particularly mothers, will selectively enhance in their children those temperamental characteristics and behaviors which agree with their child-rearing values (Fox et al., 1991). This view is consistent with evidence accumulating over recent years which, as Cassidy (1994) demonstrated, shows that infant temperament influences attachment classifications but only indirectly. Notably, significant characteristics of infants' emotionality (e.g., irritability) may be substantially modified by maternal personality and maternal behavior (Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990), family factors such as marital quality (Belsky, Fish, & Isabella, 1991), and possibly even brief therapeutic interventions aimed at enhancing maternal sensitivity (van den Boom, 1994). Future AAI-research which includes both parental and independent assessments of infant temperament will be in a position to comment on the influence of particular parental attachment patterns upon parental perceptions of infant temperament, and the possibly mediating role of parental attachment status upon associations between infant temperament and infant-parent attachments. We would predict that when maternal representations of attachment are highly coherent and secure, this minimizes the likelihood of irritable infants developing insecure attachments and maximizes the likelihood of temperamentally easy infants showing secure attachments to both parents.

Our data give reason to consider the apparently greater influence of mother as opposed to father upon infant-parent attachment classifications. Regardless of whether we look at the cross-generational comparisons according to four-way classifications (D, E, F, U \rightarrow A, B, C, D) or three-way forcing D into one of the A, B, C infant groups and U into one of the D, E, F adult categories or in a two-way (secure-insecure) fashion, the

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results are consistently somewhat weaker for fathers and their infants as compared to mothers and their infants. This asymmetry could be seen as an artifact of the present design in that the time interval between father and infant-father assessments was 6 months longer than that between mother and the infant-mother Strange Situation test. Further, the possibility that the Strange Situation may be less effective at the second time of administration, due to instrument fatigue, should be considered. However, the same pattern of weaker predictions from fathers' as compared to mothers' AAI has been observed in the two other studies that permit a similar comparison (Main & Goldwyn, in press; van IJzendoorn et al., 1991). The meta-analytic study by van IJzendoorn and Bakermans-Kranenburg (in press) shows that the combined r is .50 for mothers and their infants and only .37 for fathers and their infants. It is possible that both the Adult Attachment Interview and Strange Situation assessments are more sensitive to the characteristics of females. The Strange Situation was developed and validated on mothers and their infants, while the Adult Attachment Interview asks principally about thoughts and feelings concerning relationships, which may be seen as a topic more familiar to women (Gilligan, 1982). Indeed, attachment relationships may be a domain of emotional development in which mothers' influence is primary (Bowlby, 1969/1982), at least in the first 2 years of life.

Though the influence of the father may not be so easily observable as that of the mother in the first 2 years of life, his influence is clearly observable and somewhat distinct from that of the mother in long-term follow-ups of Strange Situation observations. Longitudinal studies indicate that the influence of attachment to father, relative to that of mother, is predictive of different areas of adaptation. For example, two studies (Suess et al., 1992; van IJzendoorn et al., 1991) converge on the suggestion that the influence of the infant-mother relationship is specific to children's levels of concentration and ego resilience in the school setting, while the attachment to father may be particularly felt in the domain of sociability with peers.

Further research is needed to elucidate the processes whereby representations of specific relationships to mother and to father during early childhood become, in the course of development, integrated within higher-order meta-representational systems, such as can be measured during adulthood

using the AAI. This is, in our view, probably the most important research issue for the attachment field. Notably, the newly developed methods for assessing attachment via consideration of verbal responses draw upon the presence of both relationship-specific representations and more global characteristics of the representational system underpinning attachment (Bretherton, Ridgeway, & Cassidy, 1990; Main & Goldwyn, in press; Shouldice & Stevenson-Hinde, 1992). For example, the Adult Attachment Interview includes rating scales that assess the probable quality (e.g., loving vs. unloving) of individuals' representation of their parents, as well as global properties of the adult's mode of communicating attachment-related feelings and thoughts such as coherence (Main et al., 1985), metacognition (Main, 1991), and reflective-self functioning (Fonagy, Steele, Steele, Moran, & Higgitt, 1991). Crucial tasks for future research will be the attempt to identify and chart the development of these mental capacities which are at once the product of secure attachment relationships and have a role in ensuring the emergence of secure relationships in a new generation, thus playing a fundamental role in the intergenerational transmission of attachment security. At the same time, future research will want to consider ways of promoting these meta-representational capacities in the context of therapeutic interventions aimed at lessening the likelihood of attachment insecurities being transmitted across generations.

Notably, the present study has many limitations that place important restrictions upon the generalizability of the findings to other socioeconomic groups and cultures. The sample is not truly representative of either North American or British families, in part because of the predominance of middle-class individuals and because the selection criteria included cohabitation of the parents at time of entry into the project. Further, the decision to wait until 18 months to assess the infant-father attachment when the infant-mother attachment had been assessed at 12 months prevented direct comparison between these two assessments; future studies aiming at such direct comparisons could counterbalance assessments with half the infant-father assessments and half the infant-mother assessments being done at each of the two ages children are assessed as some previous researchers in this area have opted to do (e.g., Sagi et al., 1985). Additionally, the significantly greater than chance levels

of prediction from parent to child attachment patterns must be considered alongside the sizable minority of children whose attachment patterns could not be predicted from knowledge of the parents' attachment status. Further research will need to explore at greater depth the developmental and methodological factors that may account for these mismatches between the classification of infant and parent attachment patterns.

In summary, the results of this study support an intergenerational and relationship-specific view of the determinants of infant patterns of attachment. The significant association between classifications of mothers' AAI during pregnancy and subsequent classifications of SSPs conducted with child and mother at 1 year was statistically independent of the significant association between classifications of fathers' AAI and infant-father SSP assessments at 18 months. The possible influence of child temperament upon infant attachment was noted in the relatively weaker association observed between infant-mother and infant-father SSPs but one that remained significant even after considering the influence of parental AAI upon SSPs in log-linear modeling. The log-linear modeling also indicated, however, that this association between the two SSPs overlapped with an association between mothers' AAI and the child-father SSPs. Overall, these results suggest that over the first 18 months of life infants are able to discern and represent significant differences in their parents' states of mind concerning attachment in ways that influence their behavior with each parent, the influence of mother being perhaps primary.

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