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Attachment Representations in Mothers, Fathers, Adolescents, and Clinical Groups: A Meta-Analytic Search for Normative Data

Marinus H. van IJzendoorn
Center for Child and Family Studies Leiden University
Marian J. Bakermans-Kranenburg
Center for Child and Family Studies Leiden University

ABSTRACT

This meta-analysis on 33 studies, including more than 2,000 Adult Attachment Interview (AAI) classifications, presents distributions of AAI classifications in samples of nonclinical fathers and mothers, in adolescents, in samples from different cultures, and in clinical groups. Fathers, adolescents, and participants from different countries show about the same distribution of AAI classifications as nonclinical mothers do. The distribution of nonclinical mothers is as follows: 24% dismissing, 58% autonomous, and 18% preoccupied mothers. About 19% of the nonclinical mothers are unresolved with respect to loss or trauma of other kinds. Mothers from low socioeconomic status show more often dismissing attachment representations and unresolved loss or trauma. Autonomous women and autonomous men are more often married to each other than can be expected by chance, and the same goes for unresolved men and women. Clinical participants show highly deviating distributions of AAI classifications, with a strong overrepresentation of insecure attachment representations, but systematic relations between clinical diagnosis and type of insecurity are absent.

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Correspondence may be addressed to Marinus H. van IJzendoorn, Center for Child and Family Studies, Leiden University, Leiden, The Netherlands, NL-2300 RB.
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During the past 10 years, the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) has been applied in an increasing number of studies of adults' current mental representation of their childhood attachment experiences. In attachment theory (Bowlby, 1985, 1989), past attachment experiences are supposed to become crystallized into an internal working model or state of mind with respect to attachment, which Main, Kaplan, and Cassidy defined as "a set of rules for the organisation of information relevant to attachment and for obtaining or limiting

access to that information" (1985, pp. 66—67). It is hypothesized that the current mental representation of childhood attachment experiences is related to the representation of attachment in the offspring, to parents' interactive behavior to this offspring, and to the occurrence of psychological disorders in adolescents and adults, as well as in their children (Main, 1990 ; Minde & Benoit, 1991 ; van IJzendoorn, 1995).

The AAI is a semistructured interview that probes alternately for general descriptions of attachment relationships, specific supportive or contradicting memories, and descriptions of current relationships with parents and other attachment figures. Participants are asked to retrieve attachment-related autobiographical memories from early childhood and to evaluate these memories from their current perspective (George et al., 1985). The coding of the AAI transcripts is not based primarily on childhood attachment experiences per se but on the way in which the participants describe and reflect on these experiences and the effects on their current functioning as adults and as parents (Main & Goldwyn, 1991). The coding of the AAI results in one of three main adult attachment classifications: Autonomous (F), Dismissing (DS), and Preoccupied (E). Adults with the F classification tend to value attachment relationships, to describe their attachment experiences–whether positive or negative–coherently, and to consider them important for their own personality. Adults with the DS classification tend to minimize the importance of attachment for their own lives or to idealize their childhood experiences without being able to provide concrete illustrations. Adults with the E classification tend to maximize the importance of attachment. They are still very much involved and preoccupied with their past experiences and are unable to describe them coherently and reflectively. Anger or passivity characterizes the discourse style of these adults. Adults with the DS and E classifications are both considered insecure. An additional classification, unresolved (U), is used if the interview shows signs of unresolved experiences of trauma usually involving the loss of attachment figures. The U classification is superimposed on the three main classifications.

The reliability of the AAI has been thoroughly tested. In a study on 83 Dutch mothers, five interviewers interviewed each woman twice, in counterbalanced order (Bakermans-Kranenburg & van IJzendoorn, 1993). First, the interviewers did not provoke systematically different AAI classification distributions. Second, each interviewer—pair showed about the same stability of AAI classifications over time. In a replication and extension on 59 Israeli college students, Sagi and his colleagues found that the interview outcome was not influenced by the interviewer even if she also served as a coder (Sagi et al., 1994). As long as adequate training is provided, the semistructured AAI appears to be robust against interviewer effects. In the same two studies, the test—retest reliability of the AAI was tested. Because internal working models of attachment become more canalized over the years (Bowlby, 1969), one might expect the adult attachment representations to be relatively stable across time. Bakermans-Kranenburg and van IJzendoorn (1993) found that 78% of the AAI classifications remained stable across a 2-month period; Sagi and his colleagues (1994) found that 90% of the classifications were stable across a 3-month period. In two other studies in different countries and with different samples, these results were basically replicated and extended: Steele and Steele (1994) found that 77% of the AAI classifications of 26 English staff and students remained stable across a 1-month period, and Benoit and Parker (1994) showed that 90% of their sample of 84 Canadian mothers received the same AAI classification across a 1.5-year period.

The discriminant validity of the AAI has been addressed in several studies. The AAI classifications appeared independent of the social desirability bias in three studies (Bakermans-Kranenburg & van IJzendoorn, 1993 ; Sagi et al., 1994 ; Waters, Crowell, Treboux, O'Connor,

Posada, & Golby, 1993). Waters et al. (1993) also found that the discourse style of individuals participating in the AAI is different from their style of discussing a nonattachment-related topic such as the participants' job. The AAI is not measuring logical reasoning abilities or verbal fluency either, because the AAI classifications appeared independent of cognitive and IQ tests in five studies (Bakermans-Kranenburg & van IJzendoorn, 1993 ; Sagi et al., 1994 ; Rosenstein & Horowitz, 1993 ; Steele & Steele, 1994 ; Ward, Botyanski, Plunket, & Carlson, 1991). Only in the Waters et al. (1993) study was there an association found between the Henmon—Nelson Test of Mental Ability and the AAI. The overall evidence, however, shows that the AAI coding system with its emphasis on coherence of discourse is remarkably little contaminated by IQ differences between the participants. Related to cognitive differences is the issue of autobiographical memory. Because the AAI heavily relies on the participants' discourse of attachment-related memories from childhood, AAI classifications might be suspected to be associated with autobiographical memory abilities. In the coding system, lack of memory of childhood attachment experiences can be interpreted as a sign of insecurity. In case of the adults with the DS classification, it is supposed that they are not open to negative aspects of their early attachment relationships and, therefore, fall back on lack of memory to avoid reflecting those aspects. Bakermans-Kranenburg and van IJzendoorn (1993) found, however, that the participants (i.e., mothers) within the three AAI classifications did not differ in their ability to remember childhood experiences that are not related to attachment and that those with a DS classification even showed somewhat better memory abilities. This finding was replicated in the Sagi et al. (1994) study with a different sample (students) and different memory measures.

The predictive validity of the AAI has been studied in more than 20 studies by different research groups and in different countries. Three validity issues appear to be important. First, the AAI has been developed to predict at least partly the parent—child attachment relationship as observed in the famous Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978). In a meta-analysis on 18 pertinent studies, including 854 parent—child dyads, van IJzendoorn (1995) found a large combined effect size ($d = 1.06$, comparable to 75% correspondence) for the relation between the security of parental attachment (as measured through the AAI) and the security of the parent—child attachment relationship (as measured through the Strange Situation or similar observational procedures). Second, in 10 studies the association between AAI classifications and parental responsive behavior to the children's attachment signals and needs was studied. The meta-analysis yielded a combined effect size of .72, comparable with $r = .34$ (total number of participants was 389; van IJzendoorn, 1995). The AAI therefore appears to be predictive of parenting behavior toward the children as well. Third, although adult attachment should be considered neither a necessary nor a sufficient condition for psychological disorders, Bowlby (1973) , for example, assumed that environmentally determined disorders might at least partly be related to insecure attachment representations. In 12 studies, some support for the predictive clinical validity of the AAI classifications was found. Our meta-analysis showed a combined effect size of 1.03 ($r = .46$; $N = 688$) for the relation between security of adult attachment and whether the participants or their children were diagnosed as clinically disturbed (van IJzendoorn, 1995).

The qualitative, semistructured AAI, therefore, appears to meet stringent psychometric criteria, not only in terms of reliability but also in terms of discriminant and predictive validity. Against this background, it seems warranted to review the available studies in order to describe important trends and to derive normative data from these studies. The present meta-analysis focuses on the following interrelated normative questions. First, how are the AAI classifications distributed in

samples of nonclinical mothers, that is, in community samples that were not selected with the purpose of including clinical participants? In these samples, we expect to find a majority of autonomous classifications, and we expect to find an overall distribution comparable with the global distribution of infant—mother attachment classifications (van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992). Second, how are the AAI classifications distributed in samples of nonclinical fathers? Several studies have recently been carried out on adult attachment representations in fathers (e.g., Radojevic, 1992 ; Steele, Steele, & Fonagy, in press ; van IJzendoorn, Kranenburg, Zwart-Woudstra, Van Busschbach, & Lambermon, 1991), and two issues are important: whether fathers indeed tend to have a more dismissing representation of their childhood attachment experiences, as Radojevic (1992) suggested, because of their generally less involved attitude toward intimate and caring relationships (Gilligan, 1982), and how the attachment representation of wives is related to that of their husbands. The question is whether "assortative mating" (Plomin, DeFries, & McLearn, 1990) causes secure wives to marry secure husbands and insecure wives to marry insecure husbands. If this is indeed the case, it will be difficult to break the cycle of intergenerational transmission of insecure attachment (Rutter, Quinton, & Hill, 1990). The third normative question concerns nonparental attachment representations: How are AAI classifications distributed in samples of adolescents and young adults without children? Because adolescents have had less time to work through their childhood attachment experiences, and might still find themselves in a struggle for independence, they may show less autonomous representations than adults. Fourth, is the distribution of AAI classifications in other cultures and low socioeconomic strata (SES) divergent from the standard distributions of nonclinical mothers in the United States? Earlier studies of infant—mother attachment showed that attachment appears to be relatively robust against cross-cultural and socioeconomic variations (van IJzendoorn & Kroonenberg, 1988), and we expect the AAI also to be independent from culture and SES, at least within the boundaries of the Western industrialized world. Fifth, how are AAI classifications distributed in clinical groups? We hypothesize, of course, that psychiatrically disturbed participants more often have insecure representations of their childhood attachment experiences than comparison participants. At the same time, we suppose that parents of disturbed children also more often show insecure attachment representations (van IJzendoorn, 1995). In both cases, we expect to find an overrepresentation of U classifications as a consequence of loss or trauma of other kinds, because in an earlier meta-analysis on Strange Situation classifications in clinical groups, an overrepresentation of disorganized or disoriented children was found (van IJzendoorn et al., 1992). Dependent on the type of disorder, an overrepresentation of DS and E classifications might be expected. Rosenstein and Horowitz (1993) , for example, supposed that internalizing problems such as depression would co-occur with preoccupied attachment representations, whereas externalizing problems such as conduct disorders would co-occur with a dismissing representation of attachment experiences.

To answer these questions, we use a specific meta-analytic approach based on correspondence analysis that in the past has been used to review infant—mother attachment studies (van IJzendoorn & Kroonenberg, 1988 ; van IJzendoorn et al., 1992).

Method

Database

Pertinent studies were selected through PsycLIT and through personal communication with Mary Main, with whom the AAI originated (George et al., 1985) and who, together with Erik Hesse

and Mary Ainsworth, trained the researchers in this field. We included only studies using the original adult attachment coding system (Main & Goldwyn, 1991). This procedure resulted in the selection of 13 samples with nonclinical mothers, 6 samples with fathers from nonclinical families, 14 clinical samples, 4 samples with adolescents and young adults, 8 samples from low socioeconomic and multiethnic background, and 1 kibbutz sample. In some cases, more than one sample was included in a study (e.g., DeKlyen, 1992); therefore, the number of studies is 33. These studies included more than 2,000 AAI classifications, and the current meta-analysis, therefore, covers data from more than 2,000 participants who completed the AAI. A large subset of studies reported not only on the three-way DS, F, and E classifications but also on the four-way classifications involving the U category. Because of the relevance of this category for clinical and theoretical purposes, we analyzed our data for the three-way as well as the four-way distributions. Because the AAI paradigm is increasingly being used in developmental and clinical psychology and in psychiatry, our collection of studies necessarily reflects the current state of the art.

Data Analysis

The samples were cast in a contingency table with the sample of nonclinical mothers as one of the two marginal distributions and frequencies of DS, F, and E classifications (Table 1) or DS, F, E, and U classifications (Table 2) over the separate samples as the other. The following types of analyses were conducted.

In the first place, adjusted standardized residuals for each cell of Tables 1 and 2 were computed to assess significant deviations in frequency of a particular classification in a given sample. These standardized residuals were computed for each cell of the tables as $O\text{-}E^{2} / E^{\½}$, that is, the square root of the cell's contribution to the overall chi square or, more correct, Pearson's chi square. These residuals are standardized deviations from a model of independence between rows (observed frequencies in the samples) and the marginal distribution of the combined nonclinical mother samples and, hence, provide an index of variability; the residuals are asymptotically standard normal distributed (Bishop, Fienberg, & Holland, 1975). A large standardized residual indicates that the observed cell frequency is considerably larger or, if the sign is negative, smaller than expected from the marginals. Protection from capitalizing on chance significance was assured by Bonferroni-like corrections of the standard alpha level of .05. In case of the nonclinical mother samples, the standard alpha level was divided by 13 (Samples) × 3 (Categories), and a two-tailed Bonferroni level of .001 was adopted ($z = 3.2$). For the father samples, .05 was divided by 6 (Samples) × 3 (Categories), and the critical level of .003 was adapted ($z = 3.0$). For the clinical samples, .05 was divided by 14 (Samples) × 3 (Categories) resulting in a Bonferronized alpha level of .001 ($z = 3.3$). For the adolescent samples, .05 was divided by 4 (Samples) × 3 (Categories), and the critical level of .004 was adapted ($z = 2.9$). For the low-SES samples, the critical level was .002 ($z = 3.1$). In case of the four-way classifications, the standard alpha level had to be divided by the number of samples in the specific category, multiplied by the number of categories (4). Corresponding z values were as follows: nonclinical mothers, $z = 3.2$; fathers, $z = 3.0$; clinical groups $z = 3.1$; adolescents, $z = 2.9$; and low-SES mothers, $z = 3.0$.

Following our earlier papers (van IJzendoorn & Kroonenberg, 1988 ; van IJzendoorn et al., 1992), we used a second type of analysis–correspondence analysis–to describe similarities and differences in sample distributions (Greenacre, 1985). Correspondence analysis, or ANACOR, permits simultaneous analysis of both sample and category profiles; its solution is obtained through singular value decomposition of the standardized residuals and a weighting of the

singular vectors by the square root of the singular values multiplied by the inverse square root of *n* participants in a sample. In the graphical representation of the results of a correspondence analysis, the origin represents the marginal distribution of both categories and samples. The maximum number of independent dimensions of such graphical representations is equal to the minimum of the number of row and column categories minus 1. Thus the standardized residuals for the DS, F, and E distributions can be perfectly represented in two dimensions, and those for the DS, F, E, and U distributions in three dimensions. The representation shows which samples have similar distributions over categories and which categories have similar distributions over samples, as well as which categories and which samples deviate strongly from their baseline distribution. The method was applied to the nonclinical-mother samples to create a baseline. The total of fathers, the total of adolescents, the total of low-SES samples, and every single clinical sample have been projected into the graphical representation of the samples of nonclinical mothers by using regression-type procedures with the total of fathers, adolescents, low SES, and the clinical sample coordinates as the criteria and the category coordinates as regression weights for the frequencies of these (combined) samples (Greenacre, 1985). The computations were performed using the ANACOR procedures of the Statistical Package for the Social Sciences (SPSS) categories. The advantage of the correspondence analysis approach is that the patterns of distributions are investigated and compared rather than the separate category frequencies. The graphic display of correspondence analysis provides a complete overview of the similarities and differences between the distribution of the samples and between the samples and the total nonclinical-mother distribution (van IJzendoorn et al., 1992).

The third type of analyses consisted of cross-tabulations of total distributions from the different types of samples. A cross-tabulation of wives' and husbands' AAI classifications was also included. The more common chi-square statistics derived from these cross-tabulations provide some inferential support for our descriptive correspondence analyses.

We used the methods of categorical data analysis for meta-analytic purposes, instead of the more traditional meta-analytic approach in which effect sizes are being combined across studies and specific hypotheses about associations between the AAI and other variables tested (Rosenthal, 1991; van IJzendoorn, 1995). This traditional, confirmatory approach does not yield the descriptive information that we are searching for in the current article, and it cannot be applied to our explorations of differences and similarities between the AAI classification distributions of separate (clinical) samples and some nonclinical baseline. The current approach therefore preserves the unique nature of every single study and outlines its position against the background of the total nonclinical mothers distribution.

Results and Discussion

Attachment Representations in Nonclinical Mothers

From Tables 1 and 2 , it can be derived that in a combined sample of $n = 584$ mothers, 24% were classified as DS, 58% as F, and 18% as E. A majority of the nonclinical mothers–albeit a small majority–were classified as F. The separate samples are quite homogeneously distributed. The adjusted standardized residuals were not significant for any of the cells (see Tables 1 and 2). The U.S. samples ($n = 268$) showed a distribution of 25% mothers classified as DS, 55% as F, and 20% as E, whereas the samples from other countries ($n = 316$) showed a distribution of 23% mothers classified as DS, 60% as F, and 17% as E. These distributions were not significantly different, $\chi^2 2, N = 584 = 1.47, p = .48$. The kibbutz mothers sample was, however, significantly

different from the total nonclinical mothers sample, $\chi^2 2, N = 629 = 7.13, p = .03$. DS kibbutz mothers were underrepresented, whereas F and E kibbutz mothers were overrepresented. Compared with the combined sample of infant—mother dyads observed in the Strange Situation (van IJzendoorn et al., 1992), the overall AAI distribution shows an underrepresentation of mothers classified as F and an overrepresentation of mothers classified as E. The Strange Situation classification distribution in nonclinical infant—mother dyads was 21% avoidantly, 67% securely, and 12% ambivalently attached. These distributions are significantly different, $\chi^2 2, N = 2168 = 18.24, p < .0001$. With the category U included, the combined sample of $n = 487$ nonclinical mothers showed the following distribution: 16% classified as DS, 55% as F, 9% as E, and 19% as U. The Strange Situation classifications distribution of nonclinical infant—mother dyads for the four-way coding system was 23% avoidantly, 55% securely, 8% ambivalently, and 15% disorganized attached (van IJzendoorn et al., 1992). The four-way AAI and Strange Situation classifications distributions did not differ significantly, $\chi^2 3, N = 793 = 6.91, p = .07$. Nevertheless, the percentage of mothers classified as U is remarkably high: About one fifth of the nonclinical mothers showed signs of unresolved loss or trauma of other kinds. The percentage of mothers in the U.S. samples who were classified as U (23%; $n = 193$) was not significantly higher than the percentage of mothers in samples from other countries who were classified as U (17%; $n = 294$), $\chi^2 2, N = 487 = 2.51, p = .11$.

Attachment Representations in Fathers and Couples

The combined distribution of nonclinical-father samples appeared to be very close to the distribution of nonclinical mothers: 22% of the fathers were classified as DS, 62% as F, and 16% as E ($n = 286$). For cross-tabulation of mothers' and fathers' classifications, $\chi^2 2, N = 870 = 1.33$, *ns* . Except for the Benoit (personal communication, April 15, 1993) sample, the separate samples of fathers did show a remarkable similarity to the total distribution of mothers. In the Benoit sample, the fathers classified as F were overrepresented, and the adjusted standardized residual for this cell reached the critical alpha level (see Table 1). We did not find support for the hypothesis that the DS classifications would be overrepresented in fathers. For the four-way distribution, the results were about the same (see Table 2). The father distribution of 15% DS, 57% F, 11% E, and 17% U did not differ significantly from the mother distribution, $\chi^2 3, N = 728 = 1.76, p = .62$.

The similarity of AAI classification distributions in fathers and mothers does, of course, not imply a similarity of AAI classifications within couples. In five studies, wives and husbands have been included (Cohn, Silver, Cowan, Cowan, & Pearson, 1992 ; Crittenden, Partridge, & Claussen, 1991 ; Miehls, 1989 ; Steele & Steele, 1994 ; Steele, Steele, & Fonagy, in press ; van IJzendoorn et al., 1991). In Table 3 , the cross-tabulation of wives' and husbands' AAI classifications is presented. For the 226 couples included in these studies, the correspondence appeared to be significant, $\chi^2 4, N = 226 = 20.24, p = .0004$. From the adjusted standardized residuals in Table 3 , it can be derived that the correspondence of attachment representations within couples is specifically based on the F category. Women and men classified as F marry each other more often than expected by chance. Men classified as F and women classified as E, however, marry each other less often than expected by chance. For the secure—insecure split, the outcome of the three-way cross-tabulation was confirmed, $\chi^2 1, N = 226 = 17.91, p < .001$. The effect size was comparable with $r = .28$.

For the four-way distribution of the AAI classifications in couples, only three samples were available (Cohn et al., 1992 ; Steele et al., in press ; van IJzendoorn et al., 1991). The cross-tabulation of the wives' and husbands' AAI classifications yielded a significant chi square, $\chi^2 9,$

$N = 152 = 18.22$, $p = .03$ (exact Fisher test). In particular, women and men classified as U appear to marry each other more often than might be expected by chance alone. Cell sizes in this four-way tabulation, however, are small (see Table 3). If the 4 × 4 cross-tabulation was collapsed to the secure—insecure split, the association was insignificant, $\chi^2 1$, $N = 152 = 0.33$, $p = .56$.

Attachment Representations in Adolescents and Young Adults

We hypothesized that adolescents might show less autonomy because they would still need time to work through their childhood attachment experiences. From Tables 1 and 2 , it can be derived that this contention is not borne out by our data. The adolescent AAI classification distribution of 27% DS, 56% F, and 17% E was not significantly different from the nonclinical mother distribution, $\chi^2 2$, $N = 861 = 1.36$, *ns* . The four-way distributions did not differ either, $\chi^2 3$, $N = 712 = 4.80$, *ns* . Because the adolescent samples include female as well as male participants (e.g., Kobak & Sceery, 1988), we also compared the adolescent distribution with the combined sample of fathers and mothers. This comparison confirmed the earlier results. In the adolescent samples, there is no overrepresentation of one of the insecure categories.

Attachment Representations in Low-SES Samples

The combined samples with very low-SES backgrounds did significantly differ from the nonclinical-mother samples, $\chi^2 2$, $N = 995 = 12.12$, $p < .01$. The DS category appeared to be overrepresented and the F category was underrepresented (see Table 1). In the four-way comparison, control and low-SES mothers also showed significant differences, $\chi^2 3$, $N = 837 = 26.23$, $p < .001$. In particular, the U category and the DS category appeared to be overrepresented in the low-SES group, whereas the F category was underrepresented (Table 2). The Ward and Carlson (1995) sample of adolescent mothers was included in this set of low-SES samples (see also Levine, Tuber, Slade, & Ward, 1991).

Attachment Representations in Clinical Samples

It was hypothesized that children's disturbed socioemotional development is related to an insecure–DS, E, or U–view of parents on their own attachment biography. It was also suggested that adolescents and adults with clinical problems would show more insecure attachment representations. In Tables 1 and 2 , 14 samples (or subsamples) have been presented with a variety of clinical problems.

As expected, the combined clinical groups showed an extremely deviating distribution of AAI classifications. For the cross-tabulation for the three-way classifications, $\chi^2 2$, $N = 1023 = 223.24$, $p < .001$. The combined clinical groups showed a strong overrepresentation of insecure participants. The same pattern was evident from the cross-tabulation of the four-way classification, $\chi^2 3$, $N = 652 = 114.83$, $p < .001$. The U category was strongly overrepresented in the combined clinical group, as was the E category. The subset of parents of clinical children and the subset of adolescents and adults with clinical problems both showed an overrepresentation of insecure attachment representations. In the case of the four-way classifications, the adolescent and adult problem samples appeared to deviate even somewhat more from the nonclinical baseline than the sample of parents of problem children, but the small number of participants in this latter sample precludes any firm conclusions.

In Figures 1 and 2 , the clinical groups have been projected into the plot of AAI distributions of the samples of nonclinical mothers. The center of the plot at the intersection of the DS, F, E vectors, represents the nonclinical-mother samples distribution. Because the distributions of the nonclinical mothers and nonclinical fathers are about the same, combining these groups would not significantly affect the results. The AAI, like the Strange Situation, was developed and validated in samples with mothers. The first dimension of Figure 1 had a singular value of .255

(percentage explained: 76%) and showed an overrepresentation of insecure classifications on the left and an overrepresentation of secure classifications on the right. The formula for calculating the X coordinate from the frequencies of the DS group (fDS), the F group (fF), and the E group (fE) was X = (–.771f Ds + .411fF – .296f E) /(.255N), where *N* = fDS + fF + fE. The second dimension (Y axis) had a singular value of .146 (percentage explained: 25%) and showed an overrepresentation of preoccupied classifications to the bottom. The formula for calculating the Y coordinate was Y = (.356 fDS + .099 fF – .774 fE) /(.146N). For the four-way classifications, the formula for calculating the X coordinate was X = (.622 fDS + .031 fF + .515 fE – .860 fU) /(.231N), where *N* = fDS + fF + fE + fU. The formula for calculating the Y coordinate in Figure 2 was Y = (–.045 fDS + .278 fF – 1.013 fE – .283 fU) /(.151N). The first dimension set the U category apart from the other categories, and the second dimension showed the contrast between E classifications (to the bottom) and the other classifications. The third dimension only showed a singular value of .069 (6% percentage explained), and was considered too weak to be included in the graphic displays.

In Figure 1 , all clinical groups were located at the left side of the graph, indicating an overrepresentation of insecure attachment representations. The center of gravity of the clinical participants was located far away from the center of the plot, showing an overrepresentation of DS as well as E participants. In Figure 2 , all clinical groups were located at the bottom of the graph, indicating an overrepresentation of participants classified as E and U. Some clinical samples (e.g., oppos/c [DeKlyen, 1992 ; DeKlyen, Endriga, Speltz, & Greenberg, 1992 ; Greenberg, Speltz, DeKlyen, & Endriga, 1991], hosp/a [Allen & Hauser, 1991], and border/a [Patrick, Hobson, Castle, Howard, & Maughan, 1994]) deviate to the left of the graph, which means that they showed an overrepresentation of participants classified as U. In contrast, the centers of gravity for the combined fathers, the combined adolescents, and the combined low-SES groups were located quite near the origin, showing their similarity to the distribution of the combined nonclinical mothers.

The correspondence analyses as depicted in Figures 1 and 2 facilitate the search for systematic relations between diagnosis and AAI classifications distribution. First, from Figure 1 it can be derived that the center of gravity for the clinical groups showed an overrepresentation of both E and DS classifications. The clinical status was therefore not related to a specific insecure adult attachment category. Second, some clinical groups clearly showed an overrepresentation of a specific insecure group without an overrepresentation of another insecure group. The failure-to-thrive sample ([ftt/c] Benoit, Zeanah, Barton, 1989), the two maltreatment samples ([abuse/m and abuse/f] Crittenden et al., 1991), the two oppositional-children samples ([oppos/c] Crowell & Feldman, 1988 ; [conduct/c] Crowell & Feldman, 1991 ; Crowell et al., 1991), and the depressive adults ([depr/a] Rosenstein & Horowitz, 1993) and borderline adults ([border/a] Fonagy, 1993 ; Fonagy et al., 1992 ; Patrick et al., 1994) showed a relative overrepresentation of E attachments. Of the clinical groups in which the children were diagnosed as disturbed, only the sleep disorder sample ([sleep/c] Benoit, Zeanah, Boucher, & Minde, 1992) showed an overrepresentation of DS classifications. For the clinical groups, in which the (young) adults are the main focus of concern, the variation was larger but a systematic trend is difficult to derive. For example, the depression disorder sample of Rosenstein and Horowitz (1993) showed an overrepresentation of E classifications, but the dysthymic sample of Patrick et al. (1994) showed a slight overrepresentation of DS classifications. The two borderline personality disorder samples (Fonagy, 1993 ; Patrick et al., 1994), however, clearly showed the same trend toward over representation of E attachment representations. Third, from Figure 1 , it can be derived that

clinical groups in which the adolescents or adults have been diagnosed as disturbed showed similar distributions as samples with parents of disturbed children. Fourth, from Figure 2 it can be derived that the clinical status was not exclusively related to the seemingly most disturbed adult attachment category, the U category including the "cannot classify" cases (Hesse, van IJzendoorn, & Main, 1993). The center of gravity for the clinical groups suggested an overrepresentation of participants with the U classification as well as those with an E classification. Figure 2 also shows that the U category was not necessarily linked to depressive symptoms (depr/a). Last, it should be noted that when the U category is included, clinical samples appeared to contain fewer participants from the DS category.

Conclusion

The field of adult attachment research is developing with a remarkable speed. The AAI is one of the most time-consuming instruments in the area of developmental and clinical psychology. It requires extensive training and practice, careful verbatim transcription of 1-hr interviews, and a laborious coding procedure. Nevertheless, after less than a decade, research groups from many different countries have produced a large body of data addressing several important developmental and clinical issues. As far as we know, more than 2,000 AAIs have been collected and processed as of January 1994, including AAIs from studies in progress. In the present meta-analysis, we surveyed the available studies and tried to derive some normative data as well as evidence to test some pertinent ideas and hypotheses. It should be noted that our meta-analysis is not an epidemiologically valid survey and that our normative data are based on a series of rather small studies. Because the AAI is time consuming, it would be impossible to perform a large-scale survey, and our approach might therefore be the best approximation.

Concerning the normative data, the combination of AAI studies on nonclinical mothers (n = 584) shows a distribution of 24% DS, 58% F, and 18% E classifications. If the U category is taken into account, we find 19% mothers classified as U in nonclinical samples. Compared with the distribution of infant—mother attachment in nonclinical U.S. samples (van IJzendoorn et al., 1992), there are about 10% fewer F mothers than secure infants. The discrepancy between the AAI and the Strange Situation classification distributions may imply a ceiling to the maximum correspondence between maternal and children's attachment (van IJzendoorn, 1992), but it should be noted that the discrepancy disappears when the U (adults) and disorganized (infants) categories are taken into account. Furthermore, the percentage of mothers classified as U is quite high. In this respect, a nonclinical population might be less "healthy" than one would expect. A study on self-proclaimed healthy volunteers supports this suggestion from a different perspective (Halbreich et al., 1989). In this respect, it is important to note that the nonclinical samples were community samples that were not screened for clinical symptoms.

Attachment theory has often been "accused" of discriminating against fathers and, by implication, mothers as well. The AAI, however, has already been applied to fathers in several studies. The distribution of AAI classifications of fathers is strikingly similar to the distribution of mothers. In particular, the DS category is not overrepresented in fathers, contrary to our expectation (e.g., Gilligan, 1982 ; Radojevic, 1992). In aggregating studies on adult attachment in couples, we found evidence for correspondences between husbands' and wives' AAI classifications. Men and women who were classified as F were more often married to each other than was expected by chance. Men classified as F and women classified as E were less likely to be married to each other. Men might not as much be characterized by DS views on attachment relationships as reject an E view on attachment in their potential partners. Because the effect size for the association between the security of wives' and husbands' attachment representations is

modest (r = .28), many insecure partners marry partners who are classified as F. Our data show, therefore, that it might not be impossible to break the cycle of intergenerational transmission of insecurity through the choice of a partner (Bowlby, 1988; Rutter et al., 1990). Furthermore, the association between the attachment security of wives and husbands may also explain the modest association between infant—mother and infant—father attachment security (Fox, Kimmerly, & Schafer, 1991).

Adolescents and young adults without children do not appear to be more insecurely attached than parents. The studies that were included in our meta-analysis predominantly cover late adolescence and early adulthood. In early adolescence, the struggle for independence might be more intense, and further studies covering this period of life might show more diverging AAI distributions. The AAI appears to be applicable to adolescents: The whole range of classifications has been found to be necessary to describe the adolescents' state of mind with respect to attachment. The same has been shown for participants from low-SES backgrounds. Low-SES mothers show distributions of AAI classifications that are somewhat different from mothers with more affluent backgrounds. Low-SES mothers more often appear to be classified as DS, and as U with respect to the loss of an attachment figure or with respect to trauma of other kinds. Impoverished environments might provoke more traumatic events than average environments. In particular among ethnic minority groups the experience of (or the experience of being witness to [Bearman & Ogawa, 1993]) traumatic events might be more frequent (Norris, 1992). The overrepresentation of DS attachment representations is more difficult to explain. Adverse and harsh socioeconomic circumstances might turn the reflection about attachment-related experiences into a lower priority. The distributions of AAI classifications, however, are relatively independent of cross-cultural variations. Samples come from a wide diversity of countries: Australia (Radojevic, 1992), Canada (Benoit & Parker, 1994), the United Kingdom (Fonagy, Steele, & Steele, 1991), the Netherlands (Bakermans-Kranenburg & van IJzendoorn, 1993 ; van IJzendoorn et al., 1991), Israel (Sagi et al., 1994), and the United States. Nevertheless, the AAI classification distributions are remarkably similar across these separate studies. As in the case of infant—mother attachment (van IJzendoorn & Kroonenberg, 1988), there is no reason to assume that adult attachment is culture bound. Our current database is, however, restricted to Western industrialized countries, and its extension to other cultures (African, Japanese, etc.) is necessary for drawing firmer conclusions. Furthermore, the crucial test for the cross-cultural validity of the AAI is, of course, its predicted associations with children's attachment and parental responsiveness, and in extreme child-rearing circumstances there are contextual (i.e., cultural) constraints to the intergenerational transmission of attachment (Aviezer, van IJzendoorn, Sagi, & Schuengel, 1994).

Our hypothesis that the parents of disturbed children would show more insecure representations of their own attachment experiences is clearly borne out by our data. In the group of parents of clinical children, the parents classified as F are a minority (14%), whereas 41% of the parents are classified as DS, and E parents are also strongly overrepresented (45%). It should be noted that the Benoit et al. (1989) group of mothers of hospitalized children with acute or chronic physical illnesses did not diverge from the control samples. As we showed in an earlier meta-analysis, children's physical impairments appear to be compensated by parental responsiveness, and they do not lead to skewed Strange Situation classification distributions (van IJzendoorn et al., 1992). As expected on the basis of this earlier meta-analysis, children's physical illnesses are not (causally) related to mothers' state of mind with respect to attachment, whereas children's socioemotional and behavioral disorders appear to be strongly related to parents' basic insecurity.

Our data show, furthermore, that disorders in adolescent and adult psychological functioning are also associated with extremely divergent distributions of AAI classifications. Apart from this global trend in the data, it appears difficult to describe systematic relations between type of adult insecurity and type of clinical status. Clinical status in general, and depression disorder more specifically, are not exclusively connected to the U category. Furthermore, the relations between oppositional and conduct disorders and DS attachment, and between affective disorders and E attachment, are not clearly and convincingly supported by the available evidence. When the U category is included, the clinical samples show in particular E and U representations and, to a lesser extent, DS representations but the latter category is not underrepresented. Our elaborations on the association between type of parental insecurity and type of clinical problem are speculative in two ways: First we need more data (i.e. clinical samples) to establish this association more firmly. Second we need more empirical information about the interactive link between parental state of mind and children's problems (van IJzendoorn 1995).
In summary our meta-analytic approach shows that the AAI distributions in samples of mothers fathers and adolescents are quite similar and independent of cross-cultural variations. The F category is smaller in size than might be expected on the basis of the Strange Situation classification distributions of nonclinical infant—mother dyads. In general the F participants in community samples constitute only a small majority particularly if the unresolved category is taken into account. The attachment representations of wives and husbands appear to be dependent: Wives classified as F are more often married to husbands classified as F than might be expected by chance and insecure men and women marry each other more often as well. The association is however,not very strong, and it leaves room for many exceptions to this rule. Samples with low-SES backgrounds show an overrepresentation of the DS and the U categories at the expense of the F category, which might be related to their more adverse living conditions, including a higher chance of experiencing or being witness to traumatic events. In samples of adolescents and adults with psychological problems or parents of disturbed children, the distribution clearly deviates from the standard distribution: The large majority of these interviews are assigned insecure classifications, but an unequivocal correspondence between type of disorder and type of attachment insecurity is absent. It should be mentioned that in some cases (e.g., adolescents, couples) our findings are based on a small number of studies, and more empirical studies are needed to confirm these conclusions. The increasing popularity of the AAI guarantees a broader database for the findings in the future.

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Table 1.

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Table 1.

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Table 2.

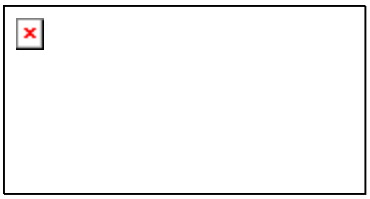

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Figure 1. Correspondence analysis solution for the forced Adult Attachment Interview classifications. Squares represent combined samples, and asterisks represent separate samples. ADOL = adolescents—young adults; FATH = nonclinical fathers; KIBB = kibbutz mothers; LOW = low-SES parents; CLIN = total clinical samples; oppos = oppositional disorder; ftt = failure to thrive; conduct = conduct disorder; sleep = sleep disorder; hosp = psychiatrically hospitalized; abuse = child abuse or neglect; depr = depression—dysthymia; border = borderline personality disorder; other = Axis II *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; American Psychiatric Association, 1980) diagnosis other than borderline; c = parents of children with problems; a = (young) adults with problems; abuse/m = maltreating mothers; abuse/f = maltreating fathers. Attachment classifications: DS = Dismissing; F = Autonomous; E = Preoccupied.

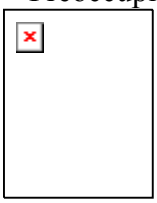

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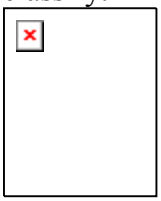
Figure 2. Correspondence analysis solution for the four-way Adult Attachment Interview classifications. Squares represent combined samples, and asterisks represent separate samples. ADOL = adolescents—young adults; FATH = nonclinical fathers; LOW = low-SES parents; CLIN = total clinical samples; oppos = oppositional disorder; conduct = conduct disorder; hosp = psychiatrically hospitalized; depr = depression or dysthymia; border = borderline personality disorder; c = parents of children with problems; a = (young) adults with problems. Attachment classifications: DS = Dismissing; F = Autonomous; E = Preoccupied; U = Unresolved—cannot classify.



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