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Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae

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Abstract
During the past 10 years nearly 80 studies on disorganized attachment involving more than 6,000 infant–parent dyads have been carried out. The current series of meta-analyses have established the reliability and discriminant validity of disorganized infant attachment. Although disorganized attachment behavior is necessarily difficult to observe and often subtle, many researchers have managed to become reliable coders. Furthermore, disorganized attachment shows modest short- and long-term stability, in particular in middle class environments, and it is not just a concomitant of constitutional, temperamental, or physical child problems. The predictive validity of disorganized attachment is established in terms of problematic stress management, the elevated risk of externalizing problem behavior, and even the tendency of disorganized infants to show dissociative behavior later in life. In normal, middle class families, about 15% of the infants develop disorganized attachment behavior. In other social contexts and in clinical groups this percentage may become twice or even three times higher (e.g., in the case of maltreatment). Although the importance of disorganized attachment for developmental psychopathology is evident, the search for the mechanisms leading to disorganization has just started. Frightening parental behavior may play an important role but it does not seem to be the only causal factor involved in the emergence of disorganized attachment.

An important developmental milestone in every child's life is the formation of an attachment bond to the parent (Sroufe, 1988). In attachment theory, it has been proposed that during the first year of life infants learn to deal with stressful circumstances and negative emotions in organized manners. Avoidantly attached infants are suggested to minimize the expression of negative emotions in the presence of a parent whom they would have experienced to be rejecting or ignoring such emotions. Ambivalently attached infants are considered to maximize the expression of negative emotions and the display of attachment behaviors, in order to draw the attention of their supposedly inconsistently responsive parent. They may remain passively or angrily focused on their parent even when the environment calls for exploration and play (Main, 1990). In a stressful situation, securely attached infants may express their distress to the parent who would be able to provide comfort and to serve as a safe base for exploration (Ainsworth, Blehar, Waters, & Wall, 1978;

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Dozier & Kobak, 1992). Securely attached children are suggested to strike a balance between seeking proximity to their attachment figure and their inclination to explore the wider environment. These three "organized" attachment strategies (A, B, and C; Ainsworth et al., 1978) may be considered as adaptive to the infants' environments, and each is supposed to allow for a maximum of proximity to the specific attachment figure whose behavior to stress or distress is anticipated (Main, 1990).

The concept of "disorganized" attachment emerged from the systematic inspection of about 200 cases from various samples that were difficult to classify in one of the three organized attachment categories (Main & Solomon, 1986). In particular, in studies on maltreated infants, the limits of the traditional Ainsworth et al. (1978) coding system became apparent because many children with an established background of abuse or neglect nevertheless had to be forced into the secure category (Carlson, Cicchetti, Barnett, & Braunwald, 1989). Common denominator of the anomalous cases appeared to be the (sometimes momentary) absence of an organized strategy to deal with the stress of the Strange Situation procedure. Disorganized attachment therefore may be defined negatively—against the background of how children with organized strategies deal with a stressful situation in the presence of their parent or other caregiver (Main, 1990). Disorganized attachment can be described as the breakdown of an otherwise consistent and organized strategy of emotion regulation. Whether secure or insecure, every child may show disorganization of attachment depending on the earlier child rearing experiences (Main & Hesse, 1990). In some cases, the disorganization of attachment is so predominant that a secondary, organized strategy cannot be detected. Disorganization of attachment is usually considered a type of insecure attachment, independent of the secondary classification.

Although disorganized attachment behaviors are most easily defined in opposition to organized attachment strategies, the Main and Solomon (1990) coding system provides several concrete behavioral indices that in and of themselves qualify the infant for a disorganized attachment classification. Contradictory behavior, misdirected or stereotypical behavior, stilling and freezing for a substantial amount of time, and direct apprehension or even fear of the parent are behavioral indices of disorganized attachment in particular when they occur in stressful circumstances in the presence of the parent and with a sufficient degree of intensity (Main & Solomon, 1990). Contradictory behavior, for example, can be observed when the infant shows indifference upon mother's return after excessive distress during separation. Misdirected behavior may consist of seeking proximity to the stranger instead of the parent after separation. Stereotypical behavior concerns, for example, the repeated pulling of hair with a dazed expression in a context in which the child is clearly stressed and the parent is available. Freezing means that the child, unable to choose between seeking proximity or avoiding the parent, stops moving for several moments as if in trance and dissociated from the regular thought processes (Hesse & Main, in press; Main & Morgan, 1996). Apprehension means showing fear of the parent immediately upon return after a brief separation, for example by a hand-to-mouth movement. Disorganized attachment behaviors are not just bizarre and incoherent; they are considered to be indicators of an experience of stress and anxiety which the child cannot resolve because the parent is at the same time the source of fright as well as the only potential haven of safety. In the face of this paradoxical situation, the infants' organized strategy to deal with stress is expected to fall apart (Main & Hesse, 1990). The essence of disorganized attachment is fright without solution (Hesse & Main, in press).

Maltreating parents, for example, are supposed to create disorganized attachment in their infants because they confront their infants with a pervasive paradox: they are potentially the only source of comfort for their children, whereas at the same time they frighten their children through their unpredictable abusive behavior. The parent is thought to be a source of fear for the child and at the

same time the only attachment figure who can provide relief from distress. The incompatible behaviors of flight and proximity seeking are proposed to lead to temporary breakdown of organized attachment behavior. Disorganization of attachment, however, does not only occur in families with a maltreating parent but has also been found to develop when the parent is struggling with unresolved loss of an attachment figure or with other traumatic experiences (see Van Ijzendoorn, 1995, for a review). Main and Hesse (1990) speculate that otherwise "normal" parents with unresolved loss may show behavior that is frightening for their infants—against their intentions. These parents may involuntary remember the loss of an important attachment figure and reexperience the fright involved in the loss. The sudden and unexpected display of parental fright is supposed to be frightening for the infant who is unaware of its cause. Children with disorganized attachment are more liable to stress in infancy (Hertsgaard, Gunnar, Erickson, & Nachmias, 1995; Spangler & Grossmann, 1993). They may become more aggressive in kindergarten (Lyons–Ruth, 1996), and they may even become vulnerable to altered states of mind such as absorption (Hesse & van Ijzendoorn, 1998) and dissociation in young adulthood (Carlson, 1998). In this respect, disorganization of attachment is considered to be a major risk factor in the development of child psychopathology (Boris, Fueyo, & Zeanah, 1997; Lyons–Ruth, 1996; Zeanah, Boris, & Larrieu, 1997; Zeanah, Boris, & Scheeringa, 1997).

In the current meta-analysis, we describe the frequency of disorganized attachment in non-clinical and clinical groups, and address the following hypotheses. First, although disorganized attachment may be more unstable because of changes in the environment than the organized attachment patterns, we expect it to be a rather stable phenomenon across time. Second, we expect that disorganized attachment does not originate from physical problems in the child, and that it is not associated with constitutional or genetic characteristics such as sex or temperament. Neurological abnormalities, however, may lead to pseudo-disorganized behavior, for example, in autistic or Down's children (Vaughn, Goldberg, Atkinson, & Marcovitch, 1994), and the coding system explicitly requires the exclusion of this potential cause (Main & Solomon, 1990; Pipp–Siegel, Siegel, & Dean, 1997). Third, we hypothesize that the antecedents of disorganized attachment are related to specific behavioral and mental problems in the parents such as maltreatment, unresolved loss or trauma, depression, and marital discord, which may confront the child with an attachment figure who is unpredictably frightening. Disorganized attachment is not just the consequence of insensitive parenting. Fourth, we expect that the sequelae of disorganized attachment concern elevated psychophysiological reactions to stressful circumstances, the display of externalizing problem behavior, and the inclination to enter into somewhat altered states of mind such as absorption or even dissociation.

In sum, through a series of meta-analyses on the available empirical evidence we test the validity of disorganized attachment.

Method

Selection of the studies

To identify studies for inclusion in the meta-analysis we applied two search strategies: Systematic computerized searches on the topic of disorganized attachment, and manual search procedures involving the references lists of review articles (e.g., Lyons–Ruth, 1996) and empirical papers. Psychological Abstracts and the Social Sciences Citation Index were used to locate studies. We found nearly 80 studies on more than 100 samples with 6,282 parent–child dyads and 1,285 disorganized attachment classifications. Several publications included the same sample, for example in the case of longitudinal studies (Easterbrooks, Davidson, & Chazan, 1993; Lyons–Ruth, Alpern, & Repacholi, 1993; Lyons–Ruth & Block 1996; Lyons–Ruth, Easterbrooks, & Cibelli, 1997). In these cases, the sample was included only once in every meta-analysis. Each study had to meet two criteria for inclusion in the meta-analysis.

First, the study should report on an empiri-

cal investigation of disorganized attachment (Main & Solomon, 1990) or its equivalents (A/C attachment, Crittenden, 1988, 1992; controlling attachment, Cassidy & Marvin with the MacArthur Working Group on Attachment, 1989; Main & Cassidy, 1988; Main, Kaplan, & Cassidy, 1985). The controlling attachment category in which children attempt to control their interaction with the parent through punitive, overbright, or rejecting behavior, has been suggested to be developmental equivalent to disorganized attachment in the case of older children (>2 years; see Greenberg, Speltz, & DeKlyen, 1993; Main & Cassidy, 1988; Main et al., 1985). From the perspective of the Main and Solomon (1990) coding system, the A/C pattern is in line with the disorganized sequential display of contradictory behavior patterns. The A/C pattern is proposed to be a subcategory of disorganized attachment that may be particularly prevalent in maltreated toddlers. Studies on the A/C pattern may underestimate the amount of disorganized behavior, and therefore lead to conservative estimates of the effect sizes. In the following meta-analyses, we will separately report on the combined effect sizes for the original Main and Solomon (1990) coding of disorganized attachment.

Secondly, the study should report the data in sufficient detail to allow for computations of effect sizes for the dichotomous variable: disorganized attachment versus organized attachment strategies (A, B, and C), or for the continuous rating scale of disorganized attachment (see Main & Solomon, 1990). To categorize disorganized attachment, the Main and Solomon (1990) coding system prescribes the coding of a continuous scale for disorganization and recommends a cut-off score. This procedure means that categorical and continuous D scores are considered equivalent. The categorical scores may suffer from restriction of range.

We did not restrict the studies to North America but also included studies on disorganized attachment from several European countries and even from developing nations. The participants in the studies come from various ethnic, socioeconomic, and cultural backgrounds. In meta-analysis, moderator variables take this diversity into account and allow for tests of its influence on the combined effect size. Although no study on disorganized attachment is without flaws and drawbacks we decided to include all available studies regardless of their methodological merits (Hedges, 1986; Mullen, 1989). Some study characteristics related to the validity issue such as sample size were included in moderator analyses. Multiple outcomes within one study were combined before this study was added to the main set of studies for further analysis. In many cases the pertinent statistics had to be derived and recomputed from indirect data provided by the papers, such as the test of sex differences. In several cases, we contacted the authors of the primary studies for more detailed information and raw data.

Disorganized attachment classifications (D) are assigned in addition to the traditional organized attachment classifications (A, B, and C). In 20 studies on 25 samples (n = 1,219) disorganized attachment appeared to be compatible with each of the three organized patterns: in 34% of the cases disorganized attachment was accompanied with a secondary classification of avoidance (D/A); in 14% of the cases it was a combination of disorganization with a secondary secure pattern (D/B); and in 46% of the cases disorganization was combined with ambivalence (D/C). Some researchers have suggested that disorganized infants with an alternate A or C classification may function differently from disorganized infants whose secondary, organized attachment strategy is secure (Lyons–Ruth, Easterbrooks, & Cibelli, 1997), whereas others have emphasized the similarity of disorganized attachment regardless of secondary classification (Spangler & Grossmann, 1993). Unfortunately, we were not able to test this issue meta-analytically because sufficiently detailed data on secondary classifications was absent in most papers. Therefore, we focused on the general contrast between disorganized attachment (regardless of secondary classification) and the organized attachment categories.

Categorical data analysis

Following our earlier papers (Van Ijzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992; Van Ijzendoorn & Kroonenberg, 1988), the samples were cast in a contingency table with the standard probability distribution, based on the nonclinical North American samples of younger infants, as one of the two marginal distributions and frequencies of A, B, C, and D classifications over the separate samples as the other (Table 1). In the first place, a χ^2 goodness-of-fit statistic was computed, using the program Multinom (Kroonenberg, 1998). This allowed an omnibus test of the deviation of the sample distribution from the standard distribution. The program also computes standardized residuals for each cell of Table 1, which were used to assess which cells mainly accounted for the deviance (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. Bonferroni-like corrections of the standard α level of .05 insured protection from capitalizing on chance significance.

Calculation of effect sizes

In the meta-analysis Pearson's product–moment correlation coefficient (r) was used as the effect size estimate. If a study reported means and standard deviations, one-directional t values were computed and transformed into r using Schwarzer's (1989) algorithms. If no means and standard deviations were available, the reported test statistics (t, F, or χ^2) or the one directional p value were transformed into r with Mullen's (1989) computer program. We applied conservative estimation procedures if a study only reported "no significant effect" or "a significant effect" (Mullen, 1989).

To compute combined effect sizes each correlation coefficient was transformed to a Fisher's Z (Mullen, 1989) and, in combining the effect sizes, individual effect sizes were weighted by sample size (Mullen, 1989; Rosenthal, 1991). Because the extremely large NICHD study on daycare was included in several meta-analyses (NICHD Early Child Care Research Network, 1997), we also checked whether weighting effect sizes by unit 1 led to different conclusions. This was not the case. A homogeneity test was performed to determine to what extent effect sizes were constant across studies and had a common population effect size (Hedges & Olkin, 1985; Rosenthal, 1991). Regardless of whether this homogeneity test is significant, Johnson, Mullen, and Salas (1995) suggest to check for significant moderator variables that may partly account for the variation across studies (see also Rosenthal, 1995). To determine whether a study characteristic explained variation in effect sizes, Rosenthal's method of focused comparison of combined effect sizes was used (Mullen, 1989). In case of dichotomous moderators, blocking was used to test their influence (Mullen, 1989). Different sets of moderators were used in different meta-analyses but in all analyses publication year, sample size, age of participants, and their socioeconomic status were included.

Results

Frequency of disorganized attachment in nonclinical and clinical groups

The percentage of disorganized infant attachment in "normal," middle class, nonclinical groups in North America (the "standard" distribution) was 15%, with 15% A, 62% B, and 9% C ($n = 2{,}104$). In older children the same percentage D was found (15%; $n = 492$). The infant A, B, C, D distributions from middle class and lower class samples differed significantly, $\chi^2 = 62.12$; $p < .001$; $n = 2{,}690$. In low SES samples ($n = 586$), the percentage of disorganized infants was 25%, which was significantly higher than in the middle class samples, $z = 6.45$. The effect size for the D versus non-D contrast was $r = .11$. When only the Main and Solomon (1990) classifications were included, the percentage of D in lower class samples increased to 34% ($n = 338$). The standard distribution also differed significantly from the distribution in other Western

Table 1. *Distributions of A, B, C, and D classifications in normal and clinical samples*

Study	Distribution					Standardized Residuals			
	A	B	C	D	n_d	A	B	C	D
NM: Normal U.S. samples, age <24 months									
NM1[a]: Main (pers. commun., 1990)	38	71	9	23	141*	4.15	–1.83	–0.97	0.49
NM2[a]: Goldberg et al. (1995)	6	34	5	6	51	–0.57	0.46	0.29	–0.58
NM3[a]: Pederson et al. (1996)	11	27	8	9	55	1.04	–1.22	1.54	0.30
NM4[a]: Ward et al. (1993)	7	18	1	2	28	1.43	0.17	–0.92	–1.07
NM5[a]: Speltz et al. (1997)	10	43	4	7	64	0.18	0.57	–0.67	–0.83
NM6[a]: Benoit & Parker (1994)	4	52	7	25	88*	–2.57	–0.33	–0.23	3.52
NM7[a]: Pipp–Siegel et al. (1995)	13	76	16	8	113	–0.95	0.79	2.14	–2.23
NM8[a]: Fish & Stifter (1995)	9	45	2	6	62	–0.06	1.12	–1.48	–1.08
NM9[a]: Teti et al. (1995)	2	14	2	2	20	–0.56	0.47	0.21	–0.57
NM10[a]: NICHD (1997)	161	711	102	177	1,151	–1.50	0.03	–0.55	1.09
NM11[a]: Howes & Hamilton (1992)	23	66	14	6	109	1.83	–0.17	1.59	–2.62
NM12[a]: Ainsworth & Eichberg (1991) ..	6	23	1	15	45	–0.26	–0.93	–1.49	3.34
NM13[a]: Scholmerich et al. (1997)	1	26	5	4	36	–1.89	0.82	1.09	–0.59
NM14[a]: Lederberg & Mobley (1990)	11	24	2	4	41	2.06	–0.27	–0.83	–0.86
NM15[a]: Beeghly et al. (1997)	9	69	4	18	100	–1.56	0.97	–1.64	0.87
Total normal U.S., age <24 months (standard)	311	1,299	182	312	2,104				
Normal other									
NMO: Normal U.S. samples, age ≥24 months									
NMO1: Main & Cassidy (1988)	12	18	6	14	50	1.70	–2.32	0.81	2.42
NMO2: Solomon et al. (1995)	9	11	14	8	42*	1.12	–2.93	5.44	0.71
NMO3: Frankel & Harmon (1996)	7	19	4	2	32	1.04	–0.17	0.74	–1.26
NMO4: DeMulder & Radke–Yarrow (1991)	8	26	3	8	45	0.52	–0.34	–0.45	0.51
NMO5: Marcovitch et al. (1997)	17	16	1	4	38*	4.80	–1.54	–1.26	–0.69
NMO6: Cohn (1990)	12	50	5	13	80	0.05	0.09	–0.73	0.33
NMO7: Speltz et al. (1990)	2	18	2	3	25	–0.88	0.65	–0.11	–0.37
NMO8: Greenberg et al. (1991)	4	18	0	3	25	0.16	0.65	–1.47	–0.37
NMO9: Moss et al. (1998)	20	71	12	18	121	0.50	–0.43	0.47	0.01
NMO10: Chatoor & Ganiban (1998)	3	28	3	0	34	–0.90	1.53	0.03	–2.25
Total normal U.S., age ≥24 months[b]	94	275	50	73	492	2.49	–1.65	1.14	0.00
CW: Normal Western									
CW1: Harrison & Ungerer (1996)	12	85	35	13	145*	–2.04	–0.48	6.34	–1.83
CW2: Jacobsen & Hoffmann (1997)	35	41	5	27	108*	4.76	–3.14	–1.42	2.74
CW3: Jacobsen et al. (1994)	9	17	2	7	35	1.68	–0.99	–0.59	0.79
CW4: Ammaniti & Speranza (1995)	18	17	0	15	50*	3.90	–2.50	–2.08	2.79
CW5: Spangler et al. (1996)	27	37	6	18	88*	3.88	–2.35	–0.58	1.37
CW6: Schuengel et al. (1999)	4	45	10	26	85*	–2.42	–1.03	0.98	3.77
CW7: Bakermans–Kranenburg & Van Ijzendoorn (1997)	5	37	23	18	83*	–2.08	–1.99	5.90	1.62
CW8: Steele et al. (1996a)	25	52	5	8	90	3.21	–0.48	–1.00	–1.46
CW9: Steele et al. (1996a) (fathers)	25	61	0	4	90*	3.21	0.73	–2.79	–2.56
CW10: Murray (1992)	9	29	0	0	38	1.43	1.14	–1.81	–2.37

CW11: Meins et al. (1998)	6	19	4	4	33	0.51	–0.30	0.68	–0.40
CW12: Rauh et al. (in press)	11	29	5	30	75*	–0.03	–2.54	–0.58	5.66
Total normal Western[b]	186	469	95	170	920*	4.29	–4.15	1.73	2.87
Total normal other	280	744	145	243	1,412				
CC: Non-Western									
CC1: True (1994)	0	18	2	6	26	–1.96	0.49	–0.17	1.09
CC2: Zevalkink (1997)	3	24	9	10	46	–1.46	–0.83	2.52	1.22
CC3: Valenzuela (1990)	9	20	9	2	40	1.27	–0.94	2.98	–1.61
CC4: Sagi et al. (1994)	0	21	9	18	48*	–2.66	–1.59	2.38	4.08
CC5: Scholmerich et al. (1997) (Central-American immigrants)	3	22	7	6	38	–1.10	–0.30	2.05	0.15
Total non-Western[b]	15	105	36	42	198*	–2.64	–1.56	4.56	2.33
Low SES									
NL: Low SES samples, age <24 months									
NL1: Vondra et al. (1997)	40	117	35	31	223*	1.23	–1.76	3.58	–0.36
NL2: Dawson et al. (1992)	1	17	0	8	26	–1.45	0.24	–1.50	2.11
NL3: Carlson (1998)	18	47	14	43	122*	–0.01	–3.26	1.06	5.86
NL4: Lyons–Ruth et al. (1997)	15	27	0	34	76*	1.12	–2.91	–2.56	6.77
NL5: Carlson et al. (1989)	2	11	4	4	21	–0.63	–0.55	1.62	0.50
NL6: Crittenden (1985)	6	16	3	0	25	1.20	0.14	0.57	–1.93
NL7: Fish & Fish (1998)	15	47	4	27	93*	0.34	–1.37	–1.43	3.56
Total low SES samples, age <24 months[b]	97	282	60	147	586*	1.12	–4.20	1.31	6.45
NLO: Low SES samples, age ≥24 months									
NLO1: Moore et al. (1997)	21	59	56	18	154*	–0.37	–3.70	11.69	–1.01
NLO2: Crittenden (1988)	18	25	4	4	51*	3.81	–1.16	–0.20	–1.30
Total low SES samples, age ≥24 months[b]	39	84	60	22	205*	1.58	–3.78	10.04	–1.52
Total low SES	136	366	120	169	791				
Child problems									
P: Prematurity									
P1: Goldberg et al. (1989)	7	40	2	15	64	–0.80	0.08	–1.50	1.79
P2: Rodning et al. (1989)	2	24	3	12	41	–1.65	–0.26	–0.29	2.40
P3: Cox (1995)	10	32	4	12	58	0.49	–0.64	–0.45	1.16
Total premature[c]	19	96	9	39	163*	–1.04	–0.46	–1.36	3.02
PH: Physical problems									
PH1: Goldberg et al. (1995)	8	17	2	13	40	0.86	–1.55	–0.78	2.90
PH2: Goldberg et al. (1995)	12	23	5	14	54	1.42	–1.79	0.15	2.12
PH4: Speltz et al. (1997) (CLP)	3	18	2	1	24	–0.29	0.83	–0.05	–1.36
PH5: Speltz et al. (1997) (CF)	5	16	6	0	27	0.51	–0.16	2.40	–2.00
PH6: Lederberg & Mobley (1990) (hearing impaired)	6	22	3	10	41	–0.02	–0.66	–0.29	1.59
Total physical problems[c]	34	96	18	38	186	1.24	–1.76	0.48	1.98
Total child problems[d]	53	192	27	77	349*	0.20	–1.60	–0.58	3.51
MP: Neurological abnormality									
MP1: Vaughn et al. (1994) (Down synd.)	12	61	4	56	133*	–1.73	–2.33	–2.21	8.17
MP2: Capps et al. (1994) (autism)	0	6	0	9	15*	–1.49	–1.07	–1.14	4.54
MP3: Willemsen et al. (1997) (autism)	4	14	3	10	31	–0.27	–1.17	0.19	2.52
MP4: Sierra (1989) (CP)	11	11	2	5	29	3.24	–1.63	–0.32	0.34

(*continued*)

Table 1. *Continued*

Study	Distribution A	B	C	D	n_d	Standardized Residuals A	B	C	D
MP: Neurological abnormality (*cont'd*)									
MP5: Hunt et al. (1997) (neuro)	5	9	3	3	20	1.19	–0.95	0.97	0.02
MP6: Hunt et al. (1997) (cranial)	2	13	1	4	20	–0.56	0.19	–0.56	0.60
Total neurological abnormality[c]	34	114	13	87	248*	–0.44	–3.16	–1.82	8.28
Maternal problems									
M: Maltreatment									
M1: Barnett et al. (1997)	0	3	0	19	22*	–1.80	–2.87	–1.38	8.71
M2: Crittenden (1985)	7	0	5	9	21*	2.21	–3.60	2.36	3.34
M3: Crittenden (1988)	25	7	7	33	72*	4.40	–5.62	0.31	6.83
M4: Valenzuela (1990)	13	3	12	13	41*	2.82	–4.43	4.49	2.81
M5: Lyons–Ruth et al. (1990)	2	2	0	5	9	0.58	–1.51	–0.88	3.17
Total maltreatment[c]	47	15	24	79	165*	4.58	–8.61	2.57	11.02
AM: Teen mothers									
AM1: Ward & Carlson (1995)	26	34	3	14	77*	4.33	–1.96	–1.42	0.76
AM2: Broussard (1995)	13	9	4	12	38*	3.12	–2.99	0.39	2.68
AM3: Spieker & Bensley (1994)	30	66	3	34	133*	2.33	–1.78	–2.51	3.21
AM4: Hubbs–Tait et al. (1996)	24	4	0	6	34*	8.46	–3.71	–1.71	0.43
Total teen mothers[c]	93	113	10	66	282*	7.95	–4.63	–2.91	3.74
Drug/alcohol abuse									
DA1: O'Connor et al. (1987, 1992)	6	22	2	16	46	–0.31	–1.20	–0.99	3.51
DA2: Rodning et al. (1989)	3	7	1	7	18	0.21	–1.23	–0.45	2.65
DA3: Rodning et al. (1991)	6	4	10	15	35*	0.36	–3.79	4.01	4.31
DA4: Claussen et al. (1998)	6	5	10	24	45*	–0.25	–4.32	3.10	6.71
Total drugs/alcohol[d]	21	38	23	62	144*	–0.06	–5.40	2.99	8.80
DE: Depression									
DE1: DeMulder & Radke–Yarrow (1991) (bipolar)	2	8	2	12	24*	–0.82	–1.77	–0.05	4.47
DE2: DeMulder & Radke–Yarrow (1991) (unipolar)	6	25	2	10	43	–0.14	–0.30	–0.89	1.43
DE3: Murray (1992) (postnatal)	16	15	2	2	35*	4.76	–1.42	–0.59	–1.40
DE4: Murray (1992) (prenatal)	6	4	0	0	10*	3.72	–0.87	–0.93	–1.22
DE5: Murray (1992) (pre + postnatal)	13	6	0	2	21*	5.62	–1.93	–1.35	–0.63
DE6: Teti et al. (1995) (young)	5	6	7	12	30*	0.27	–2.91	2.73	3.58
DE7: Teti et al. (1995) (older)	6	4	12	9	31*	0.66	–3.46	5.69	2.05
DE8: Frankel & Harmon (1996)	6	21	3	0	30	0.74	0.58	0.25	–2.11
DE9: Seifer, Sameroff, et al. (1996) (depr. + other disorders)	10	51	31	24	116*	–1.73	–2.44	6.62	1.64
Total depression[d]	70	140	59	71	340*	2.78	–4.83	5.46	2.90
Total maternal problems[b]	231	306	116	278	931*	7.96	–11.21	3.95	11.91
MI: Other problems									
MI1: DasEiden & Lenard (1996) (father alcoholic)	11	8	1	3	23*	4.12	–1.65	–0.70	–0.22
MI2: Ward et al. (1993) (FTT)	5	9	0	12	26*	0.59	–1.76	–1.50	4.15
MI3: Marcovitch et al. (1997) (adoption)	0	15	11	18	44*	–2.55	–2.33	3.69	4.49
MI4: DeKlyen (1996) (ODD)	6	5	2	12	25*	1.20	–2.66	–0.11	4.31
MI5: Speltz et al. (1990) (ODD)	3	4	2	16	25*	–0.36	–2.91	–0.11	6.38
MI6: Manassis et al. (1994) (anxiety disorder)	2	4	1	13	20*	–0.56	–2.38	–0.56	5.83

MI7: Willemsen et al. (1997) (language delay)	0	14	1	3	18	–1.63	0.87	–0.45	0.20
MI8: Chatoor & Ganiban (1998) (infantile anorexia)	4	20	7	2	33	–0.40	–0.08	2.45	–1.31
MI9: Chatoor & Ganiban (1998) (picky eaters)	3	30	1	0	34	–0.90	1.97	–1.13	–2.25
Total other problems	34	109	26	79	248				
Grand total	1,094	3,235	665	1,287	6,281				

Note: Each sample was compared with the standard distribution. Two-tailed Bonferroni level was .0006 for the sample distributions (critical χ^2 goodness of fit = 16.27). Two-tailed Bonferroni level was .00016 for the standardized residuals in the cells (critical $z = 3.65$).

[a]These samples were compared with the rest of the standard distribution. Two-tailed Bonferroni level was .0034 for the sample distributions (critical χ^2 goodness of fit = 14.55). Two-tailed Bonferroni level was .0011 for the standardized residuals (critical $z = 3.06$).

[b]These totals were compared with standard distribution. Two-tailed Bonferroni level was .01 for the distributions (critical χ^2 goodness of fit = 11.34). Two-tailed Bonferroni level was .0025 for the standardized residuals (critical $z = 2.81$).

[c]These totals were compared with the standard distribution. Two-tailed Bonferroni level was .007 for the distributions (critical χ^2 goodness of fit = 12.09). Two-tailed Bonferroni level was .0018 for the standardized residuals (critical $z = 2.92$).

[d]These totals were compared with standard distribution. Two-tailed Bonferroni level was .025 for the distributions (critical χ^2 goodness of fit = 9.35). Two-tailed Bonferroni level was .0063 for the standardized residuals (critical $z = 2.49$).

*Distributions that deviate significantly from the standard distribution. Cells within these distributions that deviate significantly are underlined.

countries, $\chi^2 = 46.90$; $p < .001$; $n = 3{,}024$, but the percentage of disorganized attachment classifications did not differ (18%; $z = 2.87$). Instead, the percentage of avoidant attachments was significantly higher ($z = 4.29$) and that of secure attachments significantly lower ($z = -4.15$) than in the standard North-American distribution. When only the Main and Solomon classifications were included, the percentage of D in other Western countries was 17% ($N = 812$). Compared to the standard distribution, the non-Western cultures appeared to differ, $\chi^2 = 35.62$; $p < .001$; $n = 2{,}302$. The non-Western distribution showed more ambivalent ($z = 4.56$) attachments (see Table 1), but a similar percentage of disorganized attachments (21%). All non-Western studies were based on the Main and Solomon (1990) coding system for disorganized attachment.

In most clinical groups the percentages of disorganized children were higher than in the standard distribution. In samples with neurological abnormalities ($n = 248$) such as cerebral palsy (Sierra, 1989), autism (Capps, Sigman, & Mundy, 1994; Willemsen, Bakermans–Kranenburg, Buitelaar, Van Ijzendoorn, & Van Engeland, 1998), and Down's syndrome (Vaughn et al., 1994), the percentage of disorganized children was 35% ($z = 8.28$). In groups of mothers with alcohol or drugs abuse ($n = 144$), the percentage of disorganized infants was 43%, $z = 8.80$. In groups of maltreating parents ($n = 165$), 48% of the children were found to be disorganized, $z = 11.02$. This percentage of disorganized maltreated children was higher when only Main and Solomon (1990) codings were used (77%; $n = 31$). It was remarkable that in groups with depressed parents ($n = 340$) the percentage of disorganized children was only 21%, $z = 2.90$; n.s. With the Main and Solomon classifications the percentage of disorganized children of depressed mothers was 19% ($n = 212$). Children with severe physical problems ($n = 186$; e.g., congenital heart disease, Goldberg, Gotowiec, & Simmons, 1995; cleft lip and palate, Speltz, Endriga, Fisher, & Mason, 1997) did not develop significantly more often disorganized attachment either (20%; $z = 1.98$, n.s.). In samples with teen mothers ($n = 282$), the percentage of disorganized children was elevated compared to the standard distribution (23%; $z = 3.74$) but this percentage was similar to the percentage of disorganized children found in low SES samples. Exclusion

Table 2. *Stability of disorganized attachment across time*

Study	*n*	SES	Age (Time 1)	Lag (months)	Stability %	Stability *r*	Stability χ^2
1. Main & Cassidy (1988), mothers	32	Middle	12	60	87	.73	17.11
2. Main & Cassidy (1988), fathers	33	Middle	18	54	85	.25	2.01
3. Main & Cassidy (1988)	50	Middle	72	1	76	.38	7.21
4. Wartner et al. (1994)	39	Diverse	12	60	82	.59	13.54
5. Lyons–Ruth et al. (1991)	46	Low	12	6	50	–.12	0.67
6. Barnett et al. (1997), comparisons	21	Low	12	6	81	.53	5.97
7. Barnett et al. (1997), maltreated	18	Low	12	6	67	.25	1.17
8. Vondra et al. (1997)	195	Low	12	6	79	.31	18.91
9. Bakermans–Kranenburg & Van Ijzendoorn (1997)	81	Middle	12	2	80	.38	11.62
10. Carlson (1998)	48	Low	12	6	79	.59	16.80
11. Milentijevic et al. (1995)	86	Low	12	30	69	.16	2.34
12. Rauh et al. (in press)	72	Middle	12	9	69	.36	9.59
13. Jacobsen et al. (1997)	32	Middle	18	54	72	.36	4.23
14. Steele et al. (1996b)	87	Middle	12	48	87	.21	3.67
Combined	$N = 840$					$r = .34$	

of the Hubbs–Tait et al. (1996) sample in which the Main and Solomon (1990) system was not used yielded a similar outcome.

Stability of disorganized attachment

In 14 samples including $n = 840$ participants the stability of disorganized attachment across 1–60 months (average time lag was 25 months) was $r = .34$ (see Table 2). The effect sizes were heterogeneous, $\chi^2(13) = 34.62$, $p < .001$, and it was not possible to create homogeneous sets of studies on the basis of moderator analyses. In samples with middle class or diverse socioeconomic backgrounds, stability was $r = .39$ ($n = 426$; $p < .001$). In samples with low socioeconomic status, stability was $r = .29$ ($n = 414$; $p < .001$). The difference in stability was not significant. Time lag between the two measurements of disorganization was not significantly associated with stability. The long-term stability of disorganization was remarkably strong. If we consider controlling behavior a sequela of disorganized infant attachment, the effect size for the association between disorganized infant attachment and later controlling attachment behavior in the pertinent studies (Jacobsen, Huss, Fendrich, Kruesi, & Ziegenhain, 1997; Main & Cassidy, 1988; Steele, Steele, & Fonagy, 1996b; Wartner, Grossmann, Fremmer–Bombik, & Suess, 1994) amounts to $r = .40$ ($n = 223$; $p < .001$). The short-term stability of disorganized attachment as assessed twice with the Main and Solomon (1990) coding system was $r = .35$ ($n = 286$; $p < .001$).

Constitutional and temperamental correlates of disorganized attachment

Temperament. In 13 samples, including 2,028 participants, the association between disorganized attachment and constitutional and temperamental variables was examined (see Table 3). The combined effect size across these studies was $r = .0008$ (n.s.), and this set of outcomes was homogeneous. When only the Main and Solomon (1990) classifications were included the combined effect size of the 12 studies was $r = .005$ (n.s.). In the nine studies on difficult temperament the association with disorganized attachment was only $r = .02$ (n.s.; $n = 1{,}790$). All studies used the Main and Solomon (1990) coding system. There is no reason to assume that disorganized attachment is the consequence of the infant's difficult temperament. In the four studies on medi-

Table 3. *Constitutional factors and infant attachment disorganization*

Study	*n*	Age (months)	SES	Constitutional Factor	Statistic	Effect Size (*r*)
1. NICHD (1997)	1,138	15	Diverse	Difficult temp.	$t = 0.53$	.02
2. Shaw et al. (1996)	83	18	Low	Difficult temp.	$r = -.02$	−.02
3. Barnett et al. (1997)	44	12	Low	Reactivity (temp.)	$\chi^2 = 1.59$	.19
4. Seifer, Schiller, et al. (1996)	49	12	Middle	Difficult temp.	$p = .50$	.00
5. Spangler et al. (1996)	88	12	Diverse	NBAS (temp.)	$r = .19$	.19
6. Lyons–Ruth et al. (1997)	69	18	Low	Distress/anger (temp.)	$r = .13$	.13
7. Cox (1995)	58	19	Low	Brain insult	$t = 1.29$	.17
8. Greenberg et al. (1991)	19	52	Middle	Medical problems	$\chi^2 = 2.77$	−.38
9. Zevalkink (1997)	46	21	Low	Health	$t = -1.54$	−.23
10. Speltz et al. (1997)	115	12	Middle	Cleft palate	$\chi^2 = 3.53$	−.18
11. Schuengel et al. (1999)	85	12	Middle	Reactivity (temp.)	$t = 0.99$	−.11
12. Bakermans & Van Ijzendoorn (1997)	83	12	Middle	Difficult temp.	$r = -.09$	−.09
13. Carlson (1998)	151	15	Low	Difficult temp.	$r = -.02$	−.02
Combined	$N = 2,028$				$r = .0008$	

cal or health problems the combined effect size was $r = -.12$ (n.s.), indicating that disorganized attachment is not due to sometimes severe physical problems (brain injury, cleft palate). In the studies using the Main and Solomon (1990) system, the effect size was $r = -.10$.

Sex. Boys have been suggested to be more liable to develop disorganized attachment behaviors than girls (Lyons–Ruth et al., 1997) as they seem to be more vulnerable to environmental risks in general (Benenson, 1996). In Table 4, 11 studies on sex and disorganized attachment involving $n = 1,858$ participants have been listed. The combined effect size across these studies was $r = -.01$ (n.s.). Excluding the study using the controlling attachment category for older children (Cohn, 1990), we found a similar absence of an association between sex and disorganization. The set of study outcomes was heterogeneous; however, $\chi^2(10) = 20.61$, $p = .02$. In particular the rather small study by Carlson et al. (1989) on non-maltreated subjects showed an outlying effect size of $r = .51$. Without this study the set of studies was homogeneous.

Concordance of infant–mother/infant–father disorganized attachment. If disorganized attachment is relationship-specific the organismic or constitutional explanation becomes less plausible. In three studies (Hesse & Main, in press; Owen & Cox, 1997; Steele, Steele, & Fonagy, 1996a) the association between disorganized attachment behavior in the presence of the mother and the father was examined. Steele et al. (1996a) found an effect size of $r = .07$ in a sample of $n = 90$ participants. Owen and Cox (1997) found a larger effect size of $r = .28$ in a somewhat smaller sample of 33 participants. Hesse and Main (in press) found an effect size of $r = .08$ in a large sample of $n = 151$. The combined effect size was $r = .10$ (n.s.) which is somewhat smaller than the concordance of the organized attachment classifications for infant–mother and infant–father relationships ($r = .17$, see Van Ijzendoorn & De Wolff, 1997).

Precursors of disorganized attachment

Maltreatment. Child maltreatment has been considered to be one of the most important causes of disorganized attachment (Crittenden & Ainsworth, 1989; George, 1996). In one of the first studies on disorganized attachment as assessed with the Main and Solomon (1990) coding system, Cicchetti and his colleagues (Barnett, Ganiban, & Cicchetti, 1997; Beeghly & Cicchetti, 1994; Carlson et al., 1989; Cicchetti & Barnett, 1991) found more than 80% of the maltreated children to be disorganized. Unfortunately, the number of repli-

Table 4. *Sex differences in disorganized child attachment*

Study	*n*	Age (months)	SES	Statistic	p_1	Effect Size (*r*)	Boys More D
1. NICHD (1997)	1,153	15	Diverse	$\chi^2 = 2.94$	.09	–.05	No
2. Lyons–Ruth et al. (1997)	70	18	Low	$F(1, 69) = 8.50$	<.05	.33	Yes
3. Broussard (1995)	38	14	Low	$\chi^2 = 0.05$	>.05	–.05	No
4. Carlson et al. (1989), maltreated	22	13	Low	$\chi^2 = 1.22$	.28	.24	Yes
5. Carlson et al. (1989), nonmaltreated	21	13	Low	$\chi^2 = 5.44$	.02	.51	Yes
6. Cohn (1990)	80	74	Middle	$\chi^2 = 0.87$	.38	–.10	No
7. Hubbs–Tait et al. (1994)	44	13	Low		>.05	–.13	No
8. Harrison & Ungerer (1996)	145	12	Middle	$\chi^2 = 0.28$	.77	–.04	No
9. Bakermans & Van Ijzendoorn (1997)	83	12	Middle	$\chi^2 = 0.50$	.60	–.08	No
10. Schuengel et al. (1999)	85	12	Middle	$\chi^2 = 0.83$	.24	.10	Yes
11. Moss et al. (1998)	117	75	Diverse	$\chi^2 = 0.029$	.86	.16	Yes
Combined	$N = 1,858$					$r = -.01$	

Table 5. *Maltreatment and infant attachment disorganization*

Study	*n*	Age (months)	Type of Maltreatment	D (%)	Effect Size (φ)
1. Crittenden (1988)[a]	46	12–24	Abuse/neglect	9 (43)	.54
			comparison	0 (0)	
2. Crittenden (1988)[a]	121	11–48	Abuse/neglect	33 (45)	.40
			comparison	4 (10)	
3. Lyons–Ruth et al. (1990)[b]	28	18	Maltreatment	5 (55)	.03
			comparison	10 (53)	
4. Barnett et al. (1997)[c]	44	12	Abuse	19 (86)	.60
			comparison	6 (27)	
5. Valenzuela (1990)[d]	81	17–20	Maltreatment	13 (32)	.34
			comparison	2 (5)	
Combined	$N = 323$				φ = .41

[a]A/C is considered D.
[b]Using the community untreated comparison group, φ = .18 (*n* = 41).
[c]Includes Carlson et al. (1989) and Beeghly and Cicchetti (1994).
[d]Valenzuela (1990) discusses the severe parenting disorder of the mothers of undernourished babies.

cations of this important study is rather small. To our knowledge, only five studies on maltreatment and disorganized or A/C attachment have been published (see Table 5), including *n* = 323 participants. Across studies, about 48% of the maltreated subjects appeared to be disorganized, compared to only 17% of the comparisons. All studies documented a strong association between disorganized attachment and maltreatment, with effect sizes varying between *r* = .03 and *r* = .60. The combined effect size across the five studies was also impressive: *r* = .41, and the set of outcomes appeared to be homogeneous. When only the Main and Solomon (1990) classifications were included (Barnett et al., 1997; Lyons–Ruth et al., 1990) the effect size was similar (*r* = .41). It should be noted that Valenzuela (1990) studied undernourished Chilean children. She considered their parents to suffer

from a severe parenting disorder (maltreatment in the sense of neglect) as they did not manage to provide their infants with sufficient food even though supplementary feeding programs were available and other mothers in comparable circumstances did protect their infants from malnourishment (Valenzuela, 1990).

Unresolved and early loss or trauma. In a previous meta-analysis, we found that parental unresolved loss or trauma—as assessed in the Adult Attachment Interview (George, Kaplan, & Main, 1985)—was significantly associated with infant disorganized attachment. Across 10 studies involving $n = 548$ participants, the combined effect size was $r = .31$ (Van Ijzendoorn, 1995). Because this meta-analysis was carried out rather recently, it was not repeated and extended here. In the earlier meta-analysis, we did not include studies on reported loss or trauma, regardless of their status as unresolved (Van Ijzendoorn, 1995). Four studies, however, examined the relation between reports of early loss or trauma (before the age of 16 years) and disorganized attachment in the infants (Ainsworth & Eichberg, 1991; Lyons–Ruth & Block, 1996; Lyons–Ruth, Repacholi, Mcleod, & Silva, 1991; Main & Hesse, 1990). The effect sizes ranged from −.10 to .38, and the combined effect size was $r = .21$ ($n = 185$; $p = .006$) in a homogeneous set of outcomes.

Marital discord. Owen and Cox (1997) suggested that children witnessing marital discord may experience disorganizing fright from their attachment figure, and they proposed marital discord as one of the alternative pathways to disorganization of attachment. In their study on 38 mothers and 33 fathers, Owen and Cox (1997) found impressive effect sizes ($r = .40$ and $r = .45$, respectively), but in studies by Radke–Yarrow, Cummings, Kuczynski, and Chapman (1985), Shaw, Owens, Vondra, Keenan, and Winslow (1996), and Moss, Rousseau, Parent, St-Laurent, and Saintonge (1998) this outcome was not replicated at $r = .04$, $n = 95$; $r = .07$, $n = 77$; and $r = -.19$, $n = 121$, respectively. In the four studies on $n = 364$ participants, the combined effect size was $r = .05$ (n.s.). In the studies using the Main and Solomon (1990) coding system (Owen & Cox, 1997; Shaw et al., 1996), the combined effect size was $r = .25$ ($p = .007$).

Parental depression. Because parental depression leads to temporary and potentially unpredictable inaccessibility of the parent, it has been considered to be another cause of attachment disorganization in the child (Solomon & George, 1994; DeMulder & Radke–Yarrow, 1991; Lyons–Ruth, Connell, Grunebaum, & Botein, 1990). Sixteen studies on depression and disorganization were available, including $n = 1{,}053$ participants. The combined effect size amounted to $r = .06$ ($p = .06$) in a homogeneous set of study outcomes (see Table 6). The eleven studies with Main and Solomon (1990) classifications showed a similar combined effect size of $r = .09$. Publication year, SES, age of parent, and type of depression assessment were not significant as predictors of study outcome, and blocking of the one study on bipolarly depressed mothers only (DeMulder & Radke–Yarrow, 1991) versus the other studies did not yield a significant contrast, $p = .15$. Sample size and age of the child at the Strange Situation were significant as predictors; however, larger samples and samples with older children yielded smaller effect sizes. The contrast between studies on clinically depressed and community samples was significant, $z = 2.24$, $p = .01$; the combined effect size for the community samples was $r = -.01$ ($k = 7$, n.s.), whereas for the samples with clinically depressed subjects it was $r = .13$ ($k = 9$, $p_1 = .003$). Both sets of studies were homogeneous.

The large NICHD study on daycare (NICHD Early Child Care Research Network, 1997) confirmed the absence of a substantial association between depression and disorganization. In this study on 1,131 one-year-olds, psychological adjustment of the mothers was assessed with the CES-D scale for depression (Radloff, 1977) and the NEO personality inventory (Costa & McRae, 1985). Psychological adjustment of the mothers was not related to infant disorganized attachment (re-computed effect size was $r = .04$).

Table 6. *Parental depression and disorganized child attachment*

Study	*n*	SES	Age: Child	Age: Parent	Depression[a]	Main[b]	Statistic	Effect Size (*r*)
1. Dawson et al. (1992)	34	Low	14	19	CES-D (≤16≤)	y	$\chi^2 = 0.07$	.05
2. Frankel & Harmon (1996)	62	Diverse	36	34	SADS (RDC)	n	$\chi^2 = 1.94$	–.18
3. Heller & Zeanah (1996)	17	Middle	12	31	BDI	y	$F = 4.27$	.46
4. Hubbs–Tait et al. (1996)	44	Low	13	18	CES-D	y	$r = .15$	.15
5. Teti et al. (1995)	50	Middle	12–21	30	BDI	y	$\chi^2 = 5.36$	.33
6. Teti et al. (1995)	54	Middle	21	30	BDI	n	$\chi^2 = 3.37$	.25
7. Murray (1992)	104	Diverse	18	28	SADS (RDC)	y	$\chi^2 = 2.40$	.15
8. DeMulder & Radke–Yarrow (1991) (bipolar)	59	Middle	15–52	32	SADS (RDC)	n	$\chi^2 = 4.68$	.28
9. DeMulder & Radke–Yarrow (1991) (unipolar)	78	Middle	15–52	32	SADS (RDC)	n	$\chi^2 = 0.00$	.01
10. Shaw et al. (1996)	85	Low	12	17–36	BDI	y	$r = .04$	.04
11. Lyons–Ruth et al. (1990) (high risk)	10	Low	18	22	CES-D	y	$\chi^2 = 1.27$	.36
12. Lyons–Ruth et al. (1990) (community)	32	Low	18	25	CES-D	y	$\chi^2 = 0.29$	.09
13. Schuengel et al. (1999)	85	Middle	14	31	EPDS	y	$t = –0.80$	–.09
14. Seifer, Sameroff, et al. (1996)	116	Middle	14	31	HRSD	y	$t = 0.87$	.08
15. Beeghly et al. (1997)	102	Middle	12	33	CES-D	y	$r = –.03$	–.03
16. Moss et al. (1998)	121	Diverse	75	—	BDI	n	$t = –0.93$	–.09
Combined	$N = 1{,}053$							$r = .06$

[a]CES-D: Center for Epidemiological Studies-Depression scale; BDI, Beck Depression Inventory; SADS, Schedule for Affective Disorders and Schizophrenia; EPDS, Edinburgh Postnatal Depression Scale; HRSD, Hamilton Rating Scale of Depression.
[b]Main and Solomon (1990) coding system for D (y, yes; n, no).

Parental insensitivity. Disorganized attachment is considered to be different from organized insecure attachment patterns in that regular parental insensitivity is supposed to be associated with insecurity (De Wolff & van Ijzendoorn, 1997) but not with disorganization (Main & Hesse, 1990). In 13 studies on $n = 1{,}951$ participants, the association between infant disorganization and parental insensitivity was examined. The combined effect size was significant but small: $r = .10$ ($p = .004$), in a heterogeneous set of study outcomes, $\chi^2(12) = 23.7$, $p = .02$ (see Table 7). Only sample size was a significant predictor of variation in effect sizes: larger samples showed smaller effects. To check the influence of the large NICHD sample (NICHD Early Child Care Research Network, 1997), we computed the combined effect size with a weighting of unit 1. The resulting combined effect size was $r = .16$ ($p < .001$). All studies except the one of Moss et al. (1998) included in this analysis used the Main and Solomon (1990) coding system for disorganized attachment; exclusion of this study did not yield different results.

Parental dissociation and frightening behavior. Because early loss and trauma in parents seemed to be related to infant disorganized attachment, Liotti (1992) and Main and Morgan (1996) proposed a dissociative model to explain the emergence of disorganized infants. Only in two studies dissociative tendencies have been assessed directly (Lyons–Ruth & Block, 1996; Schuengel, Bakermans–Kranenburg, & Van Ijzendoorn, 1999). Both studies used the self-report Dissociative Experiences

Table 7. *Parental insensitivity and disorganized attachment*

Study	*n*	SES	Age: Attachment	Age: Sensitivity	Sensitivity	Statistic	Effect Size (*r*)
1. NICHD (1997)	1,151	Diverse	15	6 + 15	Home	$t = 1.62$	.05
2. Schuengel et al. (1999)	85	Middle	14	10	Home	$t = -0.16$	−.02
3. Seifer, Schiller, et al. (1996)	49	Middle	12	4–12	Home	$p = .50$	.00
4. Hunt et al. (1997)	40	Low	25	25	Lab	$t = 0.45$	.09
5. Spangler et al. (1996)	88	Diverse	12	2–10	Home	$p = .50$	.09
6. Carlson (1998)	129	Low	12–18	6	Home	$r = .38$	.38
7. Lyons–Ruth et al. (1990)	38	Low	18	5–18	Intervention	$\chi^2 = 0.82$	.15
8. Teti et al. (1995)	50	Middle	12–21	12–21	Home	$t = 1.22$	18
9. Owen & Cox (1997) (mothers)	38	Middle	12–15	3	Home	$r = .29$	.29
10. Owen & Cox (1997) (fathers)	33	Middle	12–15	3	Home	$r = .17$	.17
11. Zevalkink (1997)	46	Low	12–30	12–30	Home	$F = 4.59$	.30
12. Bakermans–Kranenburg & Van Ijzendoorn (1997)	83	Middle	12	12	Lab	$r = .24$	.24
13. Moss et al. (1998)	121	Diverse	75	75	Lab	$t = 2.21$	.20
Combined	$N = 1,951$						$r = .10$

Note: All studies except the one by Moss et al. (1998) used the Main and Solomon (1990) coding system for disorganized attachment.

Scale (DES; Bernstein & Putnam, 1986; Van Ijzendoorn & Schuengel, 1996) and the Main and Solomon (1990) coding system for disorganized attachment. In the first study, mothers with disorganized infants had either high scores on the DES and PTSD scales or low scores on both these scales. Mothers with infants not classified as disorganized scored high on only one of the two scales. In the Lyons–Ruth and Block (1996) and the Schuengel et al. (1999) studies, the bivariate associations between maternal DES scores and infant disorganized attachment were not significant.

Main and Hesse's (1990) suggestion of a link between frightening parental behavior and disorganized infant attachment has only been tested in two observational studies (Lyons–Ruth et al., 1997; Schuengel et al., 1999). Schuengel et al. (1999) found an association between frightening maternal behavior at home and disorganization of infant attachment, $r = .19$ ($n = 85$), whereas Lyons–Ruth et al. (1997), observing frightening as well as other atypical maternal behavior, found an effect size of $r = .34$ ($n = 52$). It should be noted that Schuengel et al. (1999) also documented the protective role of secure attachment representations as secure mothers with unresolved loss showed significantly less frightening behavior than their insecure counterparts. Only in the group of insecure mothers, the Main and Hesse (1990) model of a link between maternal unresolved loss, mildly frightening and frightened maternal behavior, and infant disorganized attachment was confirmed.

Sequelae of disorganized attachment

Stress reaction. In two studies the effect of stress on the saliva cortisol levels of 1-year-old disorganized infants was assessed. Spangler and Grossmann (1993) found elevated cortisol levels in their 32 German infants from divers socioeconomic backgrounds 15 min after the Strange Situation procedure (effect size: $r = .14$). Hertsgaard et al. (1995) were able to replicate this outcome in an American low SES sample of 35 infants; they assessed cortisol levels 10 min after the Strange Situation procedure and found an effect size of $r = .33$. The combined effect size amounted to $r = .24$ ($p = .03$). Disorganized children seem to be least able to cope with the stress of the separations and reunions because they lack a consistent strategy of dealing with negative emotions. The organized attachment classifications did not differ in cortisol levels. The

studies used the Main and Solomon (1990) coding system for disorganized attachment. In the Willemsen et al. (1998) study on autistic and language-delayed children, disorganized children also seemed to be stressed more by the separation from their parent than organized children, as was indicated by heart rate assessments.

Externalizing problem behavior. In her narrative review on precursors of aggression in children, Lyons–Ruth (1996) concluded that disorganized attachment in infancy predicted aggression in school age children. In our meta-analysis on 12 studies involving 734 participants, we confirmed this conclusion (see Table 8). The combined effect size across the 12 studies was $r = .29$, and the set of study outcomes was homogeneous. The selection of problem behavior assessments was based on the following criteria: If more times of measurements were included we chose the earliest assessment; if it was possible to choose between mother-reported or teacher/observer reported problem behavior the latter assessment was chosen; the most specific indicator of aggressive or externalizing problem behavior was preferred, such as the CBCL scale for externalizing behavior (Achenbach, 1985). Mean age of attachment assessment was 39 months, and mean age of problem behavior assessment was 59 months. Age was not a significant predictor of the variation in effect sizes,and the same was true for the use of the CBCL versus the other measures. The studies using the Main and Solomon (1990) coding system showed the same combined effect size of $r = .29$.

Altered states of mind. Liotti (1992) and Hesse and Main (in press) proposed that parents who enter somewhat altered states of mind may be frightening to the child who may become disorganized. Disorganized attachment behaviors have been compared to dissociative behaviors and several similarities have been uncovered (Main & Morgan, 1996). The issue is whether disorganized infants will later in life be inclined to get involved into altered states of mind such as absorption or dissociation. Indirect evidence was provided by a retrospective study in which individuals whose parents had lost another child—or another loved one—within 2 years preceding or following their birth showed elevated propensities towards absorption as measured by Tellegen's Absorption Scale (Hesse & Van Ijzendoorn, 1998). Another study looking at the same type of losses showed an elevated risk of developing a dissociative symptoms (Liotti, 1992). The assumption is that loss around birth enhances the risk for the infant of becoming disorganized. Carlson's (1998) longitudinal study provided the direct evidence for the association between disorganized infant attachment and dissociative tendencies later in life. In a low SES sample 128, 17-year-old participants who were observed in the Strange Situation procedure in their second year of life, completed the Dissociative Experiences Scale. Carlson (1998) found a strong association of $r = .36$ between dissociation and disorganization.

Discussion and Conclusions

During the past 10 years nearly 80 studies on disorganized attachment involving more than 6,000 infant–parent dyads have been carried out. These studies document the importance of disorganized attachment in the development of child psychopathology, in particular the emergence of externalizing problem behaviors. The current series of meta-analyses have established the reliability and discriminant validity of disorganized infant attachment. Although disorganized attachment behavior is necessarily difficult to observe and often subtle, many researchers have managed to become reliable coders. Furthermore, disorganized attachment shows short- and long-term stability, in particular in stable, middle-class environments, and we proved that it is not just a concomitant of constitutional, temperamental, or physical problems. The predictive validity of disorganized attachment is established in terms of problematic stress management, the elevated risk of externalizing problem behavior, and the tendency of disorganized infants to show dissociative behavior later in life (Carlson, 1998). In normal,

Table 8. *Problem behavior and disorganized attachment*

Study	*n*	Age		SES	Behavior Measure	Statistic	Effect Size (*r*)	Main
		Attachment	Problem					
1. Hubbs–Tait et al. (1996)	44	13	54	Low	CBCL-E (mother)	$r = .29$	.29	y
2. Goldberg et al. (1995)	51	12	30	Middle	CBCL-E (parents)	$t = 1.18$	.17	y
3. Lyons–Ruth et al. (1997)	45	18	84	Low	CBCL-E (teacher)	$r = .31$	.31	y
4. Carlson (1998)	78	12	54	Low	BPS (teacher)	$r = .40$	.40	y
5. Radke–Yarrow et al. (1995)	95	30	72	Middle	CBCL/CAS (obs./mother)	$\chi^2 = 4.00$	.21	(y)
6. Shaw et al. (1996)	77	12	60	Low	CBCL/A (mothers)	$r = .34$	.34	y
7. Solomon et al. (1995)	45	70	70	Middle	CBCL/A (mothers)	$F(1, 43) = 4.73$	.31	n
8. Speltz et al. (1990)	50	55	55	Middle	ODD (DSM)	$\chi^2 = 14.35$	.54	n
9. Greenberg et al. (1991)	50	52	52	Middle	ODD (DSM)	$\chi^2 = 7.71$	.39	n
10. Marcovitch et al. (1997)	44	48	48	Low	CBCL-T (mother)	$\chi^2 = 1.45$	.18	n
11. Moss et al. (1996)	121	75	75	Diverse	PSP (teacher)	$t = 2.30$	.21	n
12. Wartner et al. (1994)	34	72	60	Diverse	MPAC (observers)	$\chi^2 = 0.05$	.04	n
Combined	$N = 734$						$r = .29$	

Note: Selection of earliest problem behavior assessment, preferably by teacher or observer, or as specific for aggression as possible (Child Behavior Checklist, CBCL/externalizing behavior or equivalents). PSP, Preschool Socioaffective Profile; MPAC, Minnesota Preschool Affect Checklist; CAS, Child Assessment Schedule (structured psychiatric interview).

middle-class families, about 15% of the infants develop disorganized attachment behavior. In other social contexts and in clinical groups this percentage may become 2 or even 3 times higher. Although the importance of disorganized attachment for developmental psychopathology is evident, the search for the mechanisms leading to disorganization has just started. Frightening or frightened and dissociated parental behavior may play an important role but it does not seem to be the only causal factor involved in the emergence of disorganized attachment (Hesse & Main, in press).

Across all studies, the intercoder reliability for disorganized attachment has been sufficient for research purposes (generally at least 80% agreement on the D/non-D classification, with κ's higher than .60). But even expert raters do not reach a maximum agreement on disorganized attachment classifications. On the A, B, C, D classifications, expert raters trained by Mary Main who, with Judith Solomon, developed the coding system for identifying D in the Strange Situation, reached κs ranging from .69 to .76 (Lyons–Ruth et al., 1997; NICHD Early Child Care Research Network, 1997; Sagi, Van Ijzendoorn, Aviezer, & Donnell, 1994). For diagnostic purposes, the coding system is complicated and the intercoder reliability only marginal. The Strange Situation procedure may offer too small a window on infants' behavior under stress to exclude the possibility of false negatives. For research, as well as for diagnostic purposes, two ways of improving the assessment of disorganized attachment may be considered. First, naturally occurring stressful situations may be observed for additional signs of disorganized attachment. In the literature, at least one case has been described of an infant who showed clear-cut disorganized attachment behavior at home, but not in the Strange Situation procedure (Schuengel, Van Ijzendoorn, Bakermans–Kranenburg, & Blom, 1997). In this case, the detection of disorganized attachment at home took, however, almost 4 hr of videotaped observations. Furthermore, the attachment figure may not always show the behavior that triggers a disorganized response of the infant. Ethically acceptable ways of inducing these triggering behaviors in the parent should be searched for. Second, because disorganization of attachment is expressed in problematic management of stress and in problematic regulation of negative emotions, salivary cortisol levels or heart rate may be used as additional markers of disorganized attachments in conjunction with behavioral indices. During and shortly after stressful separations disorganized children show more physiological stress than organized children (Hertsgaard et al., 1995; Spangler & Grossmann, 1993; Willemsen et al., 1998), and elevated stress levels might be used to start a more thorough search for disorganized behavior, for example in the home setting. The associations between physiological indices and disorganization, however, are far from perfect. Furthermore, the inclusion of physiological indices in research or in clinical diagnoses of disorganized attachment may not always be feasible.

The test–retest reliability or stability of disorganized attachment is modest. It is unclear why the stability of disorganized attachment tends to be higher in middle-class groups. In the case of the organized attachment classifications, higher stability for middle-class groups would be expected because of middle-class child rearing arrangements being more stable (Vaughn, Egeland, Sroufe, & Waters, 1979). Disorganized attachment, however, may be the consequence of unpredictable, frightening parental behavior which may be more stable in lower class homes with more life stresses and more chaotic child rearing arrangements. On the other hand, not every kind of unpredictable or even chaotic behavior may lead to disorganization. It may be specifically unpredictably *frightening* behavior that is the key. One might speculate that under low-risk circumstances frightening parental behavior is more salient and less predictable, and has a more stable influence on infant attachment. This hypothesis requires further study of the causal role of frightening behavior in different ecological contexts. Lastly, the intercoder reliability poses a limit on the stability. If we correct the stability correlation with the intercoder reliability of .76 (Sagi et al., 1994, between Marinus van Ijzendoorn and Mary

Main), the stability becomes .46 for the set of studies, in which the Main and Solomon (1990) coding system was used to establish short-term stability. The disorganized attachment category is not less stable than the other attachment classifications (Belsky, Campbell, Cohn, & Moore, 1996; Thompson, in press), and Bowlby (1973/1985) already predicted the dependence of attachment on contextual stability during the first few years of life.

Disorganized attachment appears to be characteristic of a specific relationship. The correspondence between infant–mother and infant–father disorganized attachment is low, and comparable to the correspondence between infant–mother and infant–father security of attachment (Van Ijzendoorn & De Wolff, 1997). Constitutional or temperamental characteristics of the child do not seem to contribute to disorganized attachment status. Boys have been speculated to be more liable to become disorganized than girls are, but the meta-analytic data do not confirm this contention. In attachment research, surprisingly few sex differences have been found (Benenson, 1996). Disorganized attachment cannot be considered to be the consequence of a difficult temperament either. Temperament assessments have been routinely included in many attachment studies, and examination of the pertinent data on 1,790 children revealed the absence of a correlation with disorganized attachment. Physical problems such as cleft palate (Speltz et al., 1997) are also not related to attachment disorganization. Only neurological abnormalities may increase the likelihood of disorganized behavior, for example, in Downs syndrome children (Vaughn et al., 1994) or in autistic children (Capps et al., 1994; Willemsen et al., 1998). Pipp–Siegel et al. (1997) correctly emphasize the potential neurological basis of many disorganized behaviors, and further research is needed to test the predictive validity of disorganized attachment behavior in groups at risk for neurological impairments.

Disorganized infant attachment is not just the consequence of parental insensitivity. Across almost 2,000 infant–parent dyads, the correlation between parental insensitivity and infant disorganization was only .10. In a recent meta-analysis on parental insensitivity and infant attachment insecurity, the effect size was equivalent to a correlation of .24. Within the normal, nonclinical range of parenting, insensitive parental behavior does not seem to be sufficient to evoke disorganized attachment behaviors in the child. It is clear, however, that maltreatment is an important antecedent of disorganized attachment. It is plausible that the real fright involved in this type of extremely insensitive and disturbed parenting results in a temporary breakdown of the child's regular strategy to deal with negative emotions in the face of stress. Another behavioral precursor of disorganized attachment might be frightening parental behavior in the absence of maltreatment. Hesse and Main (in press) speculated about the mechanism connecting unresolved loss in the parent with infant disorganization, and following Liotti (1992), they proposed a dissociative model in which unresolved parents' elevated propensity to dissociated behavior may cause fright in the child. The role of "dissociated" frightening behavior as opposed to real frightening interaction, however, is less clear-cut. Only two studies on the association between parental dissociation, frightening parental behavior, and disorganization have been performed, and the results are promising but need further replication (Lyons–Ruth et al., 1997; Schuengel et al., 1999). Several hours of home observation in nonclinical families were necessary to pinpoint the low frequency frightening and frightened parental behavior in the natural setting (Schuengel et al., 1999). The study of the dissociative model would become intensified if in controlled experiments frightening parental behavior could be simulated, for example through a still-face procedure.

Beside real and dissociated frightening behavior, disorganized children might experience "conflictual" frightening behavior as a consequence of witnessing chronic marital discord. Owen and Cox (1997) speculate about the disorganizing features of intensive marital discord, and they emphasize the frightening nature of the exposure to continuous marital conflict (Davies & Cummings, 1994). Marital discord may evoke role reversing and even

controlling behavior in the older child who plays the role of protective care giver for one of the parents. Controlling behavior has been suggested to be the expression of attachment disorganization in preschoolers and school-age children (Main & Cassidy, 1988). The empirical evidence for this model, however, is still scant as well as equivocal. Nevertheless, it concurs with Solomon and George's (1994) suggestion that parents who go through a divorce may feel unable to protect the child against the risks of interacting with the other parent and thereby fail to fulfill the basic role of an attachment figure. The breakdown of the protective parental role may lead to a breakdown of organized attachment patterns in the child. In this context, the association between parental depression and infant disorganization is disappointingly weak—in nonclinical groups, as well as in clinically depressed samples. Depressed parents may become withdrawn from their parental role, and feel incompetent to respond to their child's basic attachment needs. Parental bipolar depression may be especially frightening for children who are confronted with unpredictability and temporary inaccessibility of their attachment figure without being able to see its reason or cause. Further research on bipolar depression is needed to settle this issue more definitely (DeMulder & Radke–Yarrow, 1991; Radke–Yarrow, McCann, DeMulder, Belmont, Martinez, & Richardson, 1995). Furthermore, severely and chronically depressed parents have been studied less frequently. Severe and long-lasting parental depression may lead to highly incompetent parenting and to disorganization of attachment (Teti, Messinger, Gelfand, & Isabella, 1995). More empirical work is needed to address this issue meta-analytically in a more balanced way.

In 12 studies on 734 children, disorganized attachment was associated with more externalizing problem behavior as assessed by parents, teachers, or observers. The effect size is substantial, and the association appears to hold across extended periods of time, from infancy into the school-age period, and even beyond (Carlson, 1998). Disorganized attachment may certainly be considered an important risk factor in the development of child psychopathology. Combined with the elevated cortisol levels of disorganized children after stress, and their inclination to enter into somewhat dissociated states, this result may even lead to the suggestion that disorganized attachment is an early sign of psychopathology in itself. In the absence of any systematic validation of the reactive attachment disorders as defined in the DSM-IV (American Psychiatric Association, 1994; Zeanah et al., 1997), disorganized attachment may become the focus of clinical attempts to assess at least one important dimension of the reactive attachment disorders at an early stage in life. For two reasons, we should be cautious, however, about the diagnostic use of disorganized attachment. First, the meta-analytic evidence presented in this paper is only correlational and the causal nature of the association between disorganized attachment and externalizing problem behavior still has to be established. Experimental intervention studies may settle this issue if the intervention is explicitly directed at a change in that parental behavior or mental state that provokes disorganized behavior in the child. Second, the specificity of the consequences of disorganized attachment still is unclear. Externalizing problem behavior and dissociative tendencies seem rather diverging sequelae, and empirical evidence for a specific common thread is still lacking (Putnam, 1997). Disorganized attachment should predict problems in emotion regulation and control, and it should have less influence, for example, on problems in the cognitive domain or in language development.

Whereas disorganized attachment is a risk factor in developmental psychopathology, secure attachment may be considered a protective factor, which may buffer the potential negative effects of disorganization. In her longitudinal study on a high-risk sample, Lyons–Ruth and her coworkers did not find a significant buffering effect on internalizing and externalizing problem behavior (Lyons–Ruth et al., 1997). The number of disorganized children with a secondary secure strategy was small ($n = 4$), however. Spangler and Grossmann (1993) showed in their cortisol study that disorganized infants with a secondary secure strategy were more stressed than their (organized) secure and insecure counterparts. Because the power of statistical analyses on

small subgroups is rather weak, replications in further studies with larger samples are necessary. In our meta-analyses, we were unable to test for differences between alternate and secondary classifications because the primary studies did not provide sufficiently detailed data. Besides secondary security of the infant, also security of attachment representations in the parents may be a protective factor. In a study on nonclinical, middle-class mothers with and without unresolved loss, we showed that Main and Hesse's (1990) model of frightening behavior as the mechanism between parents' unresolved loss and infants' disorganized attachment is valid only for insecure mothers. Unresolved mothers with secure attachment representations show significantly less frightening behavior and thus prevent their children from becoming disorganized (Schuengel et al., 1999). This study is the first complete test of the dissociative model of disorganized attachment, and replications should be carried out to see whether the role of attachment as a protective as well as a risk factor can be substantiated.

References

Achenbach, T. M. (1985). *Assessment and taxonomy of child and adolescent psychopathology.* London: Sage.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment.* Hillsdale, NJ: Erlbaum.

Ainsworth, M. D. S., & Eichberg, C. G. (1991). Effects on infant–mother attachment of mother's unresolved loss of an attachment figure, or other traumatic experience. In C. M. Parkes, J. Stevenson–Hinde, & P. Marris (Eds.), *Attachment across the life cycle* (pp. 160–183). London: Routledge.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Ammaniti, M., & Speranza, A. M. (1995). Maternal representations and disorganized patterns of attachment in children. *Giornale di Neuropsychiatria-dell'Eta Evolutiva, 15,* 27–34.

Bakermans–Kranenburg, M. J., & Van Ijzendoorn, M. H. (1997). *Stability of disorganized attachment in the second year of life.* Unpublished manuscript, Leiden University.

Barnett, D., Ganiban, J., & Cicchetti, D. (1997). *Maltreatment, emotional reactivity, and the development of type D attachments from 12- to 24-months of age.* Unpublished manuscript.

Beeghly, M., & Cicchetti, D. (1994). Child maltreatment, attachment, and the self system: Emergence of an internal state lexicon in toddlers at high social risk. *Development and Psychopathology, 6,* 5–30.

Beeghly, M., Nelson, K. M., Olson, K. L., Kernan, H., Markov, Y., Weinberg, M. K., & Tronick, E. Z. (1997, April). *Effects of maternal depression on infant attachment in a low risk sample.* Paper presented at the Biennial Meeting of the Society for Research in Child Development, Washington, DC.

Belsky, J., Campbell, S., Cohn, J. F., & Moore, G. (1996). Instability of infant parent attachment security. *Developmental Psychology, 32,* 921–924.

Benenson, J. F. (1996). Gender differences in the development of relationships. In G. G. Noam & K. W. Fischer (Eds.), *Development and vulnerability in close relationships* (pp. 263–286). Hillsdale, NJ: Erlbaum.

Benoit, D., & Parker, K. C. H. (1994). Stability and transmission of attachment across 3 generations. *Child Development, 65,* 1444–1456.

Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *The Journal of Nervous and Mental Disease, 174,* 727–735.

Bishop, Y. Y., Fienberg, S. E., & Holland, P. W. (1975). *Discrete multivariate analysis: Theory and practice.* Cambridge, MA: MIT Press.

Boris, N. W., Fuevo, M., & Zeanah, C. H. (1997). The clinical assessment of attachment in children under five. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 291–293.

Bowlby, J. (1985). *Separation: Anxiety and anger.* London: Penguin. (Original work published 1973)

Broussard, E. R. (1995). Infant attachment in a sample of adolescent mothers. *Child Psychiatry and Human Development, 25,* 211–219.

Capps, L., Sigman, M., & Mundy, P. (1994). Attachment security in children with autism. *Development and Psychopathology, 6,* 249–261.

Carlson, E. A. (1998). A prospective longitudinal study of disorganized/disoriented attachment. *Child Development, 69,* 1107–1128.

Carlson, V., Cicchetti, D., Barnett, D., & Braunwald, K. (1989). Disorganized/disoriented attachment relationships in maltreated infants. *Developmental Psychology, 25,* 525–531.

Cassidy, J., Marvin, R. S., & MacArthur Working Group on Attachment. (1992). *Attachment organization in three- and four-year-olds: Procedures and coding manual.* Unpublished coding manual, Pennsylvania State University.

Chatoor, I., & Ganiban, J. (1998, April). *Attachment and feeding problems: Reexamination of non-organic failure to thrive and attachment security.* Poster presented at the Biennial Meeting of the International Society for Infant Studies, Atlanta, GA.

Cicchetti, D., & Barnett, D. (1991). Attachment organization in maltreated preschoolers. Special Issue: Attachment and developmental psychopathology. *Development and Psychopathology, 3,* 397–411.

Claussen, A. H., Mundy, P. C., & Willoughby, J. C. (1998, April). *Nonverbal communication, joint attention, and attachment in infants at risk.* Poster presented at the Biennial Meeting of the International Society for Infant Studies, Atlanta, GA.

Cohn, D. A. (1990). Child–mother attachment of six-year-olds and social competence at school. *Child Development, 61,* 152–162.

Costa, P. T., & McRae, R. R. (1985). *The NEO Personality Inventory manual.* Odessa, FL: Psychological Assessment Resources.

Cox, S. M. (1995, March). *Maternal childhood history as a predictor of disorganized attachment in preterm infants.* Poster presented at the Biennial Meeting of the Society for Research in Child Development, Indianapolis, IN.

Crittenden, P. M. (1985). Maltreated infants: Vulnerability and resilience. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 26,* 85–96.

Crittenden, P. M. (1988). Relationships at risk. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 136–174). Hillsdale, NJ: Erlbaum.

Crittenden, P. M. (1992). Quality of attachment in the preschool years. *Development and Psychopathology, 4,* 209–241.

Crittenden, P. M., & Ainsworth, M. D. S. (1989). Child maltreatment and attachment theory. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect* (pp. 432–463). New York: Cambridge University Press.

Davies, P. T., & Cummings, E. M. (1994). Marital conflict and child adjustment: An emotional security hypothesis. *Psychological Bulletin, 116,* 387–411.

Das Eiden, R., & Leonard, K. E. (1996). Paternal alcohol use and the mother infant relationship. *Development and Psychopathology, 8,* 307–323.

Dawson, G., Grofer Klinger, L., Panagiotides, H., Spieker, S., & Frey, K. (1992). Infants of mothers with depressive symptoms: Electroencephalographic and behavioral findings related to attachment status. *Development and Psychopathology, 4,* 67–80.

DeKlyen, M. (1996). Disruptive behavior disorder and intergenerational attachment patterns: A comparison of clinic referred and normally functioning preschoolers and their mothers. *Journal of Consulting and Clinical Psychology, 64,* 357–365.

DeMulder, E. K., & Radke–Yarrow, M. (1991). Attachment with affectively ill and well mothers: Concurrent behavioral correlates. *Development and Psychopathology, 3,* 227–242.

DeWolff, M. S., & Van Ijzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant-attachment. *Child Development, 68,* 571–591.

Dozier, M., & Kobak, R. R. (1992). Psychophysiology in attachment interviews: Converging evidence for deactivating strategies. *Child Development, 63,* 1473–1480.

Easterbrooks, M. A., Davidson, C. E., & Chazan, R. (1993). Psychosocial risk, attachment, and behavior problems among school-aged children. *Development and Psychopathology, 5,* 389–402.

Fish, M., & Fish, S. E. (1998, April). *Temperament, attachment, and heart rate variability: Comparisons of secure, avoidant, and disorganized infants.* Poster presented at the Biennial Meeting of the International Society for Infant Studies, Atlanta, GA.

Fish, M., & Stifter, C. A. (1995). Patterns of mother infant interaction and attachment: A cluster-analytic approach. *Infant Behavior and Development, 18,* 435–446.

Frankel, K. K., & Harmon, R. J. (1996). Depressed mothers: They don't always look as bad as they feel. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 289–298.

George, C. (1996). A representational perspective of child abuse and prevention: Internal working models of attachment and caregiving. *Child Abuse & Neglect, 20,* 411–424.

George, C., Kaplan, N., & Main, M. (1985). *Adult attachment interview.* Unpublished manuscript, University of California at Berkeley.

Goldberg, S., Gotowiec, A., & Simmons, R. J. (1995). Infant–mother attachment and behavior problems in healthy and chronically ill preschoolers. *Development and Psychopathology, 7,* 267–282.

Goldberg, S., Lojkasek, M., Gartner, G., & Corter, C. (1989). Maternal responsiveness and social development in preterm infants. In M. H. Bornstein (Ed.), *Maternal responsiveness: Characteristics and consequences. New Directions for Child Development* (pp. 89–103). San Francisco: Jossey–Bass.

Greenberg, M. T., Speltz, M. L., & DeKlyen, M. (1993). The role of attachment in the early development of disruptive behavior problems. Special Issue: Toward a developmental perspective on conduct disorder. *Development and Psychopathology, 5,* 191–213.

Greenberg, M. T., Speltz, M. L., DeKlyen, M., & Endriga, M. C. (1991). Attachment security in preschoolers with and without externalizing behavior problems: A replication. Special Issue: Attachment and developmental psychopathology. *Development and Psychopathology, 3,* 413–430.

Harrison, L. J., & Ungerer, J. A. (1996). *Maternal employment, infant child care and security of attachment at age 12 months.* Paper presented at the XXVI International Congress of Psychology, Montreal, Canada.

Hedges, L. V. (1986). Issues in meta-analysis. *Review of Research in Education, 13,* 353–399.

Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis.* Orlando: Academic Press.

Heller, S. S., & Zeanah, C. H. (1996). *Attachment disturbances in infants born subsequently to perinatal loss.* Unpublished manuscript, Louisiana State University.

Hertsgaard, L., Gunnar, M., Erickson, M. F., & Nachmias, M. (1995). Adrenocortical responses to the strange situation in infants with disorganized/disoriented attachment relationships. *Child Development, 66,* 1100–1106.

Hesse, E., & Main, M. (in press). Frightened behavior in traumatized but non-maltreating parents: Previously unexamined risk factor for offspring. *Psychoanalytic Inquiry.*

Hesse, E., & Van Ijzendoorn, M. H. (1998). Parental loss of close family members and propensities towards absorption in offspring. *Developmental Science, 1,* 299–305.

Howes, C., & Hamilton, C. E. (1992). Childrens relationships with child care teachers stability and concordance with parental attachments. *Child Development, 63,* 867–878.

Hubbs–Tait, L., Hughes, K. P., Culp, A. M., Osofsky, J. D., Hahn, D. M., Eberhartwright, A., & Ware, L. M. (1996). Children of adolescent mothers: Attachment representation, maternal depression, and later behavior problems. *American Journal of Orthopsychiatry, 66,* 416–426.

Hunt, K. H., Barnett, D., McCaskill, J., Butler, C., Kaplan–Estrin, M., & Behen, M. (1997). *Attachment and parenting among toddlers with birth defects.* Poster presented at the Biennial Meeting of the Society for Research in Child Development, Washington DC.

Jacobsen, T., Edelstein, W., & Hofmann, V. (1994). A longitudinal study of the relation between representations of attachment in childhood and cognitive functioning in childhood and adolescence. *Developmental Psychology, 30,* 112–124.

Jacobsen, T., & Hofmann, V. (1997). Childrens attachment representations: Longitudinal relations to school behavior and academic competency in middle childhood and adolescence. *Developmental Psychology, 33,* 703–710.

Jacobsen, T., Huss, M., Fendrich, M., Kruesi, M. P., & Ziegenhain, U. (1997). Children's ability to delay gratification: Longitudinal relations to mother–child attachment. *Journal of Genetic Psychology, 158,* 411–426.

Johnson, B. T., Mullen, B., & Salas, E. (1995). Comparison of three major meta-analytic approaches. *Journal of Applied Psychology, 80,* 94–106.

Kroonenberg, P. M. (1998). Multinom for Windows (Version 2.0a) [Computer software]. Leiden, The Netherlands: Leiden University. Available: http://www.fsw.leidenuniv.nl/~kroonenb/index.html.

Lederberg, A. R., & Mobley, C. E. (1990). The effect of hearing impairment on the quality of attachment and mother–toddler interaction. *Child Development, 61,* 1596–1604.

Liotti, G. (1992). Disorganized/disoriented attachment in the etiology of the dissociative disorders. *Dissociation: Progress in the Dissociative Disorders, 5,* 196–204.

Lyons–Ruth, K. (1996). Attachment relationships among children with aggressive behavior problems: The role of disorganized early attachment patterns. *Journal of Consulting and Clinical Psychology, 64,* 64–73.

Lyons–Ruth, K., Alpern, L., & Repacholi, B. (1993). Disorganized infant attachment classification and maternal psychosocial problems as predictors of hostile-agressive behavior in the preschool classroom. *Child Development, 64,* 572–585.

Lyons–Ruth, K., & Block, D. (1996). The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal, 17,* 257–275.

Lyons–Ruth, K., Connell, D. B., Grunebaum, H. U., & Botein, S. (1990). Infants at social risk: Maternal depression and family support services as mediators of infant development and security of attachment. *Child Development, 61,* 85–98.

Lyons–Ruth, K., Connell, D. B., Zoll, D., & Stahl, J. (1987). Infants at social risk: Relations among infant maltreatment, maternal behavior, and infant attachment behavior. *Developmental Psychology, 23,* 223–232.

Lyons–Ruth, K., Easterbrooks, M. A., & Cibelli, C. D. (1997). Infant attachment strategies, infant mental lag, and maternal depressive symptoms: Predictors of internalizing and externalizing problems at age 7. *Developmental Psychology, 33,* 681–692.

Lyons–Ruth, K., Repacholi, B., McLeod, S., & Silva, E. (1991). Disorganized attachment behavior in infancy: Short-term stability, maternal and infant correlates, and risk-related subtypes. *Development and Psychopathology, 3,* 377–396.

Main, M. (1990). Cross-cultural studies of attachment organization: Recent studies, changing methodologies, and the concept of conditional strategies. *Human Development, 33,* 48–61.

Main, M., & Cassidy, J. (1988). Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. *Developmental Psychology, 24,* 415–426.

Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism? In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research, and intervention* (pp. 161–18). Chicago and London: University of Chicago Press.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds.), *Growing points in attachment theory and research* (pp. 66–104). *Monographs of the Society of Research in Child Development, 50* (Serial No. 209).

Main, M., & Morgan, H. (1996). Disorganization and disorientation in infant strange situation behavior: Phenotypic resemblance to dissociative states? In L. Michelson & W. Ray (Eds.), *Handbook of dissociation: Theoretical, empirical and clinical perspectives* (pp. 107–138). New York: Plenum.

Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern. In T. B. Brazelton & M. W. Yogman (Eds.), *Affective development in infancy* (pp. 95–124). Norwood, NJ: Ablex.

Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research, and intervention* (pp. 121–160). Chicago and London: University of Chicago Press.

Manassis, K., Bradley, S., Goldberg, S., Hood, J., & Swinson, R. P. (1994). Attachment in mothers with anxiety disorders and their children. *Journal of the American Academy of Child and Adolescent Psychiatry, 33,* 1106–1113.

Marcovitch, S., Goldberg, S. A., Gold, A., Washington, J., Wasson, C., Krekewich, K., & Handleyderry, M. (1997). Determinants of behavioural problems in Romanian children adopted in Ontario. *International Journal of Behavioral Development, 20,* 17–31.

Meins, E., Fernyhough, C., Russell, J., & Clark–Carter, D. (1998). Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development, 7,* 1–24.

Milentijevic, I., Altman, S., & Ward, M. J. (1995, April). *Adolescent mothers and their children: Stability of attachment organization from 1 to 3.5 years.* Paper presented at the Biennial Meeting of the Society for Research in Child Development, Indianapolis, IN.

Moore, L., Crawford, F., Tucker, R., Lester, J., & Fuller, S. (1997). *Maternal, child, and family predictors of atypical attachment at 30 months.* Unpublished manuscript.

Moss, E., Parent, S., Gosselin, C., Rousseau, D., & St-Laurent, D. (1996). Attachment and teacher reported behavior problems during the preschool and early school age period. *Development and Psychopathology, 8,* 511–525.

Moss, E., Rousseau, D., Parent, S., St-Laurent, D., & Saintonge, J. (1998). Correlates of attachment at school-age: Maternal reported stress, mother–child interaction and behavior problems. *Child Development, 69,* 1390–1405.

Mullen, B. (1989). *Advanced basic meta-analysis.* Hillsdale, NJ: Erlbaum.

Murray, L. (1992). The impact of postnatal depression on infant development. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 33,* 543–561.

NICHD Early Child Care Research Network. (1997). The effects of infant child care on infant–mother attachment security: Results of the NICHD study of early child care. *Child Development, 68,* 860–879.

O'Connor, M. J., Sigman, M., & Brill, N. (1987). Disorganization of attachment in relation to maternal alcohol consumption. *Journal of Consulting and Clinical Psychology, 55,* 831–836.

O'Connor, M. J., Sigman, M. D., & Kasari, C. (1992). Attachment behavior of infants exposed prenatally to alcohol: Mediating effects of infant affect and mother–infant interaction. *Development and Psychopathology, 4,* 243–256.

Owen, M. T., & Cox, M. J. (1997). Marital conflict and the development of infant parent attachment relationships. *Journal of Family Psychology, 11,* 152–164.

Pederson, D. R., Gleason, K. E., Moran, G., & Bento, S. (1996). *Maternal attachment representations, maternal sensitivity, and infant–mother attachment.* Unpublished manuscript, University of Toronto.

Pipp–Siegel, S., Easterbrooks, M. A., Brown, S. R., & Harmon, R. J. (1995). The relation between infants self mother knowledge and 3 attachment categories. *Infant Mental Health Journal, 16,* 221–232.

Pipp–Siegel, S., Siegel, C. H., & Dean, J. (1997). *Neurological aspects of the disorganized/disoriented attachment classification system: Differentiating quality of the attachment relationship from neurological impairment.* Unpublished manuscript, University of Colorado at Boulder.

Putnam, F. W. (1997). *Dissociation in children and adolescents: A developmental perspective.* New York: Guilford.

Radke–Yarrow, M., Cummings, E. M., Kuczynski, L., & Chapman, M. (1985). Patterns of attachment in two- and three-year-olds in normal families and families with parental depression. *Child Development, 56,* 884–893.

Radke–Yarrow, M., McCann, K., Demulder, E., Belmont, B., Martinez, P., & Richardson, D. T. (1995). Attachment in the context of high-risk conditions. *Development and Psychopathology, 7,* 247–265.

Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385–410.

Rauh, H., Ziegenhain, U., Muller, B., & Wijnroks, L. (in press). Stability and change in infant–mother attachment in the second year of life: Relations to parenting quality and varying degrees of daycare experience. In P. M. Crittenden (Ed.), *The organization of attachment relationships: Maturation, culture, and context.* Cambridge: Cambridge University Press.

Rodning, C., Beckwith, L., & Howard, J. (1989). Characteristics of attachment organization and play organization in prenatally drug-exposed toddlers. *Development and Psychopathology, 1,* 277–289.

Rodning, C., Beckwith, L., & Howard, J. (1991). Quality of attachment and home environments in children prenatally exposed to PCP and cocaine. Special Issue: Attachment and developmental psychopathology. *Development and Psychopathology, 3,* 351–366.

Rosenthal, R. (1991). *Meta-analytic procedures for social research.* Beverly Hills, CA: Sage.

Rosenthal, R. (1995). Progress in Clinical Psychology: Is There Any? *Clinical Psychology-Science and Practice, 2,* 133–150.

Sagi, A., Van Ijzendoorn, M. H., Aviezer, O., & Donnell, F. (1994). Sleeping out of home in a kibbutz communal arrangement: It makes a difference for infant–mother attachment. *Child Development, 65,* 992–1004.

Schoelmerich, A., Lamb, M. E., Leyendecker, B., & Fracasso, M. P. (1997). Mother–infant teaching interactions and attachment security in Euro-American and Central-American immigrant families. *Infant Behavior & Development, 20,* 165–174.

Schuengel, C., Bakermans–Kranenburg, M. J., & Van Ijzendoorn, M. H. (1999). Frightening maternal behavior linking unresolved loss and disorganized infant attachment. *Journal of Consulting and Clinical Psychology, 67,* 54–63.

Schuengel, C., Van Ijzendoorn, M. H., Bakermans–Kranenburg, M. J., & Blom, M. (1998). Frightening maternal behavior, unresolved loss, and disorganized infant attachment: A pilot study. *Journal of Reproductive and Infant Psychology, 16,* 277–283.

Schwarzer, R. (1989). *Meta-analysis programs.* Unpublished manual, FU Berlin.

Seifer, R., Sameroff, A. J., Dickstein, S., Keitner, G., Miller, I., Rasmussen, S., & Hayden, L. C. (1996). Parental psychopathology, multiple contextual risks, and one-year outcomes in children. *Journal of Clinical Child Psychology, 25,* 423–435.

Seifer, R., Schiller, M., Sameroff, A. J., Resnick, S., & Riordan, K. (1996). Attachment, maternal sensitivity, and infant temperament during the first year of life. *Developmental Psychology, 32,* 12–25.

Shaw, D. S., Owens, E. B., Vondra, J. I., Keenan, K., & Winslow, E. B. (1996). Early risk factors and pathways in the development of early disruptive behavior problems. *Development and Psychopathology, 8,* 679–699.

Sierra, A. M. (1989, April). *The assessment of attachment in infants with mild to moderate cerebral palsy.* Paper presented at the Biennial Meeting of the Society for Research in Child Development, Kansas City.

Solomon, J., & George, C. (1994). *Disorganization of maternal caregiving strategies: An attachment approach to role reversal.* Paper presented at the 102nd Meeting of the American Psychological Association, Los Angeles, CA.

Solomon, J., George, C., & De Jong, A. (1995). Children classified as controlling at age six: Evidence of disorganized representational strategies and aggression at home and at school. *Development and Psychopathology, 7,* 447–463.

Spangler, G., Fremmer–Bombik, E., & Grossmann, K. (1996). Social and individual determinants of infant attachment security and disorganization. *Infant Mental Health Journal, 17,* 127–139.

Spangler, G., & Grossmann, K. E. (1993). Biobehavioral organization in securely and insecurely attached infants. *Child Development, 64,* 1439–1450.

Speltz, M. L., Endriga, M. C., Fisher, P. A., & Mason, C. A. (1997). Early predictors of attachment in infants with cleft lip and/or palate. *Child Development, 68,* 12–25.

Speltz, M. L., Greenberg, M. T., & Deklyen, M. (1990). Attachment in preschoolers with disruptive behavior: A comparison of clinic-referred and nonproblem children. *Development and Psychopathology, 2,* 31–46.

Spieker, S. J., & Bensley, L. (1994). Roles of living arrangements and grandmother social support in adolescent mothering and infant attachment. *Developmental Psychology, 30,* 102–111.

Sroufe, L. A. (1988). The role of infant-caregiver attachment in development. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 18–38). Hillsdale, NJ: Erlbaum.

Steele, H., Steele, M., & Fonagy, P. (1996a). Associations among attachment classifications of mothers, fathers, and their infants. *Child Development, 67,* 541–555.

Steele, H., Steele, M., & Fonagy, P. (1996b, April). *Attachment in the sixth year of life.* Paper presented at the Meetings of the International Congress of Psychology, Montreal, Canada.

Teti, D. M., Messinger, D. S., Gelfand, D. M., & Isabella, R. (1995). Maternal depression and the quality of early attachment: An examination of infants, preschoolers, and their mothers. *Developmental Psychology, 31,* 364–376.

Thompson, R. A. (in press). Effects of attachment on later development. In J. Cassidy & P. Shaver (Eds.), *Handbook of attachment theory and research.* New York: Guilford.

True, M. (1994). *Mother–infant attachment and communication among the Dogon of Mali.* Unpublished manuscript, University of California at Berkeley.

Valenzuela, M. (1990). Attachment in chronically underweight young children. *Child Development, 61,* 1984–1996.

Van Ijzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin, 117,* 387–403.

Van Ijzendoorn, M. H., & DeWolff, M. S. (1997). In search of the absent father: Meta-analyses on infant–father attachment. A rejoinder to our discussants. *Child Development, 68,* 604–609.

Van Ijzendoorn, M. H., Goldberg, S., Kroonenberg, P. M., & Frenkel, O. J. (1992). The relative effects of maternal and child problems on the quality of attachment: A meta-analysis of attachment in clinical samples. *Child Development, 63,* 840–858.

Van Ijzendoorn, M. H., & Kroonenberg, P. M. (1988). Cross-cultural patterns of attachment: A meta-analysis of the strange situation. *Child Development, 59,* 147–156.

Van Ijzendoorn, M. H., & Schuengel, C. (1996). The measurement of dissociation in normal and clinical populations: Meta-analytic validation of the dissociative experiences scale (DES). *Clinical Psychology Review, 16,* 365–382.

Vaughn, B. E., Egeland, B. R., Sroufe, L. A., & Waters, E. (1979). Individual differences in infant–mother attachment at twelve and eighteen months: Stability and change in families under stress. *Child Development, 50,* 971–975.

Vaughn, B. E., Goldberg, S., Atkinson, L., & Marcovitch, S. (1994). Quality of toddler–mother attachment in children with Down syndrome: Limits to interpretation of strange situation behavior. *Child Development, 65,* 95–108.

Vondra, J. I., Hommerding, K. D., & Shaw, D. S. (1997). *Stability and change in infant attachment in a low-income sample.* Unpublished manuscript, Pittsburgh University.

Ward, M. J., & Carlson, E. A. (1995). Associations among adult attachment presentations, maternal sensitivity, and infant–mother attachment in a sample of adolescent mothers. *Child Development, 66,* 69–79.

Ward, M. J., Kessler, D. B., & Altman, S. C. (1993). Infant–mother attachment in children with failure to thrive. *Infant Mental Health Journal, 14,* 208–220.

Wartner, U. G., Grossmann, K., Fremmer–Bombik, E., & Suess, G. (1994). Attachment patterns at age six in South Germany: Predictability from infancy and implications for preschool behavior. *Child Development, 65,* 1014–1027.

Willemsen, S. H. V., Bakermans–Kranenburg, M. J., Buitelaar, J. K., Van Ijzendoorn, M. H., & Van Engeland, H. (1998). *Insecure and disorganized attachment in children with autistic behavior: Related to social interaction and heart rate.* Unpublished manuscript, Utrecht University.

Zeanah, C. H., Boris, N. W., & Larrieu, J. A. (1997). Infant development and developmental risk: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 165–178.

Zeanah, C. H., Boris, N. W., & Scheeringa, M. S. (1997). Psychopathology in infancy. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 38,* 81–99.

Zevalkink, J. (1997). *Attachment in Indonesia. The mother–child relationship in context.* Ridderkerk, The Netherlands: Ridderprint.