Attachment & Human Development
2012; 1–30, i*First* article

Meta-analytic evidence for stability in attachments from infancy to early adulthood

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(*Received 28 April 2011; final version received 5 April 2012*)

The present meta-analysis integrates results from 127 papers on attachment stability towards mothers and fathers, respectively, from infancy to early adulthood. More than twenty-one thousand attachments ($n = 21{,}072$) and 225 time intervals were explored, ranging from half a month to 29 years (348 months). An overall coefficient of $r = .39$ between times T1 and T2 was obtained, reflecting a medium-sized stability of attachment security. However, no significant stability was found in intervals larger than 15 years. Coefficients are higher for time intervals of less than two years compared to time spans of more than five years, if attachments were assessed beyond infancy using representational rather than behavioral measures and if normal middle class as opposed to at-risk samples were involved. Furthermore, securely attached children at risk were less likely to maintain attachment security whereas insecurely attached children at risk most likely maintained insecurity.

Keywords: attachment; stability; meta-analysis; risk factors

Introduction

Attachment stability is a central topic in attachment research because attachment in infancy is considered an important predictor of later adjustment (e.g., Ainsworth & Bowlby, 1991; Crittenden, 2000; Solomon & George, 2008). Early attachment experiences, in particular, are thought to result in enduring internal structures of stored prototypical features (so called internal working models; IWMs) that are used to organize new experiences in a meaningful way, thereby determining how further attachment experiences are perceived and conceptualized (Lewis, Feiring, & Rosenthal, 2000). Thus, IWMs are considered to act as templates that organize current and filter future attachment experiences.

However, some levels of change of attachment patterns are not only possible but common. The notion of an internal working model includes centrally the idea that experiences and memories are capable of being "reworked". First, attachment research has shown that changes in the care giving environment (such as parental divorce) lead to changes of the IWM (e.g., Lewis et al., 2000). Second, childhood and adolescence is a time of dramatic biological, cognitive, emotional, and social changes (Siegler, Deloche, & Eisenberg, 2008). For example, the cognitive capacity of infants for internal representation of attachment relations is quite limited. Brain

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ISSN 1461-6734 print/ISSN 1469-2988 online

http://dx.doi.org/10.1080/14616734.2013.746257
http://www.tandfonline.com

development and associated cognitive development across childhood and adolescence enable to form increasingly abstract representations of attachment relationships and other concepts (Krawczyk, 2012) which are associated with re-evaluations of previous experiences. Third, change in attachment patterns can be expected when general developmental changes in the child are not met with corresponding changes in responses from attachment figures (NICHD Early Child Care Research Network, 2001). A fourth source of instability results from changes in the assessment methods from observations of dyadic behavior in infancy to the intrapsychic level used in older children and adolescents when individuals describe their attachment history and/or their current thoughts and feelings (Allen, 2008). Finally, the retest-reliability of measures of attachment is less than perfect which reduces the correlation of attachment measures across time (Solomon & George, 2008).

Up to now, two meta-analyses on the correlational stability of secure attachment in childhood and adolescence have been published. Fraley (2002) integrated 27 effect sizes from 23 papers that provided data on attachment security with the Strange Situation at 12 months and follow-ups at one month to 21-year intervals. He reported a weighted mean stability of secure-insecure classifications of $r(\phi) = .39$. Levels of stability tended to decline with larger length of time (from $r = 1.0$ for retests within one month to $r = .27$ in studies with intervals between 5 and 21 years). In addition, he found some evidence for higher stability in low risk samples ($r = .48$) than in high risk samples ($r = .27$), although he did not test whether this difference is statistically significant.

An unpublished meta-analysis by Vice (2005) pooled the results from 21 longitudinal studies that started between infancy and middle adulthood. This meta-analysis found average levels of attachment stability of $r = .27$ in studies that started at age one to six years. Differences between stability of attachment in samples with children at risk ($r = .32$) and with middle class families ($r = .38$) were small. However, risk status and age were confounded in that analysis.

Given the fact that a large number of studies have been published since these meta-analyses that include, in part, longer intervals (up to 29 years), the first goal of the present meta-analysis was to provide an update of available results on the stability of attachment. As a second goal, we wanted to examine the role of moderator variables of study characteristics that have not been addressed in previous meta-analyses, such as whether attachment is assessed at the behavioral or representational level or whether this assessment changed between the two points of measurement. Because the previous meta-analyses focused only on univariate effects of moderator variables that are, in part, interrelated (e.g., age at first assessment and length of interval between assessments), the third goal of the present study was to test with multivariate analysis whether univariate moderator effects remain significant after statistical control for confounders.

The influence of moderator variables

The following moderator variables were considered. The present study aims to investigate whether the stability of coefficients declines with longer time intervals. We expected increased time intervals between assessments would be associated with lower stability in attachment because longer time intervals provide greater opportunities for IWM changes than shorter time spans do (e.g., Lewis et al., 2000; NICHD Early Child Care Research Network, 2001; Teti, Sakin, Kucera, & Corns, 1996). Changes in attachment stability could be modeled as reverse J-shaped

(Fraley, 2002) because in the first weeks or months every change of attachment security means that individuals diverge from their initial pattern of attachment.

Attachment stability may also vary depending on the age of the child/adolescent when the first assessment takes place (T1). Bowlby (1973, 1980) proposed that, from infancy on, the quality of attachment should become increasingly stable and resistant against changes, due to a child's adaptation towards the interacting environment and his expectations regarding the emerging relationship. The present paper therefore assumes that comparisons based on T1 in infancy should cause greater instability than those based in middle childhood or adolescence.

Because previous meta-analyses left measurement effects unattended, the present paper aims to explore how attachment stability is affected by the assessments used, such as behavioral versus representational measures. We expected that larger stability would be found when attachment is assessed at both times of measurement with behavioral measures (such as the Strange Situation; Ainsworth, Blehar, Waters, & Wall, 1978) or representational measures (such as the Adult Attachment Interview; George, Kaplan, & Main, 1985), respectively, than in studies that use a behavioral measure at T1 and a representational measure at T2.

Furthermore, this study wanted to test whether attachment stability would be lower in at-risk samples (e.g., defined by poverty, child maltreatment, or parental divorce) than in samples with low risk. Results of previous meta-analyses were inconclusive (Fraley, 2002; Vice, 2005), possibly be due to the fact that risk factors may primarily trigger a change from secure to insecure attachment. However, the stability of IWMs of children with insecure attachment experiences may even be enhanced as a consequence of the children's coping strategies towards risks. In this paper, we expect children at risk to reveal a lower probability to remain securely attached than children without risks.

It may also be interesting to explore the attachment figures of the children, i.e. the mother and the father. The present paper therefore asks whether the stability of attachment towards the mother might be more robust than towards the father, because the different attachments seem to be of different importance. Similar questions are raised with respect to child's gender, even though no systematic gender differences in attachment security across the life-span seem to exist (Bakermans-Kranenburg & van IJzendoorn, 2009).

However, publication time and status of the studies to be analyzed might be important. Due to the fact that some of the oldest studies found very high rates of attachment stability (Connell, 1976; Waters, 1978), we aim to investigate whether cohort differences exist, reflecting differences in family characteristics as shown, for example, by increasing divorce rates (González & Viitanen, 2008) or differences in research methodology, such as a stronger focus on families at risk in more recent studies. Given the importance of stability issues for attachment theory (e.g., Crittenden, 2000; Solomon & George, 2008) it might also be possible that studies which do not find stability in attachment might risk publication. Thus, the present meta-analysis aims to investigate whether existing studies on attachment stability are compromised by a file-drawer problem (Lipsey & Wilson, 2001).

Methods

Sample

Papers were identified from the literature through electronic databases (PsycInfo, Medline, Google Scholar, Psyndex – search terms: attachment and [stability or continuity]), and cross-referencing of the individual papers and available review articles. In the present meta-analysis, papers were included if (1) longitudinal data on children's or adolescents' attachments with their biological parents as attachment figures or generalized attachment representation were available, (2) mean age of participants at the first assessment T1 was <19 years, and (3) stability coefficients were reported or could be computed from cross tabulations. Studies were excluded if they assessed attachment with romantic partners, peers, or nonparental caregivers.

The search in the electronic data bases and cross referencing identified 707 papers published until February 2012. If results on attachment-related interventions were reported, only data from the control group that did not receive this intervention were included. The majority of papers had to be excluded because they did not fulfill the criteria for inclusion ($N = 564$), were not available through interlibrary loan ($N = 3$), did not provide sufficient information for computing effect sizes ($N = 5$), or replicated results of other papers that had already been included in this meta-analysis ($N = 10$). We also tried to contact the authors of the papers that did not provide sufficient information for the computation of effect sizes, but they did not provide us with additional information. Finally, we were able to include the results from 127 papers (see Appendix 1). The full references are available from the first author.

We entered the number of participants of the longitudinal sample (inter-rater agreement $r = .95$), the mean age at first assessment (in months; $r = 1.00$), the length of the interval between the assessments (in months, $r = .93$), the level of assessment at each time of measurement (2 = representational assessment, 1 = behavioral assessment; K = .95), the risk status of the participants (2 = all children or a large part of them being at risk, 1 = no risk; K = .90), the percentage of female participants ($r = .93$), the year of publication ($r = 1.00$), publication status (2 = published, 1 = unpublished; $r = 1.00$), the implemented measures for assessing attachment (K = 1.00), the correlational coefficients describing associations of attachments at two adjunctive times T1 and T2 ($r = 91$), and the numbers of participants who remained securely attached, insecurely attached, and who changed from secure to insecure attachment and vice versa ($r = .95$).

If information on the correlational stability of attachment was provided for more than one interval, we entered the effect sizes separately because we were interested in whether the effect size would vary according to the length of the interval and age at assessment. However, in order to avoid a disproportional weight of these papers, we adjusted the weights of the individual effect sizes so that the sum of the weights of the effect sizes was equal to the weight of the paper as if only one effect size had been reported (Lipsey & Wilson, 2001). If separate data for children at risk and without risks were reported, we entered them separately into the analyses because we were interested in differences between these groups.

Measures

Attachment security was assessed with the Strange Situation and age-appropriate modifications (Ainsworth et al., 1978; 85 papers), the Attachment Q-Set (Waters & Deane, 1985; 21 papers), the Adult Attachment Interview (George et al., 1985; 13 papers), the Separation Anxiety Test (Bretherton, Ridgeway, & Cassidy, 1990; Kaplan, 1987; eight papers), and other measures (42 papers, see Appendix 1).

Risk status was described in terms of both social and biological risks. Under social risks, factors such as child maltreatment, parental divorce, maternal depression, parental alcoholism, and low socioeconomic status were considered. The birth of a sibling (Teti et al., 1996) and the transition to child care (Ahnert, Gunnar, Lamb, & Barthel, 2004) were also seen as social risk factors, as they indicate changes of the availability of the parents as attachment figures. In addition, biological risk factors were coded if chronic physical illness and disability were present in the child.

Statistical handling of the data

Meta-analytic calculations were performed in eight steps, using random-effects models and the method of moments which provides the best estimations (for computations, see Lipsey & Wilson, 2001). Similar to Fraley (2002), we (1) analyzed the stability of secure-insecure classifications rather than the stability of three- or four-category classifications (e.g., A, B, C or A, B, C, D) because each present data set allowed an unambiguous secure-insecure distinction to be made across times and methods. We computed effect sizes r (test-retest correlations) or the mathematically equivalent ϕ-coefficients for each assessed interval between T1 and T2. (2) The correlations were transformed, using Fisher's r, to z transformation. (3) We then calculated the mean z, weighted by N-3, with N being the sample size. In order to compare the mean effect sizes with effect sizes reported in the individual papers, the mean effect size z's were later converted into the original metric of product-moment correlations. (4) Significance of means was tested by dividing the weighted mean effect size by the standard error of the mean. (5) Homogeneity of effect sizes was computed using the Q statistic. (6) To test whether the results may be influenced by publication bias (a trend for nonsignificant results not to be published), we used the "trim and fill" procedure, which estimates an adjusted effect size in the presence of publication bias (Duval & Tweedie, 2000). (7) In order to test the influence of moderator variables, we used a method analogue to analysis of variance and weighted ordinary least squares regression analyses. If a significant moderator effects involved more than two groups, simple contrasts following the procedure by Rosenthal and Rubin (1982) were applied in order to determine significant differences between groups. (8) We computed odds ratios for analyzing the relative stability of secure versus insecure attachment

$$\mathrm{O}R = \frac{ps/(1-ps)}{pi/(1-pi)}$$

Whereas ps reflects the probability of staying securely attached, p_i is the probability of maintaining insecure attachment. Log odds ratios were then computed, which are approximately normally distributed with a mean of 0. The log odds ratios were weighted by the inverse of its squared standard error. Subsequently, tests for significance were computed according to steps 4–7.

Results

In total, the 127 included papers provided 225 effect sizes for which the distribution is shown in Figure 1. When we averaged the effect sizes across all papers, the

334	-.3	34
41	-.2	14
975421	-.1	24579
96544333	-0	3334456
99888776665542111000000	.0	0000011245567788899
988888886665443333211110	.1	0111333346668888889
998766664332222210000000	.2	00002223466899
99877766655543333332221110000	.3	00011233345567778
9999988877776655444433322100	.4	1234455667788
9888877666665554332222110000	.5	00012346789
99887777776554444221111000	.6	012357788
98886655554331111100	.7	13566788
2	.8	
2	.9	2
0	1	0
All effect sizes		Effect sizes of studies that started between the age of 12 and 24 months

Figure 1. Stem and leaf display of the effect sizes.

weighted mean correlation was $r = .39$ (95%-confidence interval [CI] .35 to .42, $Z = 19.87$, $p < .001$, $Q = 245.47$, n.s.). When we included intervals that only started in the second year of life, the weighted mean correlation was $r = .31$ (CI .25 to .35, $Z = 11.56$, $p < .001$; $Q = 142.38$, n.s.). According to Cohen's (1988) criteria for interpreting effect sizes, both coefficients are moderate. At both T1 and T2, about 58% of the subjects were securely attached to their mothers or fathers.

In searching for moderating effects of study characteristics, we first involved all available effect sizes and found that stability coefficients varied according to the length of time interval (Table 1, left part). With the exception of intervals larger than 180 months, all stability coefficients were significant. Simple contrasts indicated that the stability of attachment was lower in papers with intervals larger than 180 months than in papers with intervals of 1 to 60 months ($Q_B(1) = 13.63$, $p < .001$) as well as in studies with intervals of 60–180 months than in studies with shorter intervals ($Q_B(1) = 9.47$, $p < .005$).

Furthermore, the stability coefficients varied according to age at T1. Papers which assessed attachments at T1 when subjects were at age 6 years or older had higher coefficients than papers which started at ages of 1 to 5 years. Simple contrasts indicated that stability was lower when children were first assessed at age one to five years as opposed to 6–12 years ($Q_B(1) = 18.56$, $p < .001$) or 13 + years ($Q_B(1)$ 29.06, $p < .001$).

Stability coefficients also varied with regard to the use of assessment types for attachment. Coefficients were higher if representational rather than behavioral measures were used both at T1 and T2 ($Q_B(1) = 28.27$, $p < .001$). Coefficients were also higher if representational measures were used twice rather than using behavioral measures at T1 and representational measures at T2 ($Q_B(1) = 30.14$, $p < .001$).

As projective measures and parental ratings on the attachment security of their children may have limited validity (e.g., Solomon & George, 2008), we tested whether stability coefficients would vary between papers that used these measures as

Table 1. Moderating effects of study characteristics on the stability of secure attachment (univariate analyses).

	All studies							Studies with first assessment in infancy (< 24 months)						
Moderator	*k*	*N*	*r*	*LL*	*UL*	*Z*	*Q*	*K*	*N*	*r*	*LL*	*UL*	*Z*	*Q*
Length of time intervals							23.40***a							13.55*a
0–6 months	60	4207	.45	.38	.51	11.89***	81.51b	33	2039	.36	.26	.44	6.93***	38.87b
7–12 months	50	5200	.42	.35	.49	10.44***	46.60b	28	1363	.33	.21	.42	5.98***	24.99b
13–24 months	45	5946	.40	.32	.47	9.27***	44.34b	17	2245	.24	.10	.37	3.30**	21.45b
25–36 months	15	2505	.39	.26	.51	5.56***	10.94b	5	416	.39	.15	.59	3.12**	3.79b
37–60 months	18	1422	.45	.33	.56	6.63***	11.37b	12	484	.46	.32	.59	5.65***	11.53b
60–180 months	19	1008	.20	.08	.34	3.01**	12.45b	14	652	.22	.06	.36	2.69**	12.18b
> 180 months	18	784	.14	-.01	.29	1.85	15.47b	18	784	.14	-.01	.29	1.88	16.02b
Age at T_1							45.75***a							0.63a
1 year	73	4068	.32	.26	.39	9.61***	99.46*b	73	4068	.33	.26	.39	8.90***	82.75b
1–2 years	61	5224	.28	.21	.35	7.56***	58.63b	54	3915	.28	.20	.36	6.59***	41.60b
2–5 years	32	1721	.36	.27	.45	7.07***	27.10b	–						
6–12 years	28	4378	.53	.45	.60	11.06***	19.84b	–						
13+ years	31	5681	.55	.49	.61	13.21***	24.16b	–						
Types of assessment							36.92***a							1.60a
behavioral	119	8665	.34	.29	.39	12.85***	126.07b	86	6264	.33	.27	.39	10.07***	83.61b
behavioral to representat.	46	2106	.28	.19	.36	6.27***	52.03b	39	1719	.26	.16	.35	5.03***	42.54b
representational	58	10,301	.53	.48	.58	16.45***	46.18b	–						
Use of measures with limited validity							3.17a							0.09a
No	169	13,990	.37	.32	.41	15.35***	174.39b	109	7148	.31	.25	.37	10.29***	116.31b
Yes	49	7082	.44	.37	.51	10.72***	40.08b	18	835	.29	.15	.42	3.91***	12.72b
Measures							24.25***a							4.31*a
SS. structured interviews	114	7285	.30	.24	.35	10.35***	108.54b	83	1976	.26	.20	.33	7.74***	78.01b
Others	111	13,787	.47	.42	.51	18.09***	118.88b	44	6007	.39	.30	.46	8.48***	51.79b
Identical measures of security used							8.24**a							0.06a
No	82	6727	.31	.25	.38	9.18***	76.25b	65	4576	.30	.23	.37	7.69***	64.24b
Yes	143	14,345	.42	.38	.47	17.36***	148.13b	62	3407	.31	.24	.39	7.89***	64.74b

(*continued*)

Table 1. (*Continued*).

	All studies							Studies with first assessment in infancy (< 24 months)						
Moderator	*k*	*N*	*r*	*LL*	*UL*	*Z*	*Q*	*K*	*N*	*r*	*LL*	*UL*	*Z*	*Q*
Risk status							28.46^{***a}							7.40^{*a}
low risk	161	16,786	.44	.41	.48	20.08^{***}	163.45^{b}	82	4717	.36	.30	.42	10.70^{***}	84.23^{b}
high risk	64	4490	.22	.15	.30	5.93^{***}	59.57^{b}	45	2470	.21	.12	.30	4.53^{***}	44.30^{b}
Attachment figures							4.99^{a}							0.25^{a}
Mother	183	14,914	.37	.33	.41	16.19^{***}	185.66^{b}	112	6567	.31	.25	.36	10.46^{***}	112.97^{b}
Father	29	4428	.46	.37	.54	8.88^{***}	32.71^{b}	13	792	.27	.10	.42	3.15^{**}	14.12^{b}
Parents/ general represent.	13	1730	.47	.33	.59	5.93^{***}	5.53^{b}	2	624	.32	-.10	.64	1.51	2.12^{b}
Child gender							0.60^{a}							0.01^{a}
< 50% girls	89	6831	.36	.30	.42	10.96^{***}	79.74^{b}	50	4504	.29	.21	.37	6.73^{***}	48.40^{b}
≥50% girls	86	10,365	.39	.34	.45	12.27^{***}	96.93^{b}	43	2209	.29	.20	.37	6.03^{***}	48.76^{b}
Year of publication/presentation							0.60^{a}							1.28^{a}
< 1990	24	1082	.40	.28	.51	6.12^{***}	25.82^{b}	22	992	.37	.25	.48	5.53^{***}	24.87^{b}
1990–1999	80	4337	.37	.30	.43	10.36^{***}	73.47^{b}	47	2022	.30	.21	.39	6.49^{***}	42.78^{b}
2000–2012	121	15,653	.40	.35	.45	14.78^{***}	124.05^{b}	58	4969	.29	.21	.36	7.14^{***}	61.52^{b}
Publication status							0.01^{a}							0.43^{a}
unpublished	24	2401	.39	.28	.49	6.44^{***}	20.68^{b}	12	605	.25	.07	.42	2.75^{**}	7.48^{b}
published	201	18,671	.39	.35	.43	17.90^{***}	202.82^{b}	115	7378	.31	.26	.37	10.68^{***}	121.32^{b}

Notes: k = number of samples; N = number of participants, r = effect size; 95% UL/LL = lower and upper limits of 95% confidence interval (CI); Q = test for homogeneity of effect sizes. [a] Test of the homogeneity of effect sizes between conditions. [b] = Test of homogeneity of effect sizes within the condition. Significant score indicate heterogeneity. * $p < .05$; ** $p < .01$; *** $p < .001$.

compared to other papers. However, similar levels of stability were found in both groups. Because many attachment researchers suggest that the Strange Situation and structured interviews (such as the Adult Attachment Interview; George et al., 1985) are the best methods for assessing attachment (Crowell, Fraley, & Shaver, 2008; Solomon & George, 2008), we also compared stability coefficients from papers that used these measures and papers that used other assessments at least at one time point. The latter papers reported larger average effect sizes (Table 1).

Furthermore, papers focusing on children at risk revealed lower stability coefficients than low-risk papers (Table 1). We also tested whether attachment stability would vary between children with external/environmental versus internal/biological risk factors but found no significant differences ($Q(1,60) = 2.66$, n.s.).

Comparisons of attachments towards mothers, versus fathers, and of attachments not specifying attachment figures (e.g., pooled results from mothers and fathers or generalized attachments) did not reveal significant differences. Similarly, attachment stability did not vary in terms of gender, year of publication/presentation, and publication status (published vs. unpublished papers). The trim and fill procedure also found no evidence for a publication bias.

Because many of the analyzed factors were intercorrelated (Table 2) we computed a multiple linear regression analysis to highlight the most relevant factors. Only significant factors from univariate analyses were included, such as length of intervals, risk status, ages, and types of assessments. Two dummy variables were created for types of assessment, in order to compare papers consisting of two representational assessments at T1 and T2 and papers with shifts from behavioral to representational types of assessment, with papers that used behavioral assessments twice. As shown in Table 3, longer intervals were associated with lower stability, as were papers on children at risk. In addition, papers that used representational assessments for attachment throughout T1 and T2 showed higher stability than papers using behavioral assessments twice. Further factors were no longer significant predictors in multivariate analyses. Almost identical results were found for length of the interval when using a logarithmic transformation of the length which would represent a reverse J-shaped curve ($B = -.14$, $\beta = .29$, $Z = 4.06$, $p < .001$).

Furthermore, having secure attachment experiences led to higher stability than insecure attachment ($OR = 1.39$, CI 1.12 to 1.73, $Z = 3.03$, $p < .01$). As expected, the odds ratio of secure versus insecure attachment stability varied with regard to risk status ($Q(1,124) = 41.44$, $p < .001$), suggesting that children not at risk showed higher stability of secure attachment than of insecure attachment ($OR = 1.73$, CI 1.66 to 2.75, $Z = 5.86$, $p < .001$). Likewise, children at social risk showed less stability of secure attachment than of insecure attachment ($OR = .56$, CI .40 to .79, $Z = -3.29$, $p < .01$). In contrast, children with biological risks showed higher stability of secure than of insecure attachment ($OR = 3.27$, CI 1.39 to 7.20, $Z = 2.72$, $p < .01$). Furthermore, the odds ratio of secure versus insecure attachment was not affected by other study variables such as length of time intervals and types of measures.

Finally, we checked whether the results would be similar when including only papers that compared attachment security in the first or second year of life with later assessments. As shown in Table 1 (right part), similar significant effects on the stability of attachments, as opposed to papers focusing on older ages, were confirmed. However, age differences were no longer significant, probably due to the restricted age range. Similarly, no moderator effects of type of assessment and

Table 2. Intercorrelations of moderator variables.

	Variable	2	3	4	5	6	7	8	9	10	11	12	13
1	Interval	-.19*	−.43*	.62*	−.12	.08	.03	.06	.10	.04	−.04	−.38*	−.18*
2	Age group		−.48*	−.28*	.83*	.25*	−.39*	.69*	−.19*	−.33	.14	.29*	−.13
3	Behavioral assessment			−.54*	−.62*	−.42*	.33*	−.72*	.15*	.26*	−.12	−.44*	.19*
4	Behavioral to representational assessment				−.30*	.23*	−.01	−.12	.06	.10	.04	.18*	−.04
5	Representational assessment					.29*	−.39*	.85*	−.23*	−.40*	.13	.34*	−.13
6	Limited validity (1 = no, 2 = yes)						−.55*	.03	−.12	−.10	.25*	.27*	.02
7	Strange sit./structured interviews							−.62*	.34*	.17*	−.30*	−.28*	.06
8	Identical measures (1 = no, 2 = yes)								−.31*	−.36*	−.03	.36*	−.35*
9	Risk status (1 = no, 2 = yes)									.04	−.11	−.03	.02
10	Attachment to mothers (1 = yes, 0 = no)										.02	−.12	.06
11	% females											−.05	.04
12	Year of public.												−.14*
13	Publication status												

*$p < .05$.

Table 3. Moderating effects of study characteristics on the stability of secure attachment (multiple linear regression analysis).

Moderator	B	β	Z
Age group	.02	.09	0.82
Length of time intervals	−.05	−.27	−3.42***
Risk status (no risk = 1, risk = 2)	−.15	−.20	−3.34***
Types of assessment[1]			
Behavioral to representational assessment	.03	.04	0.47
Representational	.15	.22	2.02*
Use of Strange Situation or structured interviews (2 = yes, 1 = no)	−.07	−.11	−1.62
Identical measures (2 = yes, 1 = no)	−.06	−.08	−1.09
(Constant)	.56		6.93***
R^2	.26		
N	225		

Notes: [1]Reference category: studies that used behavioral measures at T_1 and T_2. R^2 = explained variance. N = number of cases. *$p < .05$; *** $p < .001$.

use of identical measures were found in these papers. As only three significant moderators were found in these univariate analyses, only length of interval (larger vs. smaller than 60 months), use of the Strange Situation and/or structured interviews, and risk status were included in a multiple linear regression analysis. Risk status ($B = -.17$, $\beta = -.24$, $Z = -2.67$, $p < .01$), use of the Strange Situation and/or structured interviews ($B = -.14$, $\beta = -.22$, $Z = -3.43$, $p > .001$), and length of interval ($B = -.04$, $\beta = -.23$, $Z = -3.87$, $p > .05$) were significant predictors of attachment stability, and explained 21% of the variability of the stability coefficients.

Discussion

In line with previous meta-analyses (Fraley, 2002; Vice, 2005), the present study found moderate average levels of attachment stability. However, the present study goes beyond previous meta-analyses by (1) focusing on longer intervals (up to 29 years), (2) showing that there is no significant correlational stability in intervals larger than 15 years, (3) showing that attachment stability varies by the age of the respondent at T1, (4) showing higher stability if studies use only representational measures rather than behavioral measures or shifting from behavioral to representational measures, (5) showing that social risk status has differential effects on the maintenance of secure versus insecure attachment, and (6) analyzing moderating effects of other study characteristics, such as the role of the attachment figure (father versus mother), child gender, and publication status.

Compared to the meta-analyses by Fraley (2002) and Vice (2005), the present paper found somewhat smaller stability coefficients when focusing on studies that started in infancy. Because the present meta-analysis involved a lot more papers, especially those tapping longer time intervals, lower stability coefficients appeared (e.g., Bahadur, 1998; Keppler, 2004).

Davila, Burge, and Hammen (1997) have suggested that attachment instability is most related to insecure attachment patterns because people whose attachment style fluctuates may not be certain about their level of security and therefore show lower levels of security than other individuals. In fact, our meta-analysis found that securely attached as opposed to insecurely attached individuals were, on average, more likely to maintain their attachment patterns. According to Lamb, Thompson, Gardner, and Charnov (1985), higher stability of secure than insecure attachments may also be based on a methodological artifact of the behavioral assessment as older infants might manifest fewer signs of insecurity. However, because the odds ratio of secure versus insecure attachment did not vary between papers that used behavioral as opposed to representational measures, the higher stability of secure attachment cannot be explained by types of measurement.

Furthermore, our results indicate that the stability of secure attachment drops considerably when focusing on intervals of more than five years, and on intervals of more than 15 years in particular. In contradiction to the meta-analysis by Fraley (2002), our long-term results support the revisionist perspective rather than the prototype perspective of attachment development because no significant stability was found in studies with longest intervals. The prototype model refers to a classical view in attachment theory that assumes that early representations of attachment (IWMs) are retained across development and have the potential to continue to shape adaptation. Although we observed lack of long-term stability of attachment security, the present data base would be insufficient for relinquishing the claim that there may be some long-term effects of early attachment patterns. First, only 18 effect sizes were available for intervals longer than 15 years. The correlation coefficient of $r = .14$ might become statistically significant if more long-term studies find similar effect sizes. Second, we have to be aware that the retest-reliability of measures of attachment is less than perfect which reduces the correlation of attachment measures across time. For example, studies with observational measures report average levels of inter-observer agreement of about .80 (Solomon & George, 2008), and some studies found low retest-reliability over short intervals (Ainsworth et al., 1978). Thus, test-retest coefficients across two time points are likely to underestimate the stability of attachment. Third, this meta-analysis focused on stability of secure attachment rather than on associations of early attachment patterns with other aspects of psychosocial development over longer time-intervals. These associations would have to be assessed in another meta-analysis.

Nonetheless, the observed lack of long-term stability may not be surprising, given the fact that childhood and adolescence is a time of dramatic biological, cognitive, emotional, and social change (Siegler et al., 2008) that affect the development of IWM. Socio-cognitive changes correspond to changes in the assessment of attachment security, and attachment as assessed with the Strange Situation is not simply a less developed version of attachment assessed with the Adult Attachment Interview (Allen, 2008). In addition, observational assessments of attachment have been found to be sensitive towards situational impact (Lamb et al., 1985), thus further reducing correlational stability.

Our results indicate that long-term stability of attachment is more likely to be expected after toddlerhood when IWM can be measured at the representational level through verbal responses. The observed age differences are in line with Bowlby's suggestion that IWMs of attachment become increasingly stable with increasing age (Bowlby, 1980), specifically during the first five years of life (Ammaniti, van

IJzendoorn, Speranza, & Tambelli, 2000). The observed stability of $r = .53$ to .55 after the age of 6 years is comparable to the mean correlational stability of adult attachment (toward the romantic partner; $r = .54$; Fraley & Brumbaugh, 2004).

Although it could be expected that the repeated use of the same measures would lead to higher correlational stability than the change of assessment methods, we only found such an effect in the univariate analysis in the total sample. As no such effect was found in studies that started in infancy and in multivariate analyses, elevated levels of stability were probably based on the repeated use of the same representational measures in older samples. Repeating the Strange Situation might not lead to elevated stability coefficients because infants are often less distressed at the follow-up, due to habituation effects or age-associated increase in competence (Lamb et al., 1985).

Whereas the meta-analysis by Vice (2005) and Fraley (2002) did not statistically test whether the stability of attachment security would be lower in children at risk, our analysis did so. We were able to show an elevated probability of shifting from secure to insecure attachment in children at social risk as opposed those without risks. Unfortunately, there was not a sufficient amount of data available in order to compare the effects of different social risk factors, such as parental divorce and child maltreatment. Children with biological risk factors, such as physical illness or failure to thrive, did not show an elevated probability of shifting from secure to insecure attachment, possibly because the social environment is more stable and many children finally overcome these risk factors.

In our meta-analysis, there were clear lacks of effects of child's gender, and attachment figures (mother vs. father) on attachment stability. Similarly, year of publication, and publication status did not vary with regard to attachment stability, indicating that results were robust against these study characteristics.

Some limitations of the present meta-analysis have to be mentioned. Firstly, our meta-analysis focused on the stability of secure versus insecure attachment, therefore leaving disorganized attachments unattended (see van IJzendoorn, Schuengel, & Bakerman-Kranenberg, 1999). Secondly, we were not able to analyze studies with time intervals longer than 29 years. Thirdly, we could not differentiate between permanent risk factors and risk factors that only emerged after the first measurement. Finally, we had to limit our analysis to the time interval between infancy and young adulthood, because no available longitudinal study has addressed intervals from childhood/adolescence to middle or late adulthood.

Nonetheless, several conclusions can be drawn from the present meta-analysis. Firstly, the stability of secure attachment in the first years of life is moderate, even when focusing on short time intervals. Secondly, there is not sufficient evidence for correlational stability of secure attachment in intervals over 15 years. Thirdly, higher stability coefficients are found beyond toddlerhood when IWMs of attachment can be assessed by representational assessments. Fourthly, children with secure as opposed to insecure attachments are prone to stability, as long as they do not face social risks. Surprisingly, less is known about defined risks. Hence, more research is needed here. Under which conditions are which risk factors most likely to result in change of attachment patterns? Furthermore, as the comparison of behavioral and representational measures indicates that the former may be less reliable, more efforts would be welcomed in order to increase the reliability of behavioral assessments. Finally, the low to moderate levels of correlative stability of attachment security indicate that there is room for change, for example, based on attachment-related interventions for families at risk. Recent studies on the effects of these interventions show promising results (Cicchetti, Rogosch, & Toth, 2006).

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Appendix 1. Characteristics of the included studies

Author	*N*	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	*r*
STUDIES WITH MULTIPLE PAPERS						
Berkeley Attachment Study						
Main (2001)	38	12	SS	216	AAI	.50
Main & Cassidy (1988)	40	72	SAT	1	SS	.63
Main, Kaplan, & Cassidy (1985)	40	12	SS	60	SS	.76 (M) .30 (F)
Main & Weston (1981)	15	12	SS	8	SS	.46 (M) .73 (F)
Berlin Day-Care Study						
Ziegenhain & Jacobsen (2000)	32	12	SS	60	IS	.45
Ziegenhain & Wolff (2000)	31	12	SS	6	SS	.26

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
Bielefeld Longitudinal Study						
Grossmann et al. (2002)	43	18	SS	102	ACRI	.37
Grossmann, Grossmann, & Kindler (2006)	38	12	SS	252	AAI	.00
Zimmerman, Fremmer-Bombik, Spangler, & Grossmann (1997)						
12 months olds	43	12	ASS	180	AAI	−.14
18 months olds	42	18	SS	174	AAI	.00
Regensburg Longitudinal Study						
Becker-Stoll (1997)	38	12	SS	180	AAI	.06 (M); .10 (F)
Becker-Stoll, Fremmler-Bomik, Wartner, Zimmermann, & Grossmann (2008)	37	72	SS	120	AAI Q-set	.01
Grossmann et al. (2006)	38	12	SS	246	AAP	.00
Keppler (2004)						
24 months interval	40	216	AAI	24	AAI	.50
48 months interval	39	192	AAI	48	AAP	.39
228 months interval	39	12	SS	228	AAP	−.15 (M) .02 (F)
Wartner, Grossmann, Fremmer-Bombik, & Suess (1994)	40	12	SS	54	AAI	.77
Zimmermann & Becker-Stoll (2002)	39	192	AAI	24	AAI	.56
Minnesota Parent–Child Project						
Egeland & Farber (1984)	189	12	SS	6	SS	.32
Egeland & Sroufe (1981)						
sample 1	32	12	SS	6	SS	.67
sample 2	25	12	SS	6	SS	.33
Vaughn, Egeland, Sroufe, & Waters (1979)	100	12	SS	6	SS	.37
Van Ruyzin, Carlson, & Stroufe (2011)	133	228	AAI	84	AAI	.20
Vaughn & Waters (1990)	58	15	SS	1	SS	.42
Waters, Merrick, Treboux, Crowell, & Albersheim (2000)						
at-risk sample	18	12	SS	240	AAI	.13
no-risk sample	32	12	SS	240	AAI	.57
Weinfield, Sroufe, & Egeland (2000)						
at-risk sample	13	12	SS	216	AAI	.59
no-risk sample	44	12	SS	216	AAI	−.05
Weinfield, Whaley, & Egeland (2004)	125	12	SS	216	AAI	.05

(*continued*)

Appendix 1. (*Continued*).

Author	*N*	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	*r*
OTHER PAPERS						
Ahnert, Gunnar, Lamb, & Barthel (2004)	56	15	SS	3	SS	.18
Aikins, Howes, & Hamilton (2009)						
36 months interval	83	12	SS	36	SS	.51
180 months interval	47	12	SS	180	AAP	−.12
Ainsworth, Blehar, Waters, & Wall (1978)	23	12	SS	0.5	SS	−.04
Allen, McElhaney, Kuperminc, & Jodl (2004)	101	191	AAI Q-set	26	AAI Q-set	.61
Ammaniti, Speranza, & Fedele (2005)						
51 months interval	35	12	SS	51	SS	.47
78 months interval	19	60	ASCT	78	AICA	.43
Ammaniti, van IJzendoorn, Speranza, & Tambelli (2000),						
sample 1, 12-month-olds	21	12	SS	126	AICA	.28
sample 1, 60-month-olds	21	60	SS	78	AICA	.21
sample 2	31	12	SS	52	SAT	.50
Atkinson et al. (1999)	53	26	SS	16	SS	.20
Aviezer, Sagi, Resnick, & Gini (2002)	53	14	SS	128	SAT	−.21
Bahadur (1998)	54	12	AQS	348	AAI	.01
Balluerka, Lacasa, Gorostiaga, Muela, & Pierrehumbert (2011)	141	185	CaMir-R	6	CaMir-R	.70
Bar-Haim, Sutton, Fox, & Marvin (2000)						
10 months interval	44	14	SS	10	SS	.37
34 months interval	45	24	SS	34	SS	−.19
44 months interval	43	14	SS	44	SS	.01
Barnett et al. (2006)	50	25	SS	16	SS	−.09
Barnett, Ganiban, & Cicchetti (1999)						
no-risk; 12 months old, 6 months interval	21	12	SS	6	SS	.44
no-risk; 12 months old, 12 months interval	20	12	SS	12	SS	.33
no-risk; 19 months old, 6 months interval	20	19	SS	6	SS	.50
at-risk; 12 months old, 6 months interval	18	12	SS	6	SS	.48
at-risk; 12 months old, 12 months interval	16	12	SS	12	SS	1.00

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
at-risk; 19 months old, 6 months interval	16	19	SS	6	SS	.30
Belsky, Campbell, Cohn, & Moore (1996)						
Pitt sample	90	12	SS	6	SS	−.03
PSU sample, M	125	12	SS	6	SS	.04
PSU sample, F	120	13	SS	7	SS	−.06
Bohlin, Hagekull, & Rydell (2000)	80	15	SS	81	SAT	.18
Bretherton, Ridgeway, & Cassidy (1990)						
12 months interval	29	25	AQS	12	ASCT	.61
19 months interval	29	18	SS	19	ASCT	.33
Brown (2009)	55	13	SS	23	AQS	.47
Buist, Reitz, & Dekovic (2008)	210	174	IPPA	24	IPPA	.77 (M) .60 (F)
Busch-Rossnagel, Fracasso, & Vargas (1994)	15	13	AQS	4	AQS	.56
Campini (2006)						
12 months interval	149	194	RQ	12	RQ	.57
24 months interval	149	194	RQ	24	RQ	.49
36 months interval	149	194	RQ	36	RQ	.26
Cassidy (1988)	50	74	SS	1	SS	.62
Cassibba, van IJzendoorn, & D'Odorico (2000)	26	27	AQS	1	AQS	.82
Cicchetti & Barnett (1991)						
maltreated children, 6 months interval	33	30	SS	6	SS	.06
maltreated children, 12 months interval	25	36	SS	12	SS	.12
maltreated children, 18 months interval	18	36	SS	18	SS	.48
control group (CG), 6 months interval	28	30	SS	6	SS	.30
CG, 12 months interval	15	30	SS	18	SS	.35
CG, 18 months interval	20	36	SS	12	SS	.49
Cicchetti, Rogosch, & Toth (2006)						
maltreated children	54	12	SS	16	SS	.00
CG	44	12	SS	14	SS	.23
Cicchetti, Toth, & Rogosch, (1999)						
CG: depressed mothers	36	20	AQS	16	AQS	.33
CG: nondepressed mothers	45	20	AQS	16	AQS	.29
Connell (1976)	47	12	SS	6	SS	.58

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
Davila & Cobb (2003)						
FPAI	94	217	FPAI	12	FPAI	.53
RQ	94	217	RQ	12	RQ	.63
Doyle, Lawford, & Markiewicz (2009)	374	181	RQ	24	RQ	.56 (M) .52 (F)
Dubois-Comtois, Cyr, & Moss (2011)	83	66	SS	36	DSCT	.55
Easterbrooks (1989)						
attachment with mothers	57	13	SS	7	SS	.11
attachment with fathers	59	13	SS	9	SS	.00
Edwards, Eiden, & Leonard (2004)	217	12	SS	6	SS	.26 (M) .20 (F)
Fagot & Pears (1996)	96	18	SS	12	SS	.71
Fish (2004)	82	15	SS	33	SS	.24
Forbes, Evans, Moran, & Pederson (2007)	71	12	SS	12	IBS	.30
Frodi, Grolnick, & Bridges (1985)	38	12	SS	8	SS	.13
Fury, Carlson, & Sroufe (1997)	61	15	SS	81	FD	.44
Ganiban, Barnett, & Cicchetti (2000)	30	19	SS	8	SS	.41
Gloger-Tippelt, Gomille, Koenig, & Vetter (2002)	27	13	SS	60	AR	.68
Goossens, van IJzendoorn, Tavecchio, & Kroonenberg (1986)	36	18	SS	1	SS	.52
Granot & Mayseless (2001)	27	132	DSCT	3	DSCT	.75
Green, Stanley, Smith, & Goldwyn (2000)	33	76	MCAST	6	MCAST	.63
Hamilton (2000)						
at-risk sample	23	12	SS	198	AAI	.63
no-risk sample	7	12	SS	198	AAI	.09
Hautamäki, Hautamäki, Neuvonen, & Maliniemi-Piispanen (2010)	33	12	SS	24	PAA	.78
Haverkock (2006)	58	18	SS	12	AQS	.35
Higgins, Jennings, & Mahoney (2010)						
12 months interval	383	144	EO	12	EO	.67 (M) .67 (F)
24 months interval	383	144	EO	24	EO	.56 (M) .58 (F)
36 months interval	383	144	EO	36	EO	.47 (M) .52 (F)

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
48 months interval	383	144	EO	48	EO	.43 (M) .44 (F)
Ho (2004)						
13-year-olds, 12-mo-int.	185	156	IPPA	12	IPPA	.55 (M) .61 (F)
13-year-olds, 24-mo-int.	185	156	IPPA	24	IPPA	.51 (M) .55 (F)
15-year-olds, 12-mo-int.	185	178	IPPA	12	IPPA	.67 (M) .75 (F)
Howes & Hamilton (1992a)	23	12	ASS	7	AQS	.20
Howes & Hamilton (1992b)						
sample 1, 18 months old, 6 month interval	61	18	AQS	6	AQS	.20
sample 1, 18 months old, 12 month interval	56	18	AQS	12	AQS	.18
sample 1, 18 months old, 18 month interval	50	18	AQS	18	AQS	.16
sample 1, 18 months old, 24 month interval	40	18	AQS	24	AQS	.22
sample 1, 24 months old, 6 month interval	56	24	AQS	6	AQS	.31
sample 1, 24 months old, 12 month interval	50	24	AQS	12	AQS	.09
sample 1, 24 months old, 18 month interval	40	24	AQS	18	AQS	.46
sample 1, 30 months old, 6 month interval	50	30	AQS	6	AQS	.14
sample 1, 30 months old, 12 month interval	40	30	AQS	12	AQS	.39
sample 1, 36 months old, 6 month interval	40	36	AQS	6	AQS	.32
sample 2	89	12	ASS	36	ASS	.45
Howes, Vu, & Hamilton (2011)	40	14	AQS	40	SSI	.18
Huang & Wu (1992)						
12 months old	56	12	AS1-3	12	AS1-3	.63
24 months old, 1 month interval	54	24	AS1-3	1	AS1-3	.69
24 months old, 12 month interval	49	24	AS1-3	12	AS1-3	.36
Jacobsen, Huss, Fendrich, Kruesi, & Ziegenhain (1997)						
12 months old	32	12	ASS	60	ASS	.34
18 months old	32	18	ASS	54	SS	.54
Kenny, Lomax, Brabeck, & Fife (1998) – M	240	168	PAQ	12	PAQ	.56 (M) .60 (F)

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
Kerns, Klepac, & Cole (1996)	32	132	SSC	1	SSC.	.75
Kerns, Tomich, Aspelmeier, & Contreras (2000)	75	108	SSC	24	SSC	.15 (M) .24 (F)
König, Gloger-Tippelt, & Zweyer (2007)	67	63	SS	16	Story telling	.40 (M) .40 (F)
Korntheuer, Lissmann, & Lohaus (2010)	85	12	SS	12	SS	.08
Larose & Boivin (1998)	298	207	IPPA	3	IPPA	.74 (M) .82 (F)
Lehman, Denham, Moser, & Reeves (1992)	23	12	SS	18	AQS	.11
Levendosky, Bogat, Huth-Bocks, Rosenblum, & von Eye (2011)	150	12	SS	36	SS	.12
Lewis, Feiring, & Rosenthal (2000)	84	12	SS	204	AIQ	−.17
Lieberman, Weston, & Pawl (1991) – control group	52	12	SS	12	AQS	.20
Lopez & Gromley (2002)	207	216	RQ	12	RQ	.33
Lounds, Borkowski, Whitman, Maxwell, & Weed (2005)	78	12	SS	48	SS	.29
Lyons-Ruth, Repacholi, McLeod, & Silva (1991)	46	12	SS	6	SS	−.03
Madigan, Ladd, & Goldberg (2003)	118	15	SS	71	FD	.61
Mangelsdorf, Plunkett, Dedrick, Berlin, & Meisels (1996)						
full-term births	39	14	SS	5	SS	.07
low birth weight	31	14	SS	5	SS	.16
Maris (2000)						
cleft lip and palate	24	12	SS	12	SS	−.24
cleft palate	22	12	SS	12	SS	−.33
healthy controls	61	12	SS	12	SS	.19
McCartney, Owen, Booth, Clarke-Stewart, & Vandell (2004)	1015	24	AQS	12	SS	.11
Minnis et al. (2010)	55	90	MCAST	1.5	MCAST	.73
Moss, Cyr, Bureau, Tarabulsy, & Dubois-Comtois (2005)						
no-risk sample	77	42	SS	24	SS	.64
at-risk sample	38	42	SS	24	SS	.58

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
Moss et al. (2011)	32	39	SS	2.5	SS	.22
Nguyen, La Marca, Ehlers, & Zulauf-Logoz (2007)	20	12	SS	96	SAT	.43
NICHD Early Child Care Research Network (2001)	1060	15	SS	21	SS	.05
Owen, Easterbrooks, Chase-Lansdale, & Goldberg (1984)	59	12	SS	8	SS	.13 (M) .14 (F)
Park & Yoo (1997)	12	16	SS	36	AQS	.76
Pederson & Moran (1996)	79	12	AQS	6	ASS	.67
Rauh, Ziegenhain, Müller, & Wijnroke (2000)	74	12	SS	9	SS	.62
Rice, Fitzgerald, Whaley, & Gibbs (1994)	54	216	IPPA	25	IPPA	.58
Ruvolo, Fabian, & Ruvolo (2001)	332	236	RQ	5	RQ.	.42
Sampson (2006)						
12 months old	161	12	SS	300	AAI	.07
19 years old	146	228	AAI	84	AAI	.20
Schneider-Rosen, Braunwald, Carlson, & Cicchetti (1985)						
no-risk sample	17	12	SS	6	SS	.48 (M) .35 (F)
at-risk sample	12	12	SS	6	SS	.08 (M) .13 (F)
Seifer et al. (2004)	601	18	SS	18	SS	.08
Shmueli-Goetz, Target, Fonagy, & Datta (2008)						
3-months interval	46	129	CAI	3	CAI	.69 (M) .64 (F)
12-months interval	33	129	CAI	12	CAI	.67 (M) .52 (F)
Spiejker, Neslon, & Condon (2011)	23	21	TAS-45	9	TAS-45	.68
Stievenart, Roskam, Meunier, & van de Moortele (2011)	399	55	ASCT	24	ASCT	.27
Stevenson-Hinde & Shouldice (1993)	72	30	SS	24	SS	.36
Symons, Clark, Isaksen, & Marshall (1998)	46	25	AQS	44	AQS	.44
Takahashi (1990)	60	12	SS	9	SS	.18
Target, Fonagy, & Shmueli-Goetz (2003)						

(*continued*)

Appendix 1. (*Continued*).

Author	N	Age in months (T_1)	Method (T_1)	Interval in months	Method (T_2)	r
3-months interval	46	132	CAI	3	CAI	.79 (M) .79 (F)
12-months interval	33	132	CAI	12	CAI	.65 (M) .60 (F)
Teti, Sakin, Kucera, & Corns (1996)	188	32	AQS	3	AQS	.71
Thompson, Lamb, & Estes (1982)	43	13	SS	7	SS	−.03
Touris, Kromelow, & Harding (1995)						
at-risk sample	20	16	SS	5	SS	−.17
no-risk sample	20	18	SS	4	SS	.22
Van Ryzin & Leve (2012)	363	168	IPPA/SS	36	AAS	.26
Vereijken, Riksen-Walraven, & Kondo-Ikemura (1997)	45	13	AQS	10	AQS	.18
Verschueren, St. Laurent, Dubois-Comtois, & Cyr (2005)	265	106	SSC	35	SSC	.28 (M) .37 (F)
Viguer, Cantero, Rico, & Serra (2009)						
at-risk sample	45	50	SAT	9	SAT	.33
no-risk sample	45	50	SAT	9	SAT	−.11
Vondra, Shaw, Swearingen, Cohen, & Owens (2001)	195	12	SS	6	SS	.31
Wendt (2002)	56	52	SS	47	SAT	.32
Wijnroks (1994)	35	12	SS	6	SS	.11
Wong et al. (2011)	121	32	AQS	15	ASCT	.36
Wright, Binney, & Smith (1995)	15	118	SAT	1	SAT	.23
Xue, Moran, Pederson, & Bento (2010)	61	13	SS	13	SS	.22
Youngblade, Park, & Belsky (1993)	72	12	AQS	24	AQS	.23 (M) .53 (F)

Notes: AAI = Adult Attachment Inventory, AAS = Adult Attachment Scale, ACST = Attachment Story Completion Test, ACRI = Attachment and Current Relationship Interview, AAP = Adult Attachment Projectives, AICA = Attachment Interview for Children and Adolescents, AIQ = Attachment Interview Q-Sort, AQS = Attachment Q-Set, AR = Attachment Representatives, AS1-3 = Attachment Scale for One-to-three-year-old Children, CAI = Child Attachment Interview, DSCT = Doll Story Completion Task, EO = Esbensen & Osgood, F = attachment with fathers, FPAI = Family and Peer Attachment Interview (Bartholomew & Horowitz, 1991), FD = family drawings, IBS = Interesting-but-Scary paradigm, IPPA = Inventory of Parent and Peer Attachment, IS = Imagined separation, M = attachment with mothers; MCAST = Manchester Child Attachment Story Task, PAA = Preschool Assessment of Attachment, RQ = Relationship Questionnaire (Bartholomew & Horowitz, 1991), PAQ = Parental Attachment Questionnaire, SAT = Separation Anxiety Test, SS = original or modified Ainsworth Strange Situation, SSC = Security scale (Kerns et al., 1996); SSI = Story Stem Interview.

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