

## Early Attachment Organization With Both Parents and Future Behavior Problems: From Infancy to Middle Childhood

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Links between children's attachment security with mothers and fathers, assessed in Strange Situation with each parent at 15 months ( $N = 101$ ), and their future behavior problems were examined. Mothers and fathers rated children's behavior problems, and children reported their own behavior problems at age 8 ( $N = 86$ ). Teachers rated behavior problems at age 6½ ( $N = 86$ ). Insecurity with both parents had a robust effect: "Double-insecure" children reported more overall problems, and were rated by teachers as having more externalizing problems than those secure with at least 1 parent. Security with either parent could offset such risks, and security with both conferred no additional benefits. High resistance toward both parents in Strange Situation may confer "dual risk" for future externalizing behavior.

Ever since Bowlby (1969/1982, 1973) introduced his groundbreaking ideas on early parent-child bonds, attachment theory and research have been among the most prominent and most productive themes in social-emotional development and developmental psychopathology. A large and rapidly growing body of research, including recent extensive meta-analytic reviews, has consistently supported the links between early security and insecurity in the child's early relationships and future adaptive and maladaptive developmental outcomes (Belsky & Nezworski, 1988; Brumariu & Kerns, 2010; DeKlyen & Greenberg, 2008; Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Sroufe, 1996, 2005; Thompson, 2006, 2008; Weinfield, Sroufe, Egeland, & Carlson, 2008). Several key gaps, however, remain in our understanding of early attachment as a predictor of future mental health.

In particular, few studies have examined the effects of the mother-child and father-child attachment for children's outcomes. The dearth of information on the implications of the child's attachment to the father for future mental health has been repeatedly underscored, including very recent

reviews. For example, Fearon et al. (2010) explicitly stated in their review of studies of attachment and children's externalizing behavior problems: "First, there were so few outcome studies that examined father-child attachment security that we were unable to include them in this meta-analysis. There is clearly an urgent need for further research into the contribution of father-child attachment security and insecurity to children's development" (p. 448). Brumariu and Kerns (2010), in their review of links between early attachment and internalizing symptoms, did include the few available studies on both parents, and concluded that attachment to the mother and to the father had a comparable impact. However, they also stated: "Assessing attachment to both parents is the exception rather than the norm of available research" (p. 195).

The few existing studies of implications of attachment to both parents for children's mental health are informative, but they have limitations. El-Sheikh and Buckhalt (2003) found that 6- to 12-year-olds' security with the mother and with the father had comparable relations with children's adjustment, reported by mothers and teachers. Noom, Dekovic, and Meeus (1999) reported similar findings for Dutch adolescents. Williams and Kelly (2005) reported a unique role for child-father security for teacher-reported externalizing behavior problems in adolescents. However, in all the above studies, parent-child attachment was assessed using

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children's self-reports (either Inventory of Parent and Peer Attachment [IPPA], Armsden & Greenberg, 1987; or Security Scale, Kerns, Klepac, & Cole, 1996), and attachment and outcomes were measured concurrently. In a short-term longitudinal study, Kerns, Tomich, Aspelmeier, and Contreras (2000), using Kerns Security Scale and teacher-rated outcomes 2 years later, found that children's self-reported attachment to their mothers predicted emotional health, and attachment to fathers—behavior regulation. Overall, however, the effects were relatively similar across the child's relationships with the two parents.

Although the above studies included children's security measures with both parents, not all of them have examined the joint effects, or configuration (insecurity or security with both parents, mixed or discordant attachment) on developmental outcomes. This issue is theoretically critical in several respects. For example, it is important from the developmental and clinical points of view to know whether security with one parent can buffer the child from potential adverse effects of insecurity with the other parent. It is also important to know whether an attachment organization concordant across both parents has additive or multiplicative effects (in other words, whether "double" security provides exceptional developmental benefits, or whereas "double" insecurity confers exceptional risks). Furthermore, given that the child's early attachment relationships are thought to provide templates for his or her internal working model of the self and the world, the process of integrating concordant or discordant early experiences is theoretically key (Bowlby, 1973; Bretherton, 1991).

The classic study (Main & Weston, 1981) examined infants' social relatedness with a stranger (a person in a clown costume) in four groups: infants secure with both parents, secure with the mother and insecure with the father, secure with the father and insecure with the mother, and insecure with both parents (based on the Strange Situation). Significant differences, anticipated on the basis of the attachment theory, were found: The first group had the highest, and the last group had the lowest relatedness scores, with the two other groups placing in the middle. In that study, however, the sample was small (44); the "outcome" measures were obtained concurrently to attachment with mothers (at 12 months), and prior to attachment with fathers, assessed at 18 months; finally, potential confounding effects of children's early temperament, including inhibition to the unfamiliar and sociability (often assessed as a response to unusually looking persons), were not examined.

In a rare longitudinal study that assessed attachment in the Strange Situation, Suess, Grossmann, and Sroufe (1992) examined many observed aspects of social competence and social information processing in 5-year-old children whose security with both parents had been measured in infancy. Early security, particularly with the mother, predicted a host of positive outcomes. Furthermore, where the joint effects of attachment to both parents were examined, children who were secure with both parents showed the best outcomes, and those who were insecure with both showed the worst outcomes. The mixed groups were in the middle, with children who were secure with their mothers showing better outcomes than those who were insecure. Unfortunately, the sample was small (30–35 for varying outcomes).

Verschueren and Marcoen (1999) examined teacher-rated measures of adjustment ( $N = 76$ ) and child-reported measures of self-representation ( $N = 49$ ) in 5-year-old Belgian children in four groups (secure with both parents, secure with the mother and insecure with the father, secure with the father and insecure with the mother, and insecure with both parents). The significant differences were between the first and the last groups. Children secure with both parents, compared to those insecure with both parents, scored significantly higher on peer competence, school adjustment, and positive view of self, and significantly lower on anxious or withdrawn behavior. In that study, the "outcome" measures and attachment were assessed concurrently; attachment was measured using story completion narratives (two series, one involving the "mother" and "child" dolls and one involving the "father" and "child" dolls).

Finally, few studies of children's early attachment and their mental health have employed well-established clinical interviews of children to assess their behavior problems. For example, in the reviews by Fearon et al. (2010) and Brumariu and Kerns (2010), the overwhelming proportion of studies have used questionnaires (typically completed by parents or teachers) to assess children's behavior problems. In one of the few studies that used children's clinical interviews, Moss et al. (2006) examined the links between 6-year-old children's attachment to their mothers (no fathers were included), observed in the separation–reunion procedure, and children's behavior problems 2 years later, rated by mothers and teachers, and reported by children themselves, using the instrument we have also adopted in the current research (the Dominic interview). Generally, insecure children had signifi-

cantly more externalizing and internalizing problems than secure children. Furthermore, whereas adults' and children's reports of externalizing problems converged, their reports of internalizing problems did not. That study underscored the importance of obtaining clinical data directly from children to complement data obtained from adult informants.

Given the critical importance of the still-debated role of the early parent-child bonds for children's future mental health, studies that make progress toward filling the remaining gaps are valuable. Our broad goal was to examine the links between children's early attachment organization and future behavior problems, while addressing some of the aforementioned lacunae in the extant research.

To our knowledge, this study is innovative in several respects. Few, if any, studies have examined the child's security organization with *both* parents in infancy, assessed using the "gold standard" (the Strange Situation), as predicting future behavior problems. Even fewer have employed four informants to assess the outcomes. Typically, data from one, two, and occasionally three informants have been available (e.g., Brumariu & Kerns, 2010; Moss et al., 2006). We report data on the child's behavior problems obtained from mothers, fathers, teachers, and the child him or herself. All data came from well-respected clinical instruments or interactive interviews. In particular, we focus on the early configuration of the child's security with both parents (insecure with both, secure with both, and secure with one but insecure with the other).

Based on the existing theory and evidence, we expected a combination of secure attachment with both parents at the end of the 1st year to be associated with the lowest level of self-reported behavior problems in middle childhood, whereas a combination of insecure attachment with both parents to predict the highest level of problems. We expected the mixed group (secure with one parent, insecure with the other) to place in between the two concordant groups.

In addition, we explored whether security with the mother or with the father could be considered "primary" in terms of the associations with future behavior problems. That issue has not yet been settled. Main and Weston (1981) and Suess et al. (1992) concluded that security with the mother appeared to play the primary role. However, significant societal and cultural changes have occurred since those studies were conducted that have led to fathers' greatly increased involvement in early child rearing. For example, Pleck (2010) reported that in 2000, fathers' interactive engagement time with

their young children was 94% higher than it had been in 1965, with most of the increase occurring since 1985. Indeed, newer studies yielded inconsistent results (Brumariu & Kerns et al., 2010; Verschueren & Marcoen, 1999).

Finally, in addition to the categorical approach to attachment organization with both parents, we have examined, in an exploratory manner, also continuous dimensions underlying the organization of attachment, based on interactive behaviors in the Strange Situation (Fraley & Spieker, 2003), as predictors of child behavior problems. In this approach, the child's attachment behavior may be described along two dimensions: proximity orientation (proximity seeking and maintenance) coupled with low avoidance and resistance. Although this strategy has been controversial, some have argued that the categorical and continuous approaches should be seen as complementary rather than competing models of attachment organization, and ideally, used together when appropriate (Cummings, 2003).

## Method

### *Participants*

Two-parent families of normally developing infants entered the study as volunteers in response to ads posted in community media and venues in eastern Iowa (a college town, a small city, and rural areas and towns). The families represented a broad demographic range. For mothers, almost 25% had a high school education (or less), 54% had an associate or college degree, and 21% had postgraduate education. The corresponding figures for fathers were: almost 30%, 51%, and 20%. They also ranged in annual family income: 8% made less than \$20,000, 17% made between \$20,000 and \$40,000, 26% made between \$40,000 and \$60,000, and 49% made over \$60,000.

Regarding ethnic background, 90% of mothers were White, 3% Hispanic, 2% African American, 1% Asian, 1% Pacific Islander, and 3% Other non-White. Among fathers, 84% were White, 8% Hispanic, 3% African American, 3% Asian, and 2% Other. In 20% of families, one or both parents were non-White.

In this article, we focus on data from the assessments at 15 months ( $N = 101$ , 51 girls), at age 6½ (or 80 months) on average ( $N = 90$ , 43 girls), and at age 8 (or 100 months) on average ( $N = 87$ , 41 girls). There were two sessions in the laboratory at 15 months, each approximately 1½ hr long, one with each parent, in a randomized order, typically

conducted within 2–3 weeks from each other (each session encompassed also assessments of parent–child interactions and children’s temperament, not used in this report). There was one 1½-hr laboratory session at age 8 (from age 6½, we report only teachers’ data). At 15 months, the standard Strange Situation procedures were conducted with each parent, during separate sessions, to assess the child’s attachment security. At age 8, the focus was mostly on obtaining questionnaire measures from the parents and laboratory measures from the child, including the clinical interview (Dominic-R). Behavior problem data reported here were available from 86 mothers, 82 fathers, 86 teachers, and 86 children. All sessions were conducted by female visit coordinators, and videotaped for future coding. The families were compensated for their time and effort throughout the study, at the rate of approximately \$30–\$35 hr. Teachers received \$20 for completing the questionnaires.

#### *Children’s Attachment Security at 15 Months*

The Strange Situation (Ainsworth & Wittig, 1969) was conducted as the first procedure during the laboratory session, according to the standard guidelines and in a room that met the required specifications. Data were coded by professional coders at another university, blind to all other information about the participants (one coder coded a given child with one parent only). Coding reliability, kappas, were .78 for the four main attachment categories (avoidant, A; secure, B; resistant, C; and disorganized or unclassifiable, D/U), and .85 for the coding of secure versus insecure attachment. All cases coded with low confidence by one coder and all D/U cases were double-coded and adjudicated. Children’s interactive behaviors (1–7, proximity seeking, proximity maintenance, avoidance, and resistance) were coded in Episodes 5 and 8, the reunions, and the D rating (1–9) was coded for the entire procedure. Reliability, alphas, were above .90 for interactive behaviors and above .80 for the D rating.

Fifty-six children were rated as secure (B) with *mothers*, and 45 were rated as insecure (12 A, 19 C, and 14 D/U). Sixty-six children were rated as secure (B) with *fathers* and 34 were rated as insecure (15 A, 6 C, and 13 D/U; parents of one child who had been very upset during the paradigm with the mother declined to participate in the father–child paradigm). There were no significant differences in the distribution of security versus insecurity in girls and boys with mothers, Pearson  $\chi^2(1) = 2.22$ , *ns*, or fathers, Pearson  $\chi^2(1) < 1$ . The organization

of the child’s attachment with the mother was unrelated to that with the father, whether examined as secure versus insecure, Pearson  $\chi^2(1) = 1.67$ , *ns*, or using all four categories, A, B, C, and D/U; Pearson  $\chi^2(9) = 10.37$ , *ns*. There were no effects of the order of the session (mother or father first) on security with the mother or the father—both Pearson  $\chi^2(1)$  values  $< 1$ .

When *attachment organization to both parents* was considered, 40 children were secure with both mothers and fathers (33 of whom returned for the assessment at 100 months and participated in the clinical interview), 18 were insecure with both (17 returned), and 42 were mixed—secure with one parent and insecure with the other (35 returned). In the mixed group, 26 were insecure with the mother and secure with the father (21 returned), and 16 were secure with the mother and insecure with the father (14 returned). One child who returned at 100 months had participated in the Strange Situation with the mother only, and thus was not included in some of the analyses.

The scores for children’s interactive behaviors, averaged across Episodes 5 and 8, were as follows: For children with mothers, for proximity seeking,  $M = 3.73$ ,  $SD = 1.44$ ; for proximity maintenance,  $M = 2.80$ ,  $SD = 1.55$ ; for avoidance,  $M = 2.32$ ,  $SD = 1.20$ ; and for resistance,  $M = 1.92$ ,  $SD = 1.20$ ; and for children with fathers, for proximity seeking,  $M = 3.47$ ,  $SD = 1.49$ ; for proximity maintenance,  $M = 2.65$ ,  $SD = 1.74$ ; for avoidance,  $M = 2.50$ ,  $SD = 1.47$ ; and for resistance,  $M = 1.51$ ,  $SD = .86$ .

#### *Comparison of Families That Did and Did Not Return at Age 8*

There were no significant differences in the distribution of security versus insecurity with either parent, as assessed by chi-square, between families that did and did not return.

#### *Parent-Reported Child Behavior Problems, Age 8, and Teacher-Reported Child Behavior Problems, Age 6½*

*Child Symptom Inventory–4* (CSI–4; Gadow & Sprafkin, 2002; Gadow, Sprafkin, & Nolan, 2001; Sprafkin, Gadow, Salisbury, Schneider, & Loney, 2002) was used. It is a well-established instrument that corresponds to *DSM–IV* (American Psychological Association, 2000). As reported by Gadow and Sprafkin (2002), Cronbach’s  $\alpha$ s for the specific scales in the parent checklist ranged from .74 to .94, and test–retest correlations over 4 weeks ranged from .46 to .87 (all  $ps < .0001$ ); the respective ranges for the

teacher checklist were .70 to .96 and .47 to .88 (over 2 weeks).

For both parents' and teachers' forms, we used Symptom Severity scoring, where each item is rated from 0 (*never*) to 3 (*very often*). For each informant (mother, father, teacher), we created the scores for *externalizing behavior problems* and *internalizing behavior problems*. The externalizing score was the sum of oppositional defiant disorder (e.g., defies, refuses, and deliberately annoys) and conduct disorder (e.g., bullies others and lies). The internalizing score was the sum of depression (e.g., depressed for most of the day), generalized anxiety disorder (e.g., has difficulty controlling worries), specific phobia (shows excessive fear to specific objects or situations), obsessive-compulsive disorder (e.g., feels compelled to perform unusual habits), post-traumatic stress (has experienced an extremely upsetting event), tic disorder (makes unusual movements or sounds), social phobia (e.g., excessively shy), and separation anxiety (e.g., very upset when expects to be separated from home or parents).

#### *Children's Self-Reported Behavior Problems, Age 8*

During the laboratory visit, the visit coordinator, having established good rapport with the child, administered the interactive, computerized version of Dominic-R (Arseneault, Kim-Cohen, Taylor, Caspi, & Moffitt, 2005; Bergeron et al., 2000; Breton, Bergeron, Valla, Berthiaume, & Gaudet, 1999; Shojaei et al., 2009; Valla, Bergeron, Bérubé, Gaudet, & St-Georges, 1994; Valla, Bergeron, & Smolla, 2000). Dominic-R is approximately 30-min-long, vignette-based, visual-auditory clinical interview instrument, appropriate for 6- to 11-year-olds. Robust psychometric qualities have been established in past studies, many with large samples. The vignettes depict specific behavior problems. Based on the child endorsing the vignettes as descriptive of him or her (yes or no), the interview produces behavior problem scores designed to map onto *DSM-IV* disorders: Three externalizing problems scales (oppositional defiant disorder, conduct disorder, attention deficit, and hyperactivity disorder) and four internalizing problems scales (separation anxiety, generalized anxiety disorder, specific phobias, and depression; Valla, 2000).

The externalizing scores cohered (Cronbach's  $\alpha = .75$ ), and so did the internalizing scores ( $\alpha = .79$ ), supporting the respective broad-band scales: the sum of externalizing problems and the sum of internalizing problems. The means (see Table 1) were consistent with data reported by

Moss et al. (2006). However, in contrast to Moss et al.'s study, where the two scores correlated .52, in our study, the scores were highly correlated,  $r(86) = .82$ ,  $p < .0001$ . Consequently, we decided that it would not be appropriate to examine them separately. Thus, the overall sum of total problems was used as the main outcome measure (except for the descriptive analysis of the correspondence among informants and intrainformant correlations). Table 1 presents all descriptive data for behavior problems measures.

## Results

### *Preliminary Analyses*

In the preliminary analyses, we examined the correlations among the child's behavior problem scores as reported by the four informants: the mother, the father, the teacher, and the child. Those are presented in Table 2.

For the adult informants, there were significant but moderate correlations between the ratings of externalizing and internalizing behavior problems, ranging from .31 for mothers to .45 for teachers. As mentioned earlier, for children's self-reports, that correlation was very high, and consequently, in the following analyses, we retained the separate scores for parents and teachers, but we used the total score for children.

The parents were in significant agreement with each other regarding the child's externalizing and internalizing problems, but their ratings did not correspond with teachers' perceptions or children's self-reports. Teachers' ratings and children's self-reports, however, did correspond, both for externalizing and internalizing problems.

We additionally examined the correlations between children's self-reported *total* problems score and the other informants' reports (not included in Table 2 due to its redundancy with self-reported externalizing and internalizing scores). Those total scores significantly correlated only with teachers' reports:  $r(82) = .40$  with teacher-rated externalizing problems and  $r(82) = .32$  with teacher-rated internalizing problems, both  $ps < .005$ .

### *Children's Attachment Security With Both Parents at 15 Months and Parent-, Teacher-, and Child-Reported Behavior Problems at Ages 6½ and 8*

We conducted the analyses of variance (ANOVAs), where mother-, father-, teacher-, and child self-reported behavior problems were the dependent

Table 1

Descriptive Data for Mother-, Father-, Teacher-, and Child-Reported Behavior Problems for the Whole Sample and by Attachment Group (Secure With Both Parents, Insecure With Both Parents, and Mixed, as Assessed in Strange Situation at 15 Months)

	Attachment group, N = 100							
	Whole sample		Secure with both parents n = 40		Insecure with both parents n = 18		Mixed n = 42	
	M	SD	M	SD	M	SD	M	SD
At age 8, N = 86								
Mother report								
Externalizing	6.67	4.25	6.18	3.62	8.06	5.61	6.50	4.10
Internalizing	9.22	7.34	10.50	9.72	7.76	3.44	8.56	5.90
At age 8, N = 82								
Father report								
Externalizing	6.26	3.68	6.29	3.63	6.50	4.27	6.18	3.56
Internalizing	10.57	7.35	11.61	6.82	8.56	5.85	10.38	8.39
At age 6½, N = 86								
Teacher report								
Externalizing	2.13	3.66	1.37	2.67	4.60	5.80	1.89	3.00
Internalizing	4.15	3.23	3.57	2.64	5.13	3.50	4.29	3.64
At age 8, N = 86								
Child self-report								
Externalizing	8.81	7.70	7.52	5.04	15.29	10.72	6.94	6.64
Internalizing	15.73	10.83	15.55	10.00	21.94	12.34	13.14	9.94
Total	24.55	17.68	23.06	14.06	37.24	22.55	20.09	15.80

Note. Mother, father, teacher reports = CSI-4; child self-report = Dominic-R.

Table 2

Intercorrelations Among Mother-, Father-, Teacher-, and Child-Reported Behavior Problems Scores

	Mother report, age 8		Father report, age 8		Teacher report, age 6½		Child self-report, age 8	
	EXT	INT	EXT	INT	EXT	INT	EXT	INT
Mother report, age 8								
EXT	—	.31**	.55***	.19 <sup>†</sup>	.09	-.08	.16	.11
INT	—	—	.16	.55***	-.01	-.01	.10	.11
Father report, age 8								
EXT	—	—	—	.37***	.03	-.07	.09	.08
INT	—	—	—	—	.08	.08	.15	.16
Teacher report, age 6½								
EXT	—	—	—	—	—	.45***	.41***	.36***
INT	—	—	—	—	—	—	.32**	.29**
Child report, age 8								
EXT	—	—	—	—	—	—	—	.82***

Note. EXT = externalizing problems, INT = internalizing problems; mother, father, teacher = CSI-4; child = Dominic-R.

<sup>†</sup>p < .10. \*\*p < .01. \*\*\*p < .001.

variables, and the organization of security (secure with both parents, insecure with both parents, and mixed—secure with one but insecure with the other) and child gender were the between-subject factors. The main effects of the organization of security were

significant for two outcomes: teacher-reported externalizing problems,  $F(2, 79) = 3.15, p < .05$ , a medium to large effect size, indicated by  $\eta^2 = .10$ , and for child self-reported total problems,  $F(2, 79) = 7.12$ , a large effect size,  $\eta^2 = .13$ . According to Cohen (1988,

pp. 285–287), the following  $\eta^2$  denote effect sizes: small = .0099, medium = .0588, and large = .1379.

For those two outcomes, the least significant difference (LSD) post hoc tests were used to examine pairwise differences among the three groups (secure with both, insecure with both, mixed). The estimated marginal means and 95% CIs for the teacher-reported externalizing problems were 1.44 [.28, 2.61] for secure with both, 4.17 [2.35, 6.00] for insecure with both, and 2.00 [.83, 3.17] for mixed. Teachers rated children who had been insecure with both parents as having significantly more externalizing problems than those who had been secure with both parents (difference of estimated marginal means was 2.73,  $SE = 1.10$ ,  $p < .025$ ), and more than those who had been mixed (difference of estimated marginal means was 2.17,  $SE = 1.10$ ,  $p = .052$ ). The latter two groups were not rated significantly different from each other (difference of estimated marginal means was .56,  $SE = .83$ , *ns*). Thus, being secure with at least one parent appeared to have a significant beneficial effect.

The estimated marginal means and 95% CIs for the child's self-reported total problems were 22.92 [17.16, 28.68] for children secure with both, 38.46 [30.28, 46.64] for insecure with both, and 19.63 [14.00, 25.25] for mixed. Children who had been insecure with both parents reported significantly more total problems than those who had been secure with both parents (difference of estimated marginal means was 15.54,  $SE = 5.05$ ,  $p < .01$ ), and significantly more than those who had been mixed (difference of estimated marginal means was 18.83,  $SE = 5.04$ ,  $p < .001$ ). The latter two groups were not significantly different from each other (difference of estimated marginal means was 3.29,  $SE = 4.04$ , *ns*). Thus, being secure with at least one parent appeared to have a significant beneficial effect.

We also conducted analogous ANOVAs for four rather than three groups, separating the mixed group into two subgroups: insecure with the mother and secure with the father, and secure with the mother and insecure with the father. For the teacher-reported externalizing problems, the effect of group remained significant at the marginal level,  $F(3, 77) = 2.18$ ,  $p < .10$ ,  $\eta^2 = .10$ . The estimated marginal means of the two mixed groups, 2.47 and 1.73, respectively, were not significantly different from each other (LSD test).

For the child self-reported total problems, the effect of group remained significant,  $F(3, 77) = 4.75$ ,  $p < .01$ ,  $\eta^2 = .14$ . The estimated marginal means of the two mixed groups, respectively, 20.88 and 18.81 were not significantly different from each other (LSD test).

*Children's Attachment Security With Mothers and Security With Fathers at 15 Months and Parent-, Teacher-, and Child-Reported Behavior Problems at Ages 6½ and 8*

We further probed (a) if the apparent effect of insecurity with both parents was additive or interactive in nature, and (b) if it was possible to determine whether security with the mother or with the father had a primary, uniquely important effect of offsetting risks for behavior problems, compared with children who were insecure with both parents. To that end, we examined security with each parent and their interaction as separate predictors (again controlling for child gender; see Table 3).

In hierarchical multiple regressions, the children's behavior problems were the dependent

Table 3  
*Attachment Organization With Mothers and Fathers at 15 Months (Insecurity vs. Security in Strange Situation) as Predictors of Mother-, Father-, Teacher-, and Child-Reported Behavior Problems: Hierarchical Multiple Regressions*

Child gender	Predictors			
	Attachment Organization		Attachment Organization	
	w/M	w/F	w/M × Attachment Organization w/F	
Dependent variable				
Mother report, age 8				
EXT	.15	.01	-.22	.04
INT	-.11	.08	-.02	.09
Father report, age 8				
EXT	.06	.08	-.10	.01
INT	-.04	.26	.01	-.07
Teacher report, age 6½				
EXT	.22*	-.23	-.31*	.19
INT	.17	.06	-.14	-.10
Child self-report, age 8				
TOT	-.15	-.49**	-.54***	.60**

Note. M = mother; F = father; EXT = externalizing problems (CSI-4); INT = internalizing problems (CSI-4); TOT = total problems (Dominic-R). The reported values are Betas from the final equations, with all the predictors entered. The order of entry was as follows: Step 1, child gender; Step 2, attachment organization with mother and with father; Step 3, Attachment Organization With Mother × Attachment Organization With Father. Child gender was coded as 0 = girl and 1 = boy; attachment organization as 0 = insecure and 1 = secure.  
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

variables. Child gender was entered in Step 1. Security with the mother and security with the father (0 = insecure, 1 = secure) were added in Step 2. The interaction term of security with the mother and the father was entered at Step 3.

The findings were consistent with the ANOVAs. There were no significant findings for parents' reports. There was one significant main effect for teachers' reports: Teachers perceived children who had been insecure with their fathers as having more externalizing problems,  $M = 3.50$ ,  $SD = 4.76$ , than those who had been secure,  $M = 1.49$ ,  $SD = 2.82$  (however, there was no interaction effect).

For children's self-reported total behavior problems, in the final equation, there were three significant predictors: security with the mother, security with the father, and their interaction (which qualified the main effects). To determine if security with one parent could be considered uniquely important or "primary," we probed the interaction effect using simple slopes (Aiken & West, 1991). Figure 1 depicts security with the mother as the independent variable and security with the father as the moderator, and Figure 2 depicts security with the father as the independent variable and security with the mother as the moderator.

In Figure 1, the simple slope for the children who had been insecure with their fathers was significant,  $b = -17.54$ ,  $SE = 6.26$ ,  $p < .01$ , but for the

children who had been secure with their fathers, it was not,  $b = 4.04$ ,  $SE = 4.76$ ,  $ns$ . For the children who were insecure with their fathers, security with their mothers was significantly associated with the decrease in behavior problems, but there was no such association for the children who were secure with the fathers.

Figure 2 depicts analogous findings: The simple slope for the children who had been insecure with their mothers was significant,  $b = -19.54$ ,  $SE = 5.63$ ,  $p < .001$ , but for the children who had been secure with their mothers, it was not,  $b = 2.04$ ,  $SE = 5.39$ ,  $ns$ . For the children who were insecure with their mothers, security with their fathers was significantly associated with the decrease in behavior problems, but there was no such effect for the children who were secure with the mothers.

*Continuous Dimensions of Children's Attachment Organization With Mothers and Fathers at 15 Months and Parent-, Teacher-, and Child-Reported Behavior Problems at Ages 6½ and 8*

We examined children's continuous scores, based on interactive behaviors in Strange Situation, as predictors of behavior problems. We followed the specific instructions by Fraley and Spieker (2003, p. 400, footnote 8) regarding the creation of the two dimensions, for the child with each parent: (a) the

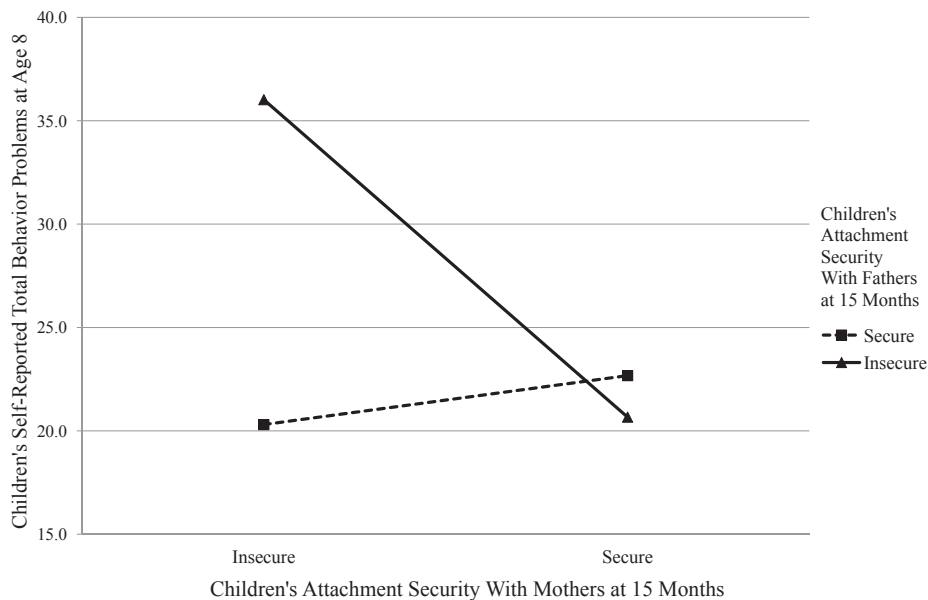


Figure 1. Children's attachment security with fathers at 15 months moderates the effect of security with mothers at 15 months on children's self-reported total behavior problems at age 8. Note. Children's gender was covaried. Solid line represents a significant simple slope; dashed line represents a nonsignificant simple slope.



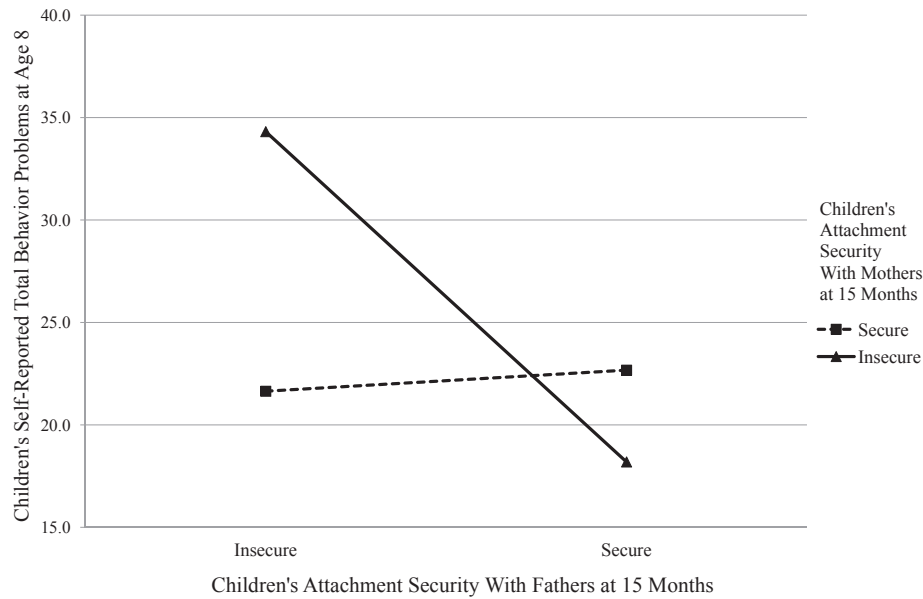


Figure 2. Children's attachment security with mothers at 15 months moderates the effect of security with fathers at 15 months on children's self-reported total behavior problems at age 8.

Note. Children's gender was covaried. Solid line represents a significant simple slope; dashed line represents a nonsignificant simple slope.

mean of avoidance (reversed), proximity seeking, and proximity maintenance, and (b) resistance. The scores were first averaged across Episodes 5 and 8 (the reunions), and then standardized. We also created two interaction terms (the score for each dimension with the mother by the score for the same dimension with the father).

We conducted a hierarchical multiple regression for each behavior problem outcome measure. Child gender was entered in Step 1, followed by the scores on the two dimensions for the mother and the same scores for the father in Step 2, and by the two interaction terms in Step 3.

Overall, the findings were modest, with one exception: There was a significant interaction effect. Resistance With the Mother  $\times$  Resistance With the Father predicted teacher-rated externalizing problems,  $\beta = .28$ ,  $p < .025$  (in the final equation, with all predictors entered). This effect, probed using simple slopes (Aiken & West, 1991), is graphed in Figure 3.

Resistance with the mother was the independent variable and resistance with the father was the moderator (we conducted also analyses that paralleled the analyses of security-insecurity in Figures 1 and 2, where we switched the independent variable and the moderator, but in those, neither slope was significant). High resistance was represented by the score 1 *SD* above the mean, and low resistance by 1

*SD* below the mean. The simple slope for the children who had been highly resistant with their fathers was significant,  $b = 1.40$ ,  $SE = .56$ ,  $p < .025$ , but for the children who had been low on resistance with their fathers, it was not,  $b = -.28$ ,  $SE = .62$ , *ns*. In other words, for the children who had been highly resistant with their fathers, high resistance with the mothers was significantly associated with the increase in teacher-rated externalizing problems, whereas low resistance with the mothers served as a protective factor. But for children who showed little resistance with the fathers, the amount of resistance with the mothers had no effect on teacher-rated behavior problems.

#### *Children's Attachment Disorganization With Mothers and Fathers at 15 Months and Parent-, Teacher-, and Child-Reported Behavior Problems at Ages 6½ and 8*

Due to the rapidly growing interest in disorganized attachment and subsequent child psychopathology (e.g., Fearon et al., 2010; Lyons-Ruth & Jacobvitz, 2008), we also explored, in a preliminary fashion, the links between disorganization in the Strange Situation and future problem behaviors. We conducted two sets of regressions for each of the seven behavior outcomes. In the first set, child gender was entered in Step 1, followed by the

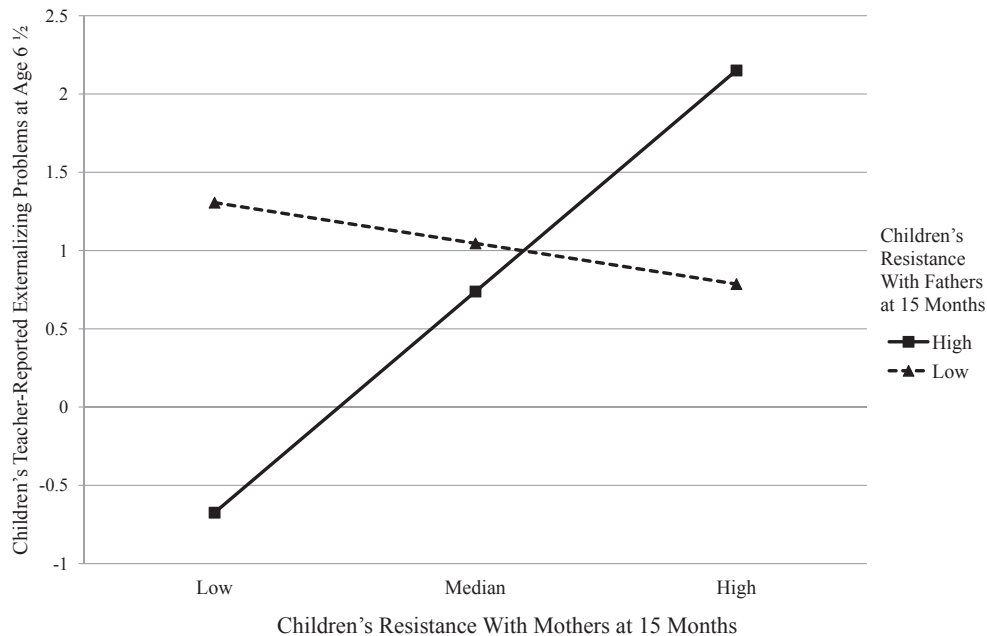


Figure 3. Children's resistance with fathers at 15 months moderates the effect of resistance with mothers at 15 months on children's teacher-reported externalizing problems at age 6½.

Note. Children's gender was covaried. Solid line represents a significant simple slope; dashed line represents a nonsignificant simple slope.

(standardized) D ratings with the mother ( $M = 2.15$ ,  $SD = 1.97$ ) and the father ( $M = 1.81$ ,  $SD = 1.67$ ) in Step 2, and the interaction of the two ratings in Step 3. There was only one significant effect associated with disorganization: Children who were more disorganized with their fathers were seen by their mothers, at age 8, as having more externalizing problems,  $\beta = .26$ ,  $p < .05$ .

The second set of regressions was parallel, but the continuous D ratings were replaced with the dichotomous scores, D (0 = D, 1 = not D). There was again only one significant effect associated with disorganization, fully consistent with the analyses of the continuous scores: Disorganized attachment with the father predicted more externalizing problems seen by the mother at age 8,  $\beta = -.60$ ,  $p < .01$ .

### Discussion

This study adds to our understanding of the key role of early attachment for developmental trajectories of mental health from infancy to middle childhood. Few studies of early attachment's implications for future behavior problems have included both parents and few have linked attachment in infancy with mother-, father-, teacher-, and child self-

reported behavior problems 6–7 years later. Furthermore, the results have not been consistent, and the studies have been subject to various limitations. In addition, several existing studies were conducted prior to fathers' rapid growth in involvement in early child care (Pleck, 2010), and consequently, potential cohort effects remain poorly understood. Thus, the current research makes a useful contribution.

The analyses of data from several informants provided information about their convergence, and furthermore, they revealed different patterns of relations between early attachment and future behavior problems depending on how those problems were assessed. Together, this study reemphasizes the long-recognized importance of multiple sources of data on children's mental health, including parents, teachers, and children themselves (e.g., Hart, Lahey, Loeber, & Hanson, 1994), that may each provide unique windows into the studied processes; it also demonstrates the known discrepancies among informants (De Los Reyes & Kazdin, 2005). Generally, the mother and the father concurred with regard to the child's behavior problems, both externalizing and internalizing, but neither parent's ratings converged with the teacher's ratings (despite the fact that parents and teachers used the same instrument), or with the child's

reports. Surprisingly, the teacher's and the child's reports showed a modest but significant concordance, despite being produced in different formats and being separated by 1½ years. The validity of teachers' reports with regard to externalizing problems has been long acknowledged (Hart et al., 1994). Our data, however, show that teachers can be accurate reporters of children's internalizing problems as well. That pattern was unexpected, and it suggests that for an astute observer, children's behavior in school may provide a very meaningful window into their inner experiences. It is notable that the strongest findings between early attachment with both parents and future behavior problems were for the measure of problems that relied on children's self-reports, supporting the importance of examining children's reports of their inner experiences along with adults' ratings.

The analyses and the results were straightforward. The most striking findings involve the very high level of behavior problems in children who as infants were insecure with both parents. This pattern was replicated across teachers' ratings of externalizing behavior, and most robustly, for children's self-reports. Remarkably, there was literally *no overlap* between the confidence interval for the self-reported behavior problems in that double-insecure group and the confidence interval in either of the other groups. That effect appeared to be multiplicative, as indicated by a significant interaction of security with the mother and security with the father.

The finding that a secure attachment with at least one parent was a powerful factor that offset risks for mental health was also important. It was also interesting that having a secure attachment with two parents did not seem to add a protective effect beyond security with one.

Our follow-up analyses of the interaction effect of security with the mother and with the father for children's self-reports indicated that neither parent could clearly be seen as "primary." The depictions of the effect with the mother as the main agent and the father as moderator, and with the father as the main agent and the mother as moderator (Figures 1 and 2) were fully parallel. The graphs again clearly indicated that children who had been insecure with both parents reported most behavior problems at age 8, and that security with the other parent (either mother or father) had a significant beneficial and protective effect. Therefore, we failed to find the primacy of the mother as an attachment figure, a finding reported by Main and Weston (1981) for infants and by Suess and colleagues (Suess et al.,

1992) for 5-year-olds. Our findings were more consistent with other studies, for example, Kerns et al. (2000) or Verschueren and Marcoen (1999). It is likely due to the fact that in more recent cohorts, fathers have become increasingly involved as caregivers (Pleck, 2010). It is also possible that security with the mother has unique effects at younger ages, but by the middle childhood, developmental dynamics change, and security with the father now also comes to influence social-emotional outcomes (Kerns et al., 2000).

Whether the organization of infant attachment should be approached as a categorical construct, a set of dimensions, or both, has been extensively debated (see Fraley & Spieker, 2003; and the special section of *Developmental Psychology*, 2003, Vol. 39). Cummings (2003) suggested that using both approaches may be beneficial. In this study, the analysis employing the two putative dimensions of attachment organization (Fraley & Spieker, 2003)—proximity seeking and maintenance coupled with low avoidance and resistance—produced an interesting finding. Children who had been highly resistant with both parents were seen by teachers as particularly high in externalizing problems. That result dovetails with another analysis, also for teacher-rated externalizing problems, that compared the three groups (double-insecure, double-secure, and mixed). Recall that teachers rated the double-insecure children as significantly higher in behavior problems than children in the other groups.

Because of the strong interest in attachment disorganization, and evidence that it may be a particular risk for future behavior problems (Fearon et al., 2010; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999), we explored, in preliminary analyses, the links between disorganization and the outcomes. Those analyses suggested that disorganized attachment with the father can indeed predict children's elevated externalizing problems. Surprisingly, there were no findings for disorganization with the mother. Given the dearth of comparable data on fathers (Fearon et al., 2010), those findings, although suggestive, need to be replicated.

An important question concerns possible mechanisms and processes that may account for the link between early attachment and future behavior problems. Several potential mechanisms that mediate those links have been implied in the literature, including the developing brain and the neuroendocrine system, emotion systems, and emotion self-regulation skills, social regulation skills, internal working models of self, others, and the world, and receptiveness to socialization (DeKlyen &

Greenberg, 2008; Weinfield et al., 2008). Our analyses based on the two dimensions of attachment suggest that children who employ highly resistant strategies with both parents might be at the highest risk for externalizing problems, perhaps because of their future difficulty in emotion regulation (Cassidy, 1994; Fearon et al., 2010). But even one secure relationship in infancy may be sufficient to provide supports for emotion regulation that serve as buffers against developing behavior problems. Mother-child secure relationships have long been recognized as contexts for adaptive regulation of emotions (Hofer, 1994; Sroufe, 1996, 2005), and father-child relationships have also been implicated in that respect (MacDonald & Parke, 1984; Parke & Buriel, 2006). However, given the overall paucity of the findings produced by the dimensional analyses with regard to behavior problems outcomes (note that the Resistance  $\times$  Resistance interaction emerged only for teachers' ratings; there was no analogous interaction for children's self-reported scores), this interpretation should be treated as preliminary and in need of replication.

The testing of mechanisms linking early attachment with future behavior problems remains an exciting research enterprise that will inform both theory and translational applications. Such testing should incorporate not only early security versus insecurity with each parent, but also the configuration of those measures with both parents as the main independent variables. This will help elucidate the nature of the specific and serious risks that—according to our findings—appear due to concurrent insecurity with both parents.

This study had several limitations. One limitation was the low-risk, normative nature of the sample, relatively limited ethnic diversity (although recall that 20% of families included a non-White parent), and a modest sample size, particularly at age 8.

Another limitation was associated with the conduct of the assessments of attachment security with the mother and the father at 15 months. Those paradigms took place within approximately 3 weeks and in the same laboratory room (especially designed for that purpose). Separating the two Strange Situation procedures by several months and conducting them in different settings is considered the most desirable strategy. In this large longitudinal study, however, attachment was only one of many assessed aspects of the parent-child relationships; thus, the sessions with the mother and the father had to be kept as parallel and as close in time as feasible. To minimize biases, the order of the mother and father sessions was randomized

(and indeed, there were no order effects on security with either parent).

Another source of caution is the surprising finding that children's externalizing and internalizing behavior problems scores in Dominic-R were very highly correlated. Typical correlations are moderate, as was the case with the reports from the adult informants. For example, Moss et al. (2006) found that the two Dominic-R scores correlated moderately in 8½-year-olds in a comparable sample. Also surprising was the relative absence of significant gender differences in the measures of behavior problems, with one exception: Teachers rated boys as higher in externalizing problems, a typical finding (boys,  $M = 3.11$ ,  $SD = 4.45$ ; girls,  $M = 1.05$ ,  $SD = 2.10$ ). However, several other aspects of this work—the longitudinal design, data from multiple informants, the participation of both parents, and the use of well-established measures of attachment and children's mental health—offset, at least in part, those limitations.

Identifying the key theoretical and empirical issues for the attachment research in the 21st century, Thompson and Raikes (2003) listed the study of integration and converging influences of multiple attachment relationships among the most critical. Those conceptual challenges should be considered in the context of societal and cultural changes that include the increasing role of fathers as involved caregivers (Cabrera, Tamis-LeMonda, Bradley, Hoff-erth, & Lamb, 2000; Pleck, 2010). Consequently, the current study makes a timely contribution to research on social-emotional development.

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