

Examining the Link Between Infant Attachment and Child Conduct Problems in Grade 1

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Abstract We examined the extent to which infant attachment status is directly related to child conduct problems 6 years later, and assessed the potential mediating roles of hostile parenting and maternal depression. The sample included 84 adolescent mothers and their children (45 girls, 39 boys). Infant attachment status was assessed using the Strange Situation when the study children were 1-year-old. Hostile parenting was coded during a parent–child interaction task when the study children were 4.5-years-old. Maternal depression was self-rated, also when the study children were 4.5-years-old, using the Beck Depression Inventory. Mothers reported child conduct problems at Grade 1 on the Child Behavior Checklist. Infant attachment status at 1 year of age was directly related to child conduct problems but not to hostile parenting or maternal depression. Neither hostile parenting nor maternal depression mediated the relationship between infant attachment status and child conduct problems. However, the pattern of relations differed by attachment security. For securely attached children, maternal depression, but not hostile parenting, was directly related to conduct problems. For insecurely attached children, hostile parenting, but not maternal depression, was directly related to child conduct problems. Implications for intervention and future research are discussed.

Keywords Attachment · Conduct problems · Hostile parenting ·
Maternal depression · Adolescent mothers

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Children and youth who exhibit aggressive, delinquent, and antisocial behavior (i.e., conduct problems) represent a salient and troubling segment of our society. Children displaying conduct problems make up 4–10% of the population and the majority of referrals to mental health clinics (e.g., Kazdin 1985). The negative correlates associated with child conduct problems put children at risk for maladjustment and extensive deficits in multiple domains including, but not limited to, cognition, social relationships, academic performance, and mental health (Essau 2003; Hill and Maughan 2001; McMahon et al. 2006). There is no single mechanism postulated through which children develop conduct problems; rather, research suggests that it is more likely that conduct problems develop in different ways for different children through an interaction among multiple risk factors including, but not limited to, inherent child factors, poor parenting practices, and less than ideal environmental conditions (Campbell et al. 2000; Gilliom and Shaw 2004; Hinshaw and Lee 2003; Loeber and Farrington 2000).

One of the most salient factors of a child's development is believed to be the nature of the parent–child relationship throughout infancy and toddlerhood (Bowlby 1969, 1982; Bronfenbrenner 1979; Erikson 1964; Freud 1965; Greenspan 1981). The development of a secure attachment in the first 2 years of life has been related to heightened sociability, greater compliance, and more effective emotion regulation (Ainsworth et al. 1978; Bretherton 1985; Richters and Waters 1991). On the other hand, insecure attachment prior to 2 years of age has been linked to lessened sociability, poor peer relations, and inferior behavioral self-control (Carlson and Sroufe 1995; Thompson 1999). Some research has attempted to more clearly delineate the relationship between infant attachment and child development outcomes. Specifically, children with insecure-disorganized and avoidant patterns of attachment have been found to be at increased risk for conduct problem behavior as much as 8 years later (e.g., Crowell and Feldman 1991; Erickson et al. 1985; Greenberg et al. 1991; Lyons-Ruth et al. 1991, 1997; Munson et al. 2001; Shaw et al. 1996). It has been suggested that insecure attachment is not directly predictive of developmental outcome, but rather increases risk (Greenberg 1999), perhaps by predisposing the parent–child dyad to developing a coercive style of interaction (Dumas et al. 1995; Patterson et al. 1992; Sroufe et al. 1999), which is, in turn, a risk factor for later conduct problems.

The strength of the association between insecure attachment in infancy and later child psychopathology appears to be influenced by the risk status of the families studied (Greenberg 1999). Studies conducted with high-risk samples are more likely than studies with samples drawn from the general population to find connections between infant attachment security and conduct problems during both the preschool (Erickson et al. 1985; Lyons-Ruth et al. 1993; Shaw and Vondra 1995) and elementary school (Renken et al. 1989) years. According to a meta analysis of 15 studies comprising over 2,000 infant–mother dyads from the United States, the distribution of attachment classifications in the general population is 62% secure (B), with insecure classifications further divided into 15% avoidant (A), 9% ambivalent (C), and 15% disorganized (D) (van IJzendoorn et al. 1999). In adolescent mother samples, higher rates of avoidant and disorganized attachment have been found. Specifically, van IJzendoorn et al. (1999) reported that samples of

children of adolescent mothers have significantly more A and D classifications, and significantly fewer B classifications (33% (A), 40% (B), 4% (C), and 23% (D)).

In general, adolescent motherhood is associated with a host of characteristics that put children at risk for developing conduct problems. Adolescent mothers provide lower quality parenting than do their adult counterparts (Brooks-Gunn and Furstenberg 1986; Scaramella et al. 1998). Additionally, observational studies have shown adolescent mothers to be more punitive, restrictive, and insensitive in their behavior toward their children. Adolescent mothers also have difficulty appropriately monitoring, stimulating, and responding to their children's psychological needs (Cassidy et al. 1996; Jaffee et al. 2001; Ragozin et al. 1982). The difficulties that adolescent mothers have are not limited to their teenage years. As adults, adolescent mothers experience high rates of marital break-up as well as frequent short-term relationships, have a greater history of substance abuse, experience lower income, achieve less education, and, in general, have inadequate social support (Furstenburg et al. 1989; Jaffee et al. 2001; Zoccolillo et al. 1997). All of these difficulties contribute to the creation of an environment that places children at risk for developing conduct problems.

Hostile parenting is also a risk factor for unfavorable childhood outcomes and has been specifically linked with the later development of conduct problems (e.g., Patterson et al. 1992). Various types of hostile parenting (including coercion, verbal and physical aggression, and harsh discipline) have been examined, and studies have consistently established a connection between hostile parenting and later conduct problems in young children (e.g., Brannigan et al. 2002; Campbell 1995; Cohen and Bromet 1992; MacKinnon-Lewis and Lofquist 1996; Patterson et al. 1992; Rothbaum and Weisz 1994; Silk et al. 2004). The link between hostile parenting and later child conduct problems is particularly salient in light of the "life-course-persistent" pathway described by Moffitt (1993), in which oppositional behaviors displayed in preschool predict the development of conduct problems in adolescence. This life course persistent pathway is connected with the most severe patterns of conduct problems, and these severe, early patterns of conduct problems have shown significant continuity and stability into adulthood (Frick and Loney 1999).

Maternal depression has also been associated with multiple negative outcomes for children including, but not limited to, poor emotional adjustment and social and psychiatric difficulties (Burt et al. 2005; Downey and Coyne 1990; Silk et al. 2006; To et al. 2004). Specifically, research has found a strong link between maternal depression and later childhood aggression (Boyle and Pickles 1997; Kim-Cohen et al. 2005; Munson et al. 2001).

Insecure attachment, hostile parenting, and maternal depression have all been linked to later child conduct problems; however, the mechanisms that underlie these relationships are still a matter of debate. While some researchers have found evidence for a direct effect of attachment on later child conduct problems (Lyons-Ruth et al. 1997; Shaw et al. 1996), others assert that the relationship between infant attachment and child conduct problems is most likely mediated by multiple variables (e.g., Greenberg 1999). Still others have found evidence for moderation of the relationship between attachment security and childhood conduct problems by social-contextual and personal factors (Belsky and Fearon 2002; Keller et al. 2005).

In this study, we looked at both direct and mediated paths from infant attachment to child conduct problems in Grade 1. In an exploratory manner, we also assessed whether the relationship of both hostile parenting and maternal depression to child conduct problems differed according to the child's attachment status. In order to ascertain whether these relationships apply to a broad range of situations, we specifically examined maternal hostile parenting and depression, included both girls and boys, and focused on an at-risk community sample of adolescent mothers. Observational measures of parenting were employed in order to examine more subtle variations in parenting and to reduce reporter bias.

We expected to find significant associations between infant attachment status and child conduct problems. Additionally, we predicted that maternal hostile parenting and depression would each mediate the relationship between infant attachment and child conduct problems. In addition, based on the findings of Belsky and Fearon (2002) and Keller et al. (2005), who found differences in child outcomes based on risk status and attachment classification, we hypothesized that the pattern of relations among maternal depression, hostile parenting, and child conduct problems would differ by attachment status. Specifically, we hypothesized that maternal depression and hostile parenting would be predictive of child conduct problems in the risk context of insecure attachment.

Method

Sample

The present research is drawn from a larger longitudinal study of adolescent mothers and their children (the Early Parenting Project). Adolescent mothers were recruited throughout the greater Seattle area, when their children were 1-year-old, for participation in a study on adolescent mothering and infant attachment. All mothers were less than 20-years-old when they delivered the study child ($M = 17.3$ years, $SD = 1.12$, range 14.5–19.5). The mothers were initially recruited from a variety of sources, including high schools, public health clinics, and social services programs for young, single mothers. After an initial assessment in infancy, two age cohorts, separated by 1 year, were assessed at five data collection time-points. Children in the younger cohort ($n = 46$) were assessed in preschool when they were 3.5 and 4.5-years-old, and during the summers following Grades 1, 2, and 3. Children in the older cohort ($n = 68$) were assessed in preschool when they were 4.5 and 5.5 years of age, and during the summers following Grades 1, 2, and 3. One hundred and fifteen mother–child dyads participated in the preschool assessment. The sample employed in the present study included the 84 mother–child dyads with available data on all the variables of interest from the initial study conducted in infancy, and the 4.5-year and Grade 1 assessments. This group of children had an approximately equal gender representation (45 girls, 39 boys) and was predominantly European-American (81.7%), but also included African-American (12.2%), Native American (3.7%), Hispanic (1.2%), and mixed heritage (1.2%) participants. The mothers averaged 10.8 years of education (range = 7–13 years) at 1 year

postpartum and 12 years (range = 7–17 years) at the Grade 1 assessment. The average family income on the Hollingshead (1975) four-factor index of social status was 26, which represents lower to lower-middle class. The sample of 84 mother–child dyads employed in the present study did not differ from the original 115 dyads or the 97 dyads remaining at the Grade 1 assessment on any of the demographic characteristics noted above ($p > .05$ in all cases).

Procedure

In infancy and preschool, when the study children were 1 and 4.5-years-old respectively, data collection procedures consisted of a laboratory interview as well as a home visit. The Grade 1 assessment, when the target children were 7-years-old, involved only a laboratory visit. At each assessment time-point, the mother completed paper and pencil questionnaires as well as participated in a parent–child interaction task (PCIT). For the infancy assessment, home interviews took place around the child's first birthday.

Measures

Infant Attachment

Attachment status at 1 year was assessed using the Strange Situation (Ainsworth et al. 1978). The videotaped interactions were coded into avoidant (A), secure (B), and ambivalent (C) categories in accordance with procedures outlined in Ainsworth et al. (1978), and a disorganized (D) category according to Main and Solomon (1986, 1990). The Strange Situation assessments were double-coded by two coders as described in Spieker and Bensley (1994). Inter-coder agreement on the A, B, C, and D categories was 82% ($K = .71$). Subsequently, the sample was divided into dichotomous “secure” (B) versus “insecure” (A, C, D) attachment status categories. In the current sample, the attachment distribution is 46.4% secure ($n = 39$) and 53.6% insecure (A: $n = 23$, 27.4%; C: $n = 2$, 2.4%, D: $n = 20$, 23.8%).

Hostile Parenting Behavior

Parenting behavior at 4.5 years was evaluated during a mother–child interaction that consisted of three structured tasks—Child's Game (i.e., child-directed free play), Parent's Game (i.e., parent-directed play), and Clean Up (Eyberg and Robinson 1983; Forehand and McMahon 1981)—conducted in a laboratory playroom. The interaction tasks were videotaped to allow for microanalytic coding. Observation of mother–child interaction throughout the PCIT produced ratings of maternal hostility from the Emotional Availability Scales (Biringen et al. 1994). The Emotional Availability Scales consist of five general measures of the emotional availability of the mother toward the child and of the child toward the mother. The videotaped interactions were

coded by observers trained to criterion through use of a manual, guided practice and role play, and practice videotapes. Interobserver agreement was satisfactory (i.e., at or above 80% for all codes). Maternal hostility consisted of behaviors (such as overtly harsh, abrasive, or demeaning facial expressions or vocalizations) as well as covert signs of impatience, resentment or anger (such as sarcasm or cold stares).

Maternal Depressive Symptomatology

During the 4.5-year assessment, each mother completed the Beck Depression Inventory (BDI; Beck et al. 1961). The BDI is a widely used, reliable, standardized self-report measure for assessing depressive symptomatology. It consists of 21 items rated on a 4-point scale (0–3), with higher scores representing greater levels of distress. In the present study, BDI scores were transformed via square root due to positive skewness.

Child Conduct Problems

Each mother completed the parent-report Child Behavior Checklist (CBCL; Achenbach 1991) during the Grade 1 assessment. The CBCL is a widely used, standardized, and normed instrument. The Externalizing *T*-score was employed as the indicator of child conduct problems.

Results

Analytic Plan

Analyses explored relationships among infant attachment security at 1 year of age, observed hostile parenting and self-reported maternal depression (both assessed when the child was 4.5-years-old), and parent-reported child conduct problems assessed following Grade 1. First, bivariate correlations were examined to assess the direct relationship between infant attachment security and child conduct problems. The potential mediating role of hostile parenting and maternal depression at 4.5 years was then assessed using the multiple regression procedure described by Baron and Kenny (1986). Finally, in an exploratory manner, bivariate regressions were conducted separately for each attachment group to assess whether the relationship of both hostile parenting and maternal depression with child conduct problems differed according to the child's attachment classification.

Descriptive Statistics

Table 1 presents the means and standard deviations for the four constructs of interest and the intercorrelations among the four constructs. Attachment status

Table 1 Descriptive statistics and intercorrelations between constructs

Descriptive statistics	Sample (N = 85)		Intercorrelations between constructs			
	M	(SD)	1	2	3	4
1. Dichotomous attachment status ^a	1.48	(.50)	–	–.10	.14	–.35**
2. Hostile parenting (age 4.5 years)	.53	(.69)		–	.00	.29**
3. Maternal depression (BDI) (age 4.5 years)	2.55	(1.22)			–	.24*
4. Child conduct problems (CBCL) ^b (Grade 1)	58.51	(9.21)				–

BDI = Beck Depression Inventory, CBCL = Externalizing T-score of the Child Behavior Checklist

* $p < .05$, ** $p < .01$

^a 1 = insecure, 2 = secure; ^b $M = 50$, $SD = 10$

($r = -.35$, $p < .01$), hostile parenting ($r = .29$, $p < .01$), and maternal depression ($r = .24$, $p < .05$) were each moderately correlated with child conduct problems. There were no significant bivariate relationships, however, between attachment status, hostile parenting, and maternal depression.

Mediation Analyses

Separate mediation analyses focused on the potential mediating roles of hostile parenting and maternal depression. The analyses were conducted using infant attachment security at 1 year, maternal variables measured when the study child was 4.5 years of age, and child conduct problems at Grade 1, with the maternal variables conceptualized as proximal variables and infant attachment security as a distal variable. First, child conduct problems were regressed on infant attachment security. Second, hostile parenting and maternal depression were each regressed separately on infant attachment security. Third, child conduct problems were regressed on attachment and hostile parenting and then, separately, on attachment and maternal depression.

As shown in Figs. 1 and 2, mediation was not supported for either hostile parenting or maternal depression. Entering both predictors into the model revealed

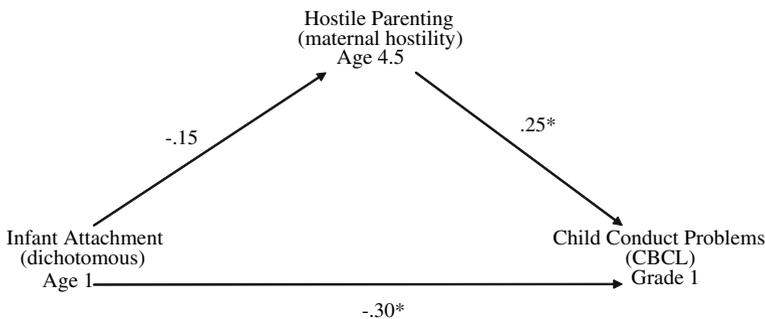


Fig. 1 Test of the mediating role of hostile parenting in explaining the association between infant attachment and child conduct problems. BDI = Beck Depression Inventory. CBCL = Child Behavior Checklist. Beta weights reported

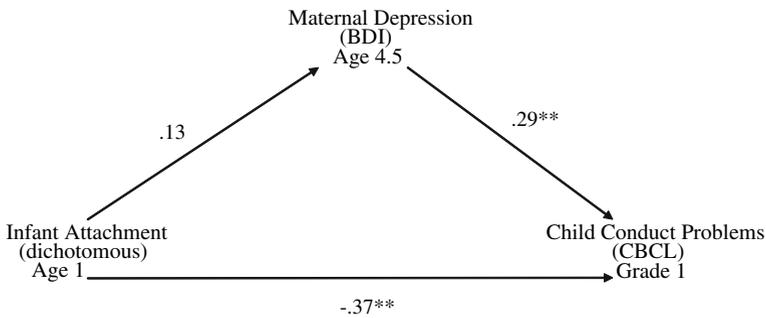


Fig. 2 Test of the mediating role of maternal depression in explaining the association between infant attachment and child conduct problems. BDI = Beck Depression Inventory. CBCL = Child Behavior Checklist. Beta weights reported

unique effects of both attachment and the maternal variables on child conduct problems. Specifically, there was a significant direct effect of hostile parenting on child conduct problems ($b = .25$, $p = .02$), whereas the relationship between attachment security and child conduct problems remained significant ($b = -.30$, $p = .01$). Similarly, the relationship between maternal depression and child conduct problems was significant ($b = .29$, $p < .01$), but the relationship between attachment security and child conduct problems again remained significant ($b = -.37$, $p < .01$).

Exploratory Analyses by Attachment Status

The sample was too small to use traditional, formal tests of moderation; thus, we split the sample by attachment secure/insecure classification to explore possible differences in the pattern of relations among maternal depression, hostile parenting, and child conduct problems. For insecurely attached infants, maternal depression did not significantly predict conduct problems ($b = .18$, $p > .05$). Hostile parenting, however, did predict conduct problems ($b = .29$, $p < .05$) for insecurely attached children.

The pattern was different for securely attached infants, for whom maternal depression significantly predicted conduct problems ($b = .47$, $p < .01$), but there was no association between hostile parenting and conduct problems ($b = .19$, $p > .05$).

Discussion

In this study we examined whether attachment status assessed in infancy was directly related to child conduct problems in Grade 1 and whether hostile parenting and maternal depression mediated this relationship.

Infant attachment status, specifically whether the child was coded secure or insecure (insecure-avoidant or insecure-disorganized), significantly predicted mother-reported child conduct problems at Grade 1. This is consistent with previous findings by Shaw and colleagues that demonstrated a link between infant attachment status and child conduct problems 2 years later in a sample of boys and girls (Shaw and Vondra 1995) and 4 years later in a sample of boys (Shaw et al. 1996), as well as research conducted by Lyons-Ruth et al. (1997) that found disorganized attachment at 18 months predicted teacher-rated conduct problems at age 7. Additionally, this finding supports prior findings with this sample that showed that the effect of attachment on conduct problems was evident by age 3.5 and persisted through Grade 3 for children classified in infancy as disorganized or avoidant (Munson et al. 2001). Furthermore, mediation analyses showed that the relationship between infant attachment status and child conduct problems was *not* mediated by either hostile parenting or maternal depression despite the strong predictive relationship of maternal hostility and depression to child conduct problems found here and, with regard to maternal depression, in a prior study conducted with this sample (Munson et al. 2001). Most studies that have examined infant attachment status as a predictor for later child conduct problems have suggested that the relationship is mediated by parent, child, or environmentally related factors such as hostile parenting, negative peer influence, and high-risk neighborhoods (e.g., Greenberg 1999). However, the unmediated direct effect presented here supports the finding of Munson et al. (2001) and extends the findings of Shaw and Vondra (1995), Shaw et al. (1996), and Lyons-Ruth et al. (1997) in terms of infant attachment status predicting childhood conduct problems despite a lengthy time span between measurement of attachment and later conduct problems. The findings also support Greenberg's hypothesis insofar as infant attachment status may uniquely contribute to later child conduct problems in the context of a high-risk adolescent mother sample.

With regard to the exploratory analyses looking at possible differences in the pattern of relations among maternal depression, hostile parenting, and later child conduct problems, the findings were of interest. Hostile parenting did not mediate the direct effect of attachment on later child conduct problems in this sample. Hostile parenting was predictive, however, of later conduct problems for the insecurely attached infants in this sample, but not for the securely attachment infants. This finding suggests the possibility that insecurely attached infants are more vulnerable, while securely attached infants are less susceptible, to the effects of poorer quality parenting (NICHD 2006). Additionally, maternal depression was predictive of later conduct problems for the securely attached infants, but not those who were insecurely attached. Frankel and Harmon (1996) suggest that the effects of maternal depression on parent–child interaction and child adaptation are individualized. In the case of attachment, it is possible that with secure attachment comes greater empathy or sensitivity to the mother's emotional state. Perhaps, as a group, securely attached infants are more reactive to their mothers' depression than are insecurely attached infants, and therefore more susceptible to developing later conduct problems.

The findings of the present study suggest a number of implications for intervention and future research. First, because neither hostile parenting nor maternal depression mediated the relationship between infant attachment security and child conduct problems, researchers and clinicians should pay attention to the direct link between attachment status and later child conduct problems. Targeting hostile parenting or maternal depression alone may not be sufficient; instead, interventionists may need to target multiple maternal factors simultaneously. An intervention or prevention approach that assesses and intervenes with multi-faceted areas of dysfunction may be more effective in breaking the link between maternal factors and later child conduct problems. Second, despite the failure to establish hostile parenting as a mediator, it was nonetheless significantly uniquely predictive of child conduct problems approximately 2.5 years later. This finding is in accordance with previous research that has suggested that the enhancement of parenting is a viable intervention and prevention target for mothers of children at risk for developing, or already exhibiting, conduct problems. Specifically, parent training while children are of preschool age may help to mitigate the development of conduct problems later in childhood (e.g., McMahon and Forehand 2003; Sanders et al. 2003; Serketich and Dumas 1996). A similar relationship was found between maternal depression and child conduct problems. Although maternal depression did not mediate the relationship between infant attachment status and child conduct problems in Grade 1, it did significantly predict child conduct problems approximately 2.5 years later. As with hostile parenting, this direct effect suggests that an intervention aimed at alleviating maternal depression could have a positive impact on children who are at risk for developing conduct problems.

Our findings support and extend prior research in several ways. First, the observational measure of parenting utilized in this study permitted a more detailed and unbiased assessment of parenting behavior. Second, the 6-year time interval between measures of infant attachment and child conduct problems in this study is consistent with previous findings connecting infant attachment security to later maternal-reported child conduct problems with this sample and others (Lyons-Ruth et al. 1997; Munson et al. 2001; Shaw and Vondra 1995; Shaw et al. 1996), suggesting the strength of this association affects child outcomes in the home even after entry into formal schooling. Third, we utilized an at-risk community sample of both boys and girls, supporting a prior finding that demonstrated similar associations with an at-risk sample of boys (Shaw et al. 1996). Fourth, the very high percentage of insecure attachment in this sample, as well as the strength of the association between infant attachment status and later conduct problems, suggests that, in addition to parent training approaches, adolescent mothers and their children are particularly good candidates for interventions targeted at reducing the development of child conduct problems via the promotion of secure attachments.

Our study had several limitations. First, the small sample size may have made it difficult to detect mediation effects. Second, we did not examine all possible mediators of the relationship between infant attachment status and child conduct problems (e.g., peer influence, neighborhood atmosphere). In addition, there may be other indicators of parenting that could mediate the relationship between attachment and subsequent conduct problems, such as discipline, monitoring, and positive

involvement; however, exploratory analyses indicated that this was not the case at least in terms of positive parenting factors. Finally, it should also be noted that the results of our study may be limited to the types of insecurity found at 1 year and the age at which outcomes were measured (Grade 1). It is possible that the predictive relationship between attachment status and subsequent conduct problems is weakened as children become older; however, Munson et al. (2001) found this relationship to hold through Grade 3. In summary, our finding that attachment status at 1 year of age predicted conduct problems 6 years later speaks to the potentially powerful impact of early mother–child relationships on the child’s later behavioral adjustment, and suggests avenues for further research and intervention.

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