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Attachment as a Moderator Between Exposure to Maternal
Depression and Externalizing Outcomes in Childhood

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Attachment as a Moderator Between Exposure to Maternal Depression and Externalizing
Outcomes in Childhood

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Introduction

Attachment theory is a guiding framework through which many clinicians and researchers conceptualize the parent-child relationship and its importance to child adjustment. Consistent with assumptions of attachment theory, a number of longitudinal studies have found significant associations between attachment quality in early childhood and later externalizing behaviors (see Madigan, Brumariu, Villani, Atkinson & Lyons-Ruth, 2016). In contrast, several studies have found that the effects of attachment decrease over time and are driven by disorganized attachment rather than insecure attachment (i.e., avoidant and ambivalent attachment; Fearon, Bakermans-Kranenberg, van IJendoorn, Lapsley & Roisman, 2010; Hoeve, Stams, van der Put, Semon Dubas, van der Laan & Gerris, 2012). In addition, the magnitude of effects may vary depending on environmental factors (Belsky & Fearon, 2002). These findings suggest that the relation between early attachment quality and later externalizing symptoms is more complex. Specifically, early attachment insecurity may not directly lead to externalizing problems, but instead may act as a lasting source of vulnerability by increasing the likelihood for maladjustment when children are exposed to certain risk factors. Guided by this conceptualization of attachment, the purpose of this study is to examine whether attachment quality at age three moderates the relationship between exposure to subsequent maternal depression (between ages three and nine) and children's externalizing symptoms at age nine.

Background

A central tenet of Bowlby's (1988) attachment theory is that young children are hardwired to seek proximity, protection, and support from a primary caretaker. The nature of interactions between young children and their primary caregiver in the early years of life,

particularly during times of heightened distress, leaves a lasting impact on the child. Specifically, it is through these repeated interactions that children build a mental representation of how relationships serve to promote or reduce emotional distress and a set of expectations and beliefs about relationships more generally. Because these mental representations influence subsequent social information processing and emotion regulation, children with an insecure attachment are presumed to be at risk for later maladjustment, including internalizing and externalizing problems (Sroufe, Carlson, Levy, & Egeland, 1999).

Early attachment quality and subsequent maladjustment

Despite the popularity of attachment theory in child clinical psychology, evidence of direct effects between early attachment insecurity and later internalizing and externalizing symptoms is mixed. In terms of externalizing symptoms in later childhood, one meta-analysis of 5,947 participants found a significant effect size of $d=0.31$ for the relationship between attachment insecurity and externalizing behaviors (Fearon et al., 2010). Notably, disorganized attachment was collapsed in the insecure attachment category. When examining subtypes of insecure attachment separately, the effect size was $d=0.12$ for the relationship between avoidant attachment and externalizing behaviors, and $d=0.11$ for the relationship between ambivalent attachment and externalizing behaviors, which are both considerably smaller. Another meta-analysis of 24,689 participants revealed a significant effect size of $d=0.49$ for the relationship between insecure attachment and externalizing behaviors (Madigan et al., 2016). In terms of the relationship between early attachment insecurity and delinquent behaviors, a meta-analysis revealed an overall mean effect size of $r=0.18$ between attachment insecurity and delinquency (Hoeve et al., 2012). Overall, these three studies reveal a significant relationship between early attachment insecurity and later externalizing symptoms, with effect sizes ranging from small to

medium. By examining these findings alone, it appears that early insecure attachment directly relates to later functioning. However, there are several qualifications to this conclusion. First, the magnitude of significant effects diminishes significantly over time (e.g., Hovee et al., 2012; Madigan et al., 2016). Second, several studies have found significant moderating factors in the link between early attachment quality and later externalizing behaviors, indicating a more complex relationship.

In light of the complexity in this body of literature, Fearon and his colleagues called for theory-driven studies that examine attachment status as a moderator of the relationship between environmental risk factors and children's adjustment (Fearon et al., 2010). From this perspective, early attachment security does not directly lead to maladjustment nor is it an early indicator of psychopathology. Rather, early insecurity may mean that children have certain attachment-related vulnerabilities, such as emotion regulation difficulties or biases in processing social information, which influence how they manage subsequent stressors. As a result, when they are exposed to specific types of environmental stressors in the later years, they may be more likely to respond in problematic ways. In this conceptualization, early attachment insecurity may act as a lasting source of differential vulnerability that is probabilistically related to later maladjustment, rather than being considered an actual marker, precursor, or determinant of maladjustment. The idea that insecure attachment starts children off on a particular path is aligned with the idea of multifinality in attachment theory, which states that there are a number of possible outcomes once a child starts on a given trajectory that will depend on other factors in the child's life (Sroufe et al., 1999).

Early attachment quality as a moderator of familial risk factors and child adjustment

Researchers have begun to address the question of early attachment quality as a lasting source of differential vulnerability for both internalizing and externalizing symptoms. For example, Milan, Snow, and Belay (2009) found that maternal depression trajectories from age three to age 12 predicted preadolescent depression symptoms only in dyads who displayed insecure attachment patterns at age three. In contrast, children with a secure early attachment did not show evidence of depression themselves, even when exposed to high levels of maternal depressive symptoms between the ages of three and 12. In the same sample, Milan, Zona, and Snow (2013) found that early attachment quality moderated the path between exposure to maternal negative emotions and adolescent internalizing symptoms at age 16. Significantly, preschool attachment classification was not directly associated with internalizing symptoms in adolescence; rather, results suggest that children with early attachment insecurity could be prone to respond in more negative ways when exposed to later maternal insensitivity, which in turn increases their likelihood for internalizing problems in the teenage years. One recent study examined the effects of insecure attachment on both internalizing and externalizing symptoms in later childhood. They found that insecure attachment measured at 12 months moderated the relationship between parenting stress assessed at 18 months and child internalizing and externalizing symptoms at age three (Tharner et al., 2012). Again, this study did not find a main effect of attachment status on internalizing and externalizing symptoms later in childhood (Tharner et al., 2012). Overall, these findings further the claim that there is not a direct relationship between early attachment classification and later internalizing symptoms. This provides additional evidence for early attachment as a lasting source of vulnerability when children are exposed to other stressors (e.g., maternal negative emotions, parenting stress).

Additional studies have examined how early attachment status may moderate the relationship between environmental stressors and later externalizing outcomes. Results from several studies by Kochanska and colleagues suggest early attachment insecurity acts as a risk factor for externalizing symptoms because it starts the child on a particular trajectory. Specifically, early attachment insecurity becomes a context that encourages oppositional and coercive family dynamics, which then creates a relational context in which externalizing behaviors are more likely. Boldt, Kochanska, and Jonas (2017) found that children who were more likely to reject maternal rules between ages two and five exhibited more externalizing behavior problems between ages 10-12; however, this association was only evident in dyads in which the children were insecurely attached to their mothers during infancy. In contrast, there was no relationship between rejection of their mother's rules and externalizing behavior problems later in childhood for children who were securely attached to their mothers in infancy. As with the study on internalizing outcomes, there was no main effect of infant attachment on later externalizing symptoms. Rather, it seems that their hypothesis of early attachment status starting dyads off on different trajectories has some empirical support.

Other studies by Kochanska and colleagues sought to identify attachment-relevant pathways leading to externalizing symptoms (Kim, Kochanska, Boldt, Nordling & O'Bleness, 2014; Kochanska, Woodard, Kim, Koenig, Yoon, & Barry, 2010). In one study, children were put into a laboratory situation in which they broke a toy, and researchers recorded both the child's distress and parental reactions (Kim et al., 2014). They hypothesized that parents can use children's feelings of regret after transgressions to facilitate internalization of rules and therefore prevent future misbehaviors (Kim et al., 2014). If, however, children do not demonstrate distress after transgressing, then parents may begin to rely on coercive discipline strategies in order to

control behavior. This longitudinal study found that children's lower distress after breaking the toy was associated with the mother using more power assertion strategies in a prohibition task, and the mother's use of these strategies was then associated with higher levels of anti-social behavior later in childhood (Kim et al., 2014). However, this relationship was only evident for children who were classified as insecure in infancy. It is important to note that there was no main effect of infant attachment security on later anti-social behavior scores; rather, early attachment insecurity was associated with one type of pathway towards externalizing symptoms (Kim et al., 2014). In another study, Kochanska and colleagues (2010) examined whether early attachment security may also promote positive socialization outcomes. They found that a willing stance by the child towards the mother, assessed during a teaching task, predicted positive socialization outcomes only for children who had a secure attachment. In terms of outcomes, the willing stance predicted the child's internalization of the mother's rules and lower levels of externalizing symptoms (Kochanska et al., 2010). Taken together, insecurity starts children off on a path that leads to more coercive parenting behaviors and ultimately higher levels of externalizing symptoms whereas secure attachment begins a trajectory that is associated with more positive outcomes.

The above studies document moderating effects of early attachment quality in the relationship between maternal risk factors and child maladjustment, consistent with the idea of early insecure attachment as a lasting source of vulnerability. The studies by Milan and colleagues suggest that the ways children respond to maternal psychopathology may vary depending on early attachment quality; however, they only examined children's internalizing symptoms as an outcome (Milan et al., 2013; Milan et al., 2009). Results from meta-analyses suggest that it is externalizing problems, rather than internalizing problems, that are more

strongly associated with insecure attachment (Madigan et al., 2016). Similarly, the studies by Kochanska and colleagues provide strong evidence that children with an insecure attachment history respond to parental behaviors in ways that increase the likelihood for externalizing problems; however, they did not examine maternal psychopathology as a family risk factor (Bold et al., 2017; Kim et al., 2014). Maternal depression is one of the most consistently documented risk factors for childhood externalizing problems (for meta-analysis, see Goodman et al., 2011), and thus may be particularly important in further understanding the relationship between attachment quality and externalizing behaviors. The present study expands the literature on attachment status as a moderator between exposure to early risk factors and later outcomes by considering the relationship between attachment status in early childhood, exposure to subsequent maternal depression, and later externalizing outcomes for children.

Current Study

Existing research suggests that early attachment insecurity may influence how children respond to subsequent risk factors within the parent-child relationship, which in turn increases their likelihood for maladjustment. The present study conceptualizes exposure to maternal depression as a risk factor that is associated with externalizing outcomes in later childhood, and investigates whether early attachment quality has a moderating effect on this relationship. Specifically, this study will examine whether attachment quality assessed at age three moderates the relationship between exposure to subsequent maternal depression (at ages five and nine) and childhood externalizing problems at age nine based on mother, child, and teacher report of problems, controlling for a number of demographic factors, early externalizing problems, and early exposure to maternal depression. Importantly, including early externalizing and maternal depression as covariates allows for a stricter test of how subsequent exposure to maternal

depression (i.e., after age three) may relate to changes in externalizing behaviors beyond those present in early childhood (i.e., at age three). In addition, using multiple measures of externalizing outcomes reduces reporting biases associated with having mothers with elevated depressive symptoms also report on child behavior problems. I hypothesize that early attachment status will moderate the relationship between exposure to subsequent maternal depression and externalizing behaviors at age nine. Specifically, I predict that only the children who were insecurely attached at age three and subsequently exposed to maternal depression will show elevated externalizing symptoms at age nine. I hypothesize that securely attached children, regardless of their subsequent exposure to maternal depression, and insecurely attached children who were not exposed to subsequent maternal depression will show similarly lower levels of externalizing behaviors.

In addition to examining insecure versus secure attachment, the present study also conducts exploratory analyses on the relationship between specific types of insecure attachment and later outcomes. Attachment theory provides two theoretical hypotheses about the relationship between different types of insecure attachment and later outcomes. Researchers hypothesized that ambivalent attachment would be related to internalizing symptoms due to the individual's problems with emotion regulation and difficulty in mastering his or her environment (Madigan et al., 2016). In addition, attachment theory predicts that avoidant attachment will be related to externalizing symptoms because of feeling rejected from caregivers in childhood (Madigan et al., 2016). In a meta-analysis of 3,675 participants, the effect size was only $d=0.12$ between avoidant attachment and externalizing behaviors (Fearon et al., 2010). This relationship is considered to be small in magnitude. Another meta-analysis found that the effect size was not significant, $d=0.18$ (Madigan et al., 2016). Similarly, small findings (e.g., $d<.20$) have been

reported in meta-analytic studies reporting on the association between ambivalent attachment and externalizing behavior (Fearon et al., 2010; Madigan et al, 2016). Together, these findings suggest the direct relationship between both avoidant and ambivalent attachment and externalizing behaviors is small. The present study sought to test whether avoidant and ambivalent attachment moderate the relationship between maternal depression and externalizing outcomes.

In addition, exploratory analyses will examine whether associations between attachment quality, maternal depression, and externalizing behaviors vary by gender. In the Fearon et al. (2010) meta-analysis, there was a non-significant effect size of $d=-0.03$ for samples with only girls, and a significant effect size of $d=0.35$ for samples of only boys for the relationship between insecure attachment and externalizing symptoms (Fearon et al., 2010). Thus, it is expected that larger effects will be found for boys relative to girls.

These research questions are addressed in a sample at elevated risk because of socioeconomic status (SES). Previous research has demonstrated higher rates of insecure and disorganized attachment in low SES samples (Fish, 2001; NICHD Early Child Care Research Network, 1997; van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Importantly, Spieker and Booth (1988) argue that it is not poverty alone that accounts for the increased rates of insecure attachment in low SES samples. Rather, they posit that teenage motherhood, low social support, and low educational attainment contribute to inadequate caregiving, which then leads to insecure attachment (Spieker & Booth, 1988). Fish (2001) found support for this hypothesis in finding similar rates of insecure attachment in a low SES sample with high social support as is found in middle class samples. In addition, maternal depression is higher in low SES samples, and Goyal, Gay, and Lee (2011) found that mothers who were unmarried and

unemployed with a low monthly income and less than a college education were 11 times more likely to experience depression than middle class mothers. In another sample, the rate of postpartum depression among low SES mothers was twice the rate found in middle class mothers (Hobfoll, Ritter, Lavin, Hulsizer, & Cameron, 1995). Therefore, the current study tested whether attachment moderates the relationship between exposure to maternal depression and later externalizing symptoms in a sample at elevated risk due to low SES, which is associated with increased levels of insecure attachment and maternal depression.

Methods

Participants and Procedure

The current study uses data from the Fragile Families and Child Well Being (FFCWB) Study, which is an ongoing birth cohort study of 3,600 children born to unwed parents and 1,100 children born to married parents. The cohort was drawn from births occurring in 1998–1999 in 75 hospitals from 20 large cities in 15 states. The goal of the FFCWB Study is to develop a better understanding of how child development and family life in low-income, unmarried families are affected by governmental policies and parental resources. Because of this purpose, nonmarital births were oversampled at a 3:1 rate. Eighty-five percent of families approached for participation agreed. The sampling design is described in detail elsewhere (Reichman, Teitler, Garfinkel, & McLanahan, 2001). Families were re-interviewed by telephone when children were one, three, five, and nine years old, with high retention of the sample over time. The parent interviews collected information on attitudes, relationships, parenting behavior, demographic characteristics, health (mental and physical), economic and employment status, neighborhood characteristics, and program participation. Additionally, in-home assessments of children and their home environments were conducted at ages three, five, and nine. Year Three data collection

occurred between 2001-2003; Year Five data collection occurred between 2003-2006; Year Nine data collection occurred between 2007-2010. During the age three, five, and nine assessments, mothers completed measures of their own mental health and of their child's behavioral adjustment. In addition, children self-reported on behavioral adjustment, and teachers were asked to complete measures of the child's adjustment through the mail. At the Year Nine follow-up, 3,630 of the original families (76%) participated.

During the course of the FFCWB panel study, there have been supplemental collaborative studies with subsets of participants. At the three-year core survey, FFCWB families were recruited to participate in the In-Home Longitudinal Study of Preschool Aged Children (LSPAC). The LSPAC was designed as a collaborative adjunct study to better understand how certain parental resources influence young children. Data was collected from 2001-2003. The LSPAC included two components: a parent interview and an activity assessment, including an assessment of attachment security. Of the 3,288 families from the FFCWB core sample who agreed to participate in the LSPAC adjunct study, 2,268 (69%) completed the Attachment Q-Sort (AQS; described in measures section). There were no significant differences in baseline income, marital status, maternal age, or education between mothers who participated in the in-home survey and those who did not; however, attrition was slightly higher among Latina women (17%) relative to African American (13%) and White women (11%) in the three-year follow-up survey.

Families who completed the AQS and had at least one age nine outcome measure of interest in this study are included in the present sample (N=1917, 84% of families who completed the AQS). Families lost to attrition did not differ from completers on maternal depression at child age three, attachment status, child externalizing symptoms at age three, or

other demographic factors, however, families who were lost to attrition were more likely to be Latinx and have mothers with lower education.

Of the 1,917 families included in this sample, the majority was African American (N=1071), and the rest identified themselves as White (N=395), Latina (N=383), or Other (N=64), and there were some participants who did not have this data available (N=4). In regards to maternal educational attainment, 32.7% of the sample did not complete high school, 4.8% had only a high school diploma, 26.6% attended some college, 26.0% earned an Associate's degree, 6.8% had a Bachelor's degree, and 3.0% had an advanced degree. Educational attainment information was missing for three mothers (0.2% of the sample). In addition, 19.1% of the mothers were married to the child's father at birth, 52.0% of the mothers were not married to the child's father at birth, and this information was missing for 28.9% of mothers in the sample. When the child was nine years old, 87.6% of the children in the sample did not live with their father, 9.4% of the children in the sample did live with their father, and this information was missing for 3% of the sample. The mean child age at the year nine assessment was 111.39 months (SD=3.68), which means that the average age of children in the study was about nine years and four months (Range = 8.7 years old to 10.8 years old).

All interviews were conducted by trained interviewers in either English or Spanish. Children's Year Nine interviews were completed via ACASI. Teacher surveys were completed using pen and paper measures sent through the mail. All procedures were approved by the IRBs of the FFCWB PI universities (for more information see: <https://fragilefamilies.princeton.edu/documentation/>).

Measures

Demographic Factors. Mothers provided detailed information on family structure, racial and ethnic background, immigration history, and economic and employment status. For the current purposes, the following variables were included as covariates: African American identification, Latina identification, maternal education (ranging from 1 = did not complete high school to 6 = advanced degree), living with child's biological father at age nine, family poverty (standardized score reflecting % of federal poverty level), child gender, and child age at outcome follow-up.

Maternal Depression. The Composite International Diagnostic Interview-Short Form (CIDI-SF), Section A (Kessler et al., 1998) was used to measure maternal depression. The CIDI-SF uses some of the questions from the full CIDI to find the probability that the participant would be a "case" (i.e., experienced a major depressive episode). The questions are based on criteria from the Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition. Participants are first asked if they have experienced feelings of dysphoria or anhedonia during the past year, and if they have experienced one or both of these symptoms for at least a two-week period, then the interviewer asked more specific questions about the other symptoms of depression. For this study, some questions regarding the persistence, recency, and impairments associated with a major depressive episode were not included, however, these questions are not used in generating the probability that the participant experienced a major depressive episode. This measure does not distinguish between Major Depressive Disorder, major depressive episodes that occur within Bipolar Disorder, or major depressive episodes that occur within psychotic disorders. The measure provides both a conservative (i.e., requires depressive symptoms be present "most of the day") and a liberal (i.e., requires depressive symptoms be present for "over at least half of the day") version of diagnoses. Walters et al. (2002) advocated for the conservative scale, and the present study used the conservative scale when determining whether a participant met criteria for

a major depressive episode. For analyses, children whose mothers met the conservative criteria for a major depressive episode at child age five or age nine follow-up were categorized as having been exposed to subsequent maternal depression.

Attachment Quality. The Toddler Attachment Q-sort (AQS) was completed by the mother or primary caregiver during the three-year follow-up visit. Mothers were supervised by a trained observer and asked to sort 39 cards containing characteristics or behaviors that their children may have into three piles. Some examples of behaviors on the cards include, “When the child is upset by mother’s leaving, he/she continues to cry or even gets angry after she is gone,” and “When child finds something new to play with, he/she carries it to mother or shows it to her from across the room.” The three piles that the mothers sorted all of the cards into were “frequently applicable to the focal child,” “conspicuously infrequent,” and “not at either extreme.” Mothers were discouraged from sorting cards into the “not at either extreme” pile and were encouraged to sort items into the other two piles. After this was complete, the “frequently applicable to the focal child” pile was sorted into the following categories: applies mostly (1) and applies often (2). The “conspicuously infrequent” pile was then sorted into the following categories: applies rarely or hardly ever (5) and applies sometimes (4). The interviewer encouraged respondents to place cards sorted into the “neither extreme” pile into either applies sometimes or applies often. The result of the sorting was that each card was rated on a five point Likert Scale ranging from one to five, as indicated in parentheses above. Security and dependency scores were calculated using AQS scoring (Waters & Deane, 1985). Secure attachment patterns were designated by a high security score and a low dependency score. Ambivalent attachment patterns were indicated

by a low security score and a high dependency score. Avoidant attachment patterns were designated by a low security score and a low dependency score.

Parent Report of Child Externalizing Symptoms. The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) contains 111 items on which a parent rates his or her child's behavior on a scale from one (not true) to three (very true). This measure provides subscales for different subtypes of behavior problems with normative data. The subscales include: aggressive behavior, withdrawn/depressed, anxious/depressed, attention problems, social problems, rule-breaking behavior, somatic complaints, and thought problems. Alpha coefficients for the scales ranged from 0.71 to 0.89 indicating strong reliability (Nakamura, Ebesutani, Bernstein, & Chorpita, 2009). The present study uses scores from the aggressive behavior subscale of the CBCL. Age three mother-report scores were used as a control variable, and age nine mother-report scores were used as a primary outcome variable.

Teacher Report of Child Externalizing Symptoms. The Conner's Teacher Rating Scale—Revised Short Form (CTRS-R:S; Conners, 2001) contains 28 items on which a teacher rates a student's behavior from zero (not true at all) to three (very much true). The measure consists of multiple subscales, including: oppositional, cognitive problems/inattention, hyperactivity, and Attention Deficit Hyperactivity Disorder. Alpha coefficients for the four subscales ranged from 0.73 to 0.95 indicating excellent reliability (Conners, Sitarenios, Parker, & Epstein, 1998). The present study used the oppositional subscale as the teacher's rating of the child's externalizing behavior.

Child Self-Reported Delinquency. The Things That You Have Done scale (Maumary-Gremaud, 2000) contains 17 items, and children were asked at age nine whether they had participated in certain delinquent activities. The questions ask about minor delinquent acts, including: “Skipped school without an excuse” and “Cheated on a school test.” The items can be summed to create a total delinquent behavior score. Subscales on this measure include: crimes against people, theft, vandalism, alcohol use, and drug use. The present study used the total score of delinquent behavior. Because this variable was positively skewed, log transformed scores were used in analyses.

Data Analytic Plan:

Descriptive and graphical approaches were used to test for normality prior to analyses. Chi-square tests were used to examine associations between attachment category and maternal depression history. To test the primary research question, Multivariate Analysis of Covariance (MANCOVA) was used to determine whether attachment status would act as a moderator between exposure to subsequent maternal depression and later externalizing outcomes across mother, teacher, and child report. Analyses controlled for child externalizing symptoms at age three, mother’s depression at child age three, level of poverty of the mother, level of education of the mother, child age, child gender, African American status, Latina status, and whether the child was living with the father at age nine. Potential covariates that were unrelated to any variable of interest include family size and immigration history, and they were not included in the analyses. Follow-up univariate tests were used to examine group differences in the three specific outcome measures. After addressing the main research question, descriptive statistics and exploratory MANCOVAS were done including gender as another independent variable (to test for gender

interactions) and using the three way attachment classification variable rather than the dichotomized secure versus insecure classification. The same variables were included as covariates.

Power Analysis

Using G Power (Faul, Erdfelder, Lang, & Buchner, 2007), a sample size of 1900 provides adequate power ($1-\beta=1$, $\alpha=0.05$) to detect a small group difference (i.e., $d=.25$) in a ANCOVA with 8 covariates included in the model.

Results

At age three, 1458 (76.1%) children were categorized as secure, 34 (1.8%) children were categorized as avoidant, and 425 (22.2%) children were categorized as ambivalent. For the purposes of initial analyses, the avoidant and ambivalent categories were grouped together as insecure attachment. When the child was three, 300 mothers (15.6%) were depressed, at age five, 206 (10.7%) mothers were depressed, and at age nine, 215 mothers (11.2%) were depressed. Overall, 18.4% of the mothers in the sample experienced a subsequent depressive episode either at child age five or at child age nine. Chi-square analyses were conducted to examine the association between maternal depression at age three and the child's insecure attachment, and it was significant, $\chi^2(1, N=1917) = 9.85, p < 0.001$. Depressed mothers at child age three were more likely to have insecurely attached children (31%) than mothers who had not experienced a depressive episode (22.6%). In addition, dyads in which the child was insecurely attached at age three were also more likely to experience subsequent maternal depression ($\chi^2(1, N=1917) = 6.51, p < 0.05$). Among securely attached dyads, 17.1% experienced subsequent maternal

depression. Among insecurely attached dyads, 22.4% experienced subsequent maternal depression.

MANCOVAS were run with mother report and child report of child externalizing behaviors as outcome variables together, and then teacher report of child externalizing behaviors was run separately in ANCOVA since only 68% of the sample had data from a teacher. There were no differences between children who had teacher data and children who did not in regards to maternal depression at child age three, five, or nine. A chi-square analysis showed that children with an insecure attachment were somewhat less likely to have the teacher report of child externalizing outcomes at age nine, $\chi^2(1, N=1917) = 6.07, p < 0.05$. Specifically, 63% of insecurely attached children had teacher report on externalizing behaviors at age nine compared to 69% of securely attached children who had this data.

To address the first research question, MANCOVA analyses were used with attachment quality (secure or insecure) and exposure to maternal depression (yes/no) as independent variables and mother and child reported externalizing behaviors as dependent variables. Covariates in the model including demographic factors (race/ethnicity, maternal education, maternal poverty, child gender, presence of the father in the household) and early risk factors (maternal report of externalizing at age three, maternal depression at age three). Results from this analysis are presented in Table 2.

Of the covariates in the model, African American status, Latina status, mother's poverty at child age nine, child's gender, and child's externalizing score at age three from the mother's report were significant at $p < 0.05$. Children who were African American, male, had more family poverty, and had higher externalizing scores at age three by their mother's report had higher

externalizing behaviors at age nine by the mother and child's report of symptoms. In addition, children of Latina mothers reported less delinquency on child self-report.

Beyond these covariates, there was a significant main effect of maternal depression, $F(2, 1768) = 17.08, p < 0.001$. This main effect was evident for both maternal report ($F(1, 1769) = 31.71, p < 0.001$) and child report ($F(1, 1769) = 7.88, p < 0.01$) of symptoms. For both child and mother report, externalizing behaviors were higher in families where mothers had experienced a depressive episode at child age five or nine. There was also a significant omnibus effect of age three attachment quality on externalizing outcomes, $F(2, 1768) = 5.08, p < 0.01$. Follow-up univariate analyses showed that there was a significant main effect of attachment status by mother's report of the child's externalizing symptoms, $F(1, 1769) = 9.82, p < 0.01$, but not by child's self-report, $F(1, 1769) = 1.67, p = 0.20$. Results from these analyses are presented in Tables 2, 3, and 4.

Of primary interest, there was also a significant interaction between attachment status and mother's subsequent depression on child's externalizing behavior, $F(2, 1768) = 9.21, p < 0.001$. A follow-up univariate analysis showed that the interaction was significant when the mother reported on her child's externalizing behavior at age nine, $F(1, 1769) = 13.56, p < 0.001$, and when the child reported on his or her externalizing behavior at age nine, $F(1, 1769) = 8.91, p < 0.01$. The nature of these differences can be seen in Table 1 and Figure 1. As shown in Figure 1, child externalizing behaviors are elevated across mother and child report only for children with an insecure attachment at age three who were subsequently exposed to maternal depression. Insecurely attached children who were not subsequently exposed to maternal depression at age five or nine have similar levels of externalizing behaviors as securely attached children after accounting for demographic differences.

Next, an ANCOVA was run to test for differences in teacher reported externalizing problems using the same covariates. African American status, mother's poverty at child age nine, child's gender, and child's externalizing score at age three from the mother's report were significant at $p < 0.05$. Children who were African American, male, had greater family poverty, and had higher externalizing scores at age three by their mother's report had higher externalizing behaviors at age nine by the teacher's report of symptoms. Again, there was a significant main effect of maternal depression ($F(1, 1240) = 5.34, p < 0.05$), with higher externalizing scores in children of mothers who experienced depression at child age five or nine. There was no main effect of attachment status on child's externalizing behaviors as reported by the teacher, $F(1, 1240) = 0.25, p = 0.62$. Finally, there was a significant interaction between attachment status and subsequent maternal depression on the child's externalizing behaviors at age nine as reported by the teacher, $F(1, 1240) = 5.17, p < 0.05$. Results from this analysis are presented in Table 5. The nature of this interaction can be seen in Table 1 and Figure 1 and it follows the same pattern as found by the mother and child report of externalizing symptoms. Specifically, insecurely attached children who were exposed to subsequent maternal depression showed significantly higher levels of externalizing behaviors at age nine by teacher report. Children with an insecure attachment who were not exposed to subsequent maternal depression had similar levels of externalizing behaviors by teacher report as their securely attached peers.

Effect sizes were computed in order to examine the magnitude of the interaction. The interaction between attachment and exposure to subsequent maternal depression had a partial eta-squared value of 0.01 (as seen in Table 2), which is indicative of a small effect by Cohen's standards. To help conceptualize the magnitude of the effect of attachment, Cohen's d was also calculated comparing each group in comparison to the group with the fewest risk factors for

externalizing outcomes (i.e., early secure attachment and no subsequent exposure to maternal depression). Across all three reporters, the effect sizes ranged from medium to large when comparing the securely attached children who were not exposed to subsequent maternal depression to the insecurely attached children who were exposed to subsequent maternal depression. In contrast, the effects were quite small when comparing the securely attached children with no subsequent exposure to maternal depression to the other two groups (e.g., insecurely attached children not exposed to subsequent maternal depression and securely attached children exposed to subsequent maternal depression). See Table 7 for effect size values.

To address the exploratory question of types of early attachment quality as a moderator, descriptive analyses were run to examine the means, standard deviations, and sizes for each group. Mean scores are presented in Table 6. Given the small number of children with an avoidant attachment who were subsequently exposed to maternal depression (i.e., $N=6$ by the mother's report on child externalizing symptoms), it was not possible to examine the exploratory question of whether type of early attachment (i.e., ambivalent, avoidant, or secure) moderates the relationship between exposure to subsequent maternal depression and externalizing behaviors in later childhood.

To address the exploratory question about gender as a moderator, analyses were rerun using gender as a between subjects factor rather than a covariate. There was a marginally significant omnibus interaction between subsequent maternal depression, child attachment status, and child gender $F(2, 1765) = 2.95, p = 0.052$ that was driven by child report of externalizing symptoms ($F(1, 1766) = 4.82, p < 0.05$), but not mother report of externalizing symptoms, ($F(1, 1766) = 2.27, p = 0.13$). The analyses were also rerun with gender as a between subjects factor for the teacher report of child externalizing behaviors, and the interaction between subsequent

maternal depression, child attachment status, and child gender was not significant, $F(1,1237) = 0.02, p = 0.88$. However, all three outcome measures showed a similar pattern in which the results were stronger for boys than for girls.

Post-hoc analyses were also done testing whether race/ethnicity moderated outcomes. All results were nonsignificant.

Discussion

The purpose of the current study was to advance our understanding of the potential role of attachment quality in the development of externalizing problems during childhood. Results revealed a nuanced relationship between early attachment status and later outcomes that is aligned with the model of differential vulnerability put forth by current research (Boldt et al., 2017; Fearon et al., 2010). Specifically, exposure to maternal depression was associated with later externalizing problems only among children with an insecure attachment at age three; this finding was consistent across mother, teacher, and child report of behaviors. In contrast, there was minimal evidence of attachment insecurity having a global main effect on child externalizing behaviors at age nine, with main effects only evident in maternal reports of child behavior. Given that mothers reported on both attachment status and child externalizing behavior, it is possible that this finding is in part due to shared variance of the same reporter. Relatedly, children with an insecure attachment who were not exposed to later maternal depression did not differ from their securely attached peers. Together, these findings provide further support that early attachment quality has a lasting impact on developmental psychopathology only under certain circumstances.

Findings from this study are particularly noteworthy because moderating effects were evident while controlling for multiple demographic factors that may be confounded with early attachment insecurity (e.g., poverty risk). Moreover, both externalizing behaviors and maternal depressive symptoms at age three were included as covariates; consequently, the significant differences evident at age nine are not simply reflections of early behavioral differences in higher risk dyads (i.e., families who experience early maternal depression). With the inclusion of these covariates, the group differences evident at age nine are more likely to reflect risk processes that unfolded after age three. Specifically, attachment quality at age three may have shaped how children responded to subsequent periods of suboptimal parenting.

Potential mechanisms of influence

There are several reasons why the combination of an insecure attachment and exposure to maternal depression could place children on a trajectory leading to externalizing outcomes. Importantly, many of these mechanisms likely occur simultaneously within families, which results in insecurely attached children who are subsequently exposed to maternal depression being at the highest risk for externalizing behaviors. One possibility is that aggressive or oppositional behaviors in these children begin as actual attachment system strategies. Children with a secure attachment expect sensitive caregiving from their mothers because of their relational history. When mothers in these dyads become depressed, their children may not experience their mother's symptomatic behavior in ways that elicit the attachment system. For example, for a securely attached child, a symptom like withdrawal by their mother may not elicit concern about caregiver availability. In contrast, when mothers of insecurely attached children become depressed, symptomatic behaviors may be experienced by their children as threatening

indicators of caregiver unavailability, which in turn may lead them to utilize strategies to ensure their attachment needs are met (i.e., behaviors to ensure proximity with a caretaker is maintained). For some young children, aggressive behaviors, acting out, or oppositional behaviors may be a way to maintain a desired level of engagement with an attachment figure (Greenberg, Speltz, & Deklyen, 1997). Over time, these behaviors may become more ingrained, leading to elevated externalizing problems.

Another mechanism through which early secure attachment quality may contribute to maladaptive outcomes in children of depressed mothers is through social information processing. Early attachment shapes how children will approach new situations, what information they attend to in their environment, how they interpret that information, and what information they remember (Sroufe et al., 1999). Attachment-related social information processing biases may have a lasting impact on how children interpret their parents' behaviors in later years. For example, Milan and colleagues (2013) found that insensitive maternal behavior in observed interactions during early adolescence was associated with adolescents developing a preoccupied attachment style only in dyads who had an insecure attachment history in preschool. This type of attachment-related social information processing bias could impact how children interpret behaviors that often occur in the context of a depressive episode. In addition to insensitive parenting, mothers who are depressed engage in more intrusive behaviors, are more authoritarian, and use more physical discipline (e.g., spanking and slapping; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Palaez, Field, Pickens, & Hart, 2008; Sohr-Preston & Scaramella, 2006; Tronick & Reck, 2009). Children with an insecure attachment history may be primed to view parents asserting power as hostile and unfair, whereas in secure relationships children may view the same power assertion as well-intentioned since they have a history of a trusting, loving

relationship (Kim et al., 2014). This interpretive bias may begin within the parent-child relationship and later become a more generalized hostile attribution bias, which is one well-researched mechanism underlying aggressive and externalizing behaviors in school-age children and adolescents (Dodge, Bates, & Pettit, 1990; Lansford et al., 2006).

Other behaviors common in depression, such as withdrawal, amotivation, or disinterest, also have the potential to be interpreted differently by children with varying attachment histories. For a child with an insecure attachment history, these behaviors may serve as evidence that adults will not be available to provide help during periods of distress. If generalized, this expectation could make children less likely to seek assistance from adults during conflictual interactions with peers or siblings; as a result, they may come to rely on maladaptive strategies of conflict resolution. Consistent with this possibility, Ramos-Marcuse and Arsenio (2001) found that insecurely attached children's narratives about moral transgressions incorporated less adult assistance and more aggressive responses. If the combination of an insecure attachment history and exposure to maternal depression jointly contribute to a child believing adults are unable or unwilling to help, he or she may learn to use aggressive responses during conflict as an alternative to seeking adult assistance. Over time, this tendency could lead to significant externalizing behavioral problems.

Early security may also protect against later maladaptive outcomes through emotion regulation. Secure attachment relationships teach children how to regulate their own emotions first through co-regulation with the caregiver (Fonagy & Target, 1997). As children get older, they internalize these abilities and develop more independent emotion regulation strategies (Fonagy & Target, 1997). Children with secure attachments have more coping resources and emotion regulation skills, such as social referencing and maternal help seeking behaviors, than

insecurely attached children (Braungart & Stifter, 1991; Schieche & Spangler, 2005). When securely attached children are subsequently exposed to maternal depression they may be able to use their emotion regulation strategies to minimize the negative impact of their mothers' symptoms on their behavior. However, insecurely attached children lack these emotion regulation skills and therefore when they are exposed to maternal depression, or potentially other stressors, they do not have the emotional resources to cope. Instead, they may respond by exhibiting externalizing behaviors.

Another potential mechanism through which attachment quality could alter how children respond to maternal behaviors is children's recognition of caregivers' emotional cues. A basic tenet of attachment theory is that insecure attachment styles are adaptive within the relationships in which they develop (Ainsworth & Bell, 1970; Bowlby, 1988). For example, an avoidant child experiences his mother retreating when he shows signs of emotional distress, so he learns to hide emotional displays in order to keep his mother physically close so that she can care for him. It is possible that insecure children may become hypervigilant to their caregivers' emotions and may better recognize their emotional cues since they had to do so in order to maintain their connection as young children (Steele, Steele, & Croft, 2008). If some insecurely attached children become hypervigilant towards their mothers' emotional states, they may be particularly aware of their mothers' depressive symptoms throughout childhood. As a result, these children may be more impacted by their mothers' depression than children with a secure attachment history simply because they are more aware of her emotional state.

Similarly, differences in child outcomes in insecurely dyads may emerge because maternal depression plays out differently in these families relative to securely attached dyads. Maternal depression does not necessarily equate to negative parenting. A recent meta-analysis on

maternal depression and caregiving sensitivity during the first year of life found an overall effect size that was small in magnitude, with several studies finding no differences associated with depression (Bernard, Nissim, Vaccaro, Harris, & Lindheim, 2018). Thus, many mothers are able to manage symptoms in ways that do not detract from their actual parenting. Plausibly, early insecurity in the parent-child relationship may be a marker of a family in which mothers' emotional states are more likely to have a negative impact on their parenting.

Differences by child gender and racial and ethnic group membership

Gender was also examined as a possible moderator (i.e., a three way interaction between attachment quality, maternal depression, and gender). There is evidence that daughters of mothers with depression are at an increased risk of internalizing disorders whereas sons of mothers with depression are at a higher risk for externalizing disorders (Goodman et al., 2011; Shaw & Vondra, 1995). There is also some evidence that boys are more vulnerable to early environmental risk factors (Zahn-Waxler, Shirtcliff, & Marceau, 2008). The only significant interaction in the present study was found when children were reporting on their own behavior, although all three reporters showed a pattern in which the results were stronger for boys than for girls. This is aligned with the literature that suggests boys show higher rates of externalizing symptoms and externalizing disorders in childhood (Merikangas, Nakamura, & Kessler, 2009).

Racial and ethnic group membership was also tested as a potential moderator, but no differences were found. However, the fact that this sample is comprised of predominantly low income, single parent, African American and Latinx families in an urban setting is relevant for the interpretation of the findings. Children from these backgrounds are at an elevated risk for externalizing outcomes (Qi & Kaiser, 2003). However, it is unclear how much early attachment

may contribute to variations in outcomes among economically high-risk groups. Many studies that showed attachment moderated the relationship between subsequent risk factors and externalizing behaviors were done on families with middle socioeconomic status or with a broad range of socioeconomic statuses (Boldt et al., 2017; Kochanska et al., 2009). In these studies, SES risk factors may confound results. The present study suggests that early attachment status acts as a moderator among low income groups as well. The single-parent status of most mothers in this study also has implications for the findings. Kochanska and Kim (2013) found that children who had an insecure relationship with their mother and father at 15 months had higher levels of externalizing behaviors later in childhood than children who had a secure attachment with one parent and an insecure attachment with the other parent. Children in single parent families, such as the children in this sample, may have less opportunity to develop a secure attachment with at least one caregiver, which increases their risk for future externalizing behaviors. This study's sample was also largely composed of African American and Latinx families, and there were no differences in how attachment was related to externalizing outcomes by race or ethnicity.

Clinical Implications

Findings from the present study have implications for clinical practice and intervention. Since its development, attachment theory has had a major impact on the way clinicians conceptualize cases and intervene with clients. Indeed, a number of evidence-based interventions were developed from attachment theory, including Infant-Parent Psychotherapy, Mentalization-Based Treatment, Minding the Baby, and Mothering from the Inside Out (Bateman & Fonagy, 2013; Lieberman, Silverman, & Pawl, 2000; Sadler et al., 2013; Suchman, DeCoste, Ordway, & Bers, 2013). In addition, Teyber's (1992) interpersonal process approach draws on attachment

theory and has been influential in the way clinicians across theoretical orientations conceptualize cases and make clinical interventions.

It is common that when ideas have a sudden spike in popularity, the original theoretical basis and empirical research gets misinterpreted and misused and this has happened in some works based on attachment theory. In Dr. Sears' book on attachment parenting, he advocates for parents to be constantly bonding with their children through breastfeeding through the toddler years, co-sleeping, and baby wearing (Sears & Sears, 1993). These recommendations are grounded in attachment theory's idea that sensitive, consistent caregiving leads to the development of a secure attachment, and there is some empirical basis for this. Previous research demonstrates that mothers who engaged in synchronous interactions with their infants at one and three months had a significantly higher proportion of securely attached children at one year (Isabella, Belsky, & von Eye, 1989). However, mothers do not need to respond contingently to their infants one hundred percent of the time in order for them to develop a secure attachment. In this way, Sears and Sears (1993) recommend a level of contingency that is not necessary for the development of secure attachment, and importantly is not feasible for many mothers, especially working mothers or single mothers. Attachment parenting grew out of attachment theory, but recommends parenting behaviors beyond what current data shows is necessary for the development of a secure attachment. This can have detrimental consequences as well since the recommendations of attachment parenting are not realistic for most families.

In a similar way, the Circle of Security intervention was originally a 20-week intervention that focused on promoting a secure attachment through recording interactions between parents and children and using attachment theory to explain the child's behavior and to help parents understand the child's needs in the moment so that the parent can respond

sensitively (Hoffman, Marvin, Cooper, & Powell, 2006). Results showed that Circle of Security intervention significantly reduced the number of children who were classified as having a disorganized attachment from 60% to 25% (Hoffman et al., 2006). In order to scale this intervention for widespread dissemination, the researchers developed stock videos instead of making videos of the parents with their children, reduced the training for clinicians to four days, and reduced the length of the intervention (Cassidy et al., 2017). This adapted intervention (Circle of Security Parenting) did not improve attachment classification in a randomized controlled trial, however, this intervention has been internationally disseminated (Cassidy et al., 2017). Both Dr. Sears' book on attachment parenting and the Circle of Security Parenting intervention show how the overenthusiasm for an idea, in this case attachment theory, can lead treatment developers away from the current science.

Both attachment parenting and Circle of Security Parenting are grounded in the idea that promoting a secure attachment is critical in order to place children on a positive trajectory. Recent meta-analyses suggest that the relationship between early attachment status and outcomes later in childhood is more complex (Fearon et al., 2010; Madigan et al., 2016). The present study suggests that targeting interventions to certain subpopulations of children (e.g., those with an early insecure attachment and exposure to subsequent risk factors) would be an effective and efficient use of resources. Many of the evidence-based treatments that focus on promoting secure attachments are resource intensive and require weekly, one-on-one meetings with a clinician (Lieberman et al., 2000; Sadler et al., 2013; Suchman et al., 2013). If these services are provided to children with an early insecure attachment who also have mothers with depression, then they will likely have the largest impact on preventing later externalizing outcomes. In contrast, Circle of Security Parenting adapted their intervention so that it could be disseminated widely, which

unfortunately negatively impacted the intervention's ability to promote a secure attachment (Cassidy et al., 2017; Hoffman et al., 2006). In many ways, delivering an intervention, such as Circle of Security Parenting that does not have current empirical support, to all parents is costly and also has a more diffuse effect on long term child outcomes since the present study demonstrates that it is only insecurely attached children who are also exposed to later risk factors that will show elevated externalizing behaviors later in childhood. Taken together, this study adds to the body of evidence that suggests that interventions that promote secure attachment should be targeted towards parents who have children with an insecure early attachment and who also have other risk factors, such as maternal depression.

Limitations

One weakness of this study is the measurement of attachment. The gold standard for assessing attachment status is the Strange Situation. The Attachment Q sort requires the observer to sort behaviors based on how likely the child is to engage in them, and the items are very behavioral. Attachment Q sorts can be completed by an independent observer or by a parent, and in the present study the mother reported on the child's attachment style. This is a limitation because the mother may not be aware of the child's behaviors or may show a bias in reporting. Indeed, parents who exhibit behaviors that lead to attachment insecurity (i.e., failure to respond to a child's signs of distress) would be expected to be less accurate in observations of their child's attachment-related behaviors. Despite this limitation, Waters and Deane (1985) found that the mother's Attachment Q sort correlated with an observer's Q sort between $r = 0.59$ to $r = 0.93$. Therefore, there is evidence that mothers' ratings are correlated with independent observers' ratings. Meta-analytic findings that combined data from 139 studies found that the Attachment Q sort by the mother's report correlated with the Strange Situation at $r = 0.14$ (van

Ijzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004); however, correlations between the Strange Situation and other measures of attachment (e.g., observer completed Q-sort, Adult Attachment Interview; van Ijzendoorn et al., 2004; Weinfeld, Sroufe, & Egeland, 2000) are small or have not been assessed (e.g., Manchester Child Attachment Story Task, Child Attachment Interview; Green, Stanley, Smith, & Goldwyn, 2000; Schueli-Goetz, Target, Fonagy, & Datta, 2008) .

While the Attachment Q sort by the mother's report is a valid measure of attachment with significant predictive validity (Van Ijzendoorn et al., 2004), it is important to consider how this measurement of attachment may have impacted the results. For example, mothers who were depressed at age three may have overreported insecure behaviors in their children because of negative cognitive biases. Similarly, higher-risk children may have been misclassified as secure if their mothers were less able to recognize their child's attachment-related behaviors. Despite these possibilities, the current findings indicate that mothers' experience of their child's attachment behaviors—whether accurate or not from an objective observer standpoint—have implications for externalizing developmental trajectories. Thus, there are benefits to parent completed measures. In particular, this type of measure is less expensive and does not require the same specialized coding as the Strange Situation; consequently, it has the potential to be used in non-research settings (e.g., clinical practice) and attachment-based interventions that aim to measure change in attachment behaviors across time points.

In addition to reliance on parental measures of attachment, there are other limitations to the study. There were very few children categorized as having avoidant attachments; thus, it was not possible to test whether type of attachment moderated the relationship between exposure to maternal depression and later externalizing symptoms in childhood. Importantly, early

attachment theory made specific predictions about later outcomes for children with an avoidant versus an ambivalent attachment. Attachment theory hypothesized that avoidant attachment would be linked with externalizing behaviors since feelings of rejection early in childhood would be expressed in the forms of anger and violence later in life (Madigan et al., 2016; Sroufe et al., 1999). In contrast, it was expected that ambivalent attachment would be related to internalizing symptoms since these children struggle to regulate their emotions (Madigan et al., 2016). However, support for these assumptions has been mixed in the literature, and given the small sample size, the present study was unable to test whether type of attachment moderated the relationship between exposure to maternal depression and later externalizing behaviors. In addition, the Attachment Q Sort does not include a metric for attachment disorganization, which has been associated with the worst outcomes. As another limitation, outcomes were measured at age nine. While aggression and oppositional behaviors are clearly present at this stage of development, it may be too early to see significant variability in delinquent behaviors, the measure that children completed. Finally, this study is limited in that there was not measurement of specific mechanisms that may help explain why insecurely attached children may be differentially responsive to maternal depression.

Strengths

The present study has a number of strengths that are important to highlight. First, this study had a longitudinal design, which allowed us to examine how early attachment as assessed at age three affected child outcomes at age nine. In addition, we controlled for child externalizing behaviors at age three and maternal depression at age three, so the current interactions are significant above and beyond baseline child externalizing symptoms and maternal depressive symptoms. Another strength of this study is the number of reporters. We examined the

moderating role of attachment on mother, teacher, and child report of child externalizing symptoms. The significant interaction across all three reporters while controlling for many potential confounds strengthens our findings.

Conclusions

The present study was conducted because meta-analyses indicate that the relationship between early attachment status and later outcomes is not as large as was originally hypothesized (Fearon et al., 2010). As a result, researchers in this area (e.g., Fearon et al., 2010) have called for more research examining early attachment as a moderator. In this approach, attachment quality does not directly lead to psychopathology, but instead acts as a source of differential vulnerability. Results from this study provide further support for this conceptualization with significant moderating effects evident across mother, teacher, and child report of externalizing symptoms. Future research should examine potential mechanisms by which attachment quality may influence how children respond to maternal depression, including social information processing, emotion regulation, and recognition of emotional cues. Findings also support the use of targeted clinical interventions that promote a secure attachment in young children in vulnerable families, particularly those experiencing maternal psychopathology, physical or emotional abuse, or trauma. In this sample, young children with a secure attachment who later experienced maternal depressive symptoms showed little evidence of elevated externalizing problems, highlighting the potentially protective, lasting effect of a secure attachment within higher risk families.

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Table 1. Mean scores for child externalizing symptoms at age nine by mother, child, and teacher report broken down by insecure versus secure attachment and exposure to subsequent maternal depression

	Insecure Attachment		Secure Attachment	
	No Depression	Depression	No Depression	Depression
Mother Report of Child Externalizing Behaviors	1.28 (0.27) N=351	1.48 (0.39) N=102	1.24 (0.25) N=1190	1.29 (0.27) N=247
Child Report of Delinquent Behaviors	1.38 (1.84) N=348	2.28 (2.79) N=98	1.27 (1.79) N=1191	1.43 (1.74) N=244
Teacher Report of Externalizing Behaviors	0.40 (0.70) N=230	0.70 (0.91) N=60	0.43 (0.70) N=839	0.48 (0.66) N=172

Table 2. MANCOVA test of maternal depression and child attachment security on externalizing outcomes

Predictor	F (df = 2, 1768)	<i>p</i>	Partial eta ²
Mother education	2.93	0.05	0.00
African American	16.65	0.00	0.02
Latina	6.44	0.00	0.01
Lives with father at age 9	1.12	0.33	0.00
Mother's poverty at age 9	5.23	0.01	0.01
Child's age	2.47	0.09	0.00
Child's gender	35.62	0.00	0.04
Total child externalizing behavior at year 3 per mother's report	118.73	0.00	0.12
Mother's depression at child age 3	0.26	0.77	0.00
Child's attachment status	5.08	0.01	0.01
Subsequent maternal depression at child age 5 or 9	17.08	0.00	0.02
Child's attachment status * Subsequent maternal depression at child age 5 or 9	9.21	0.00	0.01

Table 3. *Follow-up univariate test of maternal depression and child attachment quality on child's report of delinquent behaviors at age nine*

Predictor	F (df = 1, 1769)	<i>p</i>	Partial eta ²
Child's attachment status	1.67	0.20	0.00
Subsequent maternal depression at child age 5 or 9	7.88	0.01	0.00
Child's attachment status * Subsequent maternal depression at child age 5 or 9	8.91	0.00	0.01

Covariates include: African American status, Latina status, Child lives with father at age nine, Mother's poverty at child age nine, Mother report of child externalizing behaviors at age three, Child's age, Child's gender, Mother's depressive symptoms at child age three

Table 4. *Follow-up univariate test of maternal depression and child attachment quality on mother's report of child externalizing behaviors at age nine*

Predictor	F (df = 1, 1769)	<i>p</i>	Partial eta ²
Child's attachment status	9.82	0.00	0.01
Subsequent maternal depression at child age 5 or 9	31.71	0.00	0.02
Child's attachment status * Subsequent maternal depression at child age 5 or 9	13.56	0.00	0.01

Covariates include: African American status, Latina status, Child lives with father at age nine, Mother's poverty at child age nine, Mother report of child externalizing behaviors at age three, Child's age, Child's gender, Mother's depressive symptoms at child age three

Table 5. *Univariate analysis of variance for teacher's report of child externalizing behaviors at age nine*

Predictor	F (df = 1, 1240)	<i>p</i>	Partial eta ²
Child's attachment status	0.25	0.62	0.00
Subsequent maternal depression at child age 5 or 9	5.34	0.02	0.00
Child's attachment status * Subsequent maternal depression at child age 5 or 9	5.17	0.02	0.00

Covariates include: African American status, Latina status, Child lives with father at age nine, Mother's poverty at child age nine, Mother report of child externalizing behaviors at age three, Child's age, Child's gender, Mother's depressive symptoms at child age three

Table 6. Mean scores for child externalizing symptoms at age nine by mother, child, and teacher report broken down by all three attachment categories and exposure to subsequent maternal depression

	Secure Attachment		Insecure Attachment— Ambivalent		Insecure Attachment— Avoidant	
	No Depression	Depression	No Depression	Depression	No Depression	Depression
Mother Report of Child Externalizing Behaviors	1.23 (0.25) N=1191	1.29 (0.27) N=247	1.29 (0.28) N=323	1.48 (0.40) N=96	1.25 (0.20) N=28	1.37 (0.27) N=6
Child Report of Delinquent Behaviors	1.24 (1.78) N=1190	1.43 (1.74) N=244	1.33 (1.86) N=320	2.29 (2.83) N=93	1.93 (1.59) N=28	2.00 (2.12) N=5
Teacher Report of Child Externalizing Behaviors	0.43 (0.70) N=839	0.48 (0.66) N=172	0.38 (0.68) N=210	0.65 (0.86) N=57	0.68 (0.85) N=20	1.67 (1.44) N=3

Table 7. *Cohen's d effect sizes comparing each attachment and exposure to subsequent maternal depression group with the group that was securely attached at age three and not exposed to maternal depression*

		Insecure Attachment, no maternal depression	Insecure Attachment, maternal depression	Secure Attachment, maternal depression
Mother report	Secure Attachment, no maternal depression	0.23	0.76	0.23
Teacher report	Secure Attachment, no maternal depression	0.04	0.33	0.07
Child report	Secure Attachment, no maternal depression	0.07	0.44	0.11

Figure 1. Mean standard scores for child externalizing behavior at age nine across three reporters and broken down by attachment category

