



HHS Public Access

Author manuscript

J Abnorm Child Psychol. Author manuscript; available in PMC 2015 June 16.

Published in final edited form as:

J Abnorm Child Psychol. 2012 July ; 40(5): 803–813. doi:10.1007/s10802-011-9598-z.

The relations among maternal depressive disorder, maternal Expressed Emotion, and toddler behavior problems and attachment

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Abstract

Direct and indirect relations among maternal depression, maternal Expressed Emotion (EE: Self- and Child-Criticism), child internalizing and externalizing symptoms, and child attachment were examined. Participants were mothers with depression ($n = 130$) and comparison mothers ($n = 68$) and their toddlers (M age = 20 mo.; 53% male). Assessments included the Diagnostic Interview Schedule (maternal depression); the Five Minute Speech Sample (EE); the Child Behavior Checklist (toddler behavior problems); the Strange Situation (child attachment). Direct relations were significant linking: 1) maternal depression with both EE and child functioning; 2) Child-Criticism with child internalizing and externalizing symptoms; 3) Self-Criticism with child attachment. Significant indirect relations were found linking maternal depression with: 1) child externalizing behaviors via Child-Criticism; 2) child internalizing behaviors via Self- and Child-Criticism; and 3) child attachment via Self-Criticism. Findings are consistent with a conceptual model in which maternal EE mediates relations between maternal depression and toddler socio-emotional functioning.

Keywords

maternal depression; Expressed Emotion; attachment; internalizing behaviors; externalizing behaviors; criticism

Maternal depression poses significant risks for the social and emotional development of offspring (Goodman & Tully, 2006; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Children of mothers with depression are at increased risk for developing an insecure attachment with caregivers (Coyl, Roggman, & Newland, 2002), increased internalizing and externalizing symptoms during childhood (Silk, Shaw, Forbes, Lane, & Kovacs, 2006), and clinically significant psychopathology during childhood and adolescence (Hammen & Brennan, 2003). Although the adverse effects of maternal depression are well documented, the underlying processes by which maternal depression impacts child functioning have been less clearly elucidated (Cicchetti & Toth, 1998; Goodman & Gotlib, 1999). The purpose of this study is to examine the direct relations between maternal depression, maternal Expressed Emotion (EE), and toddler attachment security and behavior problems, and to investigate the role of maternal EE as a mediator of the relations between maternal depression and toddler socio-emotional functioning.

Expressed Emotion

Depression is a debilitating mental disorder that is often characterized by negative thoughts and emotions regarding self and the world (Beck, 1976; Beck, 2002). In mothers with depression, this tendency towards negativity may create a child-rearing environment characterized by criticism. The Five Minute Speech Sample (FMSS; Magana et al., 1986) provides one way to assess maternal representations of the child. In the FMSS, individuals are asked to speak uninterrupted for five minutes on their thoughts and feelings about a specified individual without knowledge of what constructs will be coded from their speech. The content and tone of the speech sample are assessed to rate EE, which serves as an index of an individual's affective expression. An overall EE rating is made from the speech sample along with sub-ratings of Criticism and Emotional Over-Involvement. The EE construct was initially developed in the context of predicting relapse after treatment in adults with schizophrenia (Brown, Birley, & Wing, 1972; Brown & Rutter, 1966), and high EE measured in family members has been found to predict relapse in adults with schizophrenia (Moline, Singh, Morris, & Meltzer, 1985; Yang, Phillips, Licht, & Hooley, 2004) as well as other mental illnesses (Hooley, 2007; O'Farrell, Hooley, Fals-Stewart, & Cutter, 1998; Yan, Hammen, Cohen, Daley, & Henry, 2004).

More recently, research on EE has been extended to assess the emotional climate of the relationship between parents and young children. High EE-Criticism has been found to be associated with maladaptive parental behaviors such as antagonism, negativity, disgust, harshness and decreased responsiveness in the context of the parent-child relationship (McCarty, Lau, Valeri, & Weisz, 2004). Previous research has found that high EE-Criticism is associated with adverse functioning in children and adolescents, including higher levels of internalizing and externalizing symptoms (Frye & Garber, 2005), affective disorders (Schwartz, Dorer, Beardslee, & Lavori, 1990; Silk et al., 2009), substance abuse and

conduct disorder (Schwartz et al., 1990), antisocial behavior problems (Caspi et al., 2004), and self injurious thoughts and behaviors (Wedig & Nock, 2007). With few exceptions (e.g., Hirshfeld, Biederman, Brody, & Faraone, 1997; Raishevich, Kennedy, & Rapee, 2010), high EE-Emotional Over-Involvement has been found to be less predictive of child behavior problems (Baker, Heller, & Henker, 2000; Nelson, Hammen, Brennan, & Ullman, 2003), and may lack construct validity in the context of the relationship between parents and young offspring where it has been found to be unrelated to observed behaviors during parent-child interactions (McCarty et al., 2004).

Expressed Emotion and Parental Psychopathology

EE has traditionally been coded from parental speech samples as a way to predict mental illness or relapse in offspring; however EE is also a useful tool for understanding mental representations of self and other in an individual with psychopathology and the emotional climate experienced by those around the individual. It is unique from many other assessments of parenting in that it focuses on how a parent thinks about their child rather than explicit parental behavior. Higher EE-Criticism measured in regard to offspring is significantly associated with maternal depression diagnosis and symptoms (Bolton et al., 2003; Frye & Garber, 2005; Green, Stanley, & Peters, 2007; Nelson et al., 2003; Rogosch, Cicchetti, & Toth, 2004; Tompson et al., 2010). One study found that mothers of toddlers with a history of depression also express more EE-Criticism when speaking about themselves and their spouses using the FMSS (Rogosch et al., 2004). This finding suggests that representations of both other and self are likely to be characterized by negativity in mothers diagnosed with depression, and more research is necessary to understand how maternal Self-Criticism and Child-Criticism are differentially associated with child socio-emotional functioning.

The documented associations between EE-Criticism, maternal depression, and child psychopathology and behavior problems suggest that maternal EE-Criticism may be involved in the underlying process by which maternal depression can negatively impact child socio-emotional development. A handful of studies have examined this hypothesis using child behavior problems as an assessment of child adaptation. One study found that EE-Criticism partially mediated the association between degree of maternal depression and adolescent externalizing symptoms but not internalizing symptoms in a study employing a concurrent design; notably, there also continued to be a direct effect for maternal depression on child externalizing symptoms after controlling for EE-Criticism (Nelson et al., 2003). EE-Criticism was also found to significantly mediate the association between maternal depressive symptoms and child externalizing behaviors in a cross-sectional study of children ages four to 11 (Bolton et al., 2003). In contrast, a longitudinal study that focused on adolescent aged offspring found no support for EE-Criticism as a mediator of the association between maternal depression and adolescent internalizing and externalizing symptoms (Frye & Garber, 2005). Rather, support was found for adolescent externalizing behaviors as a mediator of the association between maternal depression history and EE-Criticism (Frye & Garber, 2005). In a conceptually related area of research, longitudinal associations have been demonstrated between harsh and rejecting parenting during early childhood and child behavior problems in subsequent years (Campbell, Pierce, Moore, Marakovitz, & Newby,

1996; Shaw, Gilliom, Ingoldsby & Nagin, 2003; Shaw, Winslow, Owens, Vondra, Cohn, & Bell, 1998). Studies of school age children have also found significant indirect relations between maternal depression and child behavior problems via harsh parenting (Chang, Lansford, Schwartz & Farver, 2004; Harnish, Dodge, & Valente, 1995). Collectively, these findings highlight the importance of examining both negative parental behaviors and representations during early development. However, to date, research on maternal critical representations of the child as assessed by EE has focused exclusively on older children and adolescents, leaving unanswered questions about the role of EE-Criticism in the association between maternal depression and child behavior problems in very young children. Studying these processes in younger children may better elucidate the way in which the associations between maternal depression, EE-Criticism, and child behavior problems develop. Additionally, to our knowledge, the role of maternal EE-Criticism towards self in the association between maternal depression and child behavior problems has yet to be investigated. Examining each of these associations will allow us to evaluate whether it is child criticism specifically that poses a risk factor for child behavior problems or if children's behaviors at this young age are also related to maternal self-criticality.

An important task during the first two years of life involves developing a secure attachment relationship with the parent. Research has repeatedly shown that children of mothers with depression or elevated depressive symptoms evidence higher rates of insecure and disorganized attachment than do children of non-depressed mothers (Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990; Teti, Gelfand, Messinger, & Isabella, 1995; Toth, Rogosch, Sturge-Apple, & Cicchetti, 2009). However, the process by which maternal depression impacts child attachment is yet to be fully understood. Little research has examined the association between maternal EE and child attachment. Findings from two studies suggest significant associations between disorganized attachment and high maternal EE assessed in both a clinically referred (Green et al., 2007) and normative sample of children (Jacobsen, Hibbs, & Ziegenhain, 2000). To our knowledge, no study to date has examined maternal EE as a potential mediator of the association between maternal depression and child attachment. Through early interactions with his or her primary caregiver, the child develops a sense of self and other, influenced by the child's perceptions of his or her needs being met in the context of the caregiving relationship (Bowlby, 1969). Negative self-representations may impact a mother's perceptions of her ability to meet her child's needs. Additionally, mothers' negative child representations could impact maternal perceptions of child soothability when the child is distressed. Thus, EE-Criticism towards self and child may be associated with maternal efforts towards or success at serving as a secure base, and the role of EE has yet to be explored in the relation between maternal depression and child attachment security.

Aims of the Current Study

Previous research on the current sample has demonstrated that compared to nondepressed mothers, depressed mothers have higher levels of EE. Additionally, children of depressed mothers have higher levels of behavior problems and attachment insecurity than children of nondepressed mothers, and there is a significant relation between maternal EE and child

problem behaviors (Rogosch et al., 2004; Toth, Rogosch, Manly, & Cicchetti, 2006). The present study aims to elaborate on previous research by using a path analytic technique to test hypotheses regarding significant direct positive associations between maternal depression and (a) maternal EE Self-Criticism, (b) maternal EE Child-Criticism, (c) child internalizing and externalizing behaviors, (d) and attachment insecurity. Additionally, we hypothesize that there will be positive direct associations between EE Self- and Child-Criticism and (a) child internalizing and externalizing behaviors and (b) attachment insecurity. Subsequently, we test a model in which maternal EE Self- and Child-Criticism are each conceptualized as mediators of the association between maternal depression and (a) child internalizing and externalizing behaviors and (b) attachment insecurity in toddler aged children. We hypothesize that there will be significant indirect relationships between maternal depression and child behavior problems and attachment via maternal EE Self- and Child-Criticism.

Methods

Participants

Mothers ($n = 198$) ages 21 to 41 ($M = 31.68$, $SD = 4.68$) with and without a history of major depressive disorder since the birth of their child and their toddlers (53% male) were recruited as part of a larger study of the effects of maternal depression on child development. All study procedures were approved by the University of Rochester human subjects institutional review board, and mothers provided informed consent and permission for their child's participation in the project before study procedures were initiated. Mothers who had experienced a major depressive episode ($n = 130$) since the birth of their child were recruited through newspaper and community publication notices and flyers placed in medical offices and on community bulletin boards. A comparison group of mothers ($n = 68$) without a current or past history of any major mental disorders was recruited by contacting families who lived in the same neighborhoods as the mothers in the depressed group. Birth records were utilized to identify families with toddler-age children. Inclusion criteria for mothers in the depressed group included meeting the Diagnostic and Statistical Manual of Mental Disorders (3rd ed., rev.; DSM-III-R; American Psychiatric Association, 1987) criteria for major depression since their child's birth according to the Diagnostic Interview Schedule (Robins, Helzer, Cottler & Goldring, 1985) and having a child approximately 20 months ($M = 20.32$, $SD = 2.50$ months) of age at the time of recruitment. Mothers in the depressed group were excluded if they met criteria for bipolar disorder. Mothers were included in the nondepressed group if they had a toddler of approximately 20 months of age at the time of recruitment and did not meet criteria for any current or past major psychiatric disorder as determined by the DIS-III-R. To minimize co-occurring risk factors, only families of middle or higher socioeconomic status were included. Accordingly, mothers in both groups were required to have a minimum of a high school education and could not be receiving public assistance at the time of recruitment.

Participants in the depressed and nondepressed groups were comparable on a number of variables. Family socioeconomic status did not differ between groups, $t(196) = 1.19$, $p = .24$, nor did child gender, $\chi^2(1, N = 198) = .08$, $p = .78$. The majority (92.9%) of mothers in

sample were Caucasian, and the percent of mothers of non European-American race/ethnicity did not differ between groups, $\chi^2(1, N = 198) = 1.11, p = .29$. Maternal age differed significantly between the two groups, with mothers in the nondepressed group being slightly older ($M = 32.8, SD = 4.0$) than mothers in the depressed group ($M = 31.0, SD = 4.9$), $t(196) = 2.58, p = .01$. The majority of mothers in the sample were married (87.9%). However, mothers in the depressed group were more likely to be currently unmarried or separated than the nondepressed group mothers, $\chi^2(1, N = 198) = 11.03, p = .001$; this finding is consistent with reports of marital difficulties associated with depression (Coyne & Downey, 1991).

Measures

Diagnostic Interview Schedule (DIS-III-R; Robins et al., 1989)—The DIS-III-R is a structured interview designed to assess diagnostic criteria for Axis I disorders according to the DSM-III-R (American Psychiatric Association, 1987) and allows for the diagnosis of 48 DSM-III-R disorders. The DIS-III-R version was chosen for use in this study as it was the current diagnostic interview at the initiation of the investigation. The interview consists of modules that inquire on symptom history for different categories of DSM-III-R Axis I disorders. Questions are answered in a “yes” or “no” format, reducing the need for interviewer interpretation. Given the highly structured format of the DIS-III-R, sensitive clinical judgments are not necessary and trained nonprofessional interviewers can conduct the interview. Demographic information was also collected during the administration of the DIS-III-R.

Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961)—The BDI is a widely used self-report measure of current depressive symptoms, including cognitive, affective, motivational and physiological symptoms. It contains 21 items, and each lists four self-evaluative statements that are scored from 0 to 3, with higher scores indicating greater severity. Cutoff scores have been established to indicate different levels of depression (0–9: none or minimal; 10–18: mild to moderate; 19–29: moderate to severe; 30–63: severe) (Beck, Steer, & Garbin, 1988). The validity of the BDI has been supported by previous research (Beck et al., 1988), and internal consistency of the measure in this sample was .92.

Five Minute Speech Sample (FMSS; Magana et al., 1986)—The FMSS was conducted to assess EE in regard to self and child. EE has traditionally been coded from the Camberwell Family Interview, but the FMSS is a valid alternative method that reduces the burden of assessment on the research participant as well as the time necessary to code EE (Magana et al., 1986).

Mothers were asked to speak for five minutes without interruption on their thoughts and feelings about their child using standard administration procedures. They were then asked to speak for five minutes about themselves in a separate speech sample. They were unaware of what constructs would be coded from their speech. Based on audio recordings of the speech samples, EE was coded based on verbal content and tone using the Magana et al. (1986) coding manual. A three-point scale was used to indicate whether the mother’s level of EE-Criticism was low, borderline, or high. A high EE-Criticism rating is made if the mother

starts the FMSS with a negative comment, expresses one or more criticisms, or describes a negative relationship (the latter used only for the speech sample regarding the child). A borderline rating is made if the mother expresses one or more dissatisfactions in the absence of any of the following: critical comments, a negative initial statement, and a negative description of the relationship with the child. A low rating is made in the absence of dissatisfaction, criticism, a negative initial statement, and a negative relationship description. Independent ratings were obtained for the mother speaking on her child (Child-Criticism) and herself (Self-Criticism). The primary coder for all samples met reliability according to the standards established by the UCLA Family Project and was unaware of group status of the mother and the hypotheses of the study. A second trained coder independently rated a random subsample of 20% of the self and child speech samples to obtain inter-rater reliability. Quadratic weighted kappas (Fleiss, Levin, & Paik, 2003) were calculated, obtaining .74 for Child-Criticism and .70 for Self-Criticism, indicating good inter-rater agreement.

Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978)—Attachment security in toddlers was assessed using Ainsworth's Strange Situation, a standardized laboratory procedure designed to activate the attachment relationship in a controlled setting. Two trained raters coded the videotapes to determine attachment classifications: insecure-avoidant (A), secure (B), insecure-resistant (C), or disorganized (D). Given that the children in this sample were on average 20 months of age and the Strange Situation was originally developed for infants of approximately 12 months of age, developmentally informed modifications to the coding of toddler attachment were made based on previously published recommendations (Schnieder-Rosen, Braunwald, Carlson, & Cicchetti, 1985). Each rater coded the videotaped Strange Situation for each toddler, and agreement between raters was 90% (see Toth et al., 2006 for an elaboration). Due to small cell sizes for the A and C classifications, insecure and disorganized categories were combined for the current study and comparisons were made between secure and insecure attachment classifications.

Child Behavior Checklist (CBCL; Achenbach, 1992)—The CBCL was used to obtain maternal assessment of child behavioral and emotional problems. It is a widely used and psychometrically valid and reliable instrument. The version designed to assess 2- and 3-year-old children was used for this study. Parents rate their child's current functioning as well as that of the previous 2 months on 100 items which are scored from 0 (not true of the child) to 2 (very true or often true of the child). Standardized T-scores for internalizing and externalizing behavior problems were obtained from these ratings.

Data Analysis Plan

Analyses were performed using Mplus Version 6.00 (Muthen & Muthen, 1998–2010). To account for non-normality, we used a maximum likelihood estimator with robust standard errors (MLR) using a numerical integration algorithm (Muthen & Muthen, 1998–2010). Maximum likelihood parameter estimates with standard errors and a chi-square test statistic are robust to non-normality and non-independence of observations. Traditional maximum likelihood methods assume the distributions of the continuous variables in the model are multivariate normal. The normal distribution assumption is problematic in mediation models

as the product coefficients used to evaluate mediation rarely meet this assumption (Preacher & Hayes, 2008; Shrout & Bolger, 2002). Thus, in the current study, maternal Self-Criticism and Child-Criticism were examined as mediators of the association between maternal depression and child behavior problems using 2,000 bootstrap replicates to obtain bias-corrected bootstrap confidence intervals for the product coefficients of the indirect effects (MacKinnon, Fairchild, & Fritz, 2007). Maternal Child-Criticism and Self-Criticism were examined as mediators of the association between maternal depression and child attachment insecurity using the Joint Significance Test (JST), given that attachment was a dichotomous variable. Monte Carlo studies suggest that the JST offers the best compromise between statistical power and Type I error (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Missing data varied by indicator, ranging from 0% to 3%, and was determined to be missing at random using a full information maximum likelihood approach (Little & Rubin, 2002).

Results

Of the 130 mothers who met DSM criteria for MDD since the birth of their child, 97 met criteria for MDD in the last 6 months and 51 met criteria in the month prior to assessment. The mean BDI score of the depressed group was in the mild depression range ($M = 16.1$, $SD = 9.2$). Importantly, more than 70% of the depressed group reported that they had experienced symptoms of MDD prior to the birth of their child with a mean of 8.6 years since onset, suggesting the chronic nature of depression in this group.

The depressed and nondepressed groups differed significantly on main study variables, with depressed mothers evidencing higher Child-Criticism and Self-Criticism and having toddlers with higher levels of internalizing symptoms, externalizing symptoms, and attachment insecurity. Extensive group comparisons have been reported elsewhere (Rogosch et al., 2004; Toth et al., 2006). Pearson bivariate correlations for all study variables are presented in Table 1. Correlation analyses indicated that both maternal Child-Criticism and Self-Criticism were significantly positively associated with internalizing and externalizing behaviors. Maternal Self-Criticism was significantly positively associated with toddler attachment insecurity; maternal Child-Criticism and attachment insecurity were not significantly related. (See Table 1.)

Children of mothers in the depressed group evidenced primarily an insecure or disorganized attachment, with 32.3% being categorized as A, 19.2% as B, 9.2% as C, and 39.2% as D. In comparison, the majority of toddlers of nondepressed mothers were securely attached: 19.1% were categorized as A, 55.9% as B, 5.9% as C, and 19.1% as D. The A, C, and D groups were combined into an insecure group. Chi-square analyses indicated that there was a higher proportion of insecurely attached toddlers in the depressed group (80.7%) compared to the nondepressed group (44.1%), $\chi^2(1, N = 198) = 27.65, p < .001$.

Group differences on CBCL internalizing and externalizing T-scores were tested using one-way ANOVAs. Internalizing symptoms were significantly higher in children of mothers in the depressed group ($M = 50.55$, $SD = 8.37$) compared to toddlers of mothers in the nondepressed group ($M = 46.72$, $SD = 7.55$), $F(1, 194) = 9.96, p = .002$. Children of mothers

in the MDD group were also higher on externalizing symptoms ($M = 53.30$, $SD = 8.19$) compared to children of nondepressed mothers ($M = 50.60$, $SD = 7.62$), $F(1, 194) = 5.04$, $p = .026$.

Path Analyses

Analyses confirmed significant direct paths linking maternal depression status to child internalizing ($\beta = .188$, $p = .005$) and externalizing ($\beta = .139$, $p = .048$) symptoms, as well as attachment insecurity ($B = -1.671$, $p < .001$, Odds ratio = 4.54).

Behavior problems—Controlling for maternal marital status and age and child age, bootstrapped bias corrected CIs were used to examine the indirect effect between maternal depression and child internalizing and externalizing behaviors via maternal Self-Criticism and Child-Criticism. All traditional indices of global fit suggested good fit between the data and the model tested ($\chi^2(1, N = 198) = 2.7$, $p = .10$; Comparative Fit Index, CFI = 0.99; Root Mean Square Error of Approximation, RMSEA = 0.093; standardized root mean residuals, SRMR = 0.018). (See Table 2.)

Table 2 shows estimates for the direct and indirect effects. Maternal depression status was significantly associated with Self-Criticism and Child-Criticism. Child-Criticism was significantly associated with both internalizing and externalizing behaviors. Additionally, the indirect paths between maternal depression and child externalizing behaviors and between maternal depression and child internalizing symptoms via Child-Criticism were both significant. Whereas the direct path between Self-Criticism and child internalizing problems approached significance ($p = .059$), the indirect path from maternal depression to internalizing behaviors through Self-Criticism was significant. There was no direct association between Self-Criticism and child externalizing behaviors, and the indirect path between maternal depression and child externalizing symptoms by way of Self-Criticism was not significant.

The direct effect for maternal depression on internalizing symptoms was no longer significant after including Child-Criticism and Self-Criticism in the model, consistent with a full mediation interpretation. Similarly, the direct effect for maternal depression on child externalizing symptoms was no longer significant after including Child-Criticism in the model, also consistent with a full mediation conceptual interpretation. (See Figure 1.)

Attachment insecurity—Maternal Self-Criticism and Child-Criticism were examined separately as mediators of the association between maternal depression and child attachment insecurity, controlling for maternal marital status and age and child age. Using the JST, significant mediation is determined when the path from the predictor to the hypothesized mediator (path a) and the path from the hypothesized mediator to the dependent variable (path b) are statistically significant after the direct path from the independent variable to the outcome variable is held constant (Cohen & Cohen, 1983; Mallinckrodt, Abraham, Wei, & Russell, 2006). Self-Criticism was examined first as a mediator. Path a was tested by regressing maternal Self-Criticism onto maternal depression status and was significant ($\beta = .283$, $p < .001$). A logistic regression was used to test path b . Controlling for the direct pathway between maternal depression status and attachment, attachment classification was

regressed onto maternal Self-Criticism. Results revealed that children of mothers with higher Self-Criticism had a significantly higher probability of being classified as insecurely attached ($\beta = .369, p = .025$; Odds ratio = 1.74). The direct effect from maternal depression status to attachment insecurity remained significant while accounting for Self-Criticism as a mediator ($\beta = .680, p < .001$), suggesting a partial mediation interpretation.

Child-Criticism was next tested as a mediator. Path *a* was tested by regressing maternal Child-Criticism onto maternal depression status and was significant ($\beta = .145, p = .03$). Path *b* was tested using logistic regression; Child-Criticism was not a significant predictor of attachment security versus insecurity ($\beta = .182, p > .05$) while controlling for the direct pathway between maternal group status and attachment ($\beta = .788, p < .001$). Results do not support Child-Criticism as a significant mediator of the association between maternal depression and child attachment insecurity. (See Figures 2 and 3.)

Discussion

This study revealed important findings regarding the relations between maternal depression, negative maternal representations of self and child, and behavior problems and attachment in toddler aged offspring. Consistent with study hypotheses, maternal depression was significantly positively associated with EE Self- and Child-Criticism, child internalizing and externalizing behaviors, and attachment insecurity. There was a direct relation between maternal Child-Criticism and child internalizing and externalizing behaviors, but not attachment, partially congruent with study hypotheses. Maternal Self-Criticism was positively associated with attachment insecurity, consistent with our predictions. However, contrary to study hypotheses, maternal Self-Criticism was associated with internalizing symptoms only at the trend level and was not directly associated with child externalizing behaviors. Importantly, results are consistent with a conceptual model in which Self-Criticism partially mediates the association between maternal depression and child attachment; although a full mediation model was predicted, this finding is largely compatible with study hypotheses. Contrary to our predictions, Child-Criticism was not significant in the pathway between maternal depression and child attachment insecurity. Child-Criticism, but not Self-Criticism, mediated the association between maternal depression and child externalizing behaviors; both Self- and Child-Criticism were significant in the path between maternal depression and child internalizing behaviors, largely in line with study hypotheses.

The finding that mothers' expressed criticism towards their toddlers significantly mediated the pathway between maternal depressive status and child externalizing symptoms is consistent with some research on older children and adolescents (Bolton et al., 2003; Nelson et al., 2003). Results suggest that mothers with depression who are critical of their toddlers have offspring who may be at heightened risk for developing externalizing symptoms, which can be a precursor to later psychopathology, including oppositional behavior and conduct problems (Campbell, Shaw, & Gilliom, 2000). Contrary to our predictions, maternal Self-Criticism did not emerge as a significant mediator of the pathway between maternal depression and child externalizing symptoms. Thus, it is representations of the child among

mothers with depression that appear to be related to the extent to which children exhibit under-controlled, impulsive behavior.

Child-Criticism also emerged as a significant mediator of the association between maternal depression and child internalizing symptoms. This finding is inconsistent with previous research that has not established Child-Criticism as a mediator of the relation between maternal depression and child internalizing symptoms in older children and adolescents (Bolton et al., 2003; Nelson et al., 2003). These results suggest that different factors may be operating in the association between maternal depression and child internalizing symptoms in toddler-aged children compared to older children and highlight the importance of considering developmental stage when investigating processes influencing child internalizing symptoms in the context of maternal depression. Results may also be attributable to behavior problems being less differentiated during the toddler period than during childhood and adolescence. Results were also consistent with a conceptual model in which maternal Self-Criticism mediated the association between maternal depressive status and child internalizing symptoms, an indirect path that has not been examined in previous research. Toddlers' emerging sense of self and associated affect may be sensitive to a relational environment where mothers are critical of the child and themselves (cf. Cicchetti, Rogosch, Toth, & Spagnola, 1997). Thus, high levels of maternally expressed criticism towards both self and child may be assimilated by young toddlers and manifest through internalizing behaviors.

The finding that Self-Criticism, but not Child-Criticism, partially mediated the association between maternal depression and child attachment suggests that a mother's self-representations may be more strongly related to the attachment relationship than her representations of her child. Whereas extensive research has highlighted mother's representations of her own caregiver (see van IJzendoorn, 1995 for a meta-analysis) and maternal sensitivity (see De Wolff & van IJzendoorn, 1997 for a meta-analysis) to explain the development of the attachment relationship, these findings suggest that a mother's representation of herself may be an important factor in explaining the association between maternal depression and child attachment insecurity.

A limitation of the current study is the concurrent assessment of primary study variables. Although theoretically-informed mediational models were hypothesized, we are unable to determine whether maternal depression precipitates EE-Criticism, which in turn leads to child behavior problems and insecure attachment, or whether maternal depression leads to child behavior problems and attachment insecurity, which then results in mothers being critical of themselves and their children. It is also possible that the effects are transactional, as has been suggested by previously in regards to externalizing behaviors in adolescents (Nelson et al., 2003). Despite this limitation, the current study has established an association between maternal depression, EE-Criticism and important assessments of child functioning in toddler-aged children, an essential first step before examining the relations among these variables longitudinally.

Another potential limitation of the current research involves utilization of maternal report to assess child internalizing and externalizing symptoms. Although prior research has found

that maternal depression is associated with ratings on the CBCL as it was in this study, previous research established that maternal ratings distinguish between children with and without psychiatric problems even after controlling for maternal depression (Friedlander, Weiss, & Traylor, 1986). Additionally, because mothers provided the FMSS from which Child-Criticism and Self-Criticism were rated, information on their depressive symptoms in order to make diagnoses using the DIS, and reports on child behavior problems, inflation of associations between these constructs cannot be ruled out. In an attempt to mitigate this concern, mothers were not aware that coders would be assessing levels of criticism from their speech, and coders adhered to specific guidelines and rules for these ratings. Further, a structured diagnostic interview was used in addition to a self-report instrument to assess maternal depression. Because Child-Criticism and Self-Criticism were coded by the same rater, concerns about the independence of these variables could be raised; to minimize these concerns, speech samples were de-identified before rating occurred, and ratings of all child speech samples were completed before ratings of self speech samples were initiated. It should also be noted that although toddlers of the depressed mothers in this study had significantly higher internalizing and externalizing symptoms than the children of the nondepressed mothers, their mean symptom levels were still in the normative range. Accordingly, interventions for behavior problems were not yet indicated for the toddlers in this sample. However, understanding processes associated with the initial development of psychopathology, underscored by the high rate of insecure and disorganized attachment found among these toddlers, provides insight into the negative developmental cascade that can eventuate from risk factors such as maternal depression (Masten & Cicchetti, 2010).

Despite these limitations, the current study represents a significant contribution to the literature. This was the first study to investigate the relations among maternal depression, maternal Child-Criticism and internalizing and externalizing symptoms in toddler-aged children and among maternal depression, maternal Self-Criticism, and child problem behaviors in children of any age. Importantly, it is also the first study in children of any age to examine a conceptual model in which EE-Criticism mediates the relation between maternal depression and child attachment security. Additional strengths include the large sample size, the clinical diagnosis of MDD using a structured diagnostic interview, and the inclusion of a non-psychiatric comparison group. Different coders were utilized to assess attachment and EE, thereby eliminating concerns regarding non-independence of coding between the two paradigms.

Maternal depression is widely recognized as a risk factor for the development of child behavior problems and insecure attachment. Findings from this study contribute to the understanding of processes that may be more proximal to behavior problems and attachment insecurity in children of mothers with depression, knowledge that can inform interventions aimed at this population. The results suggest that a focus on altering negative maternal representations of self and child could deter the emergence of child behavior problems. Reducing maternal Self-Criticism may be especially relevant for interventions aimed at strengthening the attachment relationship such as Child-Parent Psychotherapy (Toth et al., 2006).

Future research should implement a longitudinal design to test the mediational models reported in this study in order to confirm the direction of hypothesized pathways. The current work also highlights maternal self-representations as an important area for future investigations of the development of the attachment relationship between mother and young offspring. Future studies should seek to more fully understand the link between maternal Self-Criticism and child attachment through examining maternal self-efficacy, self-esteem, and other self-system processes likely also involved in this association.

In conclusion, the current study extends previous research linking maternal depression and maternal EE-Criticism to internalizing and externalizing problems in toddler-aged children and to the attachment relationship. Much research suggests that supportive and responsive parenting is vital for promoting resilient adaptation in children (Masten, 2001). Thus, research directed toward understanding ways that maternal representations of their children and themselves may be affected by depression and how these representations are related to child socio-emotional functioning is of the utmost importance for advancing our understanding of processes leading to child risk for psychopathology and for preventing these processes from unfolding.

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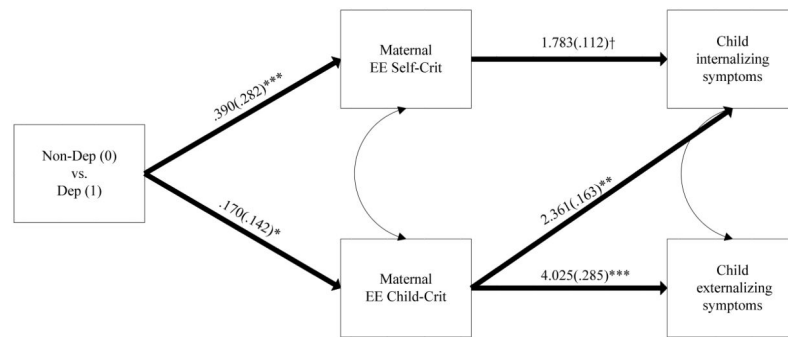


Figure 1.

Parameter estimates for mediational model testing maternal EE Self-Crit and EE Child-Crit as mediators of the association between maternal depression group and child internalizing and externalizing symptoms; estimates reported as unstandardized (standardized). Non-Dep = nondepressed group; Dep = depressed group. $\dagger p < .06$. $* p < .05$. $** p < .01$. $*** p < .001$.

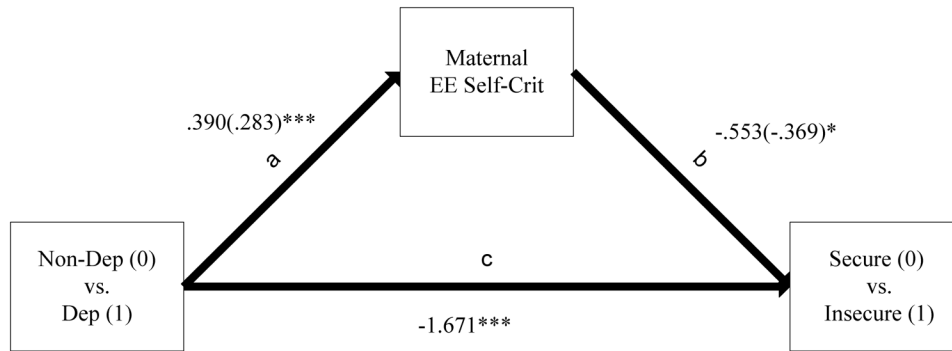


Figure 2. Parameter estimates for mediational model testing maternal EE Self-Criticism as a mediator of the association between maternal depression group and child attachment security vs. insecurity; estimates reported as unstandardized (standardized). Path *c* denotes the direct path from depression status to attachment quality, not controlling for EE Self-Criticism. Non-Dep = nondepressed group; Dep = depressed group. * $p < .05$. *** $p < .001$.

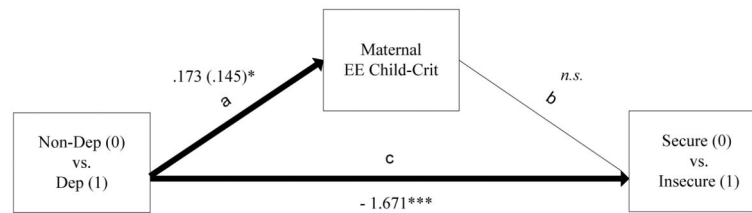


Figure 3.

Parameter estimates for mediational model testing maternal EE Child-Criticism as a mediator of the association between maternal depression group and child attachment security vs. insecurity; estimates reported as unstandardized (standardized). Path *c* denotes the direct path from depression status to attachment quality, not controlling for EE Child-Criticism. * $p < .05$. Non-Dep = nondepressed group; Dep = depressed group; n.s. = non-significant.

Table 1

Bivariate correlations between study variables

	1. Dep.	2. BDI	3. Child- Crit.	4. Self- Crit.	5. Intern.	6. Extern.	7. Attach.	8. Toddler age	9. Mother age	10. Marital Status
1. Dep.	-									
2. BDI	.64**	-								
3. Child-Crit.	.17*	.19**	-							
4. Self-Crit.	.28**	.25**	.17*	-						
5. Intern.	.22**	.19**	.24**	.23**	-					
6. Extern.	.16*	.12	.34**	.20*	.74**	-				
7. Attach.	.37**	.28**	.12	.21**	.23**	.16*	-			
8. Toddler age	-.17*	-.10	-.01	.05	-.05	-.02	-.23**	-		
9. Mother age	-.17*	-.06	-.12	-.15*	-.29**	-.24**	-.07	.07	-	
10. Marital Stat.	-.24**	-.30**	-.11	-.05	-.18*	-.12	-.09	.07	.23**	-

Table 2

Path Analyses Estimates of Direct and Indirect Effects

Independent variables	Mediator variables	Dependent variables	β	B	SE of mean ^d	95% CI ^a (lower, upper)
Dep.	→	Internalizing	.096	1.671	1.227	[-.678, 4.109]
Dep.	→	Externalizing	.047	.800	1.242	[-1.621, 3.268]
Dep.	→	Self-Crit.	.282	.390	.095	[.194, .571]*
Dep.	→	Child-Crit.	.142	.170	.081	[.009, .333]*
Self-Crit.	→	Internalizing	.142	1.783	.942	[-.039, 3.678]
Self-Crit.	→	Externalizing	.112	1.365	.934	[-.491, 3.164]
Child-Crit.	→	Internalizing	.163	2.361	.904	[.385, 4.004]*
Child-Crit.	→	Externalizing	.285	4.025	.922	[2.217, 5.757]*
Dep. →	Self-Crit. →	Internalizing	.040	.696	.696	[.026, 1.778]*
Dep. →	Self-Crit. →	Externalizing	.032	.533	.420	[-.124, 1.500]
Dep. →	Child-Crit. →	Internalizing	.023	.402	.264	[.033, 1.124]*
Dep. →	Child-Crit. →	Externalizing	.041	.685	.392	[.071, 1.651]*

Note. CI=Confidence Interval; Dep. = depressed/nondepressed group status; Child-Crit. = EE Child-Criticism; Self-Crit. = EE Self - Criticism; Internalizing = CBCL internalizing behaviors; Externalizing = CBCL externalizing behaviors.

^aThese values are based on unstandardized bootstrapped path estimates.

* p < .05