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The Effect of Maternal Depression on Mental Representations and Child Negative Affect

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Abstract

Background: Maternal depression is a widely recognized public health concern with significant implications for child functioning, including the development of negative child affect and risk for later depression. Negative mental representations may partially account for the association between maternal depression and child negative affect.

Methods: The effect of depression on low-income mothers' representations of their child, self, and mother was assessed via Expressed Emotion (EE) during Five-Minute Speech Samples. Direct and indirect pathways between maternal depression, EE, and child negative affect were examined. Mothers ($M = 24$ years old) who had experienced a major depressive episode ($n = 144$) since child's birth, non-depressed comparison mothers ($n = 62$), and their children participated.

Results: Examination of between-group differences revealed that depressed mothers had higher levels of overall self EE. Trend results also suggest depressed mothers may have higher overall EE toward their children and their own mothers. Novel coding systems for EE toward self (Identity and Depressotypic Cognitions) and EE toward mother (Source of Concrete Support and Resolution of Past Adversity) were also developed and tested. A significant indirect relation was

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found between maternal baseline depression and child negative affect at 26 months via the mother's level of EE-Criticism of her mother.

Limitations: Certain EE subcodes may need to be adapted for young children and high-risk, low-income participants.

Conclusions: Findings highlights the importance of relational interventions that focus on maternal representations for women with depression and their children.

Keywords

maternal depression; mental representations; child negative affect; Expressed Emotion

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Introduction

Maternal depression is a widely recognized public health concern with significant implications for child functioning. A recent systematic review identified a 12% incidence rate and a 17% overall prevalence rate of postpartum depression among healthy mothers (Shorey et al., 2018). Importantly, a mother's depression can affect the development of her children. For example, 9-month old infants of depressed mothers were found to have less mature regulatory behaviors, more negative emotionality, and higher cortisol reactivity compared to infants of non-affected controls (Feldman et al., 2009). Greater levels of child negative affect are associated with later risk for depression (Cicchetti & Toth, 1998; Garstein & Bateman, 2008), suggesting infants of depressed mothers may experience early risk for psychopathology. In addition to impacting child affect, maternal depression can also affect mothers' representations of themselves, their children, and their own mothers (Blatt & Homann, 1992; Rosenblum et al., 2002). Because negative representations have been associated with both maternal depression and child functioning (Bolton et al., 2003; Frye & Garber, 2005; Gravener et al., 2012; Nelson, Hammen, Brennan, & Ullman, 2003), it is possible that negative maternal representations may partially explain negative affect in infants beyond the contribution of depression.

Maternal depression is also associated with financial stress and lower socioeconomic status (McCue Horwitz et al., 2007). Therefore, it is important to examine the effect of maternal depression and representations on child negative affect in these high-risk contexts. This intergenerational pattern of development in contexts of risk is consistent with the developmental psychopathology framework, which suggests that development is influenced by the interaction of multiple levels of the ecology (e.g., individual, family, and community) at multiple points in development (Cicchetti & Lynch, 1993; Cicchetti & Toth, 2016). For children who are raised in low-income environments by mothers with depression, there are risk factors present at multiple levels of the ecology that pose a threat to the child's development. Therefore, understanding how these developmental processes unfold across generations can help identify opportunities for policy, prevention, and treatment.

Expressed Emotion as an Assessment of Mental Representations

Expressed Emotion (EE; Vaughn & Leff, 1976) is a measure of emotional quality between family members, specifically capturing elements of criticism, resentment, and over-

involvement. The EE coding system assesses mental representations by examining aspects of verbal content, vocal tone, warmth, criticism, hostility, emotional over-involvement, and dissatisfaction (Brown & Rutter, 1966; Brown et al., 1972). EE ratings have been used to assess a mother's representations of her child in the context of maternal depression, enabling researchers to quantify the effects of maternal attitudes and feelings on child functioning. High EE, specifically criticism measured with respect to offspring, is significantly associated with maternal depression (Bolton et al., 2003; Frye & Garber, 2005; Green et al., 2007; Nelson et al., 2003; Psychogiou et al., 2013; Rogosch et al., 2004).

Applications of EE within the context of maternal depression have been largely limited to assessing maternal representations of the child, with a few exceptions that have explored EE in regards to the self (Gravener et al., 2012; Rogosch et al., 2004). Central features of depression include negative feelings and cognitions about one's self, including self-blame and self-criticism (Beck & Alford, 2009). Gravener et al. (2012) found that maternal self-criticism (assessed via EE) mediated the association between maternal depression and child attachment security, whereas child criticism (assessed via EE) did not emerge as a significant mediator. These findings show that self-representations can have important implications for the development of the mother-child relationship.

Although research to date has not examined EE regarding a mother's own caregiver, the influence of a mother's parental representations on her current relationship with her child has been established by extensive research on attachment using the Adult Attachment Interview (AAI; George et al., 1984). More specifically, negative parental states of mind regarding attachment (e.g., dismissing, preoccupied, unresolved) have been associated with insecure and disorganized child attachment (Fonagy et al., 1991; Main & Hesse, 1990; van Ijzendoorn, 1995). Because representational models are formed in part from attachment experiences in infancy and childhood (Solomon & George, 1999), caregivers whose childhoods were characterized by maltreatment may be more likely to have negative representational models of themselves and their caregivers, and less positive global representations of the mother-child relationship (George, 1996; Stronach et al., 2011; Toth, Cicchetti, & Emde, 1997; Toth, Cicchetti, Macfie, Maughan, & Vanmeenen, 2000). Negative representations of this nature may lead mothers to develop behavior that is less likely to support a secure attachment relationship with their own children (van Ijzendoorn, 1995). These findings highlight the importance of exploring the impact of a mother's representations of her own mother on child outcomes.

Study Aims and Hypotheses

The current study aims to examine the effect of depression on participants' representations of their child, self, and mother when children are 12-26 months old. Given the literature on the association between negative representations and maternal depression (Blatt & Homann, 1992), participants with depression are predicted to exhibit high levels of EE regarding child, self, and mother compared to participants without depression. Mothers' self-representations also are predicted to relate to their sense of self-efficacy.

In addition, this study sought to evaluate whether these representations mediate the association between depression and young child negative affect (NA). EE toward child, self,

and mother are predicted to significantly mediate the association between maternal depression at 12 months and child NA at 26 months.

Methods

Procedure

Participants were recruited as part of a randomized clinical trial testing the efficacy of two interventions on maternal depression and the mother-child relationship in low-income mothers (see Toth et al., 2013). Participants were not seeking treatment for depression at the time of recruitment. Biological mothers between the ages of 18-44 who had a 12-month-old infant and were living at or below the federal poverty level were recruited from primary care and Women, Infant, and Children clinics in Western New York. Women were initially screened by a project recruitment coordinator with the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Those who scored above 16 were further assessed to determine eligibility for inclusion. Mothers who met current major depressive disorder (MDD) diagnostic criteria based on the Diagnostic Interview Schedule for the DSM-IV (DIS-IV; Robins et al., 1995) when their child was 12 months old were included in the depressed group. A group of mothers without a history of MDD or other major DSM-IV disorders who were similar in race, ethnicity, age, and socioeconomic status was similarly recruited as a non-depressed comparison group. Participants were diverse in race (62% Black, 36% White, 3% Other) and ethnicity (19% Hispanic).

Because evaluation of treatment effects is beyond the scope of the current study, analyses were run on the entire sample before the depressed group was randomized to intervention or enhanced treatment as usual (i.e., provision of educational resources and referral information), when children were 12 months old (T1; depressed $n = 144$, non-depressed $n = 62$). When children were 26 months old (T2), analyses were only run on depressed mothers not receiving the intervention ($n = 66$) and the non-depressed comparisons ($n = 58$). The retention rate was 89% among non-depressed and depressed mothers not receiving intervention, with no differences in attrition depending on depressive status ($\chi^2(1, n = 124) = 1.825, p = 0.177$).

Mothers provided informed consent for their and their infant's participation prior to data collection. Research was conducted with Institutional Review Board's approval. All assessments were conducted by trained interviewers who were unaware of group condition or study hypotheses. EE recordings and maternal self-efficacy ratings were completed in the home at T1 and T2. Ratings of child negative affect were completed during a separate visit to the lab at T1 and T2. Self-report measures were read aloud while participants followed along and marked their answers. Although this approach to administration has not been validated, previous studies in low-income populations with low levels of education have employed this approach to address variations in literacy and ensure that participants understand all questions.

Measures

Five Minute Speech Sample (FMSS; Magana et al., 1986).—The FMSS assessed EE in regard to child, self, and the participant's own mother. Participants were asked to speak without interruption on their thoughts and feelings about their child, themselves, and their mothers for five minutes each in three separate samples at T1, and again about their child at T2. Overall EE scores were given on each of the three speech samples. High EE was rated when there was a high EE-Criticism rating and/or a high EE-EOI rating. In addition, borderline EE was coded when there was a borderline EE-Criticism rating or a borderline EE-EOI score (Benson, Daley, Karlof, & Robison, 2011; see Appendices for details) given the concerns about Type II error when coding EE from the FMSS (Hooley & Parker, 2006). Therefore, EE-Overall scores were rated as high, borderline, or low.

A second rater independently coded 20% of all of the speech samples. Inter-rater reliability using kappa for categorical codes and an intra-class correlation coefficient for continuous codes ranged from .61 to .91 for the majority of domains, indicating adequate agreement (Landis & Koch, 1977). Scales not achieving adequate reliability are identified below and were removed from further analyses.

Representations of child.—A developmentally informed coding system (the Preschool Five Minute Speech Sample [PFMSS]) was devised to assess EE in caregivers of toddlers (Daley, 2001; Daley et al., 2003). Based on the Daley et al. (2003) coding system, the following codes were used: EE-Overall, Initial Statement (positive, neutral, negative), and Relationship (positive, neutral, negative). Warmth and Emotional Over-Involvement (EOI) based on self-sacrificing/overprotective behaviors were also assessed, but were excluded from analyses due to low inter-rater reliability. Because EE-Overall is comprised of EE-Criticism and EE-EOI, the decision to exclude EE-EOI resulted in EE-Overall being synonymous with EE-Criticism. Therefore, EE-Criticism was not included as a separate code and was instead represented by the EE-Overall code. Frequency counts of Positive Comments and Critical Comments and a ratio of Positive to Critical Comments were also calculated. A “Beck Rating” was made for each sample based on training by David Daley. This rating is a continuous score from 0 to 4 indicating the extent of negativity expressed in the speech sample. One point is given for each of the following: the absence of Positive Comments, more than one Critical Comment, negative Relationship, and negative Initial Statement (Warmth was not included because of low inter-rater reliability). Finally, a Positive Representation of child score was calculated based on the subcodes given for Relationship, Initial Statement, and Positive Comments using a strategy similar to that employed by Kaugars et al. (2007). Mothers received two points for a positive Relationship, and one point each for a positive Initial Statement and a quantity of Positive Comments one or more standard deviations higher than the mean calculated for this sample (range 0 to 4; Warmth was not included because of low inter-rater reliability).

One modification was made to the category of Positive Comments. Major developmental challenges and milestones during the 12-26 month period include learning to speak, walk, sleep through the night, and eat new foods. Thus, maternal comments regarding the child's successful navigation of any of these tasks (e.g., “He is a great sleeper,” “She has become a

really good eater,") were coded as Positive Comments although they were not considered as such in the Daley (2001) coding manual, which was developed for older preschool aged children. Additionally, a code of absent or present was added when a Relationship was coded as neutral.

Representations of self.—A modified version of the EE coding system for self-representations was applied to quantify EE-Overall, EE-Criticism (high, borderline, low), number of Positive Comments, number of Negative Comments, ratio of Critical to Positive Comments, and Initial Statement (positive, neutral, negative). Given the study's focus on depression, two additional constructs were also assessed from the FMSS: Identity (i.e., the extent to which a participant talks about herself as an individual, mother, and partner; coded low, moderate, or high), and Depressotypic Cognitions (i.e., perceptions of self, others/relationships, and the future consistent with Beck's cognitive triad; coded positive, neutral, or negative; Beck, 1970). For coding on others and the future, an absent rating was also included. Self-EOI, Identity/Individual, and Identity/Mother ratings did not achieve adequate reliability and were not used in further analyses. The full adapted coding system for self EE can be found in Appendix A.

Representations of mother.—Speech samples obtained for mothers' representations of their own mothers were coded for EE-Overall, EE-Criticism (high, borderline, low), EE-EOI (high, borderline, low), number of Critical Comments, number of Positive Comments, ratio of Critical to Positive Comments, Initial Statement valence (positive, neutral, negative), and Relationship (positive, neutral, negative). Given the high risk status and presence of adversity in the sample, two new codes were added: Source of Concrete Support (i.e., the extent to which a mother perceives her own mother as a current source of concrete support; coded low, moderate, or high) and Resolution of Past Adversity (i.e., the extent to which the speaker appears to have come to terms with and accepted difficult past events involving her mother; if evidence of past adversity was indicated, it was coded improved/resolved or not improved/unresolved). Evidence of past adversity includes but is not limited to maternal substance abuse, maternal mental illness (including severe depression), placement in foster care, and domestic violence. Poverty alone would not be included in this category. Coding was based on the tone, content, and frequency of comments made about the situation. All codes achieved adequate reliability and were used in further analysis. The full adapted coding system for mother EE can be found in Appendix B.

Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977).—The CES-D is a 20-item self-report scale designed to assess depressive symptoms within the last week within the general population. Item responses fall on a 4-point scale ranging from "rarely or none of the time (less than 1 day)" to "most or all of the time (5-7 days)." Scores range from 0 to 60 with a cut-off of 16 indicating clinically meaningful depressive symptoms. This measure was used as an initial screen in the recruitment process to determine participants' eligibility for study inclusion.

Diagnostic Interview Schedule-IV (DIS-IV; Robins et al., 1995).—The DIS-IV is a structured interview for assessing diagnostic criteria for Axis I disorders, based on the DSM-

IV (American Psychiatric Association, 1994). DSM diagnoses made using the DIS have been found to be comparable to those made by psychiatrists, with a reported mean $\kappa = .69$, sensitivity of 75%, and specificity of 94% (Robins et al., 1981). In the current study, all interviewers were trained to criterion reliability in the administration of the DIS, and diagnoses were computer generated based on forced choice responses, eliminating the need for inter-rater reliability. The DIS-IV was completed with mothers at T1. The section on Mood Disorders was used to classify the presence or absence of Major Depressive Disorder (binary depressed or non-depressed) in the current study.

Maternal Self-Efficacy Scale (Teti & Gelfand, 1991).—The Maternal Self-Efficacy Scale, a 10-item self-report measure designed to assess maternal self-efficacy, was administered at T1. Each item is rated on a 4-point scale, with higher ratings indicating greater levels of maternal self-efficacy. Nine items on this questionnaire assess maternal feelings of efficacy in relation to child-care tasks; the last item broadly assesses self-efficacy. Mean scores were used in the current study. Reliability was adequate in the current sample ($\alpha = .787$).

Positive and Negative Affect Schedule – child version (PANAS-C; Laurent et al., 1999).—The PANAS-C is a 27-item self-report scale designed to assess positive and negative affect in children. The PANAS-C was completed by mothers and by two research assistants at T1 and T2. Both research assistants spent several hours directly interacting with and observing the child over the course of multiple research visits. Only the negative affect (NA) scales were used for the purposes of the current study. The average intraclass correlation between the two research assistant reports indicated high reliability at T1 ($r = .77$) and T2 ($r = .83$) for NA. Therefore, research assistants' NA scores were averaged at T1 and T2. There was adequate internal reliability for NA across the three reporters at both time points ($\alpha = .851$ to $.934$).

Results

Statistical Analyses

First, initial comparisons assessed between-group differences on a number of demographic variables using χ^2 and t-tests. Next, between-group comparisons of EE variables were assessed using χ^2 analyses and t-tests. Due to the number of comparisons made in these analyses, the Bonferroni correction for multiple comparisons was applied. A total of 32 comparisons were made between the depressed and non-depressed group on EE subcodes. Therefore, $p < .00156$ was considered statistically significant.

In addition, mean scores on maternal self-efficacy were compared on self EE subscales using ANOVA and Tukey's HSD post hoc comparisons. Associations between maternal self-efficacy scores and self EE scores on Critical Comments, Positive Comments, and the ratio of Critical to Positive Comments were also examined using Pearson's product-moment correlations. Finally, structural equation modeling using MPlus version 7 (Muthén & Muthén, 1998-2017) was applied to examine the longitudinal association between maternal depression, child EE-Overall, self EE-Criticism, mother EE-Criticism, and child NA.

Preliminary Analyses

Mothers in the depressed and the non-depressed groups at T1 did not differ significantly on age, marital status, highest educational attainment, race, or ethnicity (see Table 1). Thus, these demographic variables were not included in the structural equation analyses below.

EE Comparisons between Depressed and Non-depressed Groups at T1—All between-group analyses on each EE domain for child, self, and mother were run on the entire sample at T1 ($N = 206$). Specifics within each domain are detailed below. Statistical values can be found in Table 2 (Child EE), Table 3 (Self EE), and Table 4 (Mother EE).

Child EE.—Initial analyses suggested that compared to participants in the non-depressed group, participants in the depressed group discussing their child at T1 ($N = 205$) had higher EE-Overall, made significantly more Critical Comments, had a higher ratio of Critical to Positive Comments, and had higher Beck Ratings of negativity. However, after applying the Bonferroni correction for multiple comparisons, no group differences were statistically significant (see Table 2).

Self EE.—With respect to self speech samples ($N = 206$), participants in the depressed group were more likely to have high EE-Overall, and borderline or high EE-Criticism. Participants in the depressed group expressed significantly more self Critical Comments and had a higher Critical to Positive Comment ratio. Higher rates of negative cognitions regarding the self and others, but not the future, were found in depressed participants as captured through the experimental Depressotypic Cognitions codes. All group differences were maintained after applying the Bonferroni correction for multiple comparisons. No other group comparisons of self-EE variables were significant (see Table 3).

Maternal self-efficacy.—Mean maternal self-efficacy scores did not differ significantly between high, borderline, and low self EE-Overall groups ($F(2, 202) = 1.354, p = .260$). There was also no significant difference in maternal self-efficacy scores between high, borderline, and low groups as designated by self EE-Criticism ($F(2, 202) = 1.096, p = .336$) or self EE-EOI ($F(2, 202) = 0.032, p = 0.968$). Maternal self-efficacy scores were not significantly correlated with self Critical Comments ($r = -0.074, p = .293$), self Positive Comments ($r = 0.121, p = .084$), or the ratio of Critical to Positive Comments ($r = -0.072, p = .306$). However, exploratory analyses assessing differences in self-efficacy between groups designated by the experimental code Depressotypic Cognitions – Self indicated that groups differed significantly ($F(2, 202) = 3.903, p = .022$). Post-hoc comparisons between the three groups using Tukey's HSD test demonstrated that participants with positive self-representations had higher maternal self-efficacy scores ($M = 3.47, SD = 0.35$) compared to those with negative self-representations ($M = 3.30, SD = 0.33$), providing preliminary support for the newly developed Depressotypic Cognitions code.

Mother EE.—With regard to speech samples about their mothers ($N = 203$), initial analyses suggested that participants in the depressed group expressed higher EE-Overall, higher EE-Criticism, viewed their mothers as less of a Source of Concrete Support, and were more likely to describe a negative or neutral Relationship rather than a positive Relationship with

their mothers. However, these group differences did not meet statistical significance after applying the Bonferroni correction for multiple comparisons. Results using this corrected critical value still showed that participants in the depressed group were significantly more likely to report adversity than non-depressed participants. However, among those who reported adversity, depressed and non-depressed participants were equally likely to be unresolved with respect to those experiences. No other group comparisons of other mother-EE variables were significant (see Table 4).

Structural Equation Modeling

Structural equation modeling analyses were conducted only with depressed participants in the enhanced treatment as usual ($n = 66$) and non-depressed groups ($n = 58$), to eliminate any intervention effects at T2. To account for non-normality, a maximum likelihood estimator with robust standard errors was used for path estimates. Missing data varied by indicator and were no more than 15% for any variable used in the final models. Missing data were determined to be missing at random and therefore all analyses were conducted using a full information maximum likelihood approach (Little & Rubin, 2002). EE-Criticism for self and mother were included in the following analyses given previous research suggesting the importance of EE-Criticism as a potential mechanism between maternal depression and maternal reports of child behavior (Bolton et al., 2003; Gravener et al., 2012; Nelson et al., 2003). As described above, the decision to exclude child EE-EOI resulted in child EE-Overall being synonymous with child EE-Criticism. Therefore, child EE-Criticism was represented by child EE-Overall. Indirect pathways were examined with the product of the coefficient approach using 2000 bootstrap replicates to obtain bias-corrected bootstrapped confidence intervals for the product coefficients of the indirect effects (MacKinnon et al., 2007). Model fit was evaluated using chi-square ($p > .05$), comparative fit index ($CFI > .95$), root mean square error of approximation ($RMSEA < .06$), and standardized root mean square residual ($SRMR < .06$) for evidence of good model fit (Hu & Bentler, 1999; Yu & Muthén, 2002).

First, the associations between the three reporters on child NA scores were examined. The two research assistant (RA) reports were highly correlated at each time point (T1: $r = .645$, $p < .001$; T2: $r = .669$, $p < .001$). However, RA and maternal report were not significantly correlated ($rs < .090$, $ps = ns$). Thus, a latent NA construct based on all three reports was not a good fit for the data at T1 or T2. Therefore, child NA based on mean RA report and NA based on maternal report were included as separate observed variables in the structural model.

In the structural model (see Figure 1), path analysis was used to examine the indirect effect between maternal depression and child NA via child EE-Overall, self EE-Criticism, and mother EE-Criticism. To test an alternative hypothesis by Frye and Garber (2005), the structural model also assessed whether there was an indirect effect between maternal depression and child EE-Overall at T2 via child negative affect (T1 maternal report). Maternal depressive status at T1 was entered as the exogenous variable. Child EE-Overall, Self EE-Criticism, Mother EE-Criticism, Child NA (maternal report), and Child NA (RA report) at T1 were entered as mediators. Child EE-Overall, Child NA (maternal report), and

Child NA (RA report) at T2 were modeled as outcome variables. Stability paths were modeled between child NA at T1 and T2 for both reporters, and between Child EE-Overall at T1 and T2. Residual covariance was modeled among the EE mediators. The model evidenced good fit to the data ($\chi^2(11, N = 124) = 7.352, ns$; CFI = 0.985; RMSEA = 0.030; SRMR = 0.048). See Table 5 for standardized path coefficients.

Based on the significant paths, bootstrapped bias corrected confidence intervals were calculated for the indirect path from maternal depressive status to maternal report of NA via Mother EE-Criticism. Results supported a significant indirect effect (95% CI [0.003, 0.102]). Nonsignificant pathways between maternal depressive status and child NA (maternal report) at T1, and between Child NA (maternal report) at T1 and child EE-Overall at T2, suggest the alternative hypothesis by Frye and Garber (2005) is not supported.

Discussion

The Effect of Depression on Representations

The first aim of the current study was to examine the effect of depression on mothers' representations of their child, self, and their own mother when their child was 12 months old. Results suggest that depressed participants have more overall negative and critical representations of themselves than non-depressed participants. In addition, depressed participants were more likely to report past adversity than non-depressed participants.

To our knowledge, this is the first study to date to use the Daley (2001) coding system to examine differences in child EE between depressed and non-depressed mothers of infants. Although our findings do not show statistically significant group differences in child EE, trend results are consistent with previous studies that have found an association between maternal depression and traditionally coded EE toward child (Green et al., 2007; Psychogiou et al., 2013; Rogosch et al., 2004). Replication in a larger sample may be warranted for these comparisons to meet significance at the Bonferroni corrected critical value.

With respect to self-representations, depressed participants had higher overall EE and were more critical both in general and in comparison to the number of positive comments they made about themselves compared to non-depressed participants. Maternal self-efficacy was not related to established self EE scores, but was related to the new Depressotypic Cognitions codes, as explained below. This pattern of results suggests that mothers' sense of self-efficacy may be distinct from self representations and may be more strongly associated with other factors such as global self-esteem, remembered maternal care, and infant soothability (Leerkes & Crockenberg, 2002).

Although not statistically significant, trend results suggest that compared to non-depressed participants, participants with depression may show higher levels of criticism when speaking about their mothers, due in part to a greater tendency to describe the relationship negatively. Depressed participants did not show greater emotional over-involvement toward their mothers compared to non-depressed participants, which is consistent with previous research (Rogosch et al., 2004).

Newly Developed EE Codes

The newly developed self EE Depressotypic Cognitions subcodes received preliminary support, with depressed participants showing more negativity when speaking about themselves and others, but not the future. Participants with more positive self-cognitions also had higher maternal self-efficacy scores, replicating previous studies showing an association between self-esteem and self-efficacy (Leerkes & Crockenberg, 2002). These findings highlight the potential for this novel code to clarify the association between different facets of self-representations and maternal self-efficacy, particularly among depressed mothers.

This study also examined new mother EE subcodes: Source of Concrete Support and Resolution of Past Adversity. Findings suggest trending group differences between depressed and non-depressed participants on their representations of their mothers as a Source of Concrete Support. With respect to Resolution of Past Adversity, participants with depression were significantly more likely to discuss adverse past experiences with their mother, but it is unclear whether this latter finding indicates that these participants were more likely to have experienced adversity or if they were more likely to discuss these experiences unprompted in a short speech sample. Regardless of the origin of this finding, it suggests that depressed participants are burdened by recollection of difficult childhood experiences with their mothers, which is consistent with previous research linking childhood adversity with adult depression (Kendler et al., 2002; Kessler & Magee, 1993).

Development of Child Negative Affect

The second aim of this study was to evaluate whether maternal representations mediated the association between maternal depression and young child NA. Findings suggest that a mother's critical representations of her own mother partially account for the relationship between her depression when her child is 12 months old and her report of the child's NA at 26 months. Effects of participants' critical maternal representations on later child NA holds above and beyond maternal report of child NA at 12 months. This association did not appear for RA report of child NA as an outcome.

Literature on multi-method consistency in temperament research suggests that independent observers are more likely to report on a child's state during the time of observation, and parents are more likely to report on the child's overall traits (Preszler & Garstein, 2018). Therefore, the lack of association between RA and maternal report of child NA may be due to differences in the child's state behavior while under observation, as compared to general trait NA as observed by the mother overall. In addition, children's behavior may vary across different relationships and environments. As a result, a child's affect expression may vary when interacting with a parent with depression and with other adults, reflecting true differences in expressed NA. Although it may also be the case that the mother's perception of her child's affect, rather than the child's true affect, is influenced by her depression and mental representations, research has shown that depressed mothers can be valid and reliable reporters of their children's behavior (Richters, 1992). Further, both maternal and RA reports of child NA were stable over time, suggesting little change in NA between 12 and 26 months.

Although pathways from child and self representations to child behavior have been evaluated in previous research (Bolton et al., 2003; Gravener et al., 2012; Nelson et al., 2003), to our knowledge, they have not been modeled together with maternal representations in a single analysis. Therefore, these findings are novel in that they suggest that representations of mothers are predictive of child NA above and beyond the effects of child or self representations. This pattern is an illustration of attachment theory, which suggests that an individual's representations of her mother can impact her behavior toward and current relationship with her child (Main et al., 1985) and the child's subsequent affective development (Braungart-Rieker, Garwood, Powers, & Wang, 2001). Research has shown that adult attachment representations assessed via AAI are associated with maternal affect and parenting behavior (Adam et al., 2004). Therefore, a mother's memories of her childhood and her experience being parented by her mother may influence her own parenting behaviors in a way that elicits greater NA from her child. However, more research is needed to clarify the process that accounts for representations of mother as the unique mediator between maternal depression and child NA.

Although the non-significance of self-representations as a mediator from maternal depression to child outcomes replicates prior research (Gravener et al., 2012), child representations have been previously found to significantly mediate the association between maternal depression and child outcomes (Bolton et al., 2003; Gravener et al., 2012; Nelson et al., 2003). However, the current study's use of a low-income sample may have introduced additional stressors into the caregiving environment that diminished this effect. There also could be an effect of developmental stage such that the effects of child EE on child outcomes are more observable in middle childhood (Bolton et al., 2003) and adolescence (Nelson et al., 2003) than in early childhood. In addition, this prior research has not examined child negative affect specifically as an outcome, suggesting there may be something unique about the effect of maternal representations (versus self and child representations) on children's affect expression as compared to other behavioral outcomes.

Strengths and Limitations

The current research advances the EE literature by validating the Daley (2001) coding system for parents of young children with a diverse, high-risk sample. Further, this study developed and tested several novel codes regarding self (Depressotypic Cognitions) and mother (Source of Concrete Support and Resolution of Past Adversity) that can be further explored in future research.

It is also important to acknowledge several limitations of the current study. With respect to inter-rater reliability, previous research has reported low inter-rater reliability (Daley et al., 2003) and a lack of construct validity for EOI in parents of young children (e.g., McCarty et al., 2004). Even with developmentally appropriate modifications, the level of emotional involvement necessary for caregivers to appropriately attend to the needs of very young children may make EOI an invalid construct when children are this young. In addition, the examples and descriptions intended to define high Warmth in the Daley (2001) manual, which were developed on a middle-income British sample, may not have been applicable to the high-risk, low-income participants in the current study. Finally, self EOI may not be an

appropriate construct when assessing self-representations. Emotional over-involvement with one's self, as indicated by behaviors such as expressing excessive self praise, crying, or focusing excessively on the past, may not be an appropriate construct when assessing self-representations. Rather, it may be useful to tease apart these traditional indicators of EOI and code them individually to assess their reliability and association with maternal depression.

In addition, findings regarding the development of child NA only emerged with maternal and not research assistant report, as explored above. As a result, findings should be interpreted with caution. Further, it is possible that there is a bidirectional effect between maternal depression and young child temperament and affect. Although the current findings suggest that child NA does not predict later child representations as identified in previous research (Frye & Garber, 2005), child NA could contribute to the emergence of depressive symptoms, which could have important implications for later child development. For example, research has shown difficult infant temperament can contribute to low feelings of self-efficacy, which predicts greater depressive symptoms (Cutrona & Troutman, 1986). This potentially bidirectional pathway would be important to consider in future research.

Conclusions and Future Directions

Results suggest that depression significantly impacts a mother's representations of her herself and may have implications for representations of mothers and children as well. Further, a depressed individual's negative representations of her own mother may put her child at greater risk for higher levels of NA, a risk factor for childhood depression (Gartstein & Bateman, 2008). These findings have important implications for both policy and practice, indicating a need for the provision of trauma-informed care, social support interventions, and treatment that addresses representational models for depressed mothers.

Given the significantly greater number of adverse experiences reported by depressed mothers in this study, trauma-informed care is particularly important. Because patterns in our findings suggest depressed individuals may be less likely to view their mothers as a source of concrete support, practical interventions that address concrete needs and increase social support may also be particularly relevant. If bidirectional patterns are present in which children's negative affect is prompting, maintaining, or worsening maternal depression, psychoeducational programs could be effective in addressing maternal depressive symptoms as well (Hiscock, Cook, Bayer, Mensah, Cann, Symon, & St. James-Roberts, 2014).

Further, this study's emphasis on representational models highlights the importance of interventions that target maternal representations for promoting positive development in children of depressed mothers. Attachment-based interventions, such as Child Parent Psychotherapy (CPP; Lieberman et al., 2015), can work with mothers to explore their childhood experiences with their own caregivers. By working through these relational memories, mothers can begin to identify representations that are impacting their relationship with their children. This process may be particularly powerful for mothers who have experienced childhood maltreatment. CPP has been effective in fostering reflective functioning, positive parenting attitudes, and secure attachment in children of depressed mothers (Lavi et al., 2015; Toth et al., 2008). Other interventions that focus on relationships, such as Interpersonal Psychotherapy (Weissman et al., 2000), may also be effective in

targeting maternal representations. By working on their current relationships with their mothers, depressed mothers may experience a change in perspective toward their children. This representational shift may be important for preventing negative child outcomes, such as insecure attachment or the intergenerational transmission of depression. Examining whether maternal representations are susceptible to change through interventions will be an important next step in supporting positive development in children of mothers with depression.

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Appendix A:: Coding EE from the FMSS - Self

Initial Statement:

No changes. This category will continue to be coded as positive, negative or neutral and is consistent with the FMSS and PFMSS coding systems. N.B. Positive comments in the Initial Statement are not counted again in the count of positive comments.

Relationship:

Omit. This category refers to the speaker's relationship with another person, thus is not relevant to the mother's speech sample on herself.

Criticism:

Code consistently with PFMSS but not FMSS. For criticism to be scored from content in the FMSS coding system, the speaker must describe a negative behavior or trait and then indicate that they do not like it, are angered by it, etc. or over embellish by listing three or more negative descriptors to describe a relative's behavior. In contrast, in the PFMSS coding system, the speaker need only describe a negative trait or behavior for a criticism to be coded from content. Coding of the mother's speech sample on herself will follow the criteria set forth in the PFMSS coding system for coding criticism based on content, meaning that a use of a critical descriptor or phrase (without indicating that the speaker doesn't like this about herself) will be used. While a mother may describe negative aspects of herself, it seems unlikely that she would indicate that she does not like this about herself, thus the sensitivity of the measure to detect maternal criticality towards herself should be improved by following the PFMSS guidelines. Guidelines for coding based on tone will not change and are consistent with the FMSS and PFMSS coding systems. Examples: "I can be very

spiteful;” “I get disgusted with myself sometimes;” “Sometimes I feel I’m not good enough for my kids.”

Dissatisfaction:

Omit – consistent with PFMSS. This category is included in the FMSS (and is referred to as experimental) but not in the PFMSS. In the FMSS, it is rated as present or absent and is intended to catch statements that “describe a relative’s unfavorable behaviors, characteristics or personality traits, but are not compelling enough to meet the criticism criteria.” Given the changes to the Criticism category consistent with the PFMSS, this category is no longer necessary, as these more subtle criticisms will be included in the criticism category.

Self-sacrificing/Overprotective behavior (EOI subcomponent):

Minor change. This will be coded using guidelines from the FMSS and PFMSS, with more developmentally appropriate examples provided in the PFMSS if the mother is talking about her behavior in relationship to her young child. This can be coded if the mother is discussing SSOP behavior in relationship to anyone in her life, not just the target child. It will be coded if the mother indicates that she has sacrifices for another in an extreme or unusual manner and that she does not enjoy such sacrifices.

Lack of Objectivity (EOI subcomponent):

This is coded in both the FMSS and the PFMSS in instances when the speaker thinks that the target of her speech is always right and always defends their behavior. However, given that the mother is talking about herself, this is not applicable.

Emotional Display (EOI subcomponent):

Code consistently with the FMSS but not the PFMSS, as this category was omitted in the latter. If the mother cries while talking about herself during the interview, this will be coded.

Excessive Detail about the Past (EOI subcomponent):

Code consistently with the FMSS but not the PFMSS, as this category was omitted in the latter. Coded if the mother provides an inordinate amount of extraneous or irrelevant information about her distant past without associating it to the present.

Statements of Attitude (EOI subcomponent):

Omit – consistent with the PFMSS but not the FMSS. The FMSS defines these as statements expressing “very strong feelings of love for the relative or willingness to do anything for the relative in the future.” Given that the mother is talking about herself, this category does not apply.

Positive comments (EOI subcomponent):

In the FMSS, this is coded under the umbrella of emotional over-involvement, while in the PFMSS it is coded as a separate category. The coding rules provided in the FMSS will be used to code positive comments, as these should be developmentally appropriate for a mother talking about herself. However, this will be analyzed as a separate category as it is in the PFMSS.

Warmth:

Omit – consistent with the FMSS, but not the PFMSS. Does not seem relevant to consider a mother's warmth (defined by tone, spontaneity and concern/empathy in the PFMSS) when a mother is talking about herself.

Proposed new code:

Identity code: These codes are being developed to capture what the mother talks about when asked to focus on herself during the speech sample. Ratings will be made for three possible identities:

1. *Individual:* The extent to which she talks about traits describing herself as an individual not in relationship to her children or another person.
2. *Mother:* The extent to which she talks about her child or herself in relation to her child/children.
3. *Partner/Spouse:* The extent to which she talks about her boyfriend/husband/partner or self in relationship to that person.
  - i. *Low:* There is no mention of this identity/role in the speech sample.
  - ii. *Moderate:* There is at least one statement regarding this identity/role in the speech sample, but this identity is not a major focus of the speech sample.
  - iii. *High:* This identity is a major focus of the speech sample. The listener gets the sense that this speaker largely identifies herself in this role.

Only one of each designation (high, moderate, and low) should be given for each speech sample except in the rare case when it is determined that the speaker identifies equally in two of the roles or not at all in two of the roles, in which case two of the same designations may be made. For example: Individual - high, mother – high, partner/spouse – moderate.

Proposed new code:

Depressotypic Cognitions: These codes are intended to capture the global nature of each speaker's representations of herself, others/relationships, and the future. Comments that fall into each of these three categories will be assessed, and an overall rating for each of these three categories will be assigned as positive, neutral or negative. For speech samples on others and the future, an absent rating will also be included. The rater will take into account the content and frequency of each statement about self, other, and future when

making the rating for each category. Comments also coded in other parts of the speech sample (especially critical comments and positive comments) should also be taken into account in these global ratings.

Examples:

Self:

- i. *Positive* (this rating is given when the rater believes that the speaker sees herself in a positive way): “I’m happy with my life,” “I feel like I’ve come a long way,” “I’m a good person.”
- ii. *Neutral* (this rating is given for neutral comments or when both negative and positive representations of the self are present and there is no clear indication of which are stronger): “I’m pretty much a happy going person unless something gets in my way;” “I’ve been doing fine;” “I can be difficult to get along with but I’m also a loving person.”
- iii. *Negative* (this rating is given when the rater believes that the speaker represents herself in a negative way, characterized by depressotypic cognitions): “Sometimes I can hardly get out of bed;” “I have a lot of problems with depression.”

Other/relationships:

- i. *Positive* (this rating is given when the rater believes that the speaker sees others and her relationships in a primarily positive way): “I love my children;” “I like to go to my mom’s house at least a few times a week.”
- ii. *Neutral* (this rating is given for neutral comments or when both negative and positive representations of others are present and there is no clear indication of which are stronger): “I’ve got several friends, but don’t go out as much as much since I had my daughter;” “my Dad and I talk on the phone once in a while.”
- iii. *Negative* (this rating is given when the rater believes that the speaker holds primarily negative representations of others and/or relationships, characterized by depressotypic cognitions): “I’ve been trying to stay to myself because my family members tell so many lies, it’s just frustrating;” “My family...I just don’t think about them, even though I know they exist.”
- iv. *Absent*. This rating is given when there is no mention of others in the speech sample.

Future:

- i. *Positive* (this rating is given when the rater believes that the speaker sees her future in a primarily positive way): “I am excited to go back to school to be a nurse;” “One of the goals I’ve been working towards is to own a house by the time I’m 35.”

- ii. *Neutral* (this rating is given for neutral or ambiguous comments, when both negative and positive representations of the future are present and there is no clear indication of which are stronger, or when there is no reference to the future): “I don’t plan on staying in the nursing field long;” “We might move down to Florida with my sister.”
- iii. *Negative* (this rating is given when the rater believes that the speaker holds a primarily negative representation of the future, characterized by depressotypic cognitions): “Things are never going to get better for me.”
- iv. *Absent*. This rating is given when there is no reference to the future in the speech sample.

Criteria for assigning the final Expressed Emotion Rating:

- A. High Expressed Emotion will be assigned when the following has been coded, consistent with the FMSS where applicable:
  - 1. Critical subtype
    - a. A negative Initial Statement
    - b. More than one criticism
  - 2. Emotional Over-involvement subtype
    - a. Self-sacrificing/over-involvement behavior
    - b. Emotional display during the interview
    - c. Both of the following:
      - i. Excessive detail about the past
      - ii. Excessive self-praise indicated by 5 or more positive comments
- B. Low Expressed Emotion will be assigned when none of the ratings above apply.
- C. Borderline Expressed Emotion:
  - 1. Borderline Criticism – One critical comment
  - 2. Borderline EOI –
    - a. Borderline Self-sacrificing/overprotective behavior, or
    - b. Excess detail about the past, or
    - c. Five or more positive remarks
- D. The newly developed Identity and Depressotypic Cognitions codes will be examined independently of the overall EE rating.

Appendix B:: Coding EE from the FMSS – Mother

Initial Statement:

No changes. This category will continue to be coded as positive, negative or neutral and is consistent with the FMSS and PFMSS coding systems. N.B. Don't count utterances from the Initial Statement again in positive comments. Relationship: Code consistently with the FMSS and PFMSS as negative, neutral, or positive. Consistent with the FMSS but not the PFMSS, a direct comment that the mothers gets along well with her own mother or that they take part in activities together (by choice, not necessity) will result in positive relationship rating. Consistent with the modification made to the PFMSS, when a neutral relationship rating is made, presence or absence of reference to the relationship will be indicated, as a neutral rating also includes "no information" about the relationship. Additionally, if a neutral rating is made as a result of multiple positive and negative relationship statements, where the rater detects ambivalence and rates the relationship as neutral due to the contradictions, the experimental "Ambivalent" designation should be made. Weight comments made about the current relationship quality more heavily than comments based on past relationship quality. N.B. If mother is deceased, code comments about past relationship as other than neutral if indicated by content and tone of statements regarding relationship between speaker and her mother when her mother was alive. This includes statements such as "I miss her" or "we were very close." N.B. Mild fighting disagreements in the relationship may be better counted under dissatisfaction than relationship – see FMSS manual for clarification.

Criticism:

Code consistently with the FMSS but not the PFMSS. For criticism to be scored from content in the FMSS coding system, the speaker must use a critical tone, use vocal emphasis in the context of expressing dissatisfaction, describe a negative behavior or trait and then indicate that they do not like it, are angered by it, etc., or over embellish by listing three or more negative descriptors in a row to describe a relative's behavior. In contrast, in the PFMSS coding system, the speaker need only describe a negative trait or behavior for a criticism to be coded from content. This coding amendment seems appropriate to coding speech samples on young children where parents may be reluctant to acknowledge disliking a child's behavior, but unnecessary for speech samples on the mother's own caregiver. These types of comments will be captured under the "dissatisfaction" category. Guidelines for coding based on tone will not change and are consistent with both the FMSS and PFMSS coding systems.

Dissatisfaction:

Code consistent with the FMSS but not the PFMSS, from which it is omitted. This category is included in the FMSS (and is referred to as experimental) but not the PFMSS. In the FMSS, it is rated as present or absent and is intended to catch statements that "describe a relative's unfavorable behaviors, characteristics or personality traits, but are not compelling enough to meet the criticism criteria." Includes evidence of fighting/clashing (see

Relationship section of FMSS for clarification). In addition to the present/absent rating, a total count of dissatisfaction comments will be recorded.

Self-sacrificing/Overprotective behavior (EOI subcomponent):

This will be coded using guidelines consistent with both the FMSS and PFMSS, meaning that this will be coded if the mother indicates that she has sacrificed for her own mother in an extreme or unusual manner and that she does not enjoy such sacrifices. This includes evidence that the relationship between the speaker and her mother is causing strife in the marital relationship.

Lack of Objectivity (EOI subcomponent):

Code consistently with the FMSS and the PFMSS, in instances when the mother thinks that her own caregiver is always right and always defends their parent's behavior.

Emotional Display (EOI subcomponent):

Code consistently with the FMSS but not the PFMSS, as this category was omitted in the latter. If the mother cries while talking about her own mother during the interview, this will be coded.

Excessive Detail about the Past (EOI subcomponent):

Code consistently with the FMSS but not the PFMSS, as this category was omitted in the latter. Will be coded if the mother provides an inordinate amount of extraneous or irrelevant information about her early childhood relationship with her mother without associating it to the present. N.B. The exception to this will be if the mother indicates that her own mother is deceased.

Statements of Attitude (EOI subcomponent):

Code consistently with the FMSS but not the PFMSS. The FMSS defines these as statements expressing "very strong feelings of love for the relative or willingness to do anything for the relative in the future" (Magana, 2002). This category was omitted from the PFMSS as it "seemed developmentally inappropriate for parents of preschool children" (Daley, 2001). These comments will be coded as part of the EOI subcode, but may also be analyzed as a separate category. N.B. Statements of love for mother must be more extreme than "I love her" to count in this category, for example "I love her to death" or "I love her so much."

Positive comments (EOI subcomponent):

In the FMSS, this is coded under the umbrella of emotional over-involvement, while in the PFMSS it is coded as a separate category. The coding rules provided in the FMSS will be used to code positive comments, as these should be developmentally appropriate for a mother talking about her own mother. These comments will be coded as part of the EOI subcode; however, this may be analyzed as a separate category as they are in the PFMSS.

Proposed new codes:

Source of Concrete Support: This code is being developed to assess the extent to which a mother perceives her own mother as a current source of concrete support in her life.

- i. *Low:* This rating can occur if the speaker explicitly indicates that her mother is not a source of support to her AND/OR the speaker indicates that caring for or providing assistance to her own mother is a source of difficulty/stress/burden on the speaker.
- ii. *Moderate:* This rating can be received if a) the speaker provides no reference to her mother as a source of support or burden; b) the speaker provides equivocal or weak evidence that her mother is a source of support (e.g., “She occasionally helps me out with the kids”); c) the speaker provides contradictory evidence, equally (in both number and conviction) citing her own mother as a source of support and a source of burden; or d) a source of support who is not always there when needed or there only if paid/compensated for doing so.
- iii. *High:* The mother indicates that her mother is clearly a source of support and/or describes how her mother helps her or is there for her without significant contradictory evidence. This may be through example only (e.g., “My mother drops me off and picks me up for work every day;” “My mother watches the kids for me every Friday so I can take my class.”). Comments such as “she’s always there for me” would not be considered evidence of high concrete support and would be better considered under the relationship category unless it is specified that the mother is “there” for her in concrete ways such as providing childcare, financial support or supplies, or providing rides or other concrete help/care for the speaker.

N.B. This category does not impact the overall EE rating.

Resolution of Past Adversity: This code was developed to capture the extent to which the speaker appears to have come to terms with and accepted difficult past events involving her mother. Evidence of past adversity includes but is not limited to maternal substance abuse, mental illness (including severe depression), abandonment or loss to foster care or a relative resource that was not an intentional decision by the mother for the daughter’s wellbeing, and domestic violence in the presence of the daughter. Poverty alone would not be included in this category. If evidence of past adversity is indicated, the rater must then indicate whether the state of mind of the speaker is “improved/resolved” regarding the past adversity or “not improved/worse” or the mother is perseverating on the adversity. This decision is made based on the tone, content and frequency of comments made about the situation. The rater may find it helpful to ask herself whether it appears that the speaker has been able to make sense of or come to terms with the past adversity or whether it continues to bother the speaker on a regular basis.

If not past adversity is noted, no further ratings in this category will be made.

N.B. This category does not affect the overall EE rating.

Criteria for assigning the final Expressed Emotion Rating:

- A. High Expressed Emotion will be assigned when the following has been coded, consistent with the FMSS:
  - 1. Critical subtype
    - a. A negative Initial Statement
    - b. A negative relationship rating
    - c. One or more criticisms
  - 2. Emotional Over-involvement subtype
    - a. Self-sacrificing/over-involvement behavior
    - b. Emotional display during the interview
    - c. Any two of the following:
      - i. Excessive detail about the past
      - ii. One or more statements of attitude
      - iii. Excessive praise indicated by 5 or more positive comments
- B. Low Expressed Emotion will be assigned when none of the ratings above apply
- C. Borderline Expressed Emotion
  - 1. Borderline Critical – One or more dissatisfaction comments is present
  - 2. Borderline EOI –
    - a. Borderline Self-sacrificing/overprotective behavior, or
    - b. One or more statements of attitude, or
    - c. Excess detail about the past, or
    - d. Five or more positive remarks
- D. Source of Concrete support and Resolution of Past Adversity codes will be examined independently of the overall EE rating.

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Highlights

- Depressed mothers have higher self-directed Expressed Emotion
- Novel coding systems for EE toward self and mother developed and tested
- Criticism of mother mediates maternal depression to child negative affect
- Relational interventions can target maternal representations in depressed mothers

Figure 1.
Structural Model

Table 1.

Between group differences on sample demographics

	Depressed (<i>n</i> = 144)	Non-depressed (<i>n</i> = 62)	Statistical Test
Age (years)	<i>M</i> = 24.11	<i>M</i> = 25.14	<i>t</i> (204) = -1.379, <i>p</i> = .170
Marital status			$\chi^2(2, N = 206) = 4.494, p = .106$
Married	12.5%	22.6%	
Divorced/Separated	10.4%	4.8%	
Never married	77.1%	72.6%	
Education			$\chi^2(2, N = 206) = 3.394, p = .183$
< High School or GED	38.9%	35.5%	
High School or GED	34.7%	25.8%	
> High School or GED	26.4%	38.7%	
Race			$\chi^2(2, N = 206) = 2.676, p = .262$
Black	59.0%	67.7%	
White	38.2%	32.3%	
Other	2.8%	0%	
Ethnicity (% Hispanic)	21.5%	12.9%	$\chi^2(1, N = 206) = 2.100, p = .150$

Note: Nonsignificant pathways indicated with dashed lines; significant pathways indicated with solid lines.

*
p < .05,

**
p < .01,

***
p < .001.

Table 2

Comparisons between depressed and non-depressed groups on Child EE

	Depressed (N= 144)	Non-Depressed (N = 61)	Statistical test
	M(SD) or %	M(SD) or %	
EE-Overall			$\chi^2(2, N= 205) = 6.162, p = .046$
High	11.1%	1.6%	
Borderline	8.3%	4.9%	
Low	80.6%	93.4%	
Critical Comments	1.51(1.94)	0.97(1.35)	$t(159.2) = -2.307, p = .022$
Positive Comments	3.87(2.67)	3.56(2.27)	$t(203) = -0.794, p = .428$
Ratio of Critical to Positive Comments	0.75(1.31)	0.42(0.91)	$t(159.7) = -2.101, p = .037$
Beck Ratings of Negativity	0.57(0.91)	0.33(0.75)	$t(136) = -1.98, p = .049$
Positive Representations Rating	1.76(1.26)	1.74(1.14)	$t(203) = -0.140, p = .889$
Initial Statement			$\chi^2(2, N= 205) = 2.049, p = .359$
Positive	39.6%	36.1%	
Neutral	54.9%	62.3%	
Negative	5.6%	1.6%	
Relationship			$\chi^2(2, N= 205) = 0.517, p = .772$
Positive	60.4%	62.3%	
Neutral	36.1%	36.1%	
Negative	3.5%	1.6%	

Note. Bonferroni-corrected critical value: $p < .00156$.

Table 3

Comparisons between depressed and non-depressed groups on Self EE

	Depressed (N = 144)	Non-Depressed (N = 62)	Statistical test
	M(SD) or %	M(SD) or %	
EE-Overall			$\chi^2(2, N = 206) = 19.06, p < .001$
High	14.6%	3.2%	
Borderline	35.4%	14.5%	
Low	50.5%	82.3%	
EE-Criticism			$\chi^2(2, N = 206) = 20.368, p < .001$
High	13.9%	3.2%	
Borderline	27.8%	6.5%	
Low	58.3%	90.3%	
Critical Comments	0.63(0.95)	0.13(0.46)	$t(201.2) = -5.102, p < .001$
Positive Comments	1.31(1.67)	1.16(1.64)	$t(203) = -0.573, p = .567$
Ratio of Critical to Positive Comments	0.50(0.84)	0.12(0.45)	$t(194.7) = -4.27, p < .001$
Initial Statement			$\chi^2(2, N = 206) = 4.714, p = .095$
Positive	20.1%	8.1%	
Neutral	77.8%	90.3%	
Negative	2.1%	1.6%	
Identity: Spouse			$\chi^2(2, N = 206) = 0.526, p = .769$
Low	93.1%	93.5%	
Moderate	6.3%	4.8%	
High	0.7%	1.6%	
Depressotypic Cognitions *			
Self Cognitions			$\chi^2(2, N = 206) = 15.692, p < .001$
Positive	30.6%	50.0%	
Neutral	44.4%	46.8%	
Negative	25.0%	3.2%	
Other Cognitions			$\chi^2(3, N = 206) = 16.959, p < .001$
Positive	41.7%	69.4%	
Neutral	39.6%	24.2%	
Negative	18.8%	6.5%	
Absent	1.6%	0.0%	
Future Cognitions			$\chi^2(3, N = 206) = 2.182, p = .536$
Positive	31.3%	33.9%	
Neutral	28.5%	32.3%	
Negative	2.8%	0.0%	
Absent	37.5%	33.9%	

Note.

* New code developed by authors. Bonferroni-corrected critical value: $p < .00156$.

Table 4

Comparisons between depressed and non-depressed groups on Mother EE

	Depressed (N = 142)	Non-Depressed (N = 61)	Statistical test
	M(SD) or %	M(SD) or %	
EE-Overall			$\chi^2(2, N = 203) = 6.807, p = .033$
High	36.6%	19.7%	
Borderline	30.3%	31.3%	
Low	33.1%	42.9%	
EE-Criticism			$\chi^2(2, N = 203) = 6.127, p = .047$
High	31.0%	16.4%	
Borderline	20.4%	18.0%	
Low	50.7%	67.2%	
EE-EOI			$\chi^2(2, N = 203) = 1.269, p = .530$
High	7.0%	3.3%	
Borderline	22.5%	26.2%	
Low	70.4%	70.5%	
Critical Comments	0.47(0.96)	0.28(0.73)	$t(146.6) = -1.506, p = .134$
Positive Comments	2.11(2.3)	2.61(2.05)	$t(201) = 1.457, p = .147$
Ratio of Critical to Positive Comments	0.39(0.88)	0.24(0.69)	$t(201) = -1.198, p = .232$
Initial Statement			$\chi^2(2) = 1.390, p = .499$
Positive	32.4%	41.0%	
Neutral	64.1%	55.7%	
Negative	3.5%	3.3%	
Relationship			$\chi^2(2, N = 203) = 7.000, p = .030$
Positive	39.4%	57.4%	
Neutral	40.8%	34.4%	
Negative	19.7%	8.2%	
Source of Concrete Support *	2.19(0.68)	2.41(0.64)	$t(201) = 2.137, p = .034$
Resolution of Past Adversity *			$\chi^2(2, N = 203) = 15.031, p < .001$
No Adversity	63.4%	90.2%	
Adversity-Resolved	16.2%	4.9%	
Adversity-Unresolved	20.4%	4.9%	

Note.

* New codes developed by authors. Bonferroni-corrected critical value: $p < .00156$.

Table 5.

Standardized paths for structural model.

Independent variables		Dependent variables	β	S.E.	<i>p</i>
Dep.	→	NA (Mom T1)	.155	.085	.070
Dep.	→	NA (RA T1)	-.096	.090	.283
Dep.	→	NA (Mom T2)	.077	.085	.362
Dep.	→	NA (RA T2)	.097	.101	.335
Dep.	→	Child EE-Overall T1	.153	.075	.042
Dep.	→	Self EE-Crit	.356	.074	<.001
Dep.	→	Mother EE-Crit	.218	.086	.011
Dep.	→	EE-Overall Child T2	-.003	.097	.974
Child EE-Overall T1	→	EE-Overall Child T2	.025	.089	.781
Child EE-Overall T1	→	NA (Mom T2)	.015	.071	.835
Child EE-Overall T1	→	NA (RA T2)	-.030	.100	.766
Self EE-Crit	→	NA (Mom T2)	-.137	.100	.170
Self EE-Crit	→	NA (RA T2)	-.056	.109	.608
Mother EE-Crit	→	NA (Mom T2)	.186	.089	.036
Mother EE-Crit	→	NA (RA T2)	.146	.101	.150
NA (Mom T1)	→	EE-Overall Child T2	-.021	.072	.766
NA (Mom T1)	→	NA (Mom T2)	.574	.101	<.001
NA (RA T1)	→	EE-Overall Child T2	.051	.100	.606
NA (RA T1)	→	NA (RA T2)	.247	.103	.016
EE-Overall Child T1	W	EE-Crit Self	.147	.132	.265
EE-Overall Child T1	W	EE-Crit Mother	.060	.100	.545
EE-Crit Self	W	EE-Crit Mother	.377	.081	<.001
EE-Overall Child T2	W	NA (Mom T2)	.097	.109	.376
EE-Overall Child T2	W	NA (RA T2)	-.027	.109	.806
NA (Mom T2)	W	NA (RA T2)	.075	.091	.408

Note: Dep. = Maternal Depressive Status; NA = Negative Affect; RA = Research Assistant; EE-Crit = EE-Criticism; W = With (modeling residual covariance)