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The Association between Maternal Depression and Sensitivity: Child-Directed Effects on Parenting during Infancy

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Abstract

The current study prospectively explored infant behaviors as a moderator of the association between maternal depression and parenting sensitivity in a sample of 167 families. Maternal depression was only associated with later sensitivity for infants who displayed more negativity during mother-infant interactions.

Keywords

maternal depression; parent-child relationships; parenting

It is well-established that maternal depression is associated with compromised parenting behaviors (i.e., decreased parenting sensitivity and warmth, impaired mother-infant interactions, caregiving difficulties) and adverse child outcomes (i.e., insecure attachment, behavior problems, cognitive and socio-emotional deficits) (e.g., Field, 2010; Goodman et al., 2011). The parenting behaviors and interactional styles of depressed mothers are proposed to act as essential mechanisms for the transmission of psychopathology to children (Downey & Coyne, 1990; Goodman & Gotlib, 1999). However, the overall effect of maternal depressive symptoms on positive parenting behaviors is small (Lovejoy, Graczyk, O'Hare, & Neuman, 2000), suggesting that other maternal, infant, or family factors may influence which depressed mothers display less sensitive parenting behaviors. Indeed, there is some, albeit limited, evidence for moderators of the association between maternal depression and sensitivity (Crockenberg & Leerkes, 2003b). As infant behavioral style (e.g., irritability) shows complex relations to parenting behaviors (Crockenberg & Leerkes, 2003a), infant characteristics may be a crucial determinant of parenting, especially for mothers with depression, who are at-risk for suboptimal parenting. Much of the research on children's influence on parenting behaviors has focused on infant temperament and, specifically, infant difficult temperament (Crockenberg & Leerkes, 2003a). Infant interactive behaviors during face-to-face interactions with their mothers may provide additional insight into the transactional mother-infant interactions that may contribute to maternal caregiving behaviors in the context of maternal depressive symptoms.

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This report examines infant interactive behaviors early in infancy as a moderator of the association between maternal depression and later maternal sensitivity. It was hypothesized that depressed mothers whose infants interacted with them in more negative ways would display less sensitivity, whereas infants who displayed less negativity might buffer the effect of maternal depression on parenting. We also explored whether these associations were specific to infant behaviors when interacting with their mothers, versus a more general interactive style (as measured by comparing results of mother-infant interactions to infant interactions with their fathers).

Data were drawn from a larger investigation that prospectively explored goodness of fit in parent-child dyads (for a description of the larger study, see Seifer, Dickstein, Parade, Hayden, Magee, & Schiller, 2014) and included assessments from the prenatal period through 30 months. Mothers with depression were oversampled, such that approximately half of the families had a mother with a lifetime history of major depression. The current study included data from a subset of 167 families at child ages 4 months and 15 months, for whom data on any of the key study variables was available.

Families were recruited during the prenatal period at the main obstetrics hospital that accounted for approximately 90% of the births in a metropolitan area in northeastern United States. Parents were approached during prenatal birthing classes and given a brief presentation about the study, noting that a history of depression was a focus of the research. Interested mothers were contacted by project staff for a more thorough study description and to schedule an enrollment assessment, including the informed consent process.

Fifty-three percent of infants were boys. Most of the sample was middle or upper socioeconomic status (SES; 84% of mothers had at least some college education). Eleven percent of mothers were of minority racial status; the remaining were White, non-Hispanic. Seventy-eight percent of mothers were married and living with their spouse, and 74% of mothers were first-time mothers.

Demographic information was collected prenatally from the families. Hollingshead (1975) 4-factor SES scores were computed from the education and occupation scores of the two adults in the household. For those families with only a mother in the home (approximately 11% of current sample), her education and occupation were used to determine SES.

Maternal depressive symptoms were measured at child age 4 months using the modified Hamilton Rating Scale for Depression (HRSD; Miller, Bishop, Norman, & Maddever, 1985), a 17-item clinician-rated interview assessing current severity of depressive symptoms. The HRSD was administered by doctoral-level clinicians.

Observers used a revised version of the Infant Engagement Phases (IEP; Weinberg & Tronick, 1998) to code infant interactive behaviors while playing with a parent at age 4 months (rater reliability .80 or above). Infant behavior was continuously coded to reflect the proportion of time infants were in one of six states during a 10-minute play episode with mothers, followed by a separate 10-minute play episode with fathers. During the play task, infants were seated in an infant seat, and toys were provided. Parents were given non-directive instructions to play with their infants for 10 minutes. The states coded include

Negative Protest, Negative Withdrawn, Social Positive, Social Monitor, Object Engagement, and Other Engaged. To reduce the number of outcome variables, two subscales were created. Infant Negativity is the combined proportion of the Negative Protest and Negative Withdrawn states. Infant Positivity is the combined proportion of the Social Positive, Object Engagement, and Other Engaged states.

The Emotional Availability Scales (EAS; Biringen, Robinson, & Emde, 1998) was used to code maternal sensitivity during 8 videotaped semi-structured home observations of mother-infant interaction at 15 months. Each observation included at least 10 minutes of three situations: mothers in close proximity to their children, children alone, and mothers engaged in caretaking behaviors (primarily feeding and diapering). Efforts were made to capture these situations naturally, but mothers were prompted when necessary to engage in one of the three types of interaction. In total, the videotaped interaction lasted approximately 45 minutes. Each observation was then coded on a 9-point scale with higher scores reflecting higher levels of maternal sensitivity (rater reliability .80 or above). Scores for each observation were averaged to compute an 8-observation aggregate score. High levels of maternal sensitivity reflect a behavioral style which is responsive to infant cues, affectively positive, flexible, interactive, and emotionally connected.

Descriptive statistics and correlations among the key variables are displayed in Table 1. The significant associations between SES and the variables of interest led us to covary SES in all analyses. When controlling for SES, the partial correlation between maternal depression at 4 months and maternal sensitivity at 15 months was in the small to medium effect size range ($r = -.19, p = .05$). Additional measures, including marital status, maternal age, and child sex, were explored as covariates, but given small and non-significant associations, they were not included in the final analyses.

Multiple regression analyses were conducted in Mplus 7.2 (Muthén & Muthén, 1998–2014) using full information maximum likelihood estimation (FIML) to account for missing data. A single multiple regression model was analyzed to examine the main and interactive effects of maternal depression, infant negative interactive behaviors, and infant positive interactive behaviors on maternal sensitivity, controlling for SES (see Table 2). A three-way interaction term between depression, infant negativity, and infant positivity did not contribute to the model and was thus eliminated from the final model. Higher levels of maternal depression at 4 months were associated with decreased maternal sensitivity at 15 months ($\beta = -.24, p < .01$), when controlling for infant behavior and SES. Both infant negativity ($\beta = -.31, p < .01$) and infant positivity ($\beta = .17, p < .05$) exerted main effects on maternal sensitivity. Infant negativity ($\beta = -.21, p < .05$), but not infant positivity ($\beta = .06, p = .41$), moderated the influence of maternal depression on maternal sensitivity. Probing the interaction by examining the effect of infant negativity at one standard deviation above the mean, at the mean, and one standard deviation below the mean (see Figure 1) indicated that maternal depressive symptoms were negatively associated with later maternal sensitivity when infant negative interactive behaviors were at the mean ($\beta = -.24, p < .01$) or high ($\beta = -.56, p < .01$). However, when infant negative interactive behaviors were low, the association between maternal depression and sensitivity was not significant ($\beta = .07, p = .59$).

In order to examine whether results were specific to infants' interactions with their mothers, in contrast to a more general style of interacting, the same multiple regression model was analyzed, but infant interactive behaviors when interacting with their fathers were substituted for infant behavior when interacting with their mothers (with the caveat that the n of this father data = 80). Of note, infant interactive behaviors with mothers and fathers were not significantly correlated (see Table 1). Neither infant negative interactive behaviors nor positive interactive behaviors (when interacting with their fathers) exerted main or interactive effects on maternal sensitivity.

Although the associations in the literature between maternal depression and decreased sensitive parenting are robust, the magnitude of the association is small, leaving the possibility that other contextual and family factors contribute to the parenting behaviors of depressed mothers. Results of the present study suggest that, when infants display low levels of negativity (but not necessarily high levels of positivity) in interactions with their mothers, maternal sensitivity one year later was protected against the detrimental effects of maternal depression. However, for infants displaying average or high levels of negativity, maternal depressive symptoms were associated with decreased sensitivity in the following year. Furthermore, infant behaviors *with* their mothers, rather than their interactive style with fathers, were more predictive of maternal sensitivity. Our findings should be interpreted in light of the fact that our sample of interactive behaviors at 4 months of age was relatively small. Nevertheless, these findings corroborate evidence that maternal depression alone is not sufficient to explain adverse outcomes for mothers, children, and families (Seifer et al., 1996). When depressed mothers interact with their more challenging infants, they may feel ineffective in their parenting and not have the capacity to be effectively attuned to and well-matched with their infant behaviors, thereby increasing both depressive symptoms and continued insensitive parenting (Crockenberg & Leerkes, 2003b). Conversely, if mothers with depression feel more effective in their parenting with relatively easy infants, they may be able to respond more sensitively.

The transactional nature of interactions between mothers and their infants may be most crucial for understanding the impact of maternal depression on parenting behaviors and child outcomes. Findings provide an increased understanding of the child-influenced determinants of parenting behavior in the context of maternal risk and highlight the bidirectional effects of infant and mother dyadic interactions in the first year of life among mothers experiencing depression.

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Highlights

- Infant negativity moderates the link between maternal depression and sensitivity.
- Maternal depression is linked with sensitivity when infants are more negative.
- Infant interactive behaviors are important for understanding maternal parenting.

Figure 1.

Plot of simple slopes depicting the association between maternal depression at 4 months and maternal sensitivity at 15 months at 4 months at 1 SD above the mean (high), at the mean (mean), and 1 SD below the mean (low) of infant negative interactive behaviors at 4 months. Simple slopes that are significant at $p < .05$ are denoted with an *.

Table 1

Descriptive Statistics and Intercorrelations of Key Variables

Variable	1	2	3	4	5	6	7
1. SES, prenatal	—	-.22**	-.15	-.03	.11	.16	.47**
2. Maternal depression, 4 mos.		—	-.06	-.03	.02	.03	-.28**
3. Infant negativity ratio with mothers, 4 mos.			—	-.02	-.47**	-.11	-.39**
4. Infant negativity ratio with fathers, 4 mos.				—	.01	-.22*	-.18
5. Infant positivity ratio with mothers, 4 mos.					—	.15	.31**
6. Infant positivity ratio with fathers, 4 mos.						—	.24
7. Maternal sensitivity, 15 mos.							—
<i>M</i>	5.43	5.85	.17	.09	.55	.64	5.58
<i>SD</i>	.94	7.62	.21	.15	.29	.22	1.10
<i>N</i>	167	165	155	80	154	80	106

*
 $p < .05$.**
 $p < .01$.Bold values indicate significant correlations at $p < .05$.

Table 2

Multiple Regression Model Predicting Maternal Sensitivity at Child Age 15 Months

	B	SE (B)	β
SES, prenatal	.44	.10	.37**
Maternal depression, 4 mos.	-.04	.01	-.24**
Infant negativity ratio, 4 mos.	-1.68	.51	-.31**
Infant positivity ratio, 4 mos.	.68	.34	.17*
Maternal depression X infant negativity	-.21	.10	-.21*
Maternal depression X infant positivity	-.04	.05	.06

Note. Total $R^2 = .39$.

*
 $p < .05$.

**
 $p < .01$.