



Maternal sensitivity during distressing tasks: A unique predictor of attachment security

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ABSTRACT

The extent to which maternal sensitivity during a non-arousing free play task and during distressing tasks at 6 months predicted infant–mother attachment security was examined. When considered simultaneously, only maternal sensitivity during distressing tasks predicted subsequent attachment security. Infant temperament was unrelated to attachment security.

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A secure mother–infant attachment is linked with positive child outcomes such as feelings of self-worth, social competence, and fewer internalizing and externalizing problems (see [Weinfield, Sroufe, Egeland, & Carlson, 2008](#) for a review). The implications of early attachment for long-term positive adjustment and adaptive family functioning illustrate the importance of identifying factors that promote a secure attachment. Sensitive maternal behavior in response to infant signals is believed to be the key precursor to a secure attachment ([Bowlby, 1969/1982](#)) and prior evidence supports this view ([Ainsworth, Blehar, Waters, & Wall, 1978](#)). In contrast to the robust effect of maternal sensitivity on attachment in Ainsworth et al.'s study which drew from extensive home observations of maternal behavior, [de Wolff and van IJzendoorn's \(1997\)](#) meta-analysis of studies linking maternal sensitivity to attachment security demonstrated that the effect size is moderate regardless of the duration of the observation.

The modest association between maternal sensitivity and mother–infant attachment security has led a number of authors to call for a narrower view of attachment and maternal sensitivity. In particular, as the function of the attachment system is to promote safety and protection, how mothers respond to their infants while distressed or during times of threat may be the most salient predictor of attachment security ([Goldberg, Grusec, & Jenkins, 1999; Thompson, 1997](#)). Drawing from this perspective, [McElwain and Booth-LaForce \(2006\)](#) demonstrated that when considered simultaneously, maternal sensitivity to infant distress cues but not sensitivity to non-distress cues at 6 months (both assessed in a free play procedure) predicted subsequent attachment security ([McElwain & Booth-LaForce, 2006](#)). However, an important limitation of this study was that infants in the subsample in which maternal sensitivity to distress was observed at 6 months were rated as more temperamentally difficult raising the possibility that the significant effect of sensitivity to distress may only be apparent, or may be stronger, among temperamentally reactive infants compared to less reactive infants.

In this study, rather than focusing on sensitivity to infant distress versus non-distress cues, maternal sensitivity was rated in two different types of observational contexts; a brief non-arousing free play period and two brief emotion-eliciting tasks designed to elicit infant distress. It was anticipated that sensitivity during the distressing tasks would be a more robust

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predictor of subsequent mother–infant attachment security than sensitivity during the free-play task because how mothers respond to infants in potentially threatening environments offers infants the best evidence as to whether or not they can count on their mother to meet their needs for safety, comfort, and protection. In addition, infant temperament was measured via maternal report and direct observation in order to examine the possibility that the effects of maternal sensitivity during distressing contexts on attachment security varies as a function of infant temperament. This also allows for examination of the possibility that temperament is indirectly related to attachment security via the effect it has on maternal sensitivity. That is, mothers of more temperamentally reactive infants may behave less sensitively given the greater challenge of responding consistently and appropriately to an infant who is frequently and intensely distressed and difficult to soothe, which in turn contributes to an insecure attachment. However, given prior evidence that the association between temperament and maternal sensitivity is quite modest (Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2007), and that temperament appears to predict attachment subtypes rather than security versus insecurity (i.e., temperamentally reactive infants are not more likely to be insecurely attached, but if they are they are more likely to be resistant than avoidant; see Vaughn, Bost, & van Ijzendoorn, 2008 for a review), it seems unlikely that infant temperament will be related to subsequent attachment security.

The sample consisted of 101 mothers and infants. Mothers were 15–37 years old ($M = 27.79$), most (64%) had a college degree, and annual income ranged from \$6000 to \$190,000 (median = \$65,000). Most mothers were European American (72%) or African American (25%) and married, living with, or dating their child's father (90%). Infants were full-term; 56 were male. At the 16-month follow-up observational data were available for 70 of these families because six families had moved from the area, three agreed to complete the questionnaires only, 17 declined to participate, and five could not be located. Families who attrited did not differ from those with complete data on demographics, maternal sensitivity, or infant temperament.

At 6 months postpartum, mothers and infants visited the research laboratory and engaged in a 10 min free play period followed by two emotion-eliciting tasks. During the *free play* mothers were instructed to interact with their infants as they wished. A basket of toys was within reach, and a soft blanket was spread on the floor. Each emotion-eliciting task lasted four minutes. During the first minute mothers were instructed to remain uninvolved, during the last three minutes mothers were allowed to interact with their infants as they wished. During the *fear task* a remote-control truck was placed on a wooden table in front of the infant. The truck approached the infant, made a series of loud sounds with flashing lights, and then backed away from the infant. This sequence was repeated three times, then the silent and still truck was placed within the infant's reach for 1 min. During the *frustration task*, the experimenter gently held the infant's forearms still and did not interact with the infant.

Maternal sensitivity during the free play, fear, and anger tasks was rated on a 5 point scale adapted from the Parent Caregiver Involvement Scale (Farran, Kasari, Comfort, & Jay, 1986). The timing, appropriateness, and quality of the response (e.g., the mother's tone of voice, quality of touch-gentle versus rough, and her affective tone-positive, neutral, negative) were considered in relation to the infant's cue in rating the sensitivity of maternal behavior. Inter-rater reliability was calculated based on 25 tapes; weighted kappa was .74 for the free-play and .78 for the distress tasks. Maternal sensitivity during the fear and anger tasks correlated highly, $r(99) = .52$, $p < .01$ and were averaged to form a single measure of sensitivity during distressing tasks.

Infant affect was continuously coded on a 7 point scale (1 = high positive, 4 = neutral, 7 = high negative) during the emotion eliciting tasks using the Observer 5.0 (Noldus Information Technology, Wageningen, The Netherlands) and inter-rater reliability was calculated based upon 33 double coded tapes (Kappa = .79). The average level of affect across the emotion-eliciting tasks was calculated; high scores indicate greater observed distress. All but 4 infants became distressed demonstrating the effectiveness of the tasks at eliciting distress, but the average duration of distress was fairly brief ($M = 55.19$, $SD = 58.00$ s). Mothers rated their infants' temperament using the Infant Behavior Questionnaire-Revised (Gartstein & Rothbart, 2003). The negative affect score was used as the measure of maternal reported temperamental reactivity ($\alpha = .89$). Observed negative affect and maternal reported temperament correlated positively, $r(99) = .25$, $p < .05$, demonstrating convergent validity.

Mothers and infants returned to the laboratory when infants were 16 months old and mother–infant attachment was assessed via the Strange Situation (Ainsworth et al., 1978). Two certified reliable coders double coded 25 videos using the traditional 3 category coding system; agreement was 88%, $k = .78$. Sixty-five percent of infants were secure, 24% were avoidant, and 11% were resistant. In the current paper, the dependent variable was the dichotomous secure versus insecure (avoidant and resistant combined) score.

Missing data were imputed using the NORM (Schafer, 1999a) software program. Predictor variables, dependent variables, and demographics were included in the imputation model to maintain unbiased associations between the variables of interest. Because 6% of data was missing overall, three complete data sets were constructed using NORM and data were analyzed separately with each (Schafer, 1999b). Results averaged across these data sets are presented. Potential covariates were screened by examining associations between maternal age, minority status, income, and child gender with measures of maternal sensitivity, infant temperament, and attachment security. None of the demographics were associated with attachment security. Thus, no covariates were included in subsequent analyses.

Next, correlations among maternal sensitivity during each type of task and infant temperament were examined. Maternal sensitivity was positively correlated across the free play and distress tasks, $r(99) = .38$, $p < .01$. Observed infant temperament was unrelated to sensitivity during the free play and distress tasks, $r(99) = .10$ and $-.09$, respectively. In contrast, mother reported temperament was modestly negatively correlated with sensitivity during the free play and distressing tasks, $r(99) = -.19$, $p < .10$ and $-.22$, $p < .05$, respectively.

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