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## Mothers' Attachment Style Predicts Response to Child Distress: The Role of Maternal Emotions and Attributions

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An important aspect of parenting is the manner in which parents respond to their children's negative emotions (e.g., sadness, fear, anger, frustration), known as parental response to distress (PRD). From a young age, children express negative emotions to communicate their needs and desires with caregivers. The responses of parents in these contexts provide valuable opportunities for children to learn which emotions are acceptable, how to cope with their own and others' emotions, and how to understand and regulate difficult emotions.

Over the last several decades, a large body of research has revealed how PRD influences numerous aspects of child development. In particular, unsupportive parental responses to children's distress place children at risk for poorer social and emotional outcomes, including externalizing and internalizing behavior problems, lower social and academic competence, insecure attachment, emotion dysregulation among peers, and diminished understanding of emotional situations (e.g., Eisenberg et al., 1999; Fabes et al., 2001; Garner et al., 1994; Luebke et al., 2011). In general, unsupportive responses to child distress include: (1) controlling strategies designed to minimize emotional displays; (2) punitive reactions, such as scolding or shaming; and (3) parents' displays of their own distress, such as feeling uncomfortable, embarrassed, or angry (e.g., Fabes et al., 2001).

Given extensive evidence of the link between unsupportive PRD and multiple aspects of children's social and emotional development, investigating factors underlying parents' negative responding to child distress is an important task for researchers. Understanding why some parents respond to child distress in unsupportive ways may inform intervention efforts to help parents rear emotionally healthy children.

### Parents' Attachment Style

A central tenet of attachment theory is that parents' own attachment influences their parenting (Bowlby, 1969/1982; Feeney & Woodhouse, 2016), and as such, parents' attachment style may be an important contributor to unsupportive PRD. Most developmental research examining this idea has used interview-based measures such as the Adult Attachment Interview (AAI; George et al., 1984) to examine how parents' "state of mind with respect to attachment" relates to PRD (e.g., Ablow et al., 2013; Leerkes et al., 2015).

A growing trend in the literature on parenting and attachment, however, involves examining parents' self-reported attachment style, which captures attachment-related thoughts, feelings, and behaviors in close adult relationships (see Jones et al., 2015). Attachment style measures are distinct from the AAI in that they typically focus on a person's experiences in recent close relationships rather than in early childhood and are believed to reflect more conscious thoughts and feelings related to attachment. Accumulating empirical evidence points to the influence of attachment style on important facets of parenting (e.g., parenting styles, parental involvement, risk for child abuse; e.g., Branjerdporn et al., 2019; see Jones et al., 2015, for a review of more than 60 studies), but little is known about its influence on parents' response to child distress specifically. Thus, a goal of this study is to investigate the link between parental attachment style and unsupportive PRD.

### **Attachment Style as a Contributor to Parents' Response to Child Distress**

In theory, attachment style relates to PRD because it reflects how individuals regulate their own distress in close relationships (i.e., how they process and express sadness or other negative emotions; Shaver & Mikulincer, 2007). Typically, measures of attachment style ask individuals to report how they experience close relationships in general, and their responses are measured by two dimensions of attachment insecurity: avoidance and anxiety. Avoidance reflects discomfort with dependency and vulnerability in oneself and others, and perceptions of others as ill-intentioned and untrustworthy (Shaver & Mikulincer, 2007); to avoid showing vulnerability, avoidant individuals tend to minimize their own distress in close relationships. Attachment anxiety is characterized by fear of rejection and abandonment, perceptions of the self as unloveable, and a strong desire for closeness in relationships; anxious individuals tend to maximize expressions and feelings of distress in relationships to maintain the intense closeness they desire and to ward off concerns of abandonment. Individuals low on both avoidance and anxiety are considered to have a more secure attachment style. Security is characterized by perceptions of the self as worthy of care and of others as well-intentioned and trustworthy, as well as the ability to provide comfort and be comforted when distressed. Secure individuals are able to flexibly express and acknowledge both their positive and negative emotions in close relationships (Shaver & Mikulincer, 2007). Because attachment style is closely related to parents' strategies for dealing with their own negative emotions, it is reasonable to predict that parents' attachment style would also relate to their strategies for dealing with their children's negative emotions. For example, parents who avoid feeling or acknowledging their own sadness because of discomfort with vulnerability might also avoid their child's sadness, as it highlights the child's vulnerability and dependency on them.

There is some empirical support for this theoretical perspective, although the few studies available provide inconsistent evidence. Further, it is unclear whether attachment avoidance and anxiety both relate to PRD. Previous research on parent behaviors and attachment style suggests that avoidant attachment style, compared to anxious attachment style, is a stronger predictor of observed parental insensitivity, but less is known about response to child distress specifically (Jones et al., 2015). There is evidence that both attachment avoidance and anxiety predict more unsupportive PRD (Goodman et al., 1997); that avoidance, but not anxiety, is related to PRD (Edelstein et al., 2004; Kohlhoff et al., 2017);

that only avoidance directly predicts PRD, but both types of attachment insecurity are indirectly related to PRD via parents' emotion dysregulation (Jones et al., 2014); and that neither avoidance nor anxiety predicts PRD (Morey & Gentzler, 2017). These inconsistent findings may be due to the fact that the link between parents' attachment style and their unsupportive responses to child distress is indirect through other aspects of parenting or through parents' own emotional or cognitive processes (e.g., Jones et al., 2014; Morey & Gentzler, 2017). Therefore, a goal of this study is to investigate potential indirect pathways between attachment style and unsupportive PRD, examining pathways from both attachment avoidance and anxiety.

## **Mechanisms Linking Parents' Attachment Style and PRD: Emotions and Attributions about Child Distress**

In attachment theory, a principal mechanism linking attachment to many aspects of social functioning is the construct of mental representational models, also known as internal working models (IWMs; Bowlby, 1969/1982). IWMs are learned cognitive representations of how people may be expected to behave, and a complementary representation of the self. They guide individuals' expectations about others' intentions, the attributions they make about others' behavior, and their own emotions in distressing situations (see Bretherton & Munholland, 2008).

As described previously, attachment insecure individuals have mental representations of others that involve intertwined negative cognitions and emotions (e.g., viewing others as ill-intentioned or rejecting), which likely stem from a history of attachment-related experiences that involved rejection or inconsistent care. Evidence suggests that both attachment avoidant and anxious adults process social information more negatively, in a way that involves both emotions and cognitions about others' intentions (Dykas & Cassidy, 2011). For example, insecure individuals have a negative attribution bias, in which they tend to attribute others' behavior to hostile intentions. Because they view others as untrustworthy, insecure individuals also tend to feel less empathy for others' distress (Shaver et al., 2016).

Evidence that insecure attachment contributes to negative social information processing in the parent-child relationship comes from studies demonstrating that insecure parents experience more negative emotions and cognitions about their children than secure parents (e.g., see Jones et al., 2015, for a review). For example, both avoidant and anxious parents perceive their children as more difficult, more reactive, less adaptable, and more interfering (e.g., Pesonen et al., 2004; Priel & Besser, 2000). These studies suggest that an insecure attachment style may lead parents both to feel and to think more negatively about their children, especially in the context of their children's distress (Leerkes & Siepak, 2006). To illustrate, an insecure parent might perceive their child's distress as manipulative or attribute the child's crying to the fact that the child is spoiled or "just wants attention."

Although evidence suggests that both avoidant and anxious parents have more negative mental representations of their children and process social information more negatively, they may do so in different ways. For example, parents with higher attachment anxiety represent infant distress as less tolerable than parents with lower attachment anxiety (River et al.,

2019); attachment avoidant parents represent infant distress as amusing and make more negative attributions about infant distress than other parents (Leerkes & Siepak, 2006).

Conversely, parents with secure attachment styles (those low in attachment anxiety and avoidance) possess mental representations of others as well intentioned, trustworthy, and deserving of care (Shaver et al., 2016). Evidence suggests that secure parents have positive emotions and cognitions about their children, such as having more empathy for their children's distress and perceiving their children and the parent-child relationship more positively (e.g., Finzi-Dottan et al., 2006). Thus, parents with less attachment avoidance and anxiety would be more likely to make positive, empathic attributions about child distress, such as thinking that the child is crying because they are upset or need something, and more likely to feel emotions that are attuned to the child's distress rather than disengaged, such as sympathy or empathy for the crying (see Stern et al., 2015).

In turn, emotions and attributions about child distress likely contribute to PRD. Empirical evidence and several theoretical perspectives support the notion that parents' negative emotions and cognitions about their children largely predict insensitive parenting behavior (e.g., An et al., 2022; see Dix, 1991, for a review; Leerkes et al., 2020). For instance, attachment theory posits that parents must notice and interpret their children's cues and respond in a way that recognizes the needs of the child outside of their own (Ainsworth et al., 1978). A parent's misinterpretation of child cues, such as attributing distress to hostile intentions, will interfere with their ability to respond supportively. From the social information processing perspective, social behavior such as parenting is influenced by how an individual processes and interprets the cues of others (Lemerise & Arsenio, 2000); this perspective has been applied to the study of harsh discipline and other aspects of parenting (e.g., Lorber & O'Leary, 2005). These theories implicate parents' negative attributions about child distress and unempathic, self-focused emotions as important affective and cognitive processes that underlie unsupportive PRD. In contrast, secure parents' ability to empathize and attribute good intentions to their children may steer them away from unsupportive PRD because they do not feel personally upset by the situation or blame the children for feeling distressed. Indeed, previous research indicates that parents' emotional and cognitive reactions to infant distress predicted how sensitively they responded to their infant's distress: whereas parents' positive emotions and cognitions about their children predicted more sensitive behavior in response to distress (Leerkes, 2010), parents' negative attribution biases about child misbehavior or self-focused emotions predicted unsupportive responding, harsh discipline, harsh parenting, or maltreatment (e.g., Berlin et al., 2013; Leerkes et al., 2020; Lorber & O'Leary, 2005).

In sum, although links between parent attachment and unsupportive PRD have been investigated using interview-based measures of state of mind with respect to attachment, less is known about how parents' self-reported attachment style (avoidance and anxiety) influences PRD, including mechanisms underlying this link. Previous studies have found links between parents' attachment style and their emotions/attributions about child distress, as well as links between emotions/attributions about child distress and PRD; the present study aims to connect these findings, examining them in a single model.

## The Present Study

The goal of the present study is to investigate prospective links between mothers' attachment style insecurity (avoidance and anxiety) and their unsupportive responses to child distress, as well as potential indirect pathways via two variables grounded in attachment theory: (1) parents' negative (i.e., unempathic, disengaged) emotions/attributions about child distress and (2) parents' positive (i.e., empathic, attuned) emotions/attributions about child distress. Positive and negative reactions were measured separately because they are not mutually exclusive and can co-occur. Our reasoning for combining emotional and cognitive aspects of parental responding is based on theory and evidence that social information processing involves closely intertwined emotional and cognitive components, that internal working models of attachment in particular involve intertwined emotions and cognitions about the self and others that cannot be easily distinguished, and that emotion and cognition are "deeply interwoven in the fabric of the brain" (Dykas & Cassidy, 2011; Lemerise & Arsenio, 2000; Okon-Singer et al., 2015, p. 58). Furthermore, empirical evidence indicates that both (1) mothers' other-oriented emotions and attributions about child distress load onto a single dimension and (2) their self-oriented emotions and attributions about child distress load onto a single dimension (Leerkes, 2010; Leerkes et al., 2012, 2015). The task examining reactions to child distress focused on infants because (1) the infant stimuli have been well validated and widely used in previous parenting research (e.g., Leerkes, 2010; Leerkes et al., 2021) and (2) the evolved tendency for adults to be moved to care for crying infants (Bowlby, 1969/1982; Zeifman, 2001) makes infant crying a salient experimental stimulus to tap individual differences in parental responses, regardless of their own child's age.

The sample consisted of urban, predominantly African American mothers from low-income communities with preschoolers attending Head Start programs. The stressors associated with low income place parents at increased risk for insecure attachment style and insensitive parenting (e.g., Norcross et al., 2020; van IJzendoorn & Bakermans-Kranenburg, 2010), which in turn may increase their children's risk for poor developmental outcomes, such as insecure attachment and emotion dysregulation (e.g., Bakermans-Kranenburg et al., 2004; Cassidy et al., 2017). Further, African American mothers are underrepresented in the literature on attachment style and parenting, making this population an important one in which to examine and understand predictors of parenting behavior.

We hypothesized that mothers' greater attachment avoidance and anxiety would predict more unsupportive responses to child distress (punishing, minimizing, and distress reactions). Given the inconsistent pattern of findings in previous studies regarding whether avoidance, anxiety, or both relate to PRD, we did not hypothesize differential links for each attachment style. Nonetheless, it is possible that anxiety and avoidance relate in different ways to PRD (e.g., perhaps avoidance is directly related to PRD due to parents' overt discomfort with vulnerability, whereas anxiety is indirectly related to PRD because poor emotion regulation interferes with parents' ability to feel empathy for child distress), or in different ways to negative emotions/cognitions about child distress. Given this possibility, we examined each style separately rather than combining them into a single measure of attachment insecurity.

In addition, we hypothesized that parents' negative emotions/attributions about infant crying would explain the links between avoidant and anxious attachment styles and PRD. Conversely, we hypothesized that parents' positive emotions/attributions would explain this link in the opposite direction (i.e., between lower attachment anxiety/avoidance and fewer unsupportive responses to child distress). See Figure 1 for the path diagram of the conceptual model. To test these hypotheses, we used structural equation modeling (SEM), a powerful multivariate method of data analysis which allowed us to estimate links among all constructs within a single model, as well as test whether links between attachment style and parenting are direct or indirect via parents' emotions/attributions.

## Method

### Participants

Participants were mothers recruited from four Head Start centers in low-income, urban communities across 15 months (see Table 1 for demographic information). All mothers in the study completed the assessments and procedure as part of a separate parenting intervention study, which is not the focus of the present study (full details of the intervention study are described in Cassidy et al., 2017). Eligibility criteria for the larger study included: age 18 or older, proficient English speaker, and lacking untreated thought disorders (e.g., schizophrenia). One hundred and sixty-four participants met eligibility criteria and are included in the present study.

### Procedure

After providing informed consent, mothers completed a baseline assessment (T1), including questionnaires measuring demographics, attachment style, responses to child distress, and other measures not related to the present study. As part of the separate intervention study, mothers were then randomly assigned to the intervention group ( $n = 91$ ), which attended weekly meetings for 10 weeks, or a waitlist control ( $n = 73$ ). Approximately 4 to 6 months after T1, all mothers participated in individual 2-hour outcome assessments (T2) at a laboratory playroom. Mothers completed the same questionnaires from T1, in addition to reporting their emotions and attributions in response to videos of infants crying. On completion of the baseline and outcome assessments, participants received \$75.

### Measures

**Attachment Style**—The self-reported Experiences in Close Relationships scale (ECR; Brennan et al., 1998; Wei et al., 2007) measures attachment anxiety and avoidance in close relationships. The anxiety dimension reflects individuals' fear of interpersonal rejection and abandonment (e.g., "I worry about being abandoned."), whereas the avoidance dimension reflects individuals' feelings of discomfort with close relationships and avoidance of intimacy or reliance on others (e.g., "I get uncomfortable when people want to be very close to me."). Each item is rated on a 7-point scale from 1 (disagree strongly) to 7 (agree strongly). We calculated mothers' attachment anxiety and avoidance scores by averaging responses across subscale items. For logistical reasons (i.e., changes in time available for measure completion), the first 53 participating mothers (at T1 only) completed the 12-item ECR—Short Version (ECR-S; 6 anxiety items,  $\alpha = .59$ ; 6 avoidance items,  $\alpha = .66$ ; Wei et



al., 2007). In all other instances, mothers completed the original 36-item scale (18 anxiety items,  $\alpha_{T1} = .91$ ,  $\alpha_{T2} = .93$ ; 18 avoidance items,  $\alpha_{T1} = .89$ ,  $\alpha_{T2} = .86$ ; Brennan et al., 1998). Given that prior research indicates the ECR-S retains psychometric properties similar to those of the original version, whether administered alone or embedded in the original measure (Wei et al., 2007), the lower reliability of the ECR-S in the current study likely reflects the different sample sizes (e.g.,  $n = 53$  versus  $n = 105$ ). The correlations between T1 and T2 ECR scores for participants who completed the ECR-S at T1 was  $r = .45$ ,  $p = .002$  (anxiety) and  $r = .42$ ,  $p = .003$  (avoidance).

Using the ECR subscale scores – either from the ECR-S or the ECR depending on which the mother completed – we created two single-indicator latent factors (attachment anxiety and attachment avoidance) by fixing the observed indicators' factor loading to 1 and their error term to 0 (making the factors identical to the measured variables, which does not account for measurement error). Because participants received different versions of the ECR, we did not use individual items to create latent factors, and as a result, were only able to use the measured subscale scores in the model.

**Emotions and Attributions about Child Distress**—Using a procedure adapted from Leerkes and Siepak (2006), we showed mothers four 1-min video clips, each of a different crying infant (all mothers saw the same four clips, 2 of White infants and 2 of Black infants). Participants were alone in a room as they viewed the videos on a laptop with headphones. Following each clip, mothers rated on a scale from 1 (not at all) to 4 (very strongly) how strongly they felt each of 17 emotions (e.g., “empathetic,” “sad,” “neutral,” “amused”), presented in a random order. Following Leerkes and Siepak (2006), we created three subscales of mothers' emotions: (1) empathy (the mean of mothers' ratings for sympathy, empathy, and concern;  $\alpha = .86$ ); (2) amusement (the mean of mothers' ratings for happiness and amusement;  $\alpha = .75$ ); and (3) neutral (the mean of mothers' ratings for neutral feelings;  $\alpha = .59$ ) across all four infants. (We made the a priori decision to omit the irritation and anxiety subscales because they may reflect ambiguous emotions; e.g., mothers could feel irritated or anxious for both empathic and self-focused reasons; see Leerkes & Siepak, 2006, p. 18).

Additionally, following each clip, mothers reported why they believed each infant was crying by rating 18 items on a scale from 1 (not at all) to 4 (very strongly), indicating how much they agreed with the statements (e.g., “no one was helping the baby,” “the baby just wanted attention”). Statements were presented in a random order. Following Leerkes and Siepak (2006), we used three subscales of mothers' attributions from these ratings across all four infants: (1) situational/emotion-focused attributions about the distress reflected an emotional need (e.g., “the baby was upset by the situation,” “the baby was trying to show he/she needs help”;  $\alpha = .79$ ); (2) negative/internal attributions reflected negative qualities of the child (e.g., “the baby is spoiled,” “the baby was trying to make mother's life difficult”;  $\alpha = .90$ ); and (3) other attributions reflected the physical state of the child or a temporary experience causing the distress (e.g., “the baby was hungry,” “the baby was in a bad mood”;  $\alpha = .92$ ).

We created two latent factors to reflect mothers' positive versus negative mental models about infant crying. These latent factors were created based on theory and findings from previous research (e.g., Leerkes, 2010; Leerkes et al., 2012, 2015). The first factor represents mothers' unempathic, misattuned reactions to infant distress (i.e., emotions that are disengaged from the infant's distress and attributions that place the reason for distress on the infant rather than on external factors). This factor, labeled Negative Emotions and Attributions, consisted of mothers' amusement, neutral emotion (considered misattuned in the context of infant distress), negative/internal attributions, and other attributions as measured indicators. The second factor represents mothers' empathic reactions to infant distress (e.g., taking the infants' perspective, feeling sympathetic, giving infant-emotion-focused attributions about the infants' distress). This factor, labeled Position Emotions and Attributions, consisted of mothers' empathy and situational/emotional attributions as measured indicators.

**Unsupportive Responses to Child Distress**—Using the Coping with Toddlers' Negative Emotions Scale (CTNES; Spinrad et al., 2007), participants rated their likelihood of engaging in each of 7 possible responses to their child's negative emotions in 12 hypothetical scenarios in which the child becomes upset or distressed (e.g., "If my child becomes upset and cries because he is left alone in his bedroom to go to sleep, I would:"). Because the present study focused on parental unsupportive behavior, we used only 3 (out of the 7 possible) responses for each of the 12 scenarios in analyses.

For each scenario, unsupportive responses include the following: (1) distress (e.g., "Become upset myself"), (2) punitive (e.g., "Tell my child that if he doesn't stop crying, we won't get to do something fun when he wakes up"), and (3) minimizing reactions (e.g., "Tell him that it's nothing to get upset about"). For each scenario, caregivers rated each response from 1 (very likely) to 7 (very unlikely). We averaged items across each of the 3 response types to create 3 subscales: punitive ( $\alpha_{T1} = .79$ ,  $\alpha_{T2} = .82$ ), minimizing ( $\alpha_{T1} = .76$ ,  $\alpha_{T2} = .80$ ), and personal distress ( $\alpha_{T1} = .77$ ,  $\alpha_{T2} = .74$ ). Subscales were reverse scored so that higher scores indicate more likely responding. The use of the CTNES (as opposed to a version of this measure designed for older children) was deemed most appropriate for the present sample following the advice of on-site experienced Head Start staff who engaged in item examination with research staff. Studies support the validity of the CTNES in preschool children, showing the expected correlations between scores on the CTNES at toddler and preschool ages (e.g., Eisenberg et al., 2010).

Using the three CTNES subscales as measured indicators, we created a latent Unsupportive Responses to Child Distress factor (one at T1 and one at T2).

## Analysis Plan

We completed all analyses using Mplus version 6.12. To examine whether attachment style was associated with unsupportive PRD, and whether this link was accounted for by emotions/attributions about infant crying (Figure 1), we employed a two-step structural equation model. In the first stage, we used confirmatory factor analysis (CFA) in which all latent factors were allowed to covary to determine whether our measured variables



were good indicators for our latent variables (see Figure 2 and the Measures section for a description of each latent variable and its indicators). We decided *a priori* to include the error covariances of T1 minimizing, punitive, and personal distress variables (unsupportive responses to child distress) with their identical T2 counterparts.

Contingent on acceptable fit of the final measurement model, we then proceeded to test structural relations among the latent variables. In the structural phase, we added the hypothesized paths among the latent variables (Figure 1). We compared two structural models for goodness of fit: a model with only an indirect path from mothers' attachment style to their parenting behavior through emotion/attribution (Structural Model 1) and a model with both direct and indirect paths from mothers' attachment style to their parenting behavior (Structural Model 2). In each, we allowed the disturbance of the Negative Emotions and Attributions factor to covary with the disturbance of the Positive Emotions and Attributions factor, because these two constructs should be negatively correlated beyond the variance due to mothers' attachment style.

To determine model fit, we used the guidelines presented by Hu and Bentler (1999) and Mueller and Hancock (2010). Adequate fit was represented by a standardized root mean square (SRMR) of .08 or less, a root mean square error of approximation (RMSEA) of .05 or less, and a comparative fit index (CFI) of .95 or more. To evaluate competing models, we used chi-squared difference tests to determine which models better fit the data.

After selecting the final structural model, we further examined the indirect pathways and tested the statistical significance of the indirect effects using bootstrapping methods.

**Covariates**—All analyses controlled for: (a) T1 levels of unsupportive responses to child distress and (b) the number of intervention sessions attended (to account for the possibility that the intervention influenced levels of the outcome or other variables; see Figure 1). For number of intervention sessions, all control group mothers received a value of 0, and intervention group mothers received a value equal to the number of sessions attended (0 to 10). Using number of sessions attended, we created a single indicator latent factor by fixing the measured variable's factor loading to 1 and error term to 0 (making the factor identical to the measured variable, which does not account for measurement error). This latent factor was not created to represent a latent construct but to stand in for the measured variable in the model, a direct measurement of attendance. We also ran all models with a single indicator latent factor created using intervention/control group random assignment rather than number of sessions; the pattern of results did not differ based on how this covariate was coded except where noted in the results.

**Missing Data**—Missing data were handled in two ways. First, full information maximum likelihood (FIML) was used to handle subscale scores defined as missing. Second, when a mother responded to at least 80% of the items on a given subscale (e.g., attachment avoidance, attachment anxiety), we used participant mean imputation to compute mothers' subscale scores (this was rare: an average of .09% of items was substituted across all subscales used). Otherwise, mothers' subscale scores were treated as missing. Simulations have demonstrated that participant mean imputation is a statistically sound technique when

less than 10% of items (across all participants that completed the subscale) are missing (Parent, 2013; Schafer & Graham, 2002). We did not use FIML for missing individual items because the subscale scores served as the measured indicators; using items as indicators would result in the model exceeding the upper limit for desirable number of indicators per factor (Koran, 2020).

## Results

### Preliminary Analyses

Descriptive statistics and correlations among study variables are presented in Table 2.

Of the 164 eligible mothers, 23 did not participate in the outcome assessment, leaving 141 with both T1 and T2 data. Mothers who attended the outcome assessment did not differ from mothers who did not attend in terms of any T1 or demographic variables (examined using independent samples t-tests or chi-square goodness-of-fit; see Table 1 and Cassidy et al., 2017, for more information about participation and attrition in each component of the study). Following Mueller and Hancock (2010), we used full information maximum likelihood estimation (FIML) to estimate missing scores, which allowed us to include all 164 participants in the analyses. According to traditional determinates of appropriate sample size for SEM (e.g., MacCallum et al., 1996; Satorra & Saris, 1985; a ratio of sample size to free parameters of 5:1; Bentler & Chou, 1987; 10 cases per indicator; Nunnally, 1967), this sample provided adequate power for the proposed model.

No participants were missing data for the number of intervention sessions attended and T1 attachment anxiety; one participant was missing data for T1 attachment avoidance, two participants were missing data for T1 PRD, 25 participants were missing data for T2 PRD (23 did not attend the outcome assessment and 2 did not complete the questionnaire), and 24 participants were missing data for T2 emotions and attributions about child distress (23 did not attend the outcome assessment and 1 mother's data were lost due to equipment failure). Results from Little's MCAR test,  $\chi^2(11) = 26.13, p = .006$ , indicated that the data may not be MCAR. Instead, the missing data are likely MAR, because the missingness was almost always a function of a participant not attending the outcome assessment, rather than skipping individual items or scales of a sensitive nature, indicating that the propensity of an item to be missing is not related to the missing item itself. To further support MAR, results of separate variance t-tests revealed that missingness on the T2 variables was significantly associated with another variable accounted for in the model – number of intervention sessions attended (see Chukwu et al., 2015).

### Principal Analyses

**Measurement Phase**—All measured variables loaded significantly on their respective latent variables (Figure 2). We examined modification indices and applied the modifications when they were both statistically and theoretically defensible. This resulted in the addition of three *post hoc* error covariances. Specifically, mothers' empathy, amusement, and neutral emotion ratings covaried with each other. Given that people tend to vary in reported emotionality in general (above and beyond the context of infant distress), we viewed this

addition to be justified. With these changes, the final measurement model fit the data well and significantly better than the initial measurement model (Table 3).

**Structural Phase**—To allow comparison between model elements, we report standardized path coefficients for both (see Figure 3 for both standardized and unstandardized coefficients). Structural Model 2 did not fit significantly better than Model 1, so we retained Model 1 as the final model for parsimony (Table 3). Notably, however, Model 2 revealed a statistically significant direct path from attachment anxiety to parenting behavior (Figure 3b).

The final structural model indicated that greater attachment anxiety at T1 predicted more negative emotions and attributions at T2, which predicted more unsupportive responses to child distress at T2 (controlling for T1 levels of unsupportive PRD and number of intervention sessions attended; Figure 3a). No other significant paths emerged.

**Analysis of the Indirect Effect**—The results from the final structural model provided evidence for an indirect link between attachment anxiety and unsupportive parenting behaviors via mothers' negative emotions and attributions. We further examined the individual indirect pathways for statistical significance by estimating the indirect effects using the MODEL INDIRECT procedure for Mplus (Stride et al., 2015). This procedure estimates each of the four specific indirect effects and tests for their statistical significance using bootstrapping methods.

The results indicated that the indirect effect of attachment anxiety on unsupportive PRD through negative emotions/attributions was significant, 95% CI [.00, .14]. When the covariate intervention group assignment was coded as a dichotomous variable rather than a continuous variable representing the number of sessions attended, the indirect effect became marginally significant, 95% CI [−.00, .14]. Consistent with the primary analyses, none of the other indirect effects was significant, including the effect of attachment anxiety through positive emotions and attributions, 95% CI [−.01, .08], attachment avoidance through negative emotions/attributions, 95% CI [−.05, .05], and attachment avoidance through positive emotions/attributions, 95% CI [−.09, .01].

All Mplus code and output have been made publicly available at The Open Science Framework and can be accessed at <https://osf.io/kh2ym/>.

## Discussion

This study examined the role of adult attachment style in predicting parental response to distress (PRD) among low-income, predominantly African American mothers of preschool children. Structural equation modeling showed that mothers' attachment anxiety prospectively predicted more unsupportive responses to children's negative emotions 4 to 6 months later, and that mothers' negative emotions and attributions regarding child distress explained this link. These results are broadly consistent with theoretical perspectives that attachment shapes caregiving behavior via internal working models (Bowlby, 1969/1982; Bretherton & Munholland, 2008; Feeney & Woodhouse, 2016)—of which emotions and

attributions regarding distress are part. Contrary to our hypotheses, attachment avoidance did not significantly predict PRD directly or indirectly, and positive emotions/attribution did not explain indirect links in the model. This study is first to our knowledge to demonstrate that previously observed links of attachment style to parenting behavior are explained by social information processing and is one of few studies examining attachment style and parenting among majority African American mothers. These findings contribute to a growing literature on the contribution of adult attachment style to parenting (Jones et al., 2015) and highlight the importance of examining *mechanisms* linking parent characteristics to parenting behaviors that have important implications for child development. For example, the fact that the model with only an indirect pathway fit the data better than a model also containing a direct pathway from mothers' attachment style to PRD may help to explain inconsistencies among previous studies on this topic. Without accounting for indirect links via cognitive and emotional processes, studies may miss some of the nuanced ways that parents' attachment style can influence responses to child distress.

Previous research has linked attachment anxiety and avoidance to individuals' negative emotions and cognitions regarding child distress (Leerkes & Siepak, 2006). In the present study, only attachment anxiety was predictive of parents' negative attributions and emotions, and of unsupportive PRD. Because attachment anxiety involves fear of rejection, perceptions of the self as unloveable, and a tendency to maximize expressions of distress (Shaver & Mikulincer, 2007), attachment-anxious parents may focus on their own needs and experience more self-focused personal distress in response to children's distress that precludes attending to the child's needs sensitively (Feeney & Woodhouse, 2016). Attachment-anxious parents also engage in more egocentric, overinvolved, and emotionally insensitive behavior toward their children (Farinelli & Guerrero, 2011) and thus may be more likely to respond to child distress with distress of their own.

Attachment avoidance was not related to parents' negative attributions and emotions, or to unsupportive PRD. This is contrary to our hypotheses, and conflicts with some previous research showing that avoidance is more consistently linked to insensitive parenting behaviors (see Jones et al., 2015), including evidence that avoidance, and not anxiety, predicts lower responsiveness to child distress (Edelstein et al., 2004; yet see Goodman et al., 1997). One explanation is that attachment avoidance indirectly predicts unsupportive behavior through mechanisms not measured in the present model (e.g., less optimistic expectations about child outcomes; Lench et al., 2006). It is also possible that findings are specific to the present sample: Parental attachment anxiety and avoidance may operate differently in low-income families. In high-stress contexts, attachment avoidance may be adaptive, allowing parents to minimize their own attachment needs to focus psychological resources on ensuring physical safety and stability for their children (for related thinking, see Stern et al., 2021). Avoidance may therefore not influence these parents' responses to child distress in the same way that it does in less stressed, middle-income samples. An alternate explanation is that avoidant parents underreported their negative parenting behavior, given findings that avoidance is associated with a general pattern of minimizing negative emotions (Mikulincer et al., 2009; Sichko et al., 2018).

Our findings linking parents' negative emotions and attributions to unsupportive PRD are consistent with a large body of previous research on social information processing influences on parenting (e.g., Fuths et al., 2017; Leerkes, 2010; Leerkes et al., 2015, 2020). Less clear is why positive, empathic reactions to distress were not meaningfully linked to attachment style or parenting behavior. These findings contrast with previous work demonstrating links between parental attachment style and empathy (Stern et al., 2015), and between empathy and sensitive parenting behavior (Leerkes, 2010). One possibility is that empathic responses to videos of infants are less relevant for parents of preschoolers; it could be that these links are apparent only for same-aged children's distress or regarding their own children's unique distress cues. Importantly, however, the present task intentionally focused on infant distress for at least two major reasons: there is an evolved tendency for adults to be moved to care for crying infants, and the infant stimuli have been well validated and widely used in previous parenting research.

The present findings also shed light on processes that may contribute to intergenerational patterns of parenting behavior and insecure attachment. Although ample data show that parents' state of mind with respect to attachment measured on the AAI predicts parenting behavior that in turn influences child attachment (e.g., Verhage et al., 2016), less research has examined the contributions of adult attachment style. Importantly, the AAI and the ECR assess different aspects of adult attachment (coherence of state of mind regarding attachment and conscious appraisals of one's feelings and behavior in close relationships, respectively; Shaver & Mikulincer, 2007), are only weakly intercorrelated, and predict somewhat different (though theoretically consistent) outcomes (Roisman et al., 2007). Thus, it is notable that a growing body of evidence, including this study, suggest that the ECR may predict similar outcomes as the AAI in the domain of parenting (Jones et al., 2015). We view the application of this well-validated and widely-used self-report measure to questions of parenting to be a fruitful endeavor, with the potential to unearth parenting processes specifically related to dimensions of anxiety and/or avoidance, as exemplified in the present findings. We encourage future research to examine the joint and interactive contributions of adult attachment style and state of mind to better understand how these parental characteristics drive sensitive caregiving.

### **Strengths, Limitations, and Future Directions**

Strengths of the study include the prospective design, allowing for examination of parental response to child distress at two time points; inclusion of a majority African American, economically stressed sample of mothers of young children, a population underrepresented in attachment research; and the application of an SEM approach, (including the rigorous examination of indirect effects), a statistically powerful technique that reduces measurement error, tests specific indirect effects, and allows for model comparison to determine the best fit for the data.

Alongside these strengths, however, we note a number of study limitations and avenues for additional research. First, a limitation of this study is that data were drawn from a study of a parenting intervention designed to help caregivers foster secure attachments in their children. Although the number of intervention sessions attended, random assignment to the

intervention, and baseline parenting were accounted for, it is possible that the intervention influenced some of the observed pathways. In particular, the intervention was related to lower unsupportive PRD at T2 in the present sample (see also Cassidy et al., 2017). Despite the fact that SEM accounts for links between the intervention and all other factors in the analytic model, and that the association between attachment style and PRD remained beyond the role of the intervention in the present study, it will be important to replicate results in community samples free from the potential influence of the intervention and therapeutic context.

Second, as noted above, the present design cannot rule out bidirectional associations or establish true longitudinal mediation. Though we controlled for parenting behavior at T1, maternal emotions and attributions were assessed at only one time point (concurrently with parenting behavior at T2). In future longitudinal studies, it will be important to measure variables at all time points, so that all autoregressive paths are controlled. Additionally, although as noted in the Method section, traditional determinates of appropriate sample size for SEM indicate that our sample was adequate for the proposed model (Bentler & Chou, 1987; MacCallum et al., 1996; Nunnally, 1967; Satorra & Saris, 1985), more recent literature suggests that there is broad variability in sample size requirements for latent models and that the present study's analyses may be underpowered based on the number of factors and indicators (Wolf et al., 2013). Despite the significant indirect effect found from attachment style to PRD, one implication of the smaller sample is that the analyses may lack power to detect other significant pathways in the model(s). Future work using SEM should conduct *a priori* power analyses to plan their sample sizes before data are collected, taking into account the type of model, number of factors and indicators, strength of indicator loadings and regressive paths, and the amount of missing data per indicator. Because of the potentially undersized sample, we were unable to model other conceptually relevant variables that may play a role in attachment and parenting, such as child gender, number of siblings, or mothers' education. Regarding number of factors, another limitation is that we were unable to create latent variables for attachment style, given different versions of the ECR were administered. Use of different versions may have introduced measurement error, which was not accounted for in the models.

Third, although outside of the present study's scope, future work may benefit from integrating other parental or family characteristics, such as personality traits, mental health status, or emotion regulation capacity of parents, to better understand the contributions of attachment style and IWMs alongside other traits within the parent. Indeed, recent work suggests that personality traits such as agreeableness and cognitive factors such as working memory and inhibitory control predict parenting behavior in part via parents' IWMs (An et al., 2022; Leerkes et al., 2021). Relatedly, the present study focused on mothers, and an important avenue for future work is to examine the potential influences of siblings, fathers, grandparents, and other caregivers who may respond to children's distress (while also shaping mothers' responses). Further, children's own characteristics, such as gender or temperament, were not examined in the present study but may elicit specific patterns of parents' responses to distress (child-driven unique effects) or interact with parents' attachment style to predict responses to distress (moderation effects).



Although the present focus on a sample of low-income, predominantly African American mothers contributes to the field's knowledge of an understudied population, this focus also limits the generalizability of the findings, given that these mothers have likely experienced unique socialization influences related to emotion expression (Dunbar et al., 2017) and faced unique stressors (e.g., racism; Murry et al., 2021)—key contextual factors that may shape parenting emotions, cognitions, and behavior. Research shows significant cultural variation in parents' attributions about child behavior (Trommsdorff et al., 2012) and in parents' emotion socialization practices (e.g., Friedlmeier et al., 2011). Specifically, racial context may shape PRD, as well as the manner in which these responses predict child outcomes (see, e.g., Dunbar et al., 2017, 2021). For example, although Black mothers of boys are more likely to employ punitive and minimizing responses to distress compared to White mothers (Nelson et al., 2012), these responses appear to be less detrimental to their children's social development (Perry et al., 2017). Specifically, mothers' minimization of children's distress, when combined with preparation for bias and high levels of support, may contribute to 5-year-olds' emotion regulation (Dunbar et al., 2021). Thus, examining the contribution of contextual factors such as racial identity, culture, parenting stress, socioeconomic status, and income level is a rich direction for further investigation (for further discussion see Stern et al., 2021).

Relatedly, although we used the same set of infants (2 Black, 2 White) to standardize our video stimuli, future work in larger samples could consider the racial identity of the infant and the mother to examine potential same- vs. other-race effects in mothers' emotions and attributions about infants' distress. Notably, the present video stimuli are well-validated, and mothers' responses to these infants, assessed prenatally, have been shown to predict their observed parenting behavior with their own infants (Leerkes et al., 2021). Nevertheless, further validation of this measure should examine the extent to which mothers' cognitions and emotions regarding unfamiliar children's distress generalize to their IWMs of their own child's distress, taking into account child characteristics such as racial identity, gender, and age. For example, several studies examining the neurobiology of parenting suggest that certain brain areas may be preferentially activated when parents view photos or listen to audio of their own child versus an unfamiliar child, and that parents may view as more emotionally salient (and thus pay more attention to) stimuli related to their own child (e.g., Grasso et al., 2009; Parsons et al., 2013).

## Conclusion

This study is part of a growing interdisciplinary literature integrating social psychology methods to enrich the developmental science of parenting and attachment. We view this as an asset, as researchers benefit from examining attachment through multiple lenses. Although interview-based and self-report measures of attachment are typically unrelated (Roisman et al., 2007), they share common, theoretically sound correlates relevant to parenting, such as sensitive behavior (Jones et al., 2015). Future research should assess parents' self-reported attachment style alongside state of mind with regard to attachment to illuminate their unique and overlapping contributions to parenting cognitions, emotions, and behavior. The present study sheds light on parental characteristics and potential mediating

processes that contribute to unsupportive responses to child distress, and points to promising future directions for parenting research and intervention.

## References

- Ablow JC, Marks AK, Feldman S, & Huffman LC (2013). Associations between first-time expectant women's representations of attachment and their physiological reactivity to infant cry. *Child Development, 84*(4), 1373–1391. 10.1111/cdev.12135 [PubMed: 23786152]
- Ainsworth MD, Blehar MC, Waters E, & Wall S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Oxford, England: Erlbaum. 10.1037/t28248-000
- An D, Bendel-Stenzel LC, & Kochanska G. (2022). Negative internal working models as mechanisms that link mothers' and fathers' personality with their parenting: A short-term longitudinal study. *Journal of Personality, 10.1111/jopy.12711*
- Bakermans-Kranenburg MJ, van IJzendoorn MH, & Kroonenberg PM (2004). Differences in attachment security between African-American and white children: Ethnicity or socio-economic status?. *Infant Behavior and Development, 27*(3), 417–433. 10.1016/j.infbeh.2004.02.002
- Bentler PM, & Chou CP (1987). Practical issues in structural modeling. *Sociological Methods & Research, 16*(1), 78–117. 10.1177/0049124187016001004
- Berlin LJ, Dodge KA, & Reznick JS (2013). Examining pregnant women's hostile attributions about infants as a predictor of offspring maltreatment. *JAMA Pediatrics, 167*(6), 549–553. 10.1001/jamapediatrics.2013.1212 [PubMed: 23588683]
- Bowlby J. (1982). *Attachment and loss: Vol. 1. Attachment*. New York, NY: Basic Books. (Original published 1969).
- Branjerdporn G, Meredith P, Strong J, & Green M. (2019). Sensory sensitivity and its relationship with adult attachment and parenting styles. *PLOS one, 14*(1), e0209555. 10.1371/journal.pone.0209555
- Brennan KA, Clark CL, & Shaver PR (1998). Self-report measurement of adult romantic attachment: An integrative overview. In Simpson JA & Rholes WS (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York, NY: Guilford.
- Bretherton I, & Munholland KA (2008). Internal working models in attachment relationships: Elaborating a central construct in attachment theory. In Cassidy J. & Shaver PR (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 102–130). New York, NY: Guilford.
- Cassidy J, Brett BE, Gross JT, Stern JA, Martin DR, Mohr JJ, & Woodhouse SS (2017). Circle of Security–Parenting: A randomized controlled trial in Head Start. *Development and Psychopathology, 29*(2), 651–673. 10.1017/S0954579417000244 [PubMed: 28401843]
- Chukwu AU, Ezichi ON, & Dike AO (2015). On comparison of some imputation techniques in multivariate data analysis. *Nature, 5*(6).
- Dix T. (1991). The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin, 110*, 3–25. 10.1037/0033-2909.110.1.3 [PubMed: 1891517]
- Dunbar AS, Leerkes EM, Coard SI, Supple AJ, & Calkins S. (2017). An integrative conceptual model of parental racial/ethnic and emotion socialization and links to children's social-emotional development among African American families. *Child Development Perspectives, 11*, 16–22. 10.1111/cdep.12218
- Dunbar AS, Lozada FT, Ahn LH, & Leerkes EM (2021). Mothers' preparation for bias and responses to children's distress predict positive adjustment among Black children: An attachment perspective. *Attachment & Human Development, 10.1080/14616734.2021.1976922*
- Dykas MJ, & Cassidy J. (2011). Attachment and the processing of social information across the life span: Theory and evidence. *Psychological Bulletin, 137*, 19–46. 10.1037/a0021367 [PubMed: 21219056]
- Edelstein RS, Alexander KW, Shaver PR, Schaaf JM, Quas JA, Lovas GS, & Goodman GS (2004). Adult attachment style and parental responsiveness during a stressful event. *Attachment & Human Development, 6*(1), 31–52. 10.1080/146167303100001659584 [PubMed: 14982678]

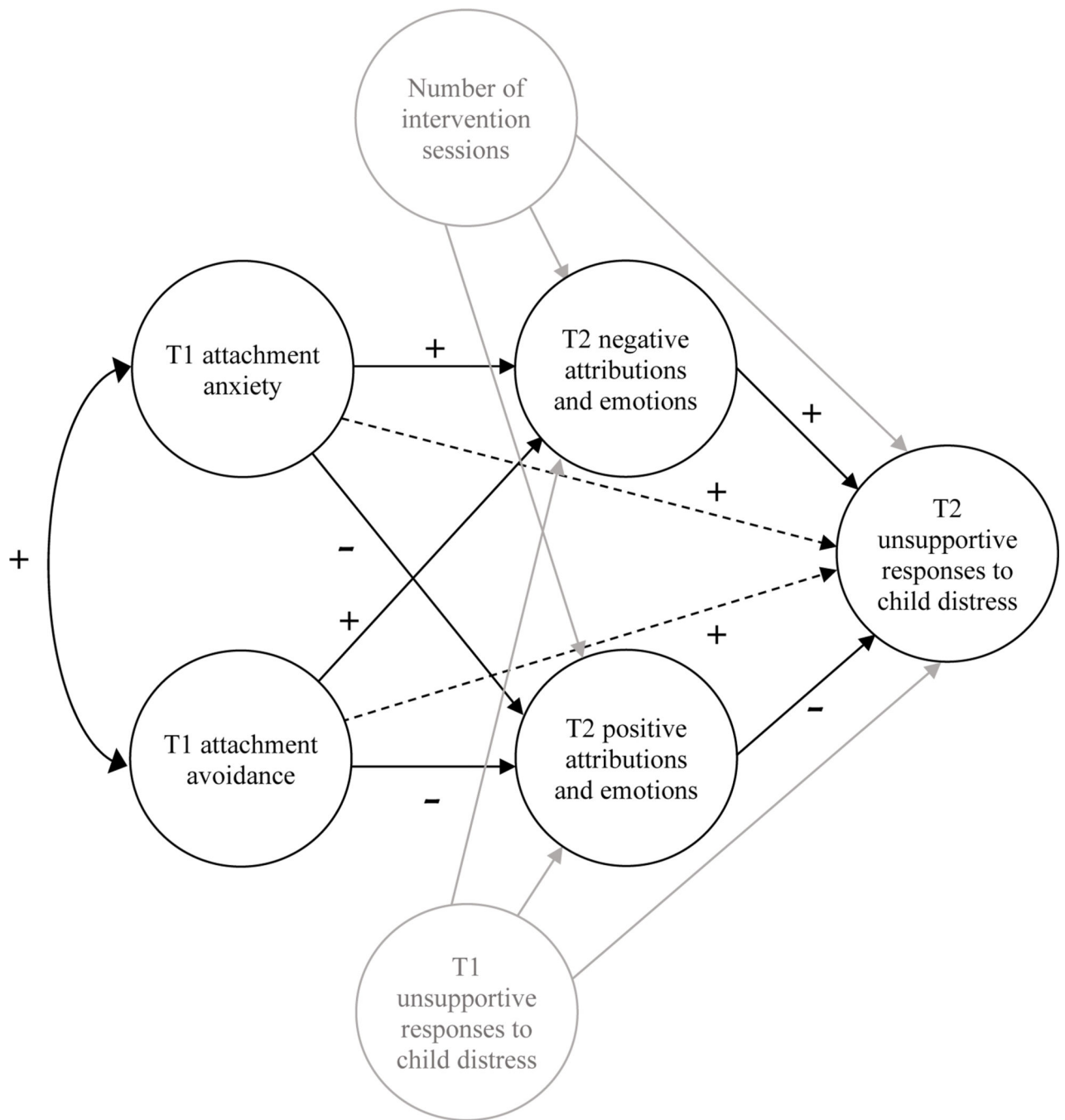
- Eisenberg N, Fabes RA, Shepard SA, Guthrie IK, Murphy BC, & Reiser M. (1999). Parental reactions to children's negative emotions: Longitudinal relations to quality of children's social functioning. *Child Development*, 70(2), 513–534. 10.1111/1467-8624.00037 [PubMed: 10218267]
- Eisenberg N, Spinrad TL, Eggum ND, Silva KM, Reiser M, Hofer C, Smith CL, Gaertner BM, Kupfer A, Tierney P, & Michalik N. (2010). Relations among maternal socialization, effortful control, and maladjustment in early childhood. *Development and Psychopathology*, 22, 507–525. 10.1017/S0954579410000246 [PubMed: 20576175]
- Fabes RA, Leonard SA, Kupanoff K, & Martin CL (2001). Parental coping with children's negative emotions: Relations with children's emotional and social responding. *Child Development*, 72(3), 907–920. 10.1111/1467-8624.00323 [PubMed: 11405590]
- Farinelli L, & Guerrero LK (2011). Associations between caregiving and health outcomes among parents of children with mental illness: An attachment perspective. *Health Communication*, 26(3), 233–245. 10.1080/10410236.2010.549811 [PubMed: 21347938]
- Feeney BC, & Woodhouse SS (2016). Caregiving. In Cassidy J. & Shaver PR (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (3rd ed., pp. 827–851). New York, NY: Guilford.
- Finzi-Dottan R, Cohen O, Iwaniec D, Sapir Y, & Weizman A. (2006). The child in the family of a drug-using father: Attachment styles and family characteristics. *Journal of Social Work Practice in the Addictions*, 6, 89–111. 10.1300/J160v06n01\_05
- Friedlmeier W, Corapci F, & Cole PM (2011). Emotion socialization in cross-cultural perspective. *Social and Personality Psychology Compass*, 5(7), 410–427. 10.1111/j.1751-9004.2011.00362.x
- Fuths S, Seehagen S, & Schneider S. (2017). How a mother processes her infant's distress: Cognitive pathways to maternal insensitivity. *Mental Health & Prevention*, 6, 19–25. 10.1016/j.mhp.2017.03.004
- Garner PW, Jones DC, & Miner JL (1994). Social competence among low-income preschoolers: Emotion socialization practices social cognitive correlates. *Child Development*, 65, 622–637. 10.2307/1131405 [PubMed: 8013243]
- George C, Kaplan N, & Main M. (1984). Adult Attachment Interview protocol. Unpublished manuscript, University of California at Berkeley. 10.1037/t02879-000
- Goodman GS, Quas JA, Batterman-Faunce JM, Riddlesberger MM, & Kuhn J. (1997). Children's reactions to and memory for a stressful event: Influences of age, anatomical dolls, knowledge, and parental attachment. *Applied Developmental Science*, 1(2), 54–75. 10.1207/s1532480xads0102\_1
- Grasso DJ, Moser JS, Dozier M, & Simons R. (2009). ERP correlates of attention allocation in mothers processing faces of their children. *Biological Psychology*, 81(2), 95–102. [PubMed: 19428973]
- Hu L, & Bentler PM (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55. 10.1080/10705519909540118
- Jones JD, Brett BE, Ehrlich KB, Lejuez CW, & Cassidy J. (2014). Maternal attachment style and responses to adolescents' negative emotions: The mediating role of maternal emotion regulation. *Parenting*, 14(3–4), 235–257. 10.1080/15295192.2014.972760 [PubMed: 25568638]
- Jones JD, Cassidy J, & Shaver PR (2015). Parents' self-reported attachment styles: A review of links with parenting behaviors, emotions, and cognitions. *Personality and Social Psychology Review*, 19(1), 44–76. 10.1177/1088868314541858 [PubMed: 25024278]
- Kohlhoff J, Eapen V, Dadds M, Khan F, Silove D, & Barnett B. (2017). Oxytocin in the postnatal period: Associations with attachment and maternal caregiving. *Comprehensive Psychiatry*, 76, 56–68. 10.1016/j.comppsy.2017.03.010 [PubMed: 28431269]
- Koran J. (2020). Indicators per factor in confirmatory factor analysis: More is not always better. *Structural Equation Modeling: A Multidisciplinary Journal*, 27(5), 765–772. 10.1080/10705511.2019.1706527
- Leerkes EM (2010). Predictors of maternal sensitivity to infant distress. *Parenting: Science and Practice*, 10(3), 219–239. 10.1080/15295190903290840 [PubMed: 20824194]
- Leerkes EM, Bailes LG, & Augustine ME (2020). The intergenerational transmission of emotion socialization. *Developmental Psychology*, 56(3), 390. [PubMed: 32077712]

- Leerkes EM, Bailes L, Swingler MM, Augustine MA, & Norcross PL (2021). A comprehensive model of women's social cognition and responsiveness to infant crying: Integrating personality, emotion, executive function, and sleep. *Infant Behavior and Development*, 64, 101577. [PubMed: 34044290]
- Leerkes EM, & Siepak KJ (2006). Attachment linked predictors of women's emotional and cognitive responses to infant distress. *Attachment & Human Development*, 8(01), 11–32. 10.1080/14616730600594450 [PubMed: 16581621]
- Leerkes EM, Sommers S, & Bailes L. (2021). The validity of prenatal assessments of mothers' emotional, cognitive, and physiological reactions to infant cry. *Parenting*, 1–29.
- Leerkes EM, Supple AJ, O'Brien M, Calkins SD, Haltigan JD, Wong MS, & Fortuna K. (2015). Antecedents of maternal sensitivity during distressing tasks: Integrating attachment, social information processing, and psychobiological perspectives. *Child Development*, 86, 94–111. 10.1111/cdev.12288 [PubMed: 25209221]
- Leerkes EM, Weaver JM, & O'Brien M. (2012). Differentiating maternal sensitivity to infant distress and non-distress. *Parenting*, 12(2–3), 175–184. 10.1080/15295192.2012.683353 [PubMed: 22798728]
- Lemerise EA, & Arsenio WF (2000). An integrated model of emotion processes and cognition in social information processing. *Child Development*, 71(1), 107–118. 10.1111/1467-8624.00124 [PubMed: 10836564]
- Lench HC, Quas JA, & Edelman RS (2006). My child is better than average: The extension and restriction of unrealistic optimism. *Journal of Applied Social Psychology*, 36(12), 2963–2979. 10.1111/j.0021-9029.2006.00137.x
- Lorber MF, & O'Leary SG (2005). Mediated paths to overreactive discipline: Mothers' experienced emotion, appraisals, and physiological responses. *Journal of Consulting and Clinical Psychology*, 73(5), 972–981. 10.1037/0022-006X.73.5.972 [PubMed: 16287397]
- Luebke AM, Kiel EJ, & Buss KA (2011). Toddlers' context-varying emotions, maternal responses to emotions, and internalizing behaviors. *Emotion*, 11(3), 697–703. 10.1037/a0022994 [PubMed: 21668116]
- MacCallum RC, Browne MW, & Sugawara HM (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130–149. 10.1037/1082-989X.1.2.130
- Mikulincer M, Shaver PR, Cassidy J, & Berant E. (2009). Attachment-related defensive processes. In Obegi JH & Berant E. (Eds.), *Attachment theory & research in clinical work with adults* (p. 293–327). Guilford.
- Morey JN, & Gentzler AL (2017). Parents' perceptions of and responses to children's emotions: Relations with meta-emotion philosophy and adult attachment. *Parenting*, 17(2), 73–103. 10.1080/15295192.2017.1304782 [PubMed: 31530998]
- Mueller RO, & Hancock GR (2010). Structural equation modeling. In Hancock GR & Mueller RO (Eds.), *The reviewer's guide to quantitative methods in the social sciences* (pp. 371–383). Routledge.
- Murry VM, Gonzalez CM, Hanebutt RA, Bulgin D, Coates EE, Inniss-Thompson MN, Debreux ML, Wilson WE Jr., Abel D, & Cortez MB (2021). Longitudinal study of the cascading effects of racial discrimination on attachment processes and adjustment among African American youth. *Attachment & Human Development*. 10.1080/14616734.2021.1976926
- Nelson JA, Leerkes EM, O'Brien M, Calkins SD, & Marcovitch S. (2012). African American and European American mothers' beliefs about negative emotions and emotion socialization practices. *Parenting*, 12, 22–41. 10.1080/15295192.2012.638871 [PubMed: 22639552]
- Norcross PL, Bailes LG, & Leerkes E. (2020). Effects of maternal depressive symptoms on sensitivity to infant distress and non-distress: Role of SES and race. *Infant Behavior and Development*, 61, 101498.
- Nunnally JC (1967). *Psychometric Theory*. McGraw-Hill.
- Okon-Singer H, Hendler T, Pessoa L, & Shackman AJ (2015). The neurobiology of emotion–cognition interactions: Fundamental questions and strategies for future research. *Frontiers in Human Neuroscience*, 9, 58. 10.3389/fnhum.2015.00058 [PubMed: 25774129]

- Parent MC (2013). Handling item-level missing data: Simpler is just as good. *The Counseling Psychologist*, 41(4), 568–600. doi: 10.1177/0011000012445176
- Parsons CE, Stark EA, Young KS, Stein A, & Kringelbach ML (2013). Understanding the human parental brain: A critical role of the orbitofrontal cortex. *Social Neuroscience*, 8(6), 525–543. [PubMed: 24171901]
- Perry NB, Leerkes EM, Dunbar AS, & Cavanaugh AM (2017). Gender and ethnic differences in young adults' emotional reactions to parental punitive and minimizing emotion socialization practices. *Emerging Adulthood*, 5(2), 83–92. 10.1177/2167696816653856
- Pesonen A, Rääkkönen K, Strandberg T, Kelitikangas-Järvinen L, & Järvenpää A. (2004). Insecure adult attachment style and depressive symptoms: Implications for parental perceptions of infant temperament. *Infant Mental Health Journal*, 25, 99–116. 10.1002/imhj.10092
- Priel B, & Besser A. (2000). Adult attachment styles, early relationships, antenatal attachment, and perceptions of infant temperament: A study of first-time mothers. *Personal Relationships*, 7, 291–310. 10.1111/j.1475-6811.2000.tb00018.x
- River LM, Borelli JL, & Nelson-Coffey SK (2019). Tolerance of infant distress among working parents: Examining the roles of attachment anxiety and work–family conflict. *Parenting*, 19(1–2), 137–159. 10.1080/15295192.2019.1556023
- Roisman GI, Holland A, Fortuna K, Fraley RC, Clausell E, & Clarke A. (2007). The Adult Attachment Interview and self-reports of attachment style: An empirical rapprochement. *Journal of Personality and Social Psychology*, 92(4), 678–697. 10.1037/0022-3514.92.4.678 [PubMed: 17469952]
- Satorra A, & Saris WE (1985). The power of the likelihood ratio test in covariance structure analysis. *Psychometrika*, 50, 83–90.
- Schafer JL, & Graham JW (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7, 147–177. 10.1037/1082-989X.7.2.147 [PubMed: 12090408]
- Shaver PR, & Mikulincer M. (2007). Adult attachment strategies and the regulation of emotion. In Gross JJ (Ed.), *Handbook of emotion regulation* (pp. 446–465). Guilford.
- Shaver PR, Mikulincer M, Gross JT, Stern JA, & Cassidy J. (2016). A lifespan perspective on attachment and care for others: Empathy, altruism, and prosocial behavior. In Cassidy J. & Shaver PR (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (3rd ed., pp. 878–916). Guilford.
- Sichko S, Borelli JL, Smiley PA, Goldstein A, & Rasmussen HF (2018). Child and maternal attachment predict school-aged children's psychobiological convergence. *Developmental Psychobiology*, 60, 913–926. 10.1002/dev.21748 [PubMed: 29936710]
- Spinrad TL, Eisenberg N, Gaertner B, Popp T, Smith CL, Kupfer A, Greving K, Liew J, & Hofer C. (2007). Relations of maternal socialization and toddlers' effortful control to children's adjustment and social competence. *Developmental Psychology*, 43(5), 1170–1186. 10.1037/0012-1649.43.5.1170 [PubMed: 17723043]
- Stern JA, Borelli JL, & Smiley PA (2015). Assessing parental empathy: A role for empathy in child attachment. *Attachment & Human Development*, 17(1), 1–22. 10.1080/14616734.2014.969749 [PubMed: 25373381]
- Stern JA, Barbarin OA, & Cassidy J. (2021). Working toward anti-racist perspectives in attachment theory, research, and practice. *Attachment & Human Development*. 10.1080/14616734.2021.1976933
- Stern JA, Jones JD, Nortey B, Lejuez CW, & Cassidy J. (2021). Pathways linking attachment and depressive symptoms for Black and White adolescents: Do race and neighborhood racism matter? *Attachment & Human Development*.
- Stride CB, Gardner S, Catley N, & Thomas F. (2015). Mplus code for mediation, moderation, and moderated mediation models.
- Trommsdorff G, Cole PM, & Heikamp T. (2012). Cultural variations in mothers' intuitive theories: A preliminary report on interviewing mothers from five nations about their socialization of children's emotions. *Global Studies of Childhood*, 2(2), 158–169. 10.2304/gsch.2012.2.2.158
- van IJzendoorn MH, & Bakermans-Kranenburg MJ (2010). Invariance of adult attachment across gender, age, culture, and socioeconomic status? *Journal of Social and Personal Relationships*, 27(2), 200–208. 10.1177/0265407509360908

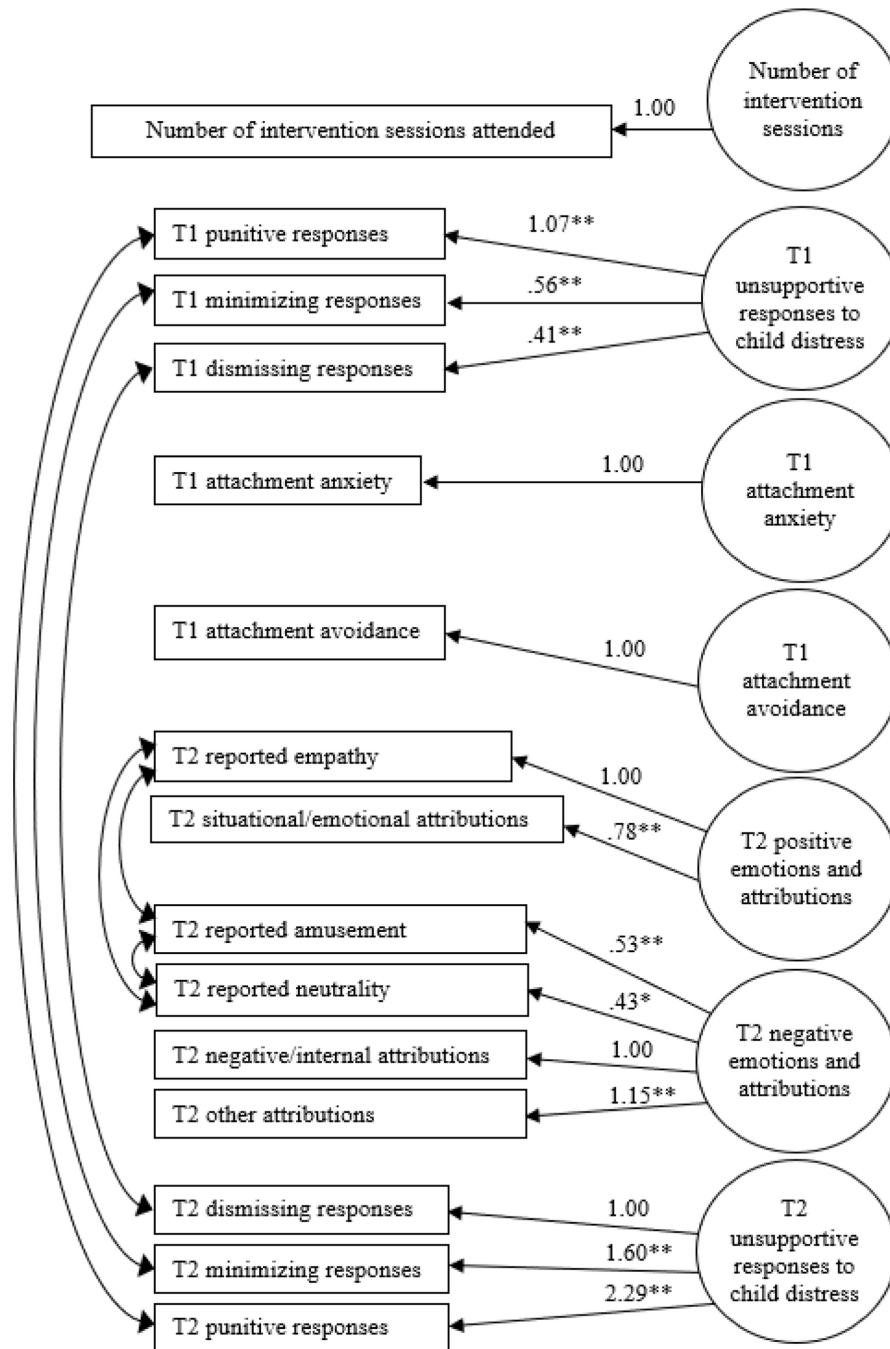
- Verhage ML, Schuengel C, Madigan S, Fearon RM, Oosterman M, Cassibba R, Bakermans-Kranenburg M. & van IJzendoorn MH (2016). Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment. *Psychological Bulletin*, 142(4), 337–366. 10.1037/bul0000038 [PubMed: 26653864]
- Wei M, Russell DW, Mallinckrodt B, & Vogel DL (2007). The Experiences in Close Relationship Scale (ECR)-short form: Reliability, validity, and factor structure. *Journal of Personality Assessment*, 88, 187–204. 10.1080/00223890701268041 [PubMed: 17437384]
- Wolf EJ, Harrington KM, Clark SL, & Miller MW (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 73(6), 913–934.
- Zeifman DM (2001). An ethological analysis of human infant crying: Answering Tinbergen's four questions. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology*, 39(4), 265–285. 10.1002/dev.1005





**Figure 1. Hypothesized Structural Models**

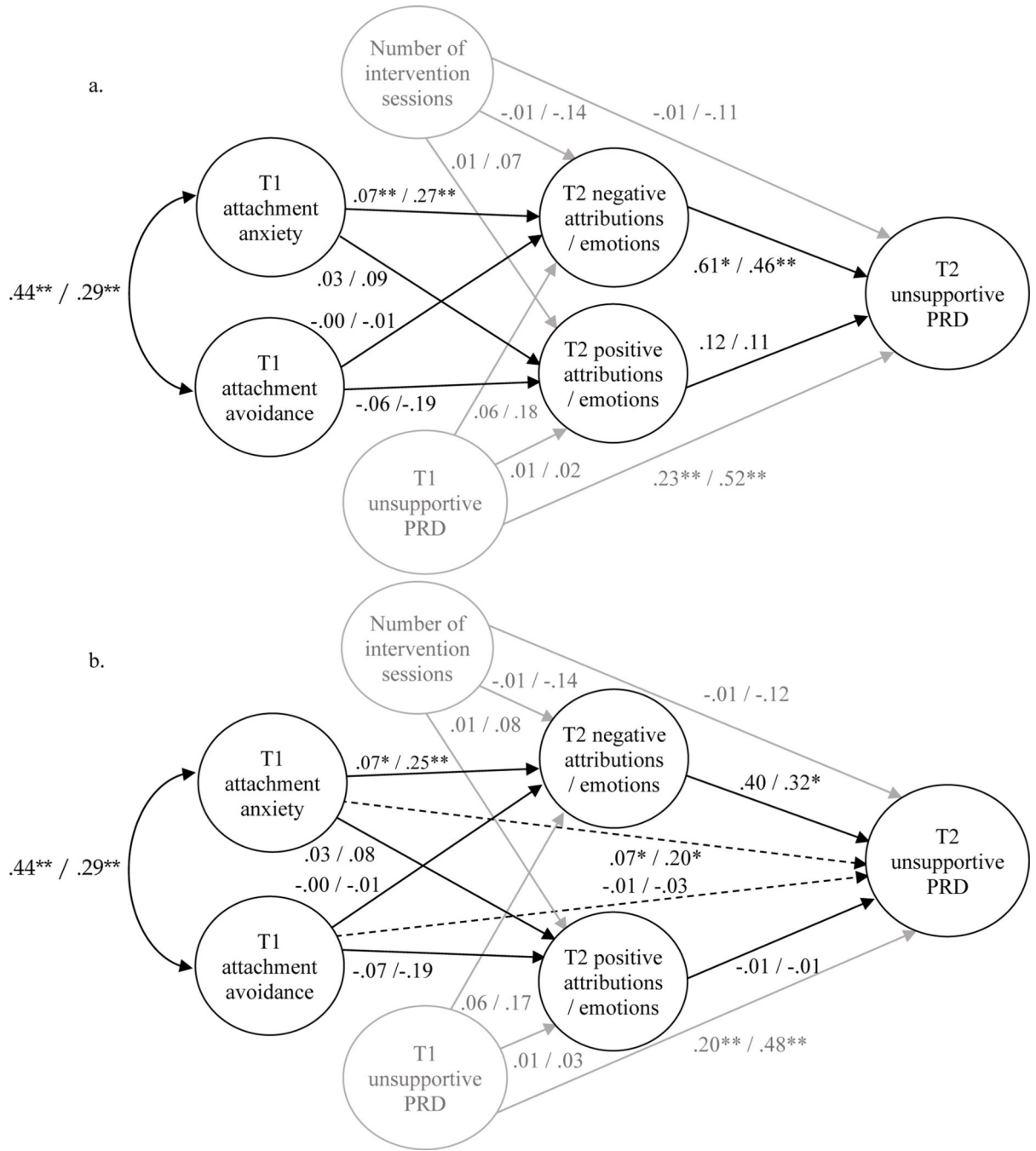
*Note.* The dotted lines represent direct paths between mothers' attachment style and parenting behavior and are only present in Structural Model 2. Proposed covariates and their pathways are depicted in grey, with no associated hypotheses.



**Figure 2. Factor Loadings of the Final Measurement Model**

*Note.* Factor loadings of 1.00 indicate reference variables for the latent factor. T1 unresponsive responses to child distress lacks a reference variable because variance was set to 1.

\* $p < .05$ . \*\* $p < .01$ .



**Figure 3. Structural Model 1 (a) and Structural Model 2 (b) with Unstandardized / Standardized Path Coefficients**

*Note.* Dotted lines represent direct paths between mothers' attachment style and parenting behavior. Disturbances of the positive and negative attributions/emotions factors statistically significantly covaried ( $-.07^{**} / -.59^{**}$  for Model 1 and  $-.07^{**} / -.56^{**}$  for Model 2; not shown for clarity). Covariates are depicted in grey. Structural Model 1 (a) was retained. T1 = Time 1; T2 = Time 2; PRD = Parental response to child distress.  $*p < .05$ .  $**p < .01$ .

**Table 1**

## Demographic and Baseline Information of Participants with and without T2 Data

Demographic or baseline variable	Attended outcome assessment ( <i>n</i> = 141)		Did not attend outcome assessment ( <i>n</i> = 23)	
	<i>n</i> (%)	<i>M</i> ( <i>SD</i> )	<i>n</i> (%)	<i>M</i> ( <i>SD</i> )
Age (years)		29.37 (6.21)		31.39 (6.96)
Education				
Some HS	23 (17)		8 (32)	
HS graduate	65 (48)		10 (40)	
Some college	43 (32)		6 (24)	
College graduate	5 (4)		1 (4)	
Race				
African American	106 (79)		18 (82)	
Other	28 (21)		4 (18)	
American Indian or Alaska Native	3 (2)		0 (0)	
Asian or Asian American	0 (0)		1 (5)	
Hispanic or Latino	2 (1)		0 (0)	
Non-Hispanic White	17 (13)		3 (14)	
Other	6 (4)		0 (0)	
Marital status				
Single	116 (84)		21 (84)	
Married	22 (16)		4 (16)	
T1 attachment style				
Anxiety		3.16 (1.27)		3.15 (1.31)
Avoidance		3.23 (1.18)		3.57 (1.29)
T1 unsupportive PRD				
Punitive		3.56 (1.15)		3.68 (.94)
Minimizing		4.02 (1.05)		4.10 (.97)
Personal distress		2.90 (1.06)		3.21 (1.14)
Child characteristics				
Age (months at T1)		44.91 (7.08)		43.17 (7.49)
Sex (girl)	82 (58)		14 (70)	

*Note.* HS = High school; T1 = Time 1; T2 = Time 2; PRD = Parental response to child distress. Missing data: Mother's age, *n* = 0; Education, *n* = 3; Race, *n* = 8; Marital status, *n* = 1; T1 attachment style, *n* = 1; T1 unsupportive PRD, *n* = 2; Child's age, *n* = 0; Child's sex, *n* = 3.

**Table 2**

Means, Standard Deviations, and Correlations among Study Variables

Study variable	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 attachment avoidance	3.28 (1.20)	--														
2. T1 attachment anxiety	3.16 (1.27)	.29**	--													
3. Empathy responses	2.69 (.69)	-.15	.08	--												
4. Neutral responses	1.80 (.58)	.06	.11	-.19*	--											
5. Amusement responses	1.30 (.41)	.10	.20*	-.18*	.46**	--										
6. SE attributions	3.36 (.47)	-.09	-.03	.41**	-.24**	-.41**	--									
7. NI attributions	1.45 (.39)	.11	.27**	-.21*	.17*	.38**	-.35**	--								
8. Other attributions	1.89 (.57)	.12	.16	-.16	.22**	.20*	-.17*	.62**	--							
9. T2 punitive PRD	3.30 (1.18)	.23**	.40**	-.11	.18*	.24**	-.05	.33**	.35**	--						
10. T2 minimizing PRD	3.89 (1.13)	.09	.17*	-.22**	.15	.26**	-.15	.28**	.34**	.53**	--					
11. T2 PD PRD	3.09 (1.01)	.11	.24**	-.00	.05	.13	.11	.23**	.16	.29**	.21*	--				
12. T1 punitive PRD	3.57 (1.12)	.20*	.29**	.01	.14	.17	.02	.16	.24**	.63**	.35**	.21*	--			
13. T1 minimizing PRD	4.04 (1.04)	.07	.15	-.11	.08	.10	-.02	.15	.20*	.30**	.61**	.12	.49**	--		
14. T1 PD PRD	2.94 (1.07)	.25**	.24**	.01	.03	.19*	.01	.06	-.08	.10	.08	.60**	.33**	.18*	--	
15. Number of intervention sessions attended	3.40 (4.13)	-.19*	-.05	.12	.01	-.03	.04	-.16	-.09	-.16	-.17*	-.06	-.03	-.02	-.09	--

Note. SE = Situational/emotional; SI = Negative/internal; PRD = Parental response to child distress; PD = Personal distress.

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 3**

Fit Indices and Variance Explained for all Models

Model comparison	SRMR	CFI	TLI	RMSEA [90% CI]	$\chi^2$ (df, <i>p</i> )
Initial measurement model	.06	.91	.86	.07 [.05, .09]	119.82 (69, .000)
Final measurement model	.06	.95	.92	.05 [.03, .07]	95.71 (66, .010)
$\chi^2$ difference test					$\chi^2$ (3) = 24.11, <i>p</i> < .001
Structural model 1	.06	.94	.91	.05 [.03, .08]	100.69 (68, .006)
Structural model 2	.06	.95	.92	.05 [.03, .07]	95.71 (66, .010)
$\chi^2$ difference test					$\chi^2$ (2) = 4.98, <i>p</i> > .05

Note. CFI = Comparative Fit Index; TLI = Tucker Lewis index; RMSEA = Root Mean-Square Error of Approximation; CI = Confidence Interval.