

## **Attachment linked predictors of women's emotional and cognitive responses to infant distress**

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### **Abstract**

The purpose of this study was to examine associations among women's emotional and cognitive responses to infant fear and anger and to identify attachment linked predictors of these responses. Four hundred and forty Caucasian and African American undergraduate college women viewed video clips of two crying infants, one displaying anger and the other displaying fear. They identified what the infants were feeling, made causal attributions about the cause of crying, rated their own emotional reactions to the crying infants, and reported on the extent to which their parents met their emotional needs in childhood and their current adult attachment patterns. Emotional and cognitive responses to infant fear and anger were interrelated. Consistent with prediction, a history of parental emotional rejection and adult attachment anxiety and avoidance correlated negatively with accurate identification of emotions and positively with negative attributions, amusement, and neutral responses to infant distress. Adult attachment security moderated the effects of early parental rejection on emotional and cognitive responses to infant distress, and these results varied based on race and parent gender. Results are discussed from an attachment theory perspective.

**Keywords:** *Adult attachment, infant crying, attributions, emotional response*

### **Introduction**

Consistent with social information processing models of social interaction (Crick & Dodge, 1994; Lemerise & Arsenio, 2000), there is growing evidence that social cognition and emotion processes such as appraisals, emotional reactions, and attributions predict the quality of parent–child interaction (see Dix, 1991, for a review). Most of this research has centered on how adults think, feel, and behave in response to child misbehavior, and relatively little is known about adults' emotional and cognitive responses to infant distress, nor about the personal characteristics that predict these responses to infant distress. Given considerable evidence that sensitive responding to negative emotions in infancy and childhood is associated with positive outcomes such as attachment security, emotion regulation/coping skills, autonomy, social competence, and positive adjustment in childhood and adulthood (Ainsworth, Blehar, Waters, & Wall, 1978; Berlin & Cassidy, 2003; Braungart-Rieker, Garwood, Powers, & Notaro, 1998; Goldberg, MacKay-Soroka, & Rochester, 1994; Magai, Consedine, Gillespie, O'Neal, & Vilker, 2004; Montague, Magai, Consedine, & Gillespie, 2003; van den Boom, 1994, 1995), this is a significant gap in our literature. Thus, the goal of this paper is twofold: (1) to examine how adults think and feel in

response to infant fear and anger, two core emotion systems in infancy (Buss & Goldsmith, 1998); and (2) to identify developmental predictors of these emotional and cognitive responses to infant distress drawing from core attachment theory predictions.

*Emotional and cognitive responses to infant distress*

Decades ago, Ainsworth, Blehar, Waters, and Wall (1978) suggested that, to respond sensitively, mothers must notice and interpret infant cues, see their infant's point of view, and respond considerately in a manner that does not distort their infant's needs based on their own. Since then, Dix (1991) theorized that negative appraisals of child behavior relate to negative parental emotions, which increase the self-focus of parenting goals, thereby interfering with parents' ability to respond sensitively to children's needs. Together, these views implicate accurate emotion identification, emotional responses, and attributions about child behavior as important affective and cognitive processes that contribute to sensitive parenting. These responses are defined below, and the process by which they influence sensitivity to infant distress is elaborated.

*Accurate identification of emotion* refers to an adult's ability to perceive distress and to identify the underlying emotion. Women who inaccurately identify negative emotions (e.g., confuse fear with anger) may engage in behaviors that are poorly matched to the infant's state. Consistent with this view, abusive mothers make more mistakes identifying specific emotions (Kropp & Haynes, 1987), and mothers at high risk for child abuse tend to rate infant emotions as both extremely more positive and extremely more negative than comparison mothers, suggesting a perceptual bias (Butterfield, 1993). In contrast, mothers who were trained to identify their infants' emotion signals accurately were more sensitive than control group mothers (van den Boom, 1994; Wendland-Carro, Piccini, & Millar, 1999).

Mothers' emotional reactions to infant distress range from empathy to anxiety or anger, and specific emotional states motivate different types of response (Dix, 1991). Empathic or child-oriented emotional reactions increase the likelihood that an adult will intervene on a child's behalf and do so sensitively because she genuinely understands the infant's point of view (Dix, Gershoff, Meunier, & Miller, 2004; Feshbach, 1987; Koren-Karie, Oppenheim, Dolev, Sher, & Etzion-Carasso, 2002). Negative emotional reactions, such as anger, embarrassment, or anxiety, promote self-focused parent behaviors (e.g., withdrawal, intrusiveness, hostility) that motivate adults to avoid or end the display of negative infant affect because it is aversive to them (Cassidy, 1994; Coplan, Hastings, Lagace-Seguin, & Moulton, 2002; Dix, Ruble, Grusec, & Nixon, 1986; Dix et al., 2004). This self-focus undermines parents' ability to behave in a developmentally appropriate manner.

*Causal attributions* about the nature of infant distress may also influence sensitivity. For example, an adult who thinks crying indicates that an infant is spoiled and trying to bother her (a negative, global, internal attribution) may respond harshly or may ignore distress because she does not believe it signals a need. In contrast, an adult with positive or realistic attributions (e.g., believes infant is crying to signal a need) is likely to intervene sensitively on an infant's behalf. Previous research indicates that adults' negative attributions about child misbehavior are associated with parental hostility, punitiveness, power assertion, and a greater focus on parent-centered relative to child-centered goals (Baden & Howe, 1992; Bugental, Blue, & Cruzcosa, 1989; Daggett, O'Brien, Zanolli, & Peyton, 2000; Dix & Reinhold, 1991; Dix, Ruble, & Zambarano, 1989; Hastings & Grusec, 1998).

In sum, a variety of evidence indicates that accurate emotion identification, emotional reactions, and causal attributions are related to parenting quality. Dix (1991) has argued that the motivational aspects of emotion influence cognitive and behavioral responses to social

partners' behaviors. For example, anger or anxiety likely activates self-oriented concerns which may contribute to negative appraisals and attributions about social partners such as thinking an infant is crying in a manipulative manner. Therefore, an important contribution of this study is the examination of associations among adults' emotional and cognitive responses to both infant fear and anger, and to determine if adults tend to respond consistently or differentially to infants' cues from these two distinct emotional systems. Next, the developmental origins of these emotional and cognitive responses to infant distress are discussed.

#### *Predictors of emotional and cognitive responses to distress*

*Childhood emotional rejection.* The manner in which adults' emotional needs were met by their parents in childhood likely influences how they respond to infant distress through attachment-related schema. According to Bowlby (1973), children develop internal working models that reflect their sense of self in relation to the world in the context of early interactions with primary caregivers. Children whose parents are emotionally available and supportive develop models of themselves as competent and loveable and models of others as loving and trustworthy. In contrast, children whose caregivers are inconsistent, rejecting, or excessively demanding develop models of themselves as incompetent and unlovable and models of others as uncaring and untrustworthy. Bowlby (1988) argued that these internal working models include general rules about regulatory processes that bias how individuals appraise themselves and others. Thus, a history of childhood emotional rejection likely contributes to adults' emotional and cognitive responses to infant distress. Several studies support this view.

Mothers who reported that their parents minimized their emotions in childhood (e.g., told them not to cry, told them to get over it when they were upset) were likely to mistake infant distress for positive emotions (Leerkes & Crockenberg, 2002). Further, victims of child abuse or neglect are less accurate than others at labeling other peoples' emotions (see Camras, Sachs-Alter, & Ribordy, 1996), a difficulty that may continue into adulthood. Childhood history with parents influences subsequent emotional reactions to others' distress also. Positive early interactions with parents are associated with higher empathy and sympathy in childhood and adulthood (Eisenberg, Fabes, Schaller, & Carlo, 1991; Eisenberg & McNally, 1993; Koestner, Franz, & Weinberger, 1990), whereas a history of child abuse or emotional rejection is associated with lower empathy and more negative emotional reactions (Feshbach, 1987; Leerkes & Crockenberg, in press; Letourneau, 1981). Finally, adults raised in punitive and controlling environments experience more hostility and negative attitudes/attribution toward their children (Daggett et al., 2000; Lesnick-Oberstein, Koers, & Cohen, 1995).

*Adult attachment.* In addition to childhood experiences, adult attachment patterns that reflect current state of mind with respect to attachment experiences (Main & Goldwyn, 1984) may also predict adult's emotional and cognitive responses to infant distress. Although childhood experiences with parents are related to adult romantic attachment, the association tends to be mild to moderate in strength (c.f., Montague et al., 2003) because changes in the quality of the parent-child relationship, how one makes sense of that relationship, and experiences in other intimate relationships subsequently influence how adults view themselves and the world (Bowlby, 1980; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000; Weinfeld, Sroufe, & Egeland, 2000). Thus, adult attachment and childhood history are distinct constructs.

Two traditions have arisen to measure adult attachment. The Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) focuses on childhood and current relationships with parents and how that has affected development. The interviews are not coded based on actual experiences but, rather, on the coherence with which the adult discusses, evaluates, and is

affected by these early experiences thus yielding four classifications: autonomous/secure, dismissing, preoccupied, and unresolved/ disorganized. In contrast, self-report measures of adult attachment include items that address how adults feel and think about close intimate relationships, in particular the ease with which they get close to others and their expectation that partners will return their feelings (Griffin & Bartholomew, 1994; Hazan & Shaver, 1987). In this tradition, researchers have argued that adult attachment is best viewed along two dimensions, attachment related-anxiety and attachment-related avoidance, and that these dimensional scores can be used to classify adults in categories similar to those that arise from the AAI (Brennan, Clark, & Shaver, 1998). These two dimensions reflect different underlying regulatory styles: anxiety reflects hyperactivation/ maximization of emotion and avoidance reflects deactivation/minimization of emotion (Cassidy, 1994; Cassidy & Kobak, 1988). Adults who are low on both dimensions have a secure attachment pattern which reflects an openness to both negative and positive emotions and the ability to behave appropriately in response to each (Mikulincer & Orbach, 1995). As reviewed below, both measurement traditions yield results that support the view that adult attachment is associated with how adults respond to emotions.

Mothers with autonomous AAI classifications were more accurate in labeling infant emotions than dismissing or preoccupied mothers (Blokland & Goldberg, 1998), and preoccupied mothers rated a distressed toddler as spoiled/mean and perceived higher levels of negative emotion than autonomous mothers (Adam, Tanaka, Broderson, & Gunnar, 1998). Likewise, autonomous mothers were more aware of and responsive to their toddlers' fear and sadness than were dismissing mothers and were more aware of and responsive to their toddlers' anger and sadness than were unresolved mothers (DeOliveira, Moran, & Pederson, 2005). AAI classifications are related to general emotional styles also such that preoccupied adults experience more extreme positive and negative affect, dismissive adults experience less positive affect, and autonomous adults experience a moderate range of both positive and negative affect (Adam, Gunnar, & Tanaka, 2004). Results based on questionnaire measures of adult attachment indicate that individuals who are anxious tend to view others positively and themselves negatively, tend to focus on distress, and feel angry in response to ambiguous situations, whereas individuals who are avoidant tend to view others negatively and themselves positively and distance themselves from distress, particularly fear and anxiety, by avoiding it or downplaying it (Bartholomew & Horowitz, 1991; Consedine & Magai, 2003; Mikulincer, 1998; Mikulincer & Florian, 2001). Thus, the defensive biases and regulatory styles characteristic of various adult attachment patterns likely influence how adults respond to infant distress. Specifically, avoidant adults may downplay infant distress thereby mistaking infant emotions for physical states or even positive emotions, have a stronger attribution bias since they tend to have a negative view of others, and experience limited emotional reactions in response to infant distress. In contrast, anxious adults should tune in more to infant distress, making it likely that they will be accurate or perhaps over-rate distress in an effort to maximize emotions, and their attributions will be less hostile, but they may experience more anxiety and anger in response to infant distress given their emotional dispositions.

*Moderating effects.* Childhood experiences with one's own parents and current state of mind with respect to attachment may affect adults' responses to infant distress jointly. Previous research indicates that adults with problematic histories with their parents who come to terms with these early difficulties through the support of a loving partner or by virtue of their own positive personality characteristics are likely to recover personally and parent effectively (Egeland, Jacobvitz, & Sroufe, 1988; Leon, Jacobvitz, & Hazen, 2004; Ricks, 1985; Rutter, Quinton, & Liddle, 1983), consistent with Bowlby's (1980) view that internal working

models change over time in response to new relationships and experiences. When this change is positive, from insecure to secure, respondents are labeled as “earned secure.” Importantly, earned secure adults are as sensitive and responsive to children as continuously secure adults, and both groups are more sensitive than currently insecure adults (Pearson, Cohn, Cowan, & Cowan, 1994; Phelps, Belsky, & Crnic, 1998), and a similar pattern emerged in relation to marital functioning (Paley, Cox, Burchinal, & Payne, 1999). Based on these data, we hypothesize that adult attachment security buffers adults from the negative effects of childhood emotional rejection on their emotional and cognitive responses to infant distress. Consistent with this view, mothers whose parents were emotionally rejecting in childhood were accurate at identifying infant distress if they were in high quality marital relationships (Leerkes & Crockenberg, in press).

Race may serve a moderating role also. Significant racial differences have been identified in: (1) parenting beliefs, goals, and behaviors; (2) emotion beliefs, expression, and regulation; (3) adult attachment; and (4) how each of former relate to theoretically relevant outcomes (c.f., Deater-Deckard, Dodge, Bates, & Pettit, 1996; Griffin & Bartholomew, 1994; Mickelson, Kessler, & Shaver, 1997; Montague et al., 2003). For example, African Americans report more punitive parental responses to their distress in childhood than European Americans, and the association between punitive socialization of emotion and adult attachment security varied by race such that it was associated with avoidance for African Americans and anxiety for European Americans (Montague et al., 2003). Thus, an important contribution of this study is the ability to examine whether responses to infant distress and their relation to the proposed predictors are similar or different for Caucasians and African Americans.

In sum, it was hypothesized that: (1) adults' attributions, accurate identification of emotions, and emotional reactions to infant fear and anger will be interrelated; (2) a history of parental emotional rejection and attachment related avoidance and anxiety will correlate with accuracy, attributions, and emotional reactions; and (3) adult attachment security will moderate the associations between childhood history and responses to infant distress. Specifically, a history of emotional rejection will be associated with negative responses to infant distress only when adult attachment security is low. Finally, we examine the possibility that the above associations vary by race.

## Method

### *Sample*

Data were collected from 547 undergraduate students. Data from male students were excluded because there were so few ( $n=52$ ), as were data from 40 women who were members of minority groups that were under-represented in the sample (11 Multiracial, 10 Asian American, 9 Hispanic, 3 Native American, and 7 other). Fifteen females had substantial missing data and were excluded from further analysis. The final sample for data analysis included 440 female undergraduates, 113 African American, and 327 Caucasian, who ranged in age from 18 to 53 years ( $M=21.11$ ). Thirty-three women (8%) had children.<sup>1</sup> The majority (84%) described their families' financial situation as stable, ranging from comfortable to wealthy.

### *Procedures*

A graduate research assistant entered several undergraduate classes, explained the study, and sought oral consent after the instructor left the room. Students uninterested in

participating left the room; those that participated were eligible for a lottery yielding a \$100 gift certificate to a local shopping mall. Students viewed two 1 minute long video clips of different infants crying loudly during procedures conducted to measure infant temperament adapted from Lab Tab (Goldsmith & Rothbart, 1996). Both infants were Caucasian and dressed in gender-neutral clothes. One infant displayed fear while a noisy toy bounced unpredictably in front of the infant. The other infant displayed frustration during an arm restraint procedure. These clips were selected because the infants' expressed emotions were consistent with the fear and anger facial configurations identified by Izard (1983). That the majority of mothers in a previous study indicated these infants were expressing fear and anger (90% and 93%, respectively) supports this view (Leerkes, Crockenberg, & Burrous, 2004). The order of presentation of the fear and anger clip was counterbalanced between classes, and the reported gender of the infants was counterbalanced by altering the wording on the questionnaires. Following each clip, the respondents filled out questionnaires in which they identified all of the emotions they thought the infant was feeling and the one emotion they thought was strongest, rated how strongly they felt 17 emotions while watching, and rated how much they agreed with 18 attributions of the cause of the infant's crying. Then, they completed questionnaire measures of childhood experiences with their own parents, attachment in current close relationships, and demographics.

### Measures

*Demographics.* Respondents indicated their age, race, and gender on a brief demographic questionnaire. For data analysis, race was dichotomized (Caucasian = 1, African American = 2). Respondents rated how much experience they had caring for or interacting with infants on a 4-point scale ranging from none to a lot. Then, they reported the types of previous experience interacting with children by checking off whether or not they had children, cared for younger siblings, played with neighborhood children, babysat, volunteered or had a job involving children, or other. The number of experiences they checked were summed to yield a measure of variety of experience with children. Amount and variety of experience correlated,  $r(478) = .31$ ;  $p < .001$ , and were averaged to yield a measure of previous experience with infants/children.

*Attributions.* Respondents rated the extent to which they agreed with 18 attribution statements about why the infant from each clip was crying on a 4-point scale ranging from strongly disagree to strongly agree. These items were factor analysed separately for responses to the fear and anger clip using principal components analysis with varimax rotation. Each factor analysis yielded four factors: *temporary/physical attributions* includes five items (having a bad day, in a bad mood, tired, hungry, not feeling well;  $\alpha = .86$  anger and  $.87$  fear), *negative/internal attributions* includes six items (spoiled, difficult temperament, trying to make mother's life difficult, unreasonable, selfish, just wanted attention;  $\alpha = .77$  anger and  $.73$  fear), and *situation/emotion attributions* includes three items (upset by the situation, no one was helping the baby, trying to show he/she needs help;  $\alpha = .66$  anger and  $.71$  fear). The final factor consisted of four items that lacked conceptual clarity (had no way to feel better, that's what babies do, crying on purpose<sup>2</sup>, couldn't help it), had poor internal reliability ( $\alpha < .45$  for anger and fear) and was considered no further.

*Accuracy.* The accuracy of respondents' identification of specific emotions was rated based on two questions. First, respondents were asked to circle all emotions they thought the infant in

the video was feeling. Then, they were asked to write down the one emotion they thought was most dominant or strongest in the video clip. Fear, anxiety, wariness, and nervousness were considered accurate fear words; anger, frustration, irritation, annoyance, and disgust were considered accurate anger words. For each clip, respondents received a score of 1 if they named the correct emotion in the entire group of emotions they circled for the first question, a score of 2 if they also identified it as the dominant emotion, and a score of 0 if they did neither. In addition, the types of errors respondents made when they listed the dominant emotion were coded into three categories: *nonemotion words* (e.g., tired, hungry, bored), *positive emotions* (e.g., pleased, interested), and *other negative* (e.g., listing sad or afraid for the anger clip, listing sad or frustrated for the fear clip). Each was coded dichotomously such that a 1 indicates the respondent made that type of error, and a 0 indicates they did not. The majority of respondents answered both accuracy questions correctly (earning a score of 2), therefore very few people made each type of dominant error (see Table I).

*Emotional reactions.* Respondents rated how strongly they felt 17 emotions in response to the baby in each clip on a 4-point scale ranging from not at all to very strongly. These items were

Table I. Descriptive statistics and correlations with covariates.

Variable	Mean	SD	Range	Age	Race. <sup>1</sup>	Exp. <sup>2</sup>	Order <sup>3</sup>	Gender <sup>4</sup>
<u>Respondent Characteristics</u>								
Mother emotionally rejecting	0.00	.90	-1.11-3.60	.27**	.09*	.09 <sup>t</sup>	-	-
Father emotionally rejecting	0.00	.89	-1.23-2.88	.23**	.03	.02	-	-
Anxiety	2.45	.85	1.00-5.00	.02	-.06	-.05	-	-
Avoidance	2.69	.68	1.00-4.75	.20**	.18**	.00	-	-
<u>Anger Clip Responses</u>								
Temporary/physical attributions	1.82	.69	1.00-4.00	-.08 <sup>t</sup>	-.04	-.10*	-.13*	.05
Negative/internal attributions	1.39	.42	1.00-2.83	-.07	.11*	-.09 <sup>t</sup>	.01	-.02
Situation/emotion attributions	3.51	.51	1.00-4.00	.03	.01	.19**	.10*	.14**
Accuracy	1.77	.47	0.00-2.00	.04	-.01	.08 <sup>t</sup>	-.02	.10*
Dom. error other negative <sup>5</sup>	15%			-.01	-.02	-.02	.03	-.03
Dom. error non emotion word <sup>5</sup>	6%			-.03	.03	-.11*	.00	-.05
Empathy	2.19	1.14	1.00-4.00	.19**	-.08 <sup>t</sup>	.08 <sup>t</sup>	-.07	.02
Amusement	1.10	.28	1.00-4.00	-.04	.04	-.04	-.07	.00
Neutral	1.46	.81	1.00-4.00	.02	.07	.05	-.08	-.12*
<u>Fear Clip Responses</u>								
Temporary/physical attributions	1.69	.62	1.00-4.00	.01	-.09 <sup>t</sup>	-.01	.14**	.03
Negative/internal attributions	1.43	.41	1.00-3.00	-.06	-.02	-.06	.02	.06
Situation/emotion attributions	3.37	.58	1.00-4.00	.07	-.04	.10*	.16**	.03
Accuracy	1.65	.61	0.00-2.00	.00	-.01	.04	-.12*	.10*
Dom. error other negative <sup>5</sup>	22%			.04	.03	-.03	.17**	-.07
Dom. error non emotion word <sup>5</sup>	4%			-.06	-.03	.05	-.06	-.10*
Dom. error positive emotion <sup>5</sup>	4%			-.06	.01	-.11*	-.03	.00
Empathy	2.08	1.05	1.00-4.00	.21**	-.06	.07	.01	-.07
Amusement	1.43	.50	1.00-3.67	.02	-.04	-.04	-.20**	-.06
Neutral	1.70	.94	1.00-4.00	.02	-.01	.06	.07	-.08 <sup>t</sup>

<sup>1</sup>1 = Caucasian; 2 = African American.

<sup>2</sup>Exp. = experience with infants and children.

<sup>3</sup>1 = anger clip first; 2 = fear clip first.

<sup>4</sup>1 = male; 2 = female.

<sup>5</sup>Percent of sample that made this error when asked to name the dominant emotion.

Note: <sup>t</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ .

factor analysed separately for responses to the fear and anger clip using principal components analysis with varimax rotation. Each factor analysis yielded four factors. *Empathy* consists of three items (sympathetic, empathetic, concerned;  $\alpha = .82$  for anger and  $.78$  for fear). *Irritation* consists of five items (irritated, angry, frustrated, annoyed, disgusted;  $\alpha = .86$  for anger and  $.90$  for fear). *Anxiety* consists of three items (worried, nervous, anxious;  $\alpha = .74$  for anger and  $.78$  for fear). *Amused* consists of two items (happy, amused;  $\alpha = .52$  for anger and  $.63$  for fear). Sad, pleased, and interested did not load on any factor. The single item *neutral* was retained as a measure to reflect the lack of an emotional response to the clips.

In a related study using an interview methodology to assess responses to the same video clips, respondents used anxiety and irritation emotion words to reflect extremely different underlying emotions when given opportunities to explain themselves (Leerkes et al., 2004). For example, some respondents explained they felt irritated at the baby's cry, whereas others felt irritated that the baby was placed in the situation, and some felt nervous in response to the sound of the cry, whereas others felt nervous for the baby. In both examples, the first explanation is consistent with the intended nature of the emotion, whereas the latter are more consistent with empathic or protective emotional responses. Similarly, Dix et al. (2004) reported that parent-oriented anger (i.e., irritated at the child) correlated positively with insensitive behavior whereas child oriented anger (i.e., irritated on the child's behalf) did not, indicating that the concerns underlying the same basic emotion alter its association with important outcomes. Thus, the meaning of anxiety and irritation likely vary in unknown ways among respondents introducing error, and the two variables were dropped from further consideration.

*Parental Bonding Instrument-Revised (PBI-R)*. The 12 item care subscale was administered to assess the acceptance and warmth received from parents during the first 16 years of life by having them rate on a 4-point scale how well each statement described their mothers and fathers (e.g., made me feel I wasn't wanted [reverse coded], appeared to understand what I needed or wanted; Parker, Tupling, & Brown, 1979). The care subscale has acceptable test-retest reliability over a 3-week period ( $.76$ ) and good split half reliability ( $.88$ ; Parker et al., 1979). Seventeen new items about how parents responded to emotions in childhood were added using the same response scale (e.g., comforted me, ignored me if upset, told me to get over it). The revised scale was factor analysed separately for responses about mothers and fathers using principal components analysis with varimax rotation. Each factor analysis yielded two factors and the appropriate items were averaged to create scores as follows. *Emotional responsiveness* consists of 23 items including all of the original care scale items and the new items that reflect parental empathy, comfort, and sensitivity in response to distress (e.g., helped me to calm down, felt badly when I cried;  $\alpha = .96$  for both mothers and fathers). *Emotion minimizing* consists of eight items reflecting parental punishment, teasing, and rejection in response to distress (e.g., told me to get over it, told me not to cry, picked on me when I was scared;  $\alpha = .81$  for mothers and  $.83$  for fathers). These variables correlated highly within parent ( $r = -.65$  and  $-.63$ ,  $p < .001$  for mothers and fathers, respectively) and were standardized and averaged with emotional responsiveness reverse scored to yield measures of mother and father emotional rejection in which high scores indicate that parents tended to be cold, rejecting, and negative in response to emotions.<sup>3</sup> Father data were missing for 33 women, 26 of whom were African Americans. Missing values were imputed based on maternal emotional rejection and race. Analyses were run both with these cases included and excluded and results did not vary. Thus, analyses based on the full sample with the imputed data are reported.

*Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994)*. This 30-item scale is intended to assess adult attachment. Respondents rate how much each statement describes their feelings about close relationships on a 5-point scale ranging from not at all like me to very much like me. These items were factor analysed using principal components analysis with varimax rotation yielding two factors, anxiety in close relationships and avoidance of close relationships. *Avoidance* consists of 12 items (e.g., difficult to depend on others, important for me to feel independent;  $\alpha = .83$ ) and *anxiety* consists of eight items (e.g., worry partners don't really love me, worry about being abandoned;  $\alpha = .84$ ). Consistent with the view that childhood experiences are related to but distinct from adult attachment, mother and father emotional rejection respectively correlated positively with anxiety,  $r(478) = .27$  and  $.23$ ,  $p < .01$ , and avoidance,  $r(478) = .33$  and  $.34$ ,  $p < .01$ , but accounted for little variation in each.

## Results

Descriptive statistics were calculated (see Table I), and distributions were examined for skew and kurtosis. None were problematic other than accuracy, which was negatively skewed. Results did not vary when accuracy was transformed (reflect and square root as recommended by Tabachnick & Fidell, 1996); therefore results with the non-transformed variable are presented. Then correlations between the variables of interest and potential covariates were examined (see Table I). In general, older and African American respondents reported more parental emotional neglect and avoidance, and previous experience with children correlated with attributions and dominant errors. Order of the clips correlated with attributions, and gender correlated with several responses to the clips such that respondents made more situation/emotion attributions, were more accurate, and less neutral if they believed the infant in the video was a girl. Thus, age, race, experience with children, order of video clips, and reported infant gender were controlled in subsequent analyses.

### Correlations

*Correlations among fear responses.* Intercorrelations among emotional and cognitive responses to infant distress were examined with the above identified covariates partialled to test hypotheses and to assist with further data reduction (see Table II). Respondents who made temporary/physical attributions and negative/internal attributions about the frightened infants were less accurate in identifying fear, tended to mistake it for other negative emotions, and were more likely to respond to infant fear with amusement. Negative/internal attributions correlated positively with temporary/physical attributions and neutral emotional responses. Consistent with the hypothesis, respondents who made situation/emotion attributions were more likely to identify fear accurately and empathize with the infant and were less likely to make each type of dominant error and report amusement. That accuracy correlated negatively with the types of dominant errors, and the types of dominant errors correlated negatively with one another, is an artifact of the coding (i.e., if someone scored high on accuracy then they did not make a dominant error, and if they made one type of error they could not have made any others). Consistent with the hypothesis, accuracy correlated positively with empathy and negatively with amusement. Respondents who mistook fear for a positive emotion were likely to report amusement. Finally, of the emotional reactions, amusement and neutral correlated positively.

Table II. Partial<sup>1</sup> correlations among emotional and cognitive responses to infant distress.

Variable	1	2	3	4	5	6	7	8	9	10
1. Temporary/physical attributions	<b>.64**</b>	.58**	.00	-.24**	.22**	.01	.03	-.05	.17**	.09 <sup>†</sup>
2. Negative/internal attributions	.57**	<b>.63**</b>	-.06	-.23**	.19**	.02	.05	-.08 <sup>†</sup>	.22**	.16**
3. Situation/emotion attributions	-.13**	-.23**	<b>.30**</b>	.29**	-.15**	-.18**	-.23**	.17**	-.21**	-.06
4. Accuracy	-.17**	-.06	.13**	<b>.03</b>	-.77**	-.29**	-.23**	.13*	-.18**	.03
5. Dom. error other negative	.04	-.02	.12*	-.74**	<b>.06</b>	-.10*	-.12*	-.08	.04	.03
6. Dom. error non emotion word	.22**	.12*	-.29**	-.50**	-.11*	<b>.07</b>	-.04	-.05	.03	-.02
7. Dom. error positive emotion	NA	NA	NA	NA	NA	NA	NA	-.04	.26**	-.03
8. Empathy	.00	-.07	.09 <sup>†</sup>	.00	.02	-.04	NA	<b>.78**</b>	.09 <sup>†</sup>	.06
9. Amusement	.03	.08	-.23**	-.09 <sup>†</sup>	-.06	.16**	NA	.06	<b>.45**</b>	.26**
10. Neutral	.13*	.25**	-.20**	-.06	-.09 <sup>†</sup>	.17**	NA	.09 <sup>†</sup>	.23**	<b>.45**</b>

<sup>1</sup>Age, race, experience with children, order of clips, and infant gender partialled.

Note: <sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ . Correlations among responses to the fear clip appear above the diagonal; correlations among responses to the anger clip appear below the diagonal; correlations between parallel fear and anger responses appear on the diagonal and are boldfaced.

*Correlations among anger responses.* Respondents who made temporary/physical attributions and negative/internal attributions about the angry infant tended not to make situation/emotion attributions and were more likely to mistake anger for a non-emotion and to report a neutral emotional response. Temporary/physical attributions correlated negatively with accuracy. Similar to the fear responses and consistent with the hypothesis, respondents who made situation/emotion attributions tended to accurately identify anger, made fewer non-emotion word errors, were more empathic, and were less likely to respond with amusement or neutrality. Further, if they made a mistake identifying infant anger, they were likely to use other negative emotion words. That accuracy correlated negatively with the types of dominant errors, which correlated negatively with one another, is an artifact of coding as explained above. Counter to expectation, anger accuracy was not significantly associated with emotional reactions. Mistaking anger for a non-emotion word correlated positively with neutral and amused emotional reactions. Finally, consistent with associations among fear responses, amusement and neutral correlated positively.

*Correlations between parallel fear and anger responses.* Associations between parallel fear and anger responses appear on the diagonal in Table II and are made bold. All of the parallel fear and anger responses correlated positively and significantly, except for accuracy and types of errors, suggesting that adults' attributions and emotional responses to fear and anger are similar, but their ability to identify specific types of negative affect vary by specific emotions.

*Predictors of emotional and cognitive responses to infant fear and anger.* Next, to test hypotheses about the predictors of emotional and cognitive responses to infant fear and anger, partial correlations, controlling for the above identified covariates, were calculated between mother and father emotional rejection, anxiety, and avoidance and the responses to clips. Results are illustrated in Table III. Consistent with the hypotheses, respondents with a history of maternal emotional rejection were more likely to make negative/internal attributions and feel amused and neutral in response to infant fear. Respondents with a history of father emotional rejection were less likely to make anger situation/emotion attributions and were more likely to respond to infant anger with amusement. In response to infant fear, respondents whose fathers were emotionally rejecting were more likely to apply temporary/physical or negative/internal attributions, were less accurate, tended to mistake fear for a positive emotion, and were more likely to respond with amusement. Anxiety in close relationships correlated positively with temporary/physical attributions of infant anger and fear and positively with mistaking fear for another negative emotion. Finally, respondents who were avoidant of close relationships were less likely to make situational/emotion attributions about infant anger and more likely to make negative/internal attributions about infant fear. Avoidant adults were also less accurate in identifying fear, tended to mistake it for another negative emotion or a positive emotion, and expressed amusement in response to infant fear.

### *Multiple regression*

To test the hypothesis that adult attachment moderates the association between early parental rejection and subsequent responses to infant distress, hierarchical linear multiple regression was used. Prior to calculating the regressions, efforts were made to reduce the number of predictors and outcome variables to maintain the Type I error rate. First, anxiety and avoidance in close relationships were standardized, reverse scored, and summed to construct a composite measure of attachment security, the proposed moderator, in which high scores reflect individuals who were low on both dimensions of insecurity, and hence

Table III. Partial<sup>1</sup> correlations between predictors and responses to infant distress.

Variable	MER	FER	Anx.	Avd.
<b>Anger Clip Responses</b>				
Temporary/physical attributions	.00	-.01	.19**	.07
Negative/internal attributions	.06	.07	.07	.09 <sup>t</sup>
Situation/emotion attributions	-.02	-.12*	.03	-.16**
Accuracy	-.01	-.01	-.03	-.04
Dom. error other negative	-.04	-.05	.05	-.01
Dom. error non emotion word	.01	.04	-.02	.04
Empathy	.04	-.01	.09 <sup>t</sup>	-.05
Amusement	.08 <sup>t</sup>	.13**	-.04	.05
Neutral	.08 <sup>t</sup>	.04	-.02	.02
<b>Fear Clip Responses</b>				
Temporary/physical attributions	.08	.13*	.21**	.10 <sup>t</sup>
Negative/internal attributions	.17**	.14**	.08	.11*
Situation/emotion attributions	.05	-.04	.02	.01
Accuracy	-.03	-.14**	-.07	-.12**
Dom. error other negative	.00	.05	.13*	.12*
Dom. error non emotion word	-.02	.02	-.05	-.05
Dom. error positive emotion	.06	.14**	-.04	.10*
Empathy	.03	.04	.07	-.02
Amusement	.12*	.17**	.05	.10*
Neutral	.12*	.07	.03	.04

Note: <sup>t</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ .

<sup>1</sup>Age, race, experience with children, order of clips, and infant gender partialled.

MER = mother emotionally rejecting, FER = father emotionally rejecting, Anx. = anxiety, Avd. = avoidance.

more secure (the two dimensions correlated,  $r(478) = .29$ ;  $p < .01$ , further justifying this approach). To reduce the number of attribution measures, a measure of *negative attribution bias* was created by subtracting temporary and situational attribution scores from the negative attribution score so high scores reflect a strong negative attribution bias. Fear and anger attribution bias correlated positively,  $r(478) = .46$ ;  $p < .01$ . Next, parallel fear and anger responses that correlated significantly (attribution bias, as noted above, and empathy, amusement, and neutral reactions, see Table II) were averaged to form composite measures that reflect responses to infant distress in general. Fear and anger accuracy were maintained as separate outcome variables because they were unrelated. Finally, dominant errors were dropped from further consideration because they were dichotomous variables and very few participants made each type of error (see Table I).

In each regression model, the covariates of age, race, order of clips, reported infant gender, and experiences with children were entered in the first block. Then, mother and father emotion rejection were entered in the second block, and the security composite in the third. Next, interaction terms between the parental emotional rejection variables and the security composite were entered in block 4. Each 2-way interaction involving race was entered in block 5 (race X mother emotional rejection, race X father emotional rejection, and race X security composite). Finally, 3-way interactions between mother or father emotional rejection, security, and race were entered in block 6. Consistent with Aiken and West's (1991) recommendations, variables were centered prior to constructing interaction terms, significant interactions were plotted at fixed points (1 standard deviation below the mean, the mean, and 1 standard deviation above the mean), and simple slopes were calculated. In sum, six regression models were calculated with 15 predictors in each.

The sample size ( $N=440$ ) more than adequately meets standard conventions for the number of predictors relative to the sample size (Harris, 1985). Results are displayed in Table IV for regressions in which interactions were statistically significant and are summarized below for each outcome variable.

*Fear accuracy.* Maternal emotional rejection interacted with the security composite to predict accurate identification of fear. Consistent with the hypothesis, and as illustrated in Figure 1, a history of maternal emotional rejection was negatively associated with accuracy only when current security in close relationships was low ( $\beta = .03$ , n.s.). When security was high, maternal emotional rejection was positively associated with accuracy ( $\beta = .19$ ,  $p < .05$ ). The three-way interaction between father emotional rejection, the security composite, and race was statistically significant also. To interpret this and subsequent three-way interactions, the regressions were run separately for the Caucasian and African American groups, with the main effect and interactions involving race removed. The interaction between father rejection and security was statistically significant for both groups, but in the opposite direction,  $\beta(309) = -.49$ ,  $p < .01$  for Caucasians and  $\beta(138) = 1.01$ ,  $p < .05$  for African Americans. The effect for the African American group was consistent with the hypothesis and the findings for mother emotional rejection illustrated in Figure 1. That is, a history of father emotional rejection was negatively associated with fear accuracy when security was low ( $\beta = -.23$ ,  $p < .10$ ) but was positively associated with fear accuracy when security was high ( $\beta = .40$ ,  $p < .05$ ). The effect for the Caucasian group was inconsistent with the hypothesis. A history of father emotional rejection was negatively associated with fear accuracy when security was high ( $\beta = -.39$ ,  $p < .01$ ) but was unrelated to accuracy when security was low ( $\beta = .08$ , n.s.).

*Attribution bias.* The three-way interaction between paternal emotional neglect, security, and race was statistically significant in relation to the composite negative attribution bias as well. When the paternal emotional rejection by security interaction was rerun for each group, it was significant for African Americans,  $\beta(150) = -.72$ ,  $p < .05$ , but not for Caucasians,  $\beta(326) = .20$ , n.s. Consistent with prediction and as illustrated in Figure 2, among African American women, father emotional rejection was positively associated with a negative

Table IV. Hierarchical multiple regressions predicting responses to infant distress.

	Fear accuracy		Attribution bias		Amusement	
	$\beta$	$R^2\Delta$	$\beta$	$R^2\Delta$	$\beta$	$R^2\Delta$
1. Covariates		.03		.05**		.02
2. M emotion Rejection	.05		.00		.03	
F emotion Rejection	-.15*	.02*	.07	.00	.18*	.03**
3. Security composite	.09	.01	.13*	.01	.02	.00
4. M X Security	.37*		-.13		-.56*	
F X Security	-.23	.01 <sup>†</sup>	.04	.00	.53*	.03*
5. M X Race	.10		-.09		-.03	
F X Race	.07		.01		-.07	
Security X Race	.20	.01	-.31 <sup>†</sup>	.01	.11	.01
6. M X Security X Race	-.39 <sup>†</sup>		-.06		.20	
F X Security X Race	.76*	.03*	-.55*	.02*	-.53*	.01*
Total model		.11**		.09**		.10**

Note:  $\beta$  is standardized beta at entry. <sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ .  
M = mother emotional rejection, F = father emotional rejection.

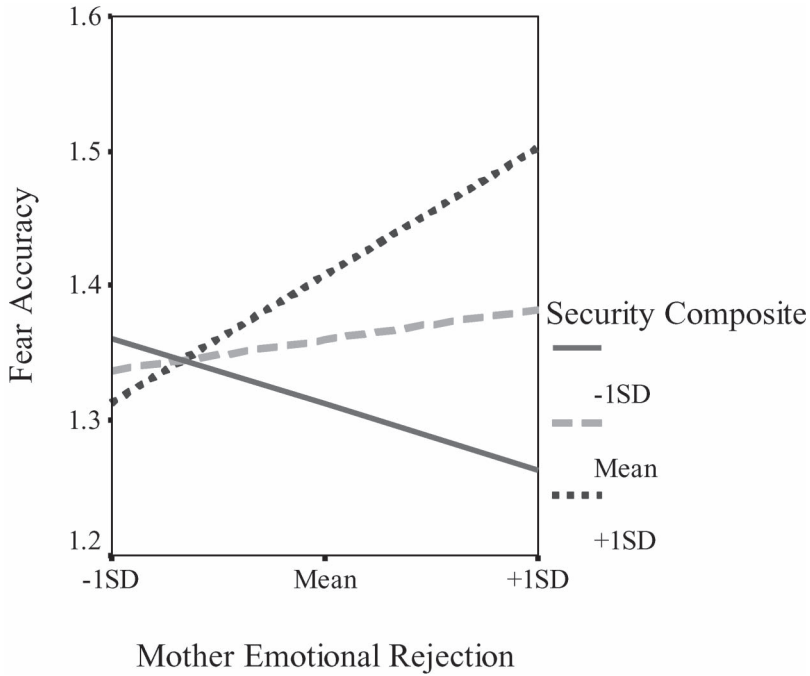


Figure 1. The moderating effect of adult attachment security on the association between mother's emotional rejection and accurate identification of infant fear.

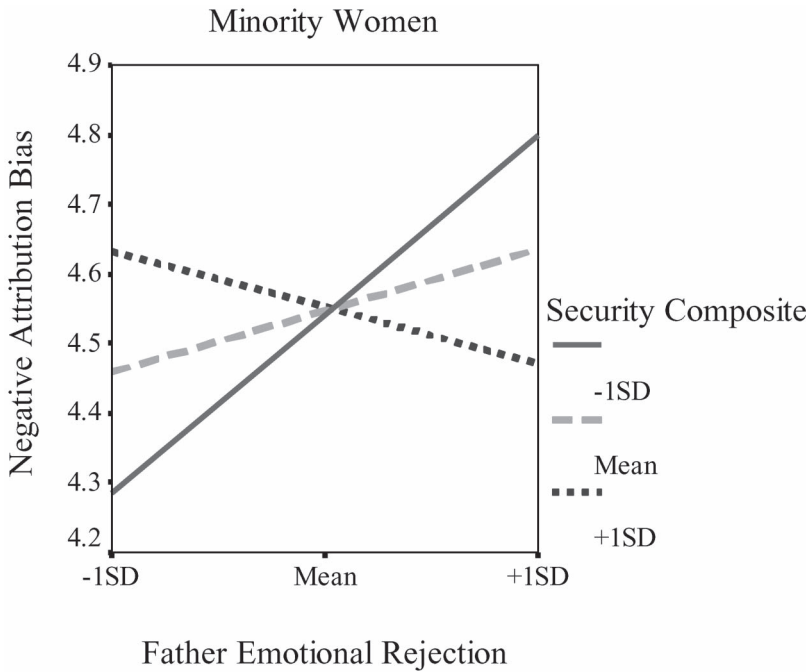


Figure 2. The moderating effect of adult attachment security on the association between father's emotional rejection and negative attributions about infant distress among African American women.

attribution bias when security was low ( $\beta = .32, p < .05$ ), but was negatively associated with attribution bias when security was high ( $\beta = -.16, n.s.$ ).

*Amusement.* Consistent with the hypothesis, security moderated the association between mother emotional rejection and amusement in response to distress. As illustrated in Figure 3, mother's emotional rejection was positively associated with amusement when security was low ( $\beta = .13, p < .05$ ), but was negatively associated with amusement when security was high ( $\beta = -.23, p < .05$ ). The two-way interaction between father emotional rejection and security in relation to amusement was significant also, but it was qualified by a three-way interaction with race. When re-run separately by race, the two way interaction between father emotional rejection and security was significant for Caucasians,  $\beta(326) = .69, p < .01$ , but not for African Americans,  $\beta(150) = -.29, n.s.$  Among Caucasians, the interaction operated counter to the hypothesis as was the case in relation to fear accuracy. Father emotional rejection was positively associated with amusement when security was high ( $\beta = .34, p < .01$ ) and was unrelated to amusement when security was low ( $\beta = .07, n.s.$ ). In the regressions predicting anger accuracy and the empathy and neutral emotional reaction composites, none of the interaction effects were statistically significant.

In sum, a total of 42 interactions were tested (seven interaction terms in relation to six outcomes), although only 24 tested the core prediction that security would moderate the association between emotional rejection and responses to distress. Of these, seven were significant, exceeding the number expected by chance alone, and five were consistent with the buffering hypothesis. The two effects that were inconsistent with the buffering hypothesis were in relation to a history of father emotional rejection and were only apparent among Caucasian respondents.

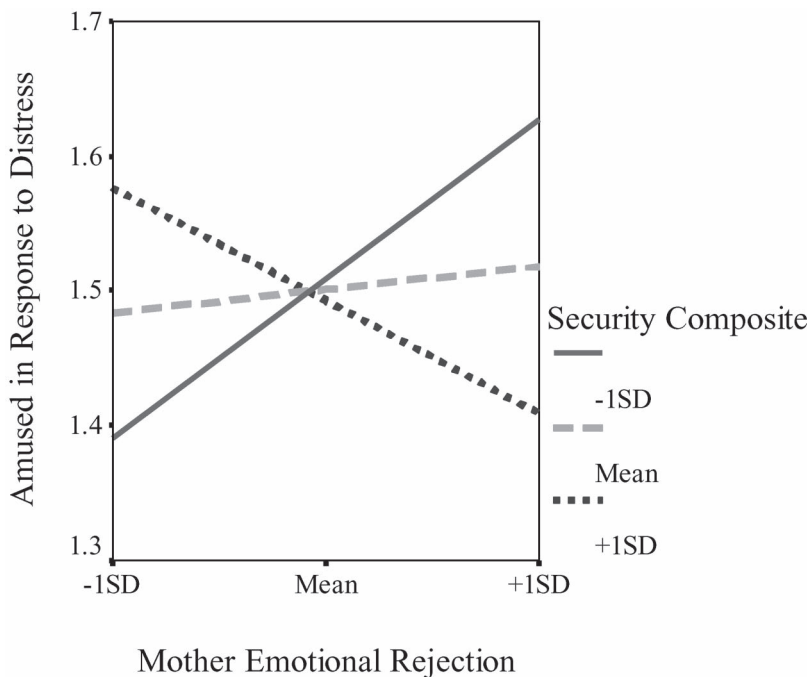


Figure 3. The moderating effect of adult attachment security on the association between mother's emotional rejection and amusement in response to infant distress.

## Discussion

Consistent with an attachment theory framework, individuals whose emotional needs were not met in childhood or who have insecure working models as adults are less accurate at identifying infant emotions, more likely to make negative attributions about a distressed infant, and more likely to be amused or neutral in response to infant distress than others. Moreover, associations between childhood experiences with parents and responses to infant distress were moderated by adult attachment security. The nature of these associations varied in important ways based on race and parent gender. Further, consistent with Dix's (1991) assertion about the central role of emotions in parent cognitions, respondents' emotional reactions correlated with their attributions about and accurate identification of infant distress, which were also interrelated. Finally, adults' attributions and emotional reactions to fear and anger were highly consistent, whereas their accurate identification of the underlying emotion was not. Each of these issues is discussed below.

### *Predictors of responses to infant distress*

That adults' cognitive and emotional responses to infant distress were related to how their parents responded to their emotions in childhood is consistent with the attachment theory view that the manner in which caregivers meet a child's emotional needs affects how they perceive and respond to others in the future (Bowlby, 1988). That a history of parental emotional rejection was associated with more negative/internal attributions about the infant is consistent with previous findings that mothers who reported harsh parenting in childhood had more negative views of their own children (Daggett et al., 2000), and supports the attachment theory view that individuals whose own emotional needs were not met in childhood develop negative expectations of others (Bowlby, 1973). Further, that a history of parental emotional rejection was associated with more temporary attributions and fewer emotion oriented attributions about the cause of infant crying, less accuracy at identifying infant fear, and amusement and neutral responses to infant distress is consistent with the view that individuals whose emotional needs were not met in childhood may minimize others' negative emotions to protect themselves from painful memories of childhood distress through defensive exclusion (Bowlby, 1980).

The results support also the view that adults' current states of mind with respect to attachment influence how they perceive, think about, and feel in response to infant negative emotions. That attachment related avoidance was associated with more negative attributions for infant fear and fewer emotion and situation oriented attributions for infant anger, less accuracy identifying fear, and amusement in response to fear is consistent with the view that avoidance reflects a tendency to minimize, downplay, or distance oneself from negative emotions (Cassidy, 1994; Cassidy & Kobak, 1988). The pattern of association with attachment related anxiety may seem somewhat less clear as it was associated with making temporary and physical attributions about infant crying and mistaking fear for another negative emotion. Perhaps these thought patterns promote a style of responding that is mismatched to the social partner's underlying emotions (e.g., feeding a frightened infant rather than providing comfort) which may maintain distress for a longer period, thereby serving the anxious adult's goal of maintaining proximity with the distressed infant for a longer period (Cassidy, 1994).

Consistent with the proposed buffering effect, adult attachment security protected the *full sample* from the negative impact of *maternal* emotional rejection and *African American* women from the negative impact of *paternal* emotional rejection on their emotional and cognitive

responses to infant distress. Consistent with recent evidence that earned security is as adaptive as continuous security in relation to parenting and marital functioning (Paley et al., 1999; Pearson et al., 1994; Phelps et al., 1998), women whose mothers did not meet their emotional needs in childhood were still accurate at identifying infant fear and were unlikely to become amused in response to infant distress if their current state of mind with regard to attachment was highly secure. Similarly, African American women whose fathers were emotionally rejecting were accurate at identifying infant fear and were unlikely to have a negative attribution bias about infant distress if their adult attachment security was high. That emotional rejection was positively associated with adaptive emotional and cognitive responses to infant distress for this group of women suggests that the experience of knowing first hand what it feels like to have emotional needs neglected coupled with subsequent healing experiences may make these adults particularly attuned to and appropriately responsive to the distress of others.

#### *Racial differences in responses and their prediction*

That African Americans scored higher on avoidance is consistent with previous research indicating that dismissiveness and avoidance are more common among African Americans than European Americans (Griffin & Bartholomew, 1994; Mickelson et al., 1997; Montague et al., 2003) and is likely explained by the greater emotional rejection or punitive emotion socialization from parents reported by African American respondents in this and other samples (Montague et al., 2003). That there were no racial differences in emotional reactions to infant distress is somewhat surprising given these differences in emotion socialization and suggests that the same parental behavior may have a different meaning and hence correlate differently with outcomes in different racial groups as has been found with physical discipline (c.f., Deater-Deckard et al., 1996; Lansford et al., 2005).

The joint effect of childhood history with *fathers* and adult attachment on responses to infant distress varied also by race. Adult attachment security was a sufficient buffer of father emotional rejection for African American women only. This difference may be accounted for by racial differences in family structure and process. That is, single mother households and father absence are more common and father warmth and involvement less common in African American relative to European American families (Hofferth, 2003; Weinraub, Horvath, & Gringlas, 2002). To the extent that father emotional rejection reflects greater deviation from the cultural norm for Caucasian women, it may exert a greater negative effect on outcomes that may be harder to overcome. This interpretation is similar to the finding that physical discipline has a greater negative effect on children in racial or cultural groups in which physical discipline is less normative (Lansford et al., 2005). Further, extended kin and fictive kin are more actively involved in the lives of children in African American families than in Caucasian families (Garcia Coll, 1990; Harrison, Wilson, Pine, Chan, & Buriel, 1990; McAdoo, 1982), perhaps providing African American women whose fathers are emotionally rejecting with more alternative supportive relationships to draw from than Caucasian women. Thus, it may take a longer time and consistent exposure to positive intimate relationships, particularly a significant other, for Caucasian women to be buffered from early negative interactions with their fathers. These types of intimate relationships seem unlikely to exist prior to adulthood.

#### *Associations among emotional and cognitive responses to distress*

That emotional reactions to and causal attributions about infant crying are related is consistent with the view that emotions reflect, in part, a person's appraisal of how a situation

will affect them (Dix, 1991; Frijda, 1986). For example, an adult who makes an initial negative attribution about an infant's crying may experience less empathy as a result. However, the direction of effect between these cognitive and emotive processes remains uncertain due to the correlational design. That comparable responses to fear and anger tended to correlate suggests that high functioning adults' responses to distress are consistent across different specific emotions. A different result may emerge in samples that include adults with various risk characteristics that bias their perceptions of specific emotions. For example, a hostile/angry person may maximize anger, whereas a depressed or anxious person may maximize fear. That fear and anger accuracy did not correlate may indicate that it requires different skills to perceive each. More likely is the possibility that the limited range of the current measure of accuracy, which is best described as a nominal scale, undermined the ability to identify a statistical association. Consistent with this latter view, in another study using the same infant video clips, mothers were similarly accurate at identifying fear and anger,  $r = .66$ , but this measure of accuracy also included the accuracy of mothers' ratings of the intensity of distress on a 7-point scale contributing to a composite measure with greater variability (Leerkes, Crockenberg, & Burrous, 2004).

#### *Limitations and directions for future research*

Several methodological factors limit the conclusions drawn from this study. First, all constructs were measured via self-report raising the possibility that associations are due in part to shared method variance. Most problematic is that current state of mind with respect to attachment may affect how adults rate their childhood experiences with parents; in particular, dismissive individuals may underreport parental emotional rejection given their tendency to idealize their parents (George, Kaplan, & Main, 1985). The use of a self-report measure of adult attachment which did not specify if respondents should think about parents, friends, or romantic partners (i.e., instructions said to focus on close relationships), undermines our ability to fully interpret the nature of the moderating effect of attachment security on parental emotional rejection. That is, it remains unclear if adults who experienced parental emotional rejection in childhood and subsequently scored high on security experienced positive change in or acceptance of their parent-child relationship or had experienced substantially more positive relationships with important others. In addition, due to the correlational design, there is the possibility that an unmeasured third variable, such as depression and its related pattern of cognitions and emotions, accounts for the associations between attachment relevant factors and responses to infant distress. Finally, effect sizes were small for both main effects and interaction effects, which may be due to the nature of the research design. That is, in this convenience sample, most of the respondents were young adults who did not have children and were unlikely to plan on having children in the near future. Further, they were responding to a video clip of infants to whom they had no emotional connection.

Despite these limitations, the majority of effects were consistent with predictions derived from attachment theory supporting the conceptualization that adults' internal working models influence how they think about and feel in response to infant distress. Coupled with evidence that parental emotions and cognitions influence sensitive parental behavior (Dix, 1991; Leerkes, Crockenberg, & Burrous, 2004), these findings offer insight into the transmission gap between adults' current state of mind with respect to attachment and their infants' attachment security (Meins, 1999; van IJzendoorn, 1995). That is, parenting related emotions and cognitions rooted in attachment experiences likely influence parenting behavior in *emotionally arousing contexts*, which in turn affects the development of attachment

security in the next generation. Additional prospective longitudinal research with parents that utilizes a more precise measure of adult attachment is needed to test this proposition directly and to replicate and extend the current findings.

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### Notes

- 1 All analyses were run with and without parents included. There were no consistent differences in the findings either way, so analyses are reported for the full sample.
- 2 We anticipated that crying on purpose would load on the negative/internal attribution factor; that it did not is likely due to the ambiguity of the phrase and variability in how individual respondents interpreted it. That is, when administering this questionnaire during an interview in a related study, respondents often questioned what the item meant. Some interpreted it to mean that the infant was deliberately crying to communicate a need or provide a signal, a relatively innocuous interpretation, whereas others interpreted it to mean that the infant was crying in a manipulative manner, a negative attribution.
- 3 This variable was scored negatively to facilitate testing the hypothesis that adult attachment security would buffer women from the negative effect of not having emotional needs met in childhood.

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