

Adult attachment style and parental responsiveness during a stressful event

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ABSTRACT Despite widespread use of self-report measures of adult attachment, relatively little research has explored the predictive utility of these measures in the domain of parent–child relationships. The present study examined the association between self-reported attachment style and parental responsiveness during a stressful event. Children and their parents were observed while children received an inoculation at a county immunization clinic. Children’s reactions to the inoculation were rated and parents’ responsiveness was assessed with the Emotional Availability Scales (EAS). Results revealed that children of parents scoring high on self-reported attachment avoidance were more distressed during the inoculation than children of parents scoring low on avoidance. Moreover, parents high on avoidance were less responsive when children were highly distressed, whereas this pattern was reversed among parents scoring low on avoidance. Finally, the influence of adult attachment on parental behavior and children’s distress was found to be independent of children’s temperament and parental personality. These findings suggest that self-report adult attachment measures may be useful in the domain of parent–child relationships.

KEYWORDS: adult attachment – children – emotional availability – parental responsiveness – stress – self-report

INTRODUCTION

Despite a common theoretical foundation in attachment theory (Bowlby, 1969), two relatively independent lines of research have emerged in the area of adult attachment, each using a distinct type of measurement (Crowell, Fraley, & Shaver, 1999; Shaver, Belsky, & Brennan, 2000; Shaver & Mikulincer, 2002). Primarily self-report measures have been used in the domain of romantic and marital relationships, whereas narrative measures, such as the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1984), have typically been used in the study of parent–child relationships. In part as a result of this division, relatively little is currently known about how attachment measured in one type of relationship may be related to attachment measured in

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another type of relationship. It is also unclear whether, in either domain, what is being assessed is domain-specific or applicable to attachment relationships more generally. Moreover, there is currently considerable disagreement about how attachment should be measured in adulthood (Crowell et al., 1999). Specifically, the advisability of using self-report measures to assess the quality of an individual's attachment, especially in the context of parent-child relationships, has been questioned (Crowell & Treboux, 1995; George & West, 1999; Hesse, 1999).

Recent research examining the convergence between self-report and interview measures of adult attachment suggests that the degree of correspondence across formats is modest to moderate (e.g., Bartholomew & Shaver, 1998; Crowell et al., 1999; Crowell, Treboux, & Waters, 1999; Shaver et al., 2000). Relatively little research, however, has directly examined the utility of the different measures beyond their intended domain (but see, e.g., Cohn, Silver, Cowan, Cowan, & Pearson, 1992; Rholes, Simpson, Blakely, Lanigan, & Allen, 1997; and Simpson, Rholes, Oriña, & Grich, 2002, for exceptions). Nevertheless, attachment assessed with one kind of measure may reflect a more general orientation toward close relationships (including both romantic and parent-child relationships) and thus may predict behavior in the context of either kind of relationship.

In the present study, we were particularly interested in the ability of self-report adult attachment measures to assess aspects of parent-child relationships. We observed parent-child dyads while children received inoculations, and examined whether self-report attachment measures predicted parental responsiveness toward distressed children. If the dynamics being assessed by self-report measures of adult romantic attachment are applicable to attachment relationships more generally, then findings based on these measures may correspond to those obtained using measures specifically designed to assess the parent-child relationship. In the following sections, we briefly summarize self-report attachment measures and compare these measures to narrative attachment measures. Next, we discuss research linking self-reported attachment styles with caregiving behavior in the context of romantic and parent-child relationships. Finally, we consider research on children's reactions to stressful medical procedures, particularly in relation to parental attachment style.

Self-Report Measures of Adult Romantic Attachment

Numerous self-report measures of adult romantic attachment have been developed over the last several years; these measures share a common methodology that requires individuals to report on their experiences and feelings in romantic or other close relationships (see Brennan, Clark, & Shaver, 1998, for a review). Although earlier measures were based on ratings of potentially self-descriptive paragraphs (e.g., Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987), more recent measures include a number of self-descriptive items, which are combined to create either categorical classifications (i.e., secure, preoccupied, dismissive and fearful avoidant) or continuous dimensions. Recent research suggests that two relatively independent dimensions, avoidance and anxiety, underlie the four categories commonly derived from self-report measures (Fraley & Waller, 1998). These dimensions are conceptually similar to those that underlie Ainsworth's infant attachment patterns (Ainsworth, Blehar, Waters, & Wall, 1978, Figure 10, p. 102; Brennan et al., 1998). The avoidance dimension reflects the extent to which attachment behavior (e.g., proximity-seeking) is regulated in potentially threatening situations (e.g., separation

from attachment figures). The anxiety dimension reflects the extent to which an individual fears abandonment and rejection by relationship partners. Individuals scoring high on avoidance (classified by Bartholomew & Horowitz, 1991, as fearful or dismissive avoidant) tend to report discomfort with close relationships, prefer not to get too close to romantic partners, and find it difficult to depend on close others. Individuals scoring high on anxiety (classified as preoccupied or fearful avoidant) tend to report fears of being alone and are more preoccupied with intimacy and relationship partners. In this two-dimensional framework, individuals who score low on both dimensions are considered secure.

Self-reported attachment classifications have been validated by their theoretically predictable and meaningful associations with behavior, cognition, and emotion in the context of close relationships (Crowell et al., 1999; Feeney, 1999; Shaver & Mikulincer, 2002). Adults scoring high on avoidance, for instance, tend to minimize the expression of distress (Fraley & Shaver, 1997) and are unlikely to turn to others for support under stressful conditions (Simpson, Rholes, & Nelligan, 1992). Avoidant adults also show deficits in the processing of and memory for attachment-related information (Fraley, Garner, & Shaver, 2000; Mikulincer & Orbach, 1995) and decreased cognitive accessibility of proximity-related words and attachment figures under threatening conditions, especially when the threat concerns separation (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer, Gillath, & Shaver, 2002). These findings are consistent with those reported for avoidant infants (Ainsworth et al., 1978; Spangler & Grossmann, 1993) and children (Main, Kaplan, & Cassidy, 1985; Solomon, George, & De Jong, 1995), as well as for adults when attachment is assessed with the AAI (Dozier & Kobak, 1992; Kobak & Sceery, 1988). In general, these findings are consistent with the view that avoidance, across the lifespan and across relationship types, reflects 'deactivation' or minimization of the attachment system (Cassidy, 2000; Edelstein & Shaver, 2004).

Attachment anxiety, in contrast, appears to reflect 'hyperactivation' of the attachment system (Cassidy, 2000). Like anxious-ambivalent infants, adults scoring high on anxiety are easily distressed by separations from attachment figures (Feeney & Noller, 1992; Fraley & Shaver, 1998) and seek emotional closeness when distressed (Simpson et al., 1992), but often do not feel that their need for attachment security is satisfied by relationship partners (Hazan & Shaver, 1987). Like individuals classified as preoccupied on the AAI, adults scoring high on anxiety appear preoccupied with attachment relationships and experiences, and their descriptions of close relationships are often characterized by negative emotion (Feeney, 1999; Hesse, 1999). In addition, anxious adults exhibit increased cognitive accessibility of negative emotional memories (Mikulincer & Orbach, 1995), threats to the attachment system (Mikulincer et al., 2000), and mental representations of attachment figures (Mikulincer et al., 2002).

Yet, self-report measures of adult attachment differ from the AAI and other narrative attachment measures in several important ways. First, as discussed earlier, the majority of self-report measures are designed to assess adult *romantic* attachment, whereas most narrative measures are designed to assess representations about attachment to early childhood attachment figures. Second, and perhaps of most importance, the two types of measures differ in their emphasis on conscious versus unconscious methods of assessment. Central to the AAI and other narrative measures is the assumption that attachment representations may not necessarily be consciously accessible, as a result of defensive processes that render individuals unable or unwilling

to provide an accurate account of early experiences. Thus, according to this perspective (and in contrast to the assumption underlying self-report measures), the reports of research participants cannot be taken at face value, which necessitates a more indirect means of assessment. The AAI is designed to accomplish this goal by 'surprising the unconscious' during a semistructured interview in which participants are asked to recollect childhood experiences with parents and other attachment figures (see Hesse, 1999, for a review). Participants' responses are coded primarily for discourse properties (e.g., coherence) and indices of defensive processing, rather than for the content of their recollections *per se*. AAI scales assess the probable quality of early experiences with each parent (e.g., loving rejecting, neglecting) and the individuals' current 'state of mind' about those experiences (e.g., derogation of attachment, coherence of the transcript). An attachment classification (i.e., preoccupied, avoidant, secure, unresolved) is determined from the constellation of scale scores given for each interview, with particular weight given to the state of mind scales.

Individuals classified as secure on the AAI describe attachment figures in a balanced, convincing, and coherent way and can support their descriptions with specific childhood memories. Those classified as avoidant, in contrast, often claim not to remember specific childhood events or experiences, and may describe attachment figures in idealized terms without providing support for those descriptions. Avoidant individuals are also characterized by their tendency to minimize the importance of past attachment relationships. Individuals who are classified as preoccupied often display unresolved anger toward childhood attachment figures; they may have difficulty maintaining the boundaries of the interview and often provide more information to the interviewer than necessary or appropriate. Finally, an unresolved classification is given to individuals who demonstrate lapses in 'metacognitive monitoring' during discussions of potentially traumatic experiences (e.g., abuse, loss of an attachment figure). For instance, their discourse may suggest that they (perhaps temporarily) believe a deceased person to be simultaneously alive and dead. The validity of AAI attachment classifications has been established through their associations with a variety of theoretically meaningful constructs and outcomes, including mental health (Dozier, Stovall, & Albus, 1999), maternal sensitivity (De Wolff & van IJzendoorn, 1997), and infant attachment classifications (e.g., Benoit & Parker, 1994; van IJzendoorn, 1995).

Given the differences between self-report and narrative measures of adult attachment, it is perhaps not surprising that the two types of measures are only modestly associated with one another (e.g., Crowell et al., 1999). Yet, findings obtained using self-report measures are generally consistent with those obtained using alternative measures of adult attachment, such as the AAI, suggesting that the two types of measures may assess similar constructs. Of particular relevance to the present study, caregiving behavior has been associated with attachment as assessed by both self-report and narrative attachment measures. In the following section, we discuss research linking self-reported attachment styles and caregiving behavior in the context of parent-child and romantic relationships.

Self-Reported Attachment Styles and Caregiving Behavior

Despite the proliferation of research using self-report attachment measures, such research has been limited largely to the domain of romantic relationships. The few existing studies that have explored the relation between self-reported attachment

styles and parenting suggest that parental attachment insecurity (i.e., high scores on avoidance and/or anxiety) is associated with ambivalence about having children and with more negative models of parenthood and parent-child relationships (Rholes, Simpson, & Blakely, 1995; Rholes, Simpson, Blakely, Lanigan, & Allen, 1997). Insecure parents also report feeling less close to their children (Rholes et al., 1995). With respect to parental *behavior*, Rholes et al. (1995) found that attachment avoidance was negatively related to parental supportiveness during a laboratory-teaching task. This effect was qualified by an interaction with children's negative behavior during the session: When children were highly negative, parents' attachment style was unrelated to their supportiveness. In fact, regardless of parental attachment style, children's negative behavior during the session was the strongest determinant of parental behavior. It is important to note, however, that this study was not conducted under conditions that would ordinarily elicit attachment behavior on the part of either the parents or the children. Attachment dynamics should be most readily observable when children are threatened or stressed (i.e., when their attachment systems are activated; Bowlby, 1973; Goldberg, Grusec, & Jenkins, 1999; Solomon & George, 1999), which may in part explain why parental attachment style did not have a large influence on supportiveness in the Rholes et al. (1995) laboratory session.

In fact, relatively few studies, particularly those conducted beyond infancy, have examined caregiving behavior in attachment-relevant contexts. One exception is a study of children undergoing voiding cystourethrogram fluoroscopy (VCUG), a usually threatening and painful medical procedure involving catheterization (Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1997). Goodman et al. (1997) observed children during the procedure and obtained reports from parents regarding their romantic attachment style and their behavior toward their child following the VCUG. Results revealed that parental self-reported attachment insecurity was related to parents' supportive behavior following the VCUG: Compared to secure parents, insecure parents were less likely to discuss the procedure with their child and to physically comfort their child afterwards (see also Quas et al., 1999). These results suggest that self-reported romantic attachment style predicts parental behavior; however, reliance on parental *reports* of caregiving, which may not necessarily be accurate (Cohen, Manimala, & Blount, 2000), should be bolstered by further research using more objective measures (e.g., observations of actual behavior).

Another line of research concerns the observation of romantic partners under threat of separation and in anxiety-producing situations (Feeney & Collins, 2001; Fraley & Shaver, 1998; Simpson et al., 1992). Results from these studies reveal that emotional support and caregiving provided to a partner are predicted by an interaction between the caregiver's self-reported attachment avoidance and the partner's level of distress. When threat or stress is low, avoidance is unrelated (or even slightly positively related) to the provision of emotional support; however, when threat or stress is high, avoidance and the provision of emotional support are negatively related. Simpson et al. (1992), for instance, led the female members of heterosexual romantic dyads to believe that they were about to participate in an anxiety-provoking activity. Highly avoidant men were less supportive than were men scoring low on avoidance when their partners were distressed. When women were less distressed, men scoring high on avoidance were slightly *more* supportive than men scoring low on avoidance (see also Feeney & Collins, 2001). Fraley and Shaver (1998) similarly reported that, among couple members separating at an airport, self-reported avoidance

was negatively related to caregiving behavior, whereas this pattern was reversed among non-separating couples.

These findings suggest that the ability to provide support to a romantic partner in anxiety-producing situations is influenced by self-reported attachment style. Moreover, this pattern of results is consistent with developmental research indicating that parental supportiveness depends not only on parents' attachment orientation, assessed with the AAI (e.g., Cohn et al., 1992; Crowell & Feldman, 1988; Goldberg, MacKay-Soroka, & Rochester, 1994; Raval et al., 2001; van IJzendoorn, 1995), but also on the context and on the child's behavior (e.g., Ainsworth et al., 1978; Belsky, Rovine, & Taylor, 1984; Grossmann, Grossmann, & Schwan, 1986; Milligan, Atkinson, Trehub, Benoit, & Poulton, 2003). For instance, Grossmann et al. (1986) found that mothers of avoidant infants, who are likely themselves to be avoidant (van IJzendoorn, 1995), engaged actively in a play session with their infant only when the infant was relatively content. When the infant expressed negative affect, mothers of avoidant infants withdrew their attention.

It is important to note that support-giving in an anxiety-producing situation is likely to be driven by the *caregiving* system, a behavioral system organized around protection of dependent others, rather than by the attachment system *per se*. However, research findings suggest that individuals' caregiving and attachment styles are closely related (e.g., George & Solomon, 1999; Kuncz & Shaver, 1994), which may explain the consistent finding that adult attachment (measured with the AAI or self-report measures) predicts caregiving behavior. Moreover, caregiving behavior in romantic relationships associated with attachment avoidance is similar to that exhibited by avoidant mothers, who tend to dismiss or devalue their children's signals of distress, resulting in rejecting or otherwise unsupportive behavior (George & Solomon, 1999).

In the present study, we explored the relation between parents' self-reported attachment style and their supportive behavior during a relatively stressful medical procedure, a child's inoculation. To the extent that self-report measures of attachment can capture more general orientations toward attachment relationships, including parent-child relationships, we expected to find a pattern of results similar to that of previous research with adult romantic dyads. That is, we expected parents' responsiveness to be predicted by an interaction between their attachment-related avoidance score and their children's experience of distress, such that highly avoidant parents would be particularly unresponsive when children's distress was high. Because previous research has not revealed a consistent relation between attachment *anxiety* and responsiveness, no specific predictions were made for the anxiety dimension.

We were also interested in examining the relative contributions of parental personality characteristics and adult attachment style in predicting parental responsiveness. In one of the few studies of personality and parenting behavior, Belsky, Crnic, and Woodworth (1995) found that neuroticism, extraversion, and agreeableness predicted parental sensitivity in home observations, but the parent-child interactions they studied did not necessarily occur in contexts that elicit attachment behavior (see also Clark, Kochanska, & Ready, 2000; Kochanska, Clark, & Goldman, 1997). Thus, it is possible that personality traits would predict parental behavior under routine or unemotional circumstances, whereas adult attachment style would be more influential in stressful or attachment-eliciting situations. Because Belsky et al. did not assess parents' attachment styles and Rholes et al. (1995) did not

include measures of personality, the relative influences of adult attachment and personality could not be compared. Given the stressful nature of the inoculations we observed, we expected that parental attachment style would predict responsiveness even after controlling for the influence of parental personality traits.

In addition, we examined the role of children's temperament in predicting parental responsiveness. To the extent that children play an active role in eliciting responses from caregivers, children's temperamental characteristics may influence parental behavior (see Putnam, Samson, & Rothbart, 2002, for a review). Temperament may also be related to children's reactions to stressful events (e.g., Donzella, Gunnar, Krueger, & Alwin, 2000), which may, in turn, influence parental behavior. Although previous research is inconsistent regarding the relation between children's temperament and parental responsiveness (Vaughn & Bost, 1999), we expected that parental attachment would predict responsiveness even after controlling for children's temperament.

Children's Reactions To Stressful Medical Procedures

Studies of parent-child interactions during stressful or painful medical procedures, including inoculations, suggest a link between parental behavior and children's distress (see Blount, Davis, Powers, & Roberts, 1991; Rudolph, Dennig, & Weisz, 1995, for a review). In general, parental behaviors that promote children's ability to cope constructively with the situation tend to decrease children's distress (e.g., Cohen, Blount, & Panopolous, 1997; Gonzalez, Routh, & Armstrong, 1993), whereas less constructive behaviors (e.g., criticizing, apologizing to the child) are associated with increased distress (e.g., Manne et al., 1992). Few studies, however, have examined the influence of parental personality characteristics, which may predict parents' behavior, on children's distress during medical procedures (but see, e.g., Jacobsen et al., 1990; Jay, Ozolins, Elliott, & Caldwell, 1983). In one exception, Jay et al. (1983) found that children of parents high on trait anxiety were more distressed during a bone marrow aspiration than were children of parents low on trait anxiety. Parental attachment style has also been linked with children's distress: Goodman et al. (1997) found that parental self-reported attachment style predicted children's emotional reactions to the invasive VCUg, such that both attachment avoidance and anxiety were positively related to children's distress.

Further research is needed, however, to clarify the relation between parental characteristics and children's reactions to medical procedures. For instance, because previous studies have not included measures of both parental personality and parental attachment style, and because self-report attachment measures are moderately correlated with measures of personality (Shaver & Brennan, 1992), it is not yet possible to determine their independent contributions to children's distress. In addition, it is possible that the relation between parental personality and children's distress is due to a common relation with children's temperament; in fact, research suggests that temperamental factors predict children's responses to stressful situations (e.g., Donzella et al., 2000; Wertlieb, Weigel, Springer, & Feldstein, 1987). Few studies, however, have explored the influence of children's temperament on their behavior in the context of stressful medical procedures (Rudolph et al., 1995).

In the present study, we expected that, consistent with previous research, parental attachment style would predict children's distress during the inoculation. Specifically,

we expected children of insecure parents to be more distressed than children of secure parents. The relation between parental attachment style and children's distress was expected to be independent of more general parental personality characteristics and of children's temperament.

METHOD

Participants

Thirty-nine parent-child dyads participated in the present study. The children (19 boys, 20 girls) ranged in age from 3 to 7, with a mean age of 5.23 years ($SD = .97$). The majority of the children (56%) were Caucasian, 26% were Hispanic, and 13% were African American. The number of shots children received ranged from 1 to 4 ($M = 1.90$, $SD = .94$). Parents (35 mothers, 4 fathers) ranged in age from 22 to 48, with a mean age of 32.36 years ($SD = 7.49$). The socio-economic status (SES) of the families, assessed using Watt's (1976) adaptation of Hollinghead's SES scale, ranged from 1 (high) to 7 (low). The mean SES was 4.71 ($SD = 1.87$).

Measures

Relationship Scales Questionnaire Parental attachment style was measured with the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994). The RSQ is a 30-item questionnaire requiring participants to rate, on a 7-point scale, the extent to which each statement describes their characteristic style in close relationships (1 = not at all like me, 7 = very much like me). Items are summed to create two subscales, corresponding to the dimensions of avoidance and anxiety. Sample items include 'I find it difficult to depend on my partner' (avoidance) and 'I worry about being abandoned by my partner' (anxiety). Internal consistencies of the two dimensions in the present study were .85 and .90 for avoidance and anxiety, respectively.

NEO Five-Factor Inventory The Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992), a 60-item self-report measure, was used to assess five general dimensions of parental personality. The Five-Factor Model is a taxonomy of the personality traits considered to be most fundamental and general (McCrae & Costa, 1999). Respondents are asked to rate the extent to which they agree with each item on a 5-point scale (1 = disagree strongly, 5 = agree strongly). Scores are then derived for five scales: neuroticism, extroversion, openness to experience, agreeableness, and conscientiousness. In the present study, the internal consistencies of the five personality scales were .85 (neuroticism), .68 (extroversion), .69 (openness), .85 (agreeableness), and .82 (conscientiousness). Because one parent did not complete the NEO, the sample size for analyses including this measure is 38.

Children's Behavior Questionnaire Children's temperament was assessed with the Children's Behavior Questionnaire (CBQ; Ahadi, Rothbart, & Ye, 1993). This measure is designed for use with parents of 3- to 7-year-old children and includes 120 statements that parents rate on a 7-point scale according to how true each statement is about their child (1 = extremely untrue, 7 = extremely true). The CBQ yields 12

dimensions, which can be further reduced into three temperamental factors: surgency (a composite of high intensity pleasure, activity level, approach, and shyness [reversed]), negative affect (a composite of sadness, fearfulness, anger, and soothability [reversed]), and effortful control (a composite of low intensity pleasure, inhibitory control, attentional focusing, and perceptual sensitivity [reversed]). In the present study, the internal consistencies of the three factors were .84 (surgency), .80 (negative affect), and .82 (effortful control). Because one parent did not complete the CBQ, the sample size for analyses including the temperamental factors is 38.

Procedure

Children and parents were recruited from county immunization clinics when the children arrived to receive their inoculations. Written consent to participate and to videotape their child's inoculation were obtained from parents prior to the procedure. Approximately two weeks later ($M = 12.53$ days; $SD = 6.53$), children and their parents came to our university laboratory for the second session of the study. During this session, parents completed the self-report measures of personality and attachment style and the measure of their children's temperament.

Coding of Videotapes

Children's distress Children's reactions to the inoculation were coded from videotapes by two independent researchers blind to the study's hypotheses, the attachment styles of the parents, and parents' responsiveness scores. The measure of distress used in the present study was a global rating of children's overall reaction, scored on a 7-point scale (1 = very happy, 2 = happy, 3 = somewhat happy, 4 = somewhat upset, 5 = upset, 6 = very upset, 7 = hysterical). Ratings were based on a global evaluation of each child's distress as observed throughout the entire procedure. Similar measures of children's reactions to medical procedures have been used in previous research (e.g., Alexander et al., 2002; Goodman, Hirschman, Hepps, & Rudy, 1991; Katz, Kellerman, & Siegel, 1980; Shrimpton, Oates, & Hayes, 1998); such measures have been shown to correlate highly with distress ratings made by both children and parents (Shrimpton et al., 1998) and with more objective observational scores of behavioral distress (Jay, 1988). In the present study, inter-rater reliability for 26% ($n = 10$) of the videotapes was .80. The remaining videotapes were coded by one of the two reliable researchers.

Parental responsiveness Parental responsiveness was assessed from the videotapes using the third edition of the Emotional Availability Scales (EAS; Biringen, Robinson, & Emde, 1998). This measure, designed to capture the affective quality of parent-child interactions, is intended for use with videotaped observations of dyads in both naturalistic and lab settings, as well as in structured, semi-structured, and unstructured contexts. The EAS yields four somewhat interrelated parental responsiveness variables: sensitivity, structuring, nonintrusiveness, and nonhostility. *Parental sensitivity* is the most complex variable; it involves an integrated assessment of the parent's affect, accessibility, responsiveness, flexibility, and acceptance of the child. *Parental structuring*, based on work by Vygotsky (1962) and others (for a review, see Doctoroff, 1996), assesses the ability of the parent to successfully structure the interaction by 'scaffolding' or helping 'just enough' so that the child can take the next

step by him- or herself, rather than by directing, controlling, or passively watching the child's activity. *Parental nonintrusiveness* assesses the parent's ability to create a spacious environment in which the child can take the lead in expressing his or her preferences, desires, and creativity. *Parental nonhostility* assesses the level of covert or overt hostility on the part of the parent. Previous research indicates that scores on these scales are related to parental AAI classifications, such that secure parents are more sensitive and structuring than are insecure parents (e.g., Aviezer, Sagi, Joels, & Ziv, 1999; Biringen et al., 2000; Oyen, Landy, & Hibern-Cobb, 2000).

Each of the emotional availability (EA) variables is coded on a Likert scale, from 1, which is the lowest rating, to 9 (parental sensitivity) or 5 (parental structuring, nonintrusiveness, and nonhostility), which are the most optimal ratings. The coding manual provides both overall content descriptions of each variable and 'prototypes' for each odd-numbered scale point. For the present study, emotional availability was coded by a researcher who had previously established high reliability with the Biringen laboratory. Inter-rater reliabilities for this independent sample ($n = 8$) ranged from .88–.99 for the different subscales. The coder was blind to the study's hypotheses, parents' attachment styles, and the distress ratings of the children.

RESULTS

Children's reactions to the inoculation

On average, children were somewhat distressed by the inoculation, as indicated by their overall reaction ($M = 4.62$, $SD = 1.14$, on a 7-point scale). Table 1 presents the correlations between children's distress, temperament, demographic variables, and parent characteristics. As shown in Table 1, distress did not differ as a function of the gender of the child or parent. Children who were younger and who received more shots were somewhat more distressed during the inoculation; however, these relations did not reach statistical significance ($ps = .11$). Children's reactions to the inoculation were negatively related to one of the three temperament factors, effortful control, suggesting that children may have appeared less distressed to the extent that they were better able to regulate their emotions. Surgency and negative affect were not significantly related to children's reactions.

Consistent with previous research (Goodman et al., 1997; Quas et al., 1999), children of parents scoring high on attachment avoidance were more distressed during the inoculation. Attachment anxiety, however, was unrelated to children's reactions. One parental NEO-PI scale, agreeableness, was negatively correlated with children's reactions, such that children whose parents were less agreeable reacted more negatively to the inoculation. (Although agreeableness was negatively correlated with the number of shots children received, the relation between agreeableness and children's reactions remained significant with number of shots statistically controlled, $r = -.35$, $p < .05$.) The other four parental personality factors were not significantly related to children's distress.

To examine the influence of parental attachment on children's distress, after controlling for parental personality, a hierarchical regression analysis was conducted. Because of the relatively small size of our sample, only the one personality factor that was significantly correlated with children's reactions, parental agreeableness, was entered on the first step. The two attachment dimensions were entered on the second

Table 1 Intercorrelations among child and parent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Child Variables															
1. Age															
2. Gender ^a	.12														
3. Surgency	.22	.51**													
4. Negative Affect	-.26	.00	.11												
5. Effortful Control	.24	-.06	.21	-.23											
6. Number of Shots	-.09	-.28	.05	.16	-.03										
7. Distress	-.26	.06	.00	.19	-.36*	.26									
Parent Variables															
8. Gender ^a	-.32*	-.18	-.24	.16	-.11	.05	-.04								
9. Avoidance	-.16	.02	-.21	-.03	-.11	.18	.44**	.19							
10. Anxiety	-.17	-.09	.01	.30	-.02	.29	.08	.17	.30						
11. Responsiveness	-.29	-.22	.01	-.06	.22	-.01	-.30	-.02	-.19	.08					
12. Neuroticism	-.25	-.10	-.12	.21	.06	.08	.03	.25	.18	.44**	.15				
13. Extraversion	-.21	.15	.01	-.10	.22	-.14	-.19	.06	-.35*	-.05	.05	-.33*			
14. Openness	.05	.18	.05	-.11	.21	.26	-.17	.21	.15	.16	.18	.18	.13		
15. Agreeableness	.14	.12	.16	-.27	.18	-.42**	-.40*	.15	-.26	-.35*	.26	-.42**	.30	.05	
16. Conscientiousness	.05	.11	-.09	-.17	-.16	.07	-.27	-.04	-.18	-.05	-.09	-.32*	.24	-.07	.04

Note. N = 39; ^a0 = male, 1 = female; *p ≤ .05, **p < .01.

step. The overall model was significant, $F(3, 34) = 4.17, p < .01$, and the addition of the attachment dimensions resulted in a significant increase in the amount of variance explained, R^2 change = .22, $p < .01$. Both avoidance, $\beta = .50, p < .01$, and agreeableness, $\beta = -.31, p < .05$, remained significant predictors of children's distress. When agreeableness was replaced with each of the remaining four parental personality variables, only parental avoidance was significantly associated with children's distress.

A second hierarchical regression analysis was conducted to examine the influence of parental attachment on children's distress, after controlling for child temperament. For this analysis, effortful control was entered on the first step, followed by the two attachment dimensions on the second step. Consistent with the previous analysis, the overall model was significant, $F(3, 34) = 4.47, p < .01$, and the addition of the attachment dimensions resulted in a significant increase in the amount of variance explained, R^2 change = .16, $p < .05$. Both parental avoidance, $\beta = .41, p < .05$, and effortful control, $\beta = -.32, p < .05$, remained significant predictors of children's distress. When effortful control was replaced with each of the other two temperament variables, only avoidance was significantly associated with children's distress. Thus, the influence of parental avoidance on children's distress was statistically independent of both parental personality and child temperament factors.

Parental responsiveness

The mean ratings for the four EA scales were 6.08 ($SD = 1.58$) for sensitivity (9-point scale); 3.56 ($SD = 1.02$) for structuring (5-point scale); 4.58 ($SD = .71$) for nonintrusiveness (5-point scale); and 4.64 ($SD = .64$) for nonhostility (5-point scale). Scores on the four scales were moderately to highly correlated with one another (r s ranged from .38 to .85, mean $r = .62$); thus, a composite 'parental responsiveness' variable ($\alpha = .86$) was created, based on the standardized scale scores, for use in subsequent analyses.

The correlations between this composite variable and the other parent and child variables are presented in Table 1. Parental responsiveness was marginally related to children's age ($p < .07$), suggesting that parents were somewhat less responsive with older compared to younger children. The correlation between children's distress and parental responsiveness was also marginally significant ($p < .07$), indicating that children who were more distressed had parents who were less responsive. Responsiveness was not significantly related to children's or parents' gender or to the number of shots children received. The two attachment variables, the five NEO personality factors, and the three child temperament factors were not significantly correlated with parental responsiveness.

To test the prediction that highly avoidant parents would be particularly unresponsive when children's distress was high, a hierarchical regression analysis was conducted with parental responsiveness as the dependent variable. Parental avoidance and children's distress were entered as predictors on the first step, followed by the interaction between avoidance and children's distress on the second step. Children's age and parental anxiety were also included on the first step, given their respective relations with children's distress, parental responsiveness, and parental avoidance. The resulting model accounted for 48% of the variance in parental responsiveness (see Table 2). As predicted, the interaction between avoidance and children's distress was significant, R^2 change = .23, $p < .01$. When children were distressed, parental avoidance was negatively related to responsiveness (see Figure 1).

In addition, as shown in Table 2, children’s age remained a significant predictor of parental responsiveness, such that parents were less responsive toward older children. The main effect of children’s distress, however, was nonsignificant.¹

To examine the influence of the avoidance-by-distress interaction on parental responsiveness, after controlling for parental personality characteristics, a second set of hierarchical regression analyses was conducted. In separate analyses, each of the five parental personality variables was entered on the first step, followed by parental avoidance and anxiety, children’s age, and children’s distress on the second step. On the third step, the interaction between children’s distress and parental avoidance was entered. For all five analyses, the addition of the interaction term yielded a significant R^2 change, ranging from .26 to .31, all $ps < .01$. None of the personality variables emerged as a significant predictor of parental responsiveness.

Next, an identical series of regression analyses was conducted, replacing the personality variables (on the first step) with one of the three child temperamental factors. The addition of the interaction between parental avoidance and children’s

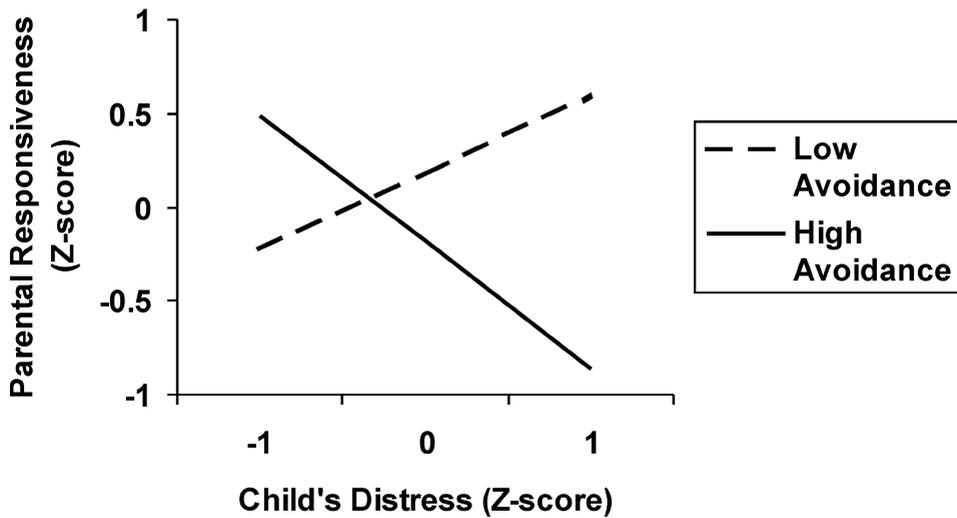


Figure 1 The relation between child’s distress and parental responsiveness for parents high and low on avoidance. Lines are plotted for parents one standard deviation above and below the mean of avoidance.

Table 2 Regression analysis predicting parental responsiveness

	<i>B</i>	<i>SE</i>	β	<i>t</i>
Parental avoidance	– .16	.13	– .19	– 1.27
Parental anxiety	– .07	.12	– .08	– .57
Child’s age	– .03	.01	– .38	– 2.90**
Child’s distress	– .11	.13	– .13	– .85
Avoidance \times distress	– .49	.13	– .54	– 3.82**

Note. $N = 39$; $F(5, 33) = 6.03^{**}$, $R^2 = .48$; * $p < .05$, ** $p < .01$.

distress resulted in a significant increase in the amount of variance explained for all three equations, R^2 change ranged from .22 to .24, all p s < .01. None of the child temperament factors was a significant predictor of responsiveness. Thus, the influence of parental avoidance and children's distress on parental responsiveness during the inoculation was independent of both parental personality and child temperamental factors.

DISCUSSION

In the present study, we investigated the ability of a self-report adult attachment measure to predict both parent and child behaviors in the context of a stressful event, a child's inoculation. We also examined the extent to which the influence of parental attachment style on children's distress and parental behavior was independent of more general parental personality characteristics and of children's temperament.

Children's reactions to the inoculation

Consistent with previous research demonstrating that parental attachment insecurity is related to children's reactions to painful medical procedures (e.g., VCUG; Goodman et al., 1997; Quas et al., 1999), we found that children of parents scoring high on avoidance were more upset during the inoculation than were children of less avoidant parents. The influence of parental avoidance on children's distress was independent of more general personality characteristics, although parental agreeableness was negatively related to children's distress. In contrast to previous findings suggesting a link between parental trait anxiety and children's reactions to medical procedures (e.g., Jay et al., 1983), in the present study neither parental attachment anxiety nor neuroticism were related to children's distress.

The relation between children's distress and parental avoidance in this context may reflect a parent's ability (or lack thereof) to serve as an attachment figure. Given the stressful nature of the inoculation, children who perceive that they are unable to rely on their caregiver for support and comfort may be especially likely to become distressed. Further, over time, children of avoidant parents may develop perceptions that stressful situations are beyond their control, with such perceptions being linked with children's distress during medical procedures (e.g., Carpenter, 1992; Goertzel & Goertzel, 1991).² An alternative explanation is that insecure parents and their children share common temperamental factors that explain both parental attachment style and children's reactions to the inoculation. Our data do not support this explanation, however: In the present sample, the relation between parental attachment style and children's distress was independent of children's temperament and parents' scores on the 'big five' personality factors.

Of note, our finding that self-reported parental avoidance was associated with increases in children's distress is somewhat inconsistent with findings from the infant attachment literature. Specifically, avoidant infants, whose parents are likely to be classified as avoidant on the AAI (van IJzendoorn, 1995), tend not to display outward manifestations of distress during brief separations from caregivers. Despite their apparent indifference, however, avoidant infants show heightened physiological arousal (indicative of distress) during these separations (Spangler & Grossmann, 1993; Sroufe & Waters, 1977). Thus, based on these findings, children of self-reported avoidant parents might be expected to exhibit *less* distress during stressful medical

procedures compared to children of nonavoidant parents. There are several possible explanations for the discrepancy between our findings and those stemming from research with infants. First, divergent findings may be due to differences in age across the two types of studies (i.e., infants vs. children); however, research with avoidant adults (e.g., Dozier & Kobak, 1992) suggests a pattern of emotion regulation similar to that observed among infants. Second, it is possible that the nature of the attachment-related threat varies across studies, perhaps leading to a breakdown of avoidant defensive strategies during stressful medical procedures (see Berant, Mikulincer, & Florian, 2001). Third, the children of self-reported avoidant parents may not themselves be avoidant. Given the paucity of research linking self-reported attachment styles to children's attachment status, further research is necessary to address this possibility. Finally, it is possible that avoidance as assessed by self-report measures differs from avoidance as assessed by the AAI. This possibility seems unlikely, however, given the consistency in avoidance-related findings across studies using different types of measures (e.g., caregiving behavior; Fraley & Shaver, 1998; Milligan et al., 2003; memory; Dozier & Kobak, 1992; Mikulincer & Orbach, 1995). Further research may thus be warranted to explore the link between parental avoidance and children's distress during medical procedures.

Adult attachment style and parental responsiveness

Previous research with adult romantic dyads suggests that the provision of support in attachment-eliciting situations is predicted by an interaction between the caregiver's self-reported avoidant attachment and his or her partner's level of distress (Fraley & Shaver, 1998; Simpson et al., 1992). The primary goal of the present study was to extend this research to the domain of parent-child relationships. Based on the aforementioned research, and on the assumption that general beliefs about close relationships (i.e., not limited to romantic relationships) underlie responses to self-report attachment measures, we expected that parental supportiveness would be predicted by an interaction between parental avoidance and children's reaction to the inoculation. Our results supported this hypothesis: Parents scoring high on avoidance were less responsive with their children, particularly if their children were distressed. In fact, the influence of adult attachment style was comparable to that reported in similar studies of romantic partners (e.g., Simpson et al. 1992), suggesting that the influence of attachment in this context may be similar across relationships. Additionally, our finding that avoidance was associated with unsupportive behavior mainly when children's stress was high is consistent with observations of mothers of avoidant infants, who are likely to reject or ignore their infants' bids for comfort primarily when the infants are distressed (e.g., Ainsworth et al., 1978; Belsky et al., 1984; Grossmann et al., 1986).

There are several reasons why avoidant parents might be less supportive toward their dependent children when the children are most upset. First, although children's distress is more likely to activate a parent's caregiving system than his or her attachment system, individual differences in these two systems may be closely related (as documented by George & Solomon, 1999, and Kuncle & Shaver, 1994). Avoidant caregivers tend to dismiss or devalue their children's attachment needs, often adopting a strategy of providing care 'from a distance' (George & Solomon, 1999). Second, adults with an avoidant attachment style are generally uncomfortable with expressions of emotion, vulnerability, and distress (Feeney & Collins, 2003;

Mikulincer & Nachshon, 1991; Zeanah et al., 1993). One way to regulate that discomfort may be to distance oneself from others who are openly expressing distress. Consistent with this proposal, Mikulincer, Florian, and Weller (1993) found that avoidant adults were more likely than secure individuals to distance themselves from others as a coping strategy under stressful conditions. Third, individuals with an avoidant attachment style view themselves as less competent caregivers (e.g., Feeney & Collins, 2003; George & Solomon, 1999; Rholes et al., 1997); their anxiety about parenting may cause them to withdraw from distressed children precisely when parental competence is most urgently needed. Finally, avoidant individuals' discomfort with close physical contact (Fraley, Davis, & Shaver, 1998; Main, 1981) may prevent them from comforting their distressed children.

Results from the present study also indicated that the influence of adult attachment style on parental responsiveness was independent of general parental personality characteristics and of child temperamental factors. Such general characteristics, represented in this study by the Five-Factor Model, may be more relevant to parental behavior in less threatening, more everyday circumstances, whereas adult attachment may be more relevant to behavior under stress and in the context of attachment relationships. Consistent with this suggestion are the findings of Belsky et al. (1995), indicating that neuroticism, extraversion, and agreeableness predicted parental supportiveness in relatively non-threatening home observations. Because parental attachment was not measured by Belsky et al. (1995), and because we did not include a nonstressful event in the present study, the two studies cannot be directly compared. This comparison would be a valuable focus for future research.

Of note, our findings are consistent with research linking emotional availability and adult attachment status as assessed with the AAI (e.g., Biringen et al., 2000; Oyen et al., 2000). Biringen et al. (2000), for instance, found that mothers classified as secure on the AAI were more sensitive and structuring with their children than were mothers classified as insecure. In addition, mothers who scored high on the AAI 'lack of recall' coding scale, which is associated with an avoidant attachment classification (Hesse, 1999), were less sensitive with their children than were mothers with low scores on this scale. Thus, although self-report measures of adult attachment show only modest correspondence with the AAI, our findings are consistent with previous research suggesting that attachment classifications derived from the two types of measures may predict comparable outcomes.

It should also be noted that the relation between parental behavior and children's distress likely reflects a bidirectional process. That is, although our model emphasizes the influence of children's distress on parents' behavior, it is also likely that parental behavior influences children's reactions (e.g., Blount et al., 1989). Although our findings are consistent with previous research suggesting that caregiving behavior is driven, at least in part, by the distress exhibited by a child or relationship partner (e.g., Grossmann et al., 1986; Simpson et al., 1992), the correlational nature of our data precludes definitive interpretations about causality.

CONCLUSIONS

In summary, results from the present study suggest that self-report measures of adult attachment may be useful not only in the context of romantic relationships, but in that of parent-child relationships as well. Our findings are consistent both with

studies of romantic dyads in attachment-activating situations and with developmental studies of infant-mother attachment. Thus, the influence of self-reported attachment style on caregiving behavior may be similar across relationships and to that of other measures of attachment.

Moreover, that attachment measured in the context of *romantic* relationships is related to attachment behavior in the context of *parent-child* relationships suggests that individuals may have similar internal working models, and hold similar beliefs about attachment, across relationship domains. For instance, we found that parents who reported difficulty being depended upon by relationship partners (i.e., parents scoring high on avoidance) were observed to have an apparently similar difficulty being depended upon by their children during an inoculation. The source of this similarity may be an individual's comfort with serving as an attachment figure.

Finally, given that the measure used in this study was designed specifically to assess adult romantic attachment, self-report measures designed with parent-child relationships in mind may prove even more useful in the prediction of parental behavior. Thus, further research should explore the extent to which self-report measures could be used to study parent-child attachment relationships. Equally important would be an examination of the relative contributions of different types of adult attachment measures, given that different measures may better assess different components of attachment behavior and relationships.

NOTES

- 1 We also examined whether the relation between parental avoidance and responsiveness was *mediated* (as opposed to moderated) by children's distress; it was not, Sobel test z -value = -1.35 , $p = .18$.
- 2 Note that, in the present study, parental responsiveness did not mediate the relation between parental avoidance and children's distress, Sobel test z -value = $.93$, $p = .35$. It is possible that this relation reflects a history of interactions that was not captured by our behavioral observation of a single event.

REFERENCES

- Ahadi, S. A., Rothbart, M. K., & Ye, R. (1993). Children's temperament in the US and China: Similarities and differences. *European Journal of Personality*, *7*, 359-377.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Alexander, K. W., Goodman, G. S., Schaaf, J. M., Edelstein, R. S., Quas, J. A., & Shaver, P. R. (2002). Children's memory and suggestibility: Relations with attachment and cognitive inhibition. *Journal of Experimental Child Psychology*, *83*, 262-290.
- Aviezer, O., Sagi, A., Joels, T., & Ziv, Y. (1999). Emotional availability and attachment representations in kibbutz infants and their mothers. *Developmental Psychology*, *35*, 811-821.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology*, *61*, 226-244.
- Bartholomew, K., & Shaver, P. R. (1998). Methods of assessing adult attachment: Do they converge? In J. A. Simpson & W. S. Rholes (Eds), *Attachment theory and close relationships* (pp. 25-45). New York: Guilford Press.

- Belsky, J., Crnic, K., & Woodworth, S. (1995). Personality and parenting: Exploring the mediating role of transient mood and daily hassles. *Journal of Personality, 63*, 905–929.
- Belsky, J., Rovine, M., & Taylor, D. G. (1984). The Pennsylvania Infant and Family Development Project: II. The origins of individual differences in infant-mother attachment: Maternal and infant contributions. *Child Development, 55*, 718–728.
- Benoit, D., & Parker, K. C. (1994). Stability and transmission of attachment across three generations. *Child Development, 65*, 1444–1456.
- Berant, E., Mikulincer, M., & Florian, V. (2001). Attachment style and mental health: A 1-year follow-up study of mothers of infants with Congenital Heart Disease. *Personality and Social Psychology Bulletin, 27*, 956–968.
- Biringen, Z., Brown, D., Donaldson, L., Green, S., Krcmarik, S., & Lovas, G. (2000). Adult Attachment Interview: Linkages with dimensions of emotional availability for mothers and their pre-kindergarteners. *Attachment and Human Development, 2*, 188–202.
- Biringen, Z., Robinson, J. L., & Emde, R. N. (1998). *The Emotional Availability Scales, 3rd Edition*. Unpublished coding manual, Department of Human Development and Family Studies, Colorado State University.
- Blount, R. L., Corbin, S. M., Sturges, J. W., Wolfe, V. V., Prater, J. M., & James, L. D. (1989). The relationship between adults' behavior and child coping and distress during BMA/LP procedures: A sequential analysis. *Behavior Therapy, 20*, 585–601.
- Blount, R., Davis, N., Powers, S., & Roberts, M. (1991). The influence of environmental factors and coping style on children's coping and distress. *Clinical Psychology Review, 11*, 93–116.
- Bowlby, J. (1969). *Attachment and loss. Vol. I. Attachment*. New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss. Vol. II. Separation: Anxiety and anger*. New York: Basic Books.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.
- Carpenter, P. (1992). Perceived control as a predictor of distress in children undergoing invasive medical procedures. *Journal of Pediatric Psychology, 17*, 757–773.
- Cassidy, J. (2000). Adult romantic attachments: A developmental perspective on individual differences. *Review of General Psychology, 4*, 111–131.
- Clark, L. A., Kochanska, G., & Ready, R. (2000). Mothers' personality and its interaction with child temperament as predictors of parenting behavior. *Journal of Personality and Social Psychology, 79*, 274–285.
- Cohen, L. L., Blount, R. L., & Panopoulos, G. (1997). Nurse coaching and cartoon distraction: An effective and practical intervention to reduce child, parent, and nurse distress during immunizations. *Journal of Pediatric Psychology, 22*, 355–370.
- Cohen, L. L., Manimala, R., & Blount, R. L. (2000). Easier said than done: What parents say they do and what they do during children's immunizations. *Children's Health Care, 29*, 79–86.
- Cohn, D. A., Cowan, C. P., Cowan, P. A., & Pearson, J. A. (1992). Mothers' and fathers' working models of childhood attachment relationships, parenting styles, and child behavior. *Development and Psychopathology, 4*, 417–431.
- Cohn, D. A., Silver, D. H., Cowan, C. P., Cowan, P. A., & Pearson, J. A. (1992). Working models of childhood attachment and couple relationships. *Journal of Family Issues, 13*, 432–449.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Crowell, J. A., & Feldman, S. S. (1988). Mothers' internal models of relationships and children's behavioral and developmental status: A study of mother-child interaction. *Child Development, 59*, 1273–1285.
- Crowell, J. A., & Treboux, D. (1995). A review of adult attachment measures: Implications for theory and research. *Social Development, 4*, 294–327.

- Crowell, J. A., Fraley, R. C., & Shaver, P. R. (1999). Measurement of individual differences in adolescent and adult attachment. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 434–465). New York: Guilford Press.
- Crowell, J. A., Treboux, D., & Waters, E. (1999). The Adult Attachment Interview and the Relationship Questionnaire: Relations to reports of mothers and partners. *Personal Relationships*, 6, 1–18.
- De Wolff, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68, 571–591.
- Doctoroff, S. (1996). Parents' support of infants' object play: A review of the literature. *Infant-Toddler Intervention*, 6, 153–166.
- Donzella, B., Gunnar, M. R., Krueger, W. K., & Alwin, J. (2000). Cortisol and vagal tone responses to competitive challenge in preschoolers: Associations with temperament. *Developmental Psychobiology*, 37, 209–220.
- Dozier, M., & Kobak, R. R. (1992). Psychophysiology in attachment interviews: Converging evidence for deactivating strategies. *Child Development*, 63, 1473–1480.
- Dozier, M., Stovall, K. C., & Albus, K. E. (1999). Attachment and psychopathology in adulthood. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 497–519). New York: Guilford Press.
- Edelstein, R. S., & Shaver, P. R. (2004). Avoidant attachment: Exploration of an oxymoron. In D. Mashek & A. Aron (Eds), *Handbook of closeness and intimacy*. (pp. 397–412). Mahwah, NJ: Lawrence Erlbaum Associates.
- Feeney, B. C., & Collins, N. L. (2001). Predictors of caregiving in adult intimate relationships: An attachment theoretical perspective. *Journal of Personality and Social Psychology*, 80, 972–994.
- Feeney, B. C., & Collins, N. L. (2003). Motivations for caregiving in adult intimate relationships: Influences on caregiving behavior and relationship functioning. *Personality and Social Psychology Bulletin*, 29, 950–968.
- Feeney, J. A. (1999). Adult romantic attachment and couple relationships. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 355–377). New York: Guilford Press.
- Feeney, J. A., & Noller, P. (1992). Attachment style and romantic love: Relationship dissolution. *Australian Journal of Psychology*, 44, 69–74.
- Fraley, R. C., & Shaver, P. R. (1997). Adult attachment and the suppression of unwanted thoughts. *Journal of Personality and Social Psychology*, 73, 1080–1091.
- Fraley, R. C., & Shaver, P. R. (1998). Airport separations: A naturalistic study of adult attachment dynamics in separating couples. *Journal of Personality and Social Psychology*, 75, 1198–1212.
- Fraley, R. C., & Waller, N. G. (1998). Adult attachment patterns: A test of the typological model. In J. A. Simpson & W. S. Rholes (Eds), *Attachment theory and close relationships* (pp. 77–114). New York: Guilford Press.
- Fraley, R. C., Davis, K. E., & Shaver, P. R. (1998). Dismissing avoidance and the defensive organization of emotion, cognition, and behavior. In J. A. Simpson & W. S. Rholes (Eds), *Attachment theory and close relationships* (pp. 249–279). New York: Guilford Press.
- Fraley, R. C., Garner, J. P., & Shaver, P. R. (2000). Adult attachment and the defensive regulation of attention and memory: Examining the role of preemptive and postemptive defensive processes. *Journal of Personality and Social Psychology*, 79, 816–826.
- George, C., & Solomon, J. (1999). Attachment and caregiving: The attachment behavioral system. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 649–670). New York: Guilford Press.
- George, C., & West, M. (1999). Developmental vs. social personality models of adult attachment and mental ill health. *British Journal of Medical Psychology*, 72, 285–303.

- George, C., Kaplan, N., & Main, M. (1984). *Adult Attachment Interview*. Unpublished manuscript, University of California, Berkeley.
- Goertzel, L., & Goertzel, T. (1991). Health locus of control, self-concept, and anxiety in pediatric cancer patients. *Psychological Reports, 68*, 531–540.
- Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999). Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology, 13*, 475–483.
- Goldberg, S., MacKay-Soronko, S., & Rochester, M. (1994). Affect, attachment, and maternal responsiveness. *Infant Behavior and Development, 17*, 335–339.
- Gonzalez, J. C., Routh, D. K., & Armstrong, F. D. (1993). Effects of maternal distraction versus reassurance on children's reactions to injections. *Journal of Pediatric Psychology, 18*, 593–604.
- Goodman, G. S., Hirschman, J. E., Hepps, D., & Rudy, L. (1991). Children's memory for stressful events. *Merrill-Palmer Quarterly, 37*, 109–157.
- Goodman, G. S., Quas, J. A., Batterman-Faunce, J. M., Riddlesberger, M. M., & 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*, 54–75.
- Griffin, D., & Bartholomew, K. (1994). Models of the self and other: Fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology, 67*, 430–445.
- Grossmann, K. E., Grossmann, K., & Schwan, A. (1986). Capturing the wider view of attachment: A reanalysis of Ainsworth's strange situation. In C. E. Izard & P. B. Read (Eds), *Measuring emotions in infants and children* (Vol. 2, pp. 124–171). New York: Cambridge University Press.
- Hazan, C., & Shaver, P. R. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 59*, 511–524.
- Hesse, E. (1999). The adult attachment interview: Historical and current perspectives. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 395–433). New York: Guilford Press.
- Jacobsen, P. B., Manne, S. L., Gorfinkle, K., Schorr, O., Rapkin, B., & Redd, W. H. (1990). Analysis of child and parent behavior during painful medical procedures. *Health Psychology, 9*, 559–576.
- Jay, S. M. (1988). Invasive medical procedures: Psychological intervention and assessment. In D. K. Routh (Ed), *Handbook of pediatric psychology* (pp. 401–425). New York: Guilford Press.
- Jay, S. M., Ozolins, M., Elliott, C. H., & Caldwell, S. (1983). Assessment of children's distress during painful medical procedures. *Health Psychology, 2*, 133–147.
- Katz, E. R., Kellerman, J., & Siegel, S. E. (1980). Behavioral distress in children with cancer undergoing medical procedures: Developmental considerations. *Journal of Consulting and Clinical Psychology, 49*, 470–471.
- Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: Working models, affect regulation, and representations of self and others. *Child Development, 59*, 135–146.
- Kochanska, G., Clark, L. A., & Goldman, M. S. (1997). Implications of mothers' personality for their parenting and their young children's developmental outcomes. *Journal of Personality, 65*, 387–420.
- Kunce, L. J., & Shaver, P. R. (1994). An attachment-theoretical approach to caregiving in romantic relationships. In K. Bartholomew & D. Perlman (Eds), *Advances in personal relationships* (Vol. 5, pp. 205–237). London, England: Kingsley.
- Main, M. (1981). Avoidance in the service of attachment: A working paper. In K. Immelmann, G. Barlow, L. Petrinoitch, & M. Main (Eds), *Behavioral development: The Bielefeld interdisciplinary project* (pp. 651–693). New York: Cambridge University Press.

- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds), *Growing points in attachment theory and research. Monographs of the Society for Research in Child Development*, 50 (1–2, Serial No. 209), 66–104.
- Manne, S., Bakeman, R., Jacobsen, P., Gorfinkle, K., Bernstein, D., & Redd, W. (1992). Adult-child interaction during invasive medical procedures. *Health Psychology*, 11, 241–249.
- McCrae, R. R., & Costa, P. T. (1999). A five-factor theory of personality. In L. A. Pervin & O. P. John (Eds), *Handbook of personality: Theory and research* (2nd ed., pp. 139–153). New York: Guilford Press.
- Mikulincer, M., & Nachshon, O. (1991). Attachment styles and patterns of self-disclosure. *Journal of Personality and Social Psychology*, 61, 321–331.
- Mikulincer, M., & Orbach, I. (1995). Attachment styles and repressive defensiveness: The accessibility and architecture of affective memories. *Journal of Personality and Social Psychology*, 68, 917–925.
- Mikulincer, M., Birnbaum, G., Woddis, D., & Nachmias, O. (2000). Stress and accessibility of proximity-related thoughts: Exploring the normative and intraindividual components of attachment theory. *Journal of Personality and Social Psychology*, 78, 509–523.
- Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment styles, coping strategies, and posttraumatic psychological distress: The impact of the Gulf War in Israel. *Journal of Personality and Social Psychology*, 68, 817–826.
- Mikulincer, M., Gillath, O., & Shaver, P. R. (2002). Activation of the attachment system in adulthood: Threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology*, 83, 881–895.
- Milligan, K., Atkinson, L., Trehub, S. E., Benoit, D., & Poulton, L. (2003). Maternal attachment and the communication of emotion through song. *Infant Behavior and Development*, 26, 1–13.
- Oyen, A., Landy, S., & Hibern-Cobb, C. (2000). Maternal attachment and sensitivity in an at-risk sample. *Attachment and Human Development*, 2, 203–217.
- Putnam, S. P., Samson, A. V., & Rothbart, M. K. (2002). Child temperament and parenting. In M. H. Bornstein (Ed), *Handbook of parenting: Vol. 1: Children and parenting* (2nd ed), (pp. 255–277). Mahwah, NJ: Lawrence Erlbaum Associates.
- Quas, J. A., Goodman, G. S., Bidrose, S., Pipe, M., Craw, S., & Ablin, D. S. (1999). Emotion and memory: Children's long-term remembering, forgetting, and suggestibility. *Journal of Experimental Child Psychology*, 72, 235–270.
- Raval, V., Goldberg, S., Atkinson, L., Benoit, D., Myhal, N., Poulton, L., & Zwiars, M. (2001). Maternal attachment, maternal responsiveness, and infant attachment. *Infant Behavior and Development*, 24, 281–304.
- Rholes, W. S., Simpson, J. A., & Blakely, B. S. (1995). Adult attachment styles and mothers' relationships with their young children. *Personal Relationships*, 2, 35–54.
- Rholes, W. S., Simpson, J. A., Blakely, B. S., Lanigan, L., & Allen, E. A. (1997). Adult attachment styles, the desire to have children, and working models of parenthood. *Journal of Personality*, 65, 357–385.
- Rudolph, K. D., Dennig, M. D., & Weisz, J. R. (1995). Determinants and consequences of children's coping in the medical setting: Conceptualization, review, and critique. *Psychological Bulletin*, 118, 328–357.
- Shaver, P. R., & Brennan, K. A. (1992). Attachment styles and the "Big Five" personality traits: Their connections with each other and with romantic relationship outcomes. *Personality and Social Psychology Bulletin*, 18, 536–545.
- Shaver, P. R., Belsky, J., & Brennan, K. A. (2000). The adult attachment interview and self-reports of romantic attachment: Associations across domains and methods. *Personal Relationships*, 7, 25–43.
- Shaver, P. R., & Mikulincer, M. (2002). Attachment-related psychodynamics. *Attachment and Human Development*, 4, 133–161.

- Shrimpton, S., Oates, K., & Hayes, S. (1998). Children's memory of events: Effects of stress, age, time delay, and location of interview. *Applied Cognitive Psychology, 12*, 133–143.
- Simpson, J. A., Rholes, W. S., & Nelligan, J. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation: The role of attachment styles. *Journal of Personality and Social Psychology, 62*, 434–446.
- Simpson, J. A., Rholes, W. S., Oriña, M. M., & Grich, J. (2002). Working models of attachment, support giving, and support seeking in a stressful situation. *Personality and Social Psychology Bulletin, 28*, 598–608.
- Solomon, J., & George, C. (1999). The measurement of attachment security in infancy and childhood. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 287–316). New York: Guilford Press.
- Solomon, J., George, C., & DeJong, A. (1995). Children classified as controlling at age six: Evidence of disorganized representational strategies and aggression at home and at school. *Development and Psychopathology, 7*, 447–463.
- Spangler, G., & Grossmann, K. E. (1993). Biobehavioral organization in securely and insecurely attached infants. *Child Development, 64*, 1439–1450.
- Sroufe, L., & Waters, E. (1977). Heart-rate as a convergent measure in clinical and developmental research. *Merrill-Palmer Quarterly, 23*, 3–27.
- van IJzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the adult attachment interview. *Psychological Bulletin, 117*, 387–403.
- Vaughn, B. E., & Bost, K. K. (1999). Attachment and temperament: Redundant, independent, or interacting influences of interpersonal adaptation and personality development? In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 198–225). New York: Guilford Press.
- Vygotsky, L. S. (1962). *Thought and language*. New York, NY: Wiley.
- Watt, N. (1976). *Two-factor index of social position: Amherst modification*. Unpublished manuscript, Department of Psychology, University of Denver.
- Wertlieb, D., Weigel, C., Springer, T., & Feldstein, M. (1987). Temperament as a moderator of children's stressful experiences. *American Journal of Orthopsychiatry, 57*, 234–245.
- Zeanah, C. H., Benoit, D., Barton, M., Regan, C., Hirshberg, L. M., & Lipsitt, L. (1993). Representations of attachment in mothers and their one-year-old infants. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 278–286.

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