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Parenting and Temperament Prior to September 11, 2001, and Parenting Specific to 9/11 as Predictors of Children's Posttraumatic Stress Symptoms Following 9/11

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Parenting is related to children's adjustment, but little research has examined the role of parenting in children's responses to disasters. This study describes parenting responses specific to the 9/11 terrorist attacks and examines pre-9/11 parenting, child temperament, and 9/11-specific parenting as predictors of children's posttraumatic stress (PTS) symptoms among children geographically distant from the attack locations. A community sample of children and parents ($n = 137$, ages 9–13 years) participating in an ongoing study were interviewed 1 month following 9/11. Parents reported engaging in a number of parenting responses following 9/11. Pre-9/11 acceptance and 9/11-specific, self-focused parental responses predicted PTS symptoms. Pre-9/11 parenting and temperament interacted to predict PTS symptoms, suggesting that parenting and temperament are important prospective predictors of children's responses to indirect exposure to disasters.

This study examined posttraumatic stress (PTS) symptom outcomes in a sample of children who were geographically distant from the September 11, 2001, terrorist attacks. Direct exposure to traumatic events and cognitive and emotional responses to such events are related to the development of PTS symptoms (Salmon & Bryant, 2002). However, children do not need to experience disasters directly to be affected by them (e.g., Pfefferbaum et al., 2000), and indirect exposure to such events occurs at high rates among children (Comer & Kendall, 2007). Knowing someone killed or injured or being exposed to media about the events contributes to children's adjustment following major disasters, even among children geographically distant from disasters (e.g., Pfefferbaum et al., 2000; Pine, Costello, & Masten, 2005).

In the case of the 9/11 terrorist attacks, television exposure (number of hours and viewing graphic content) was related to higher levels of PTS symptoms in children following the events (e.g., Fairbrother, Stuber, Galea, Fleischman, & Pfefferbaum, 2003; Saylor, Cowart, Lipovsky, Jackson, & Finch, 2003). In children distant from the attacks, fearing a loved one might have died (Saylor et al., 2003) and knowing someone who died (Lengua, Long, Smith, & Meltzoff, 2005) were associated with higher levels of posttraumatic stress disorder (PTSD) symptoms. Another study found increased levels of PTS symptoms in a sample of adolescents in California (Whalen, Henker, King, Jamner, & Levine,

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2004), demonstrating that even in children physically distant from the attacks of 9/11, elevated levels of PTS symptoms were possible.

PARENTING AND CHILDREN'S PTS RESPONSES

Parental psychopathology and stress responses following disasters have been shown to relate to children's responses, as has social support provided by parents (Silverman & La Greca, 2002). However, relatively little research has examined the possible role that parenting might play in children's responses to disasters, despite growing evidence that parental stress responses contribute to children's adjustment (Pine et al., 2005). Following a major flood, Green et al. (1991) found that the magnitude of maternal stress reactions and a negative family atmosphere predicted PTS symptoms. Similar findings have been shown after Hurricane Hugo (Swenson et al., 1996) and following a nuclear waste disaster (Korol, Green, & Gleser, 1999). Thus, parental mental health is associated with children's adjustment, and one potential mechanism of this effect might be parenting behaviors or responses following a disaster.

Parenting is consistently related to children's adjustment and plays a significant role in children's responses to life stressors and violence (Gorman-Smith, Henry, & Tolan, 2004; Grant, Compas, Thurm, McMahon, & Gipson, 2004; Kliewer et al., 2004). For instance, maternal acceptance and consistent discipline relate to better child adjustment following stressors such as divorce (e.g., Wolchik, Wilcox, Tein, & Sandler, 2000). In a comparison of three groups of children exposed to ongoing violence in the home, a dog attack, or a minor life stressor, Rossman, Bingham, and Emde (1997) found that maternal acceptance was associated with lower levels of PTS symptoms across all groups. A study of preschool children who had been exposed to a variety of traumatic events (e.g., automobile accidents, domestic violence) found positive discipline moderated the relation between PTSD symptoms and autonomic regulation, such that consistent parenting had a protective effect by reducing reactivity (Scheeringa, Zeanah, Myers, & Putnam, 2004). Thus, parenting may impact the reduction or maintenance of children's PTSD symptoms. Parental acceptance and consistent discipline were examined in this study. We define acceptance as a parent's level of warmth and affection for the child, whereas consistency is defined as a parent's level of predictable discipline responses to children's behaviors. These core dimensions of parenting have been most studied in the literature relating to children's adjustment to stress and trauma, and theory suggests they may be particularly important to consider in the context of stress responses (e.g., Salmon & Bryant, 2002). An accepting parent–child relationship may provide security that is protective in times of stress, and a history of consistency may buffer children from the effects of disruption that can accompany traumatic events.

Parent responses following direct or indirect exposure to a disaster have the potential to influence children's stress responses. There are a number of mechanisms through which this might occur. First, parenting behaviors can change the level of indirect exposure that children receive. Limiting media exposure might serve to decrease indirect exposure, whereas the quality and amount of discussion might also be a form of indirect exposure. Second, parenting behaviors might assist or impede children's processing. For instance, explaining the events calmly or helping process emotional responses may facilitate children's cognitive and emotional processing. In contrast, parents who are extremely distressed themselves may be unavailable to provide assistance to their children. Children may also perceive heightened threat levels and experience more negative emotions if they see their parent experiencing distress. Children who saw their parents crying were more likely to seek counseling after 9/11 (Stuber et al., 2002). There is also evidence that among parents living in economically disadvantaged neighborhoods in Chicago, parenting practices, particularly supervision behaviors and rules, increased following the events of 9/11 (Henry, Tolan, & Gorman-Smith, 2004). In this study, we examine parental media restriction, perceptions of parental helpfulness, and ways in which parents explained the events of 9/11 to their children as predictors of PTS symptoms.

PARENTING, TEMPERAMENT, AND CHILDREN'S ADJUSTMENT

There is evidence that parenting and temperament interact to predict children's adjustment, and this may also be the case following disasters. Children's temperamental characteristics such as emotionality and self-regulation may be important prospective pretrauma predictors (Salmon & Bryant, 2002). Negative emotionality, or a child's tendency to experience negative affective states such as fear and irritability, might increase a child's risk for developing PTS symptoms. Children high in negative emotionality may experience higher levels of negative arousal when experiencing traumatic events. Effortful control, or a child's attention regulation and inhibitory control skills, might be protective, as children who are able to regulate their emotions and behaviors may also be more able to process traumatic experiences (Salmon & Bryant, 2002). Some evidence of the direct effects of temperament on PTS symptoms emerged from the sample used in the present study (see Lengua et al.,

2005). However, there is a growing body of research providing theoretical and empirical support for an interactional model of temperament and parenting in the prediction of children's adjustment (Belsky, 2005).

There is limited research on Temperament × Parenting interactions in the context of adjustment to stressors. Lengua, Wolchik, Sandler, and West (2000) investigated adjustment following divorce in middle childhood and found a stronger association between parental rejection and adjustment problems when children had lower levels of positive emotionality. Inconsistent discipline also interacted with temperament, such that inconsistency was more strongly related to problems for children high in impulsivity. Thus, beyond direct relations with PTS symptoms, parenting and temperament are likely to interact in the prediction of children's adjustment following a stressor such as the events of September 11, 2001.

Prospective research examining children's response to stressors and disasters has the potential to inform models of developmental psychopathology and prevention and intervention programs (Grant et al., 2004). The model that informed the current study is based on this disaster response model (Silverman & La Greca, 2002), as well as on models of PTS symptom development (see Figure 1). This theory presumes that parental responses following a disaster serve as important posttrauma factors in the development of PTS symptoms. The current prospective study examined the effects of parenting and child temperament from prior to the 9/11 terrorist attacks and parents' specific responses to the attacks in relation to children's PTS symptoms and related functional impairment in the context of indirect exposure. The three interlocking aims of the current longitudinal study were to (a) describe 9/11-specific parenting responses reported by parents and children, (b) investigate whether 9/11-specific parenting was related to children's PTS outcomes, and (c) examine pre-9/11 parenting and child temperament as predictors of PTS outcomes. In analyses, we accounted for child age, gender, minority status, and household income, which were selected a priori as they have been associated with PTS outcomes in previous research (e.g., Green et al., 1991; Salmon & Bryant, 2002), as well as preattack child adjustment problems and maternal depression.

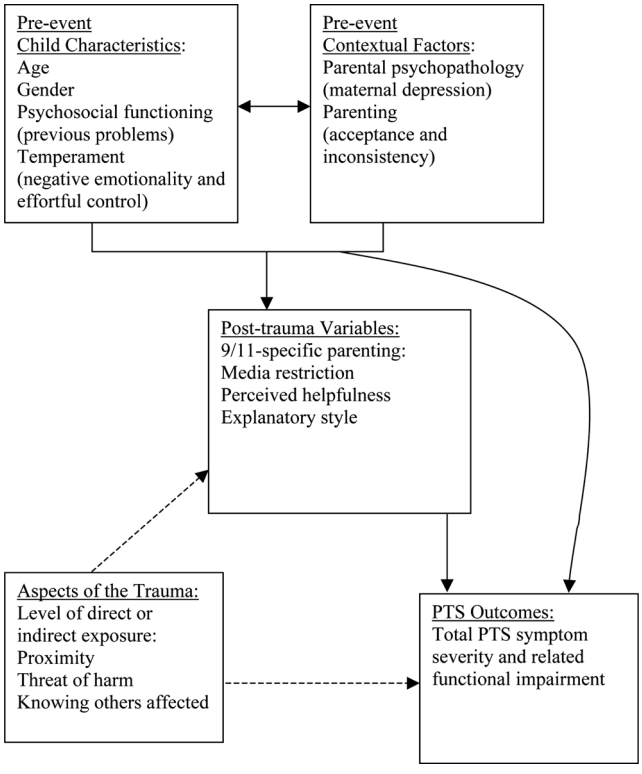

FIGURE 1 Model of child characteristics and parenting context in posttraumatic stress (PTS) symptom development. Adapted from Foa et al., 1989; Silverman & La Greca, 2002.

We hypothesized that 9/11-specific parenting would relate to PTS outcomes, specifically that 9/11-specific media restriction by parents and parental helpfulness after the attacks would be associated with lower PTS symptoms. We also hypothesized that pre-9/11 parenting and temperament would contribute to PTS outcomes and would interact to predict PTS outcomes. Pre-9/11 parental acceptance and consistency were hypothesized to relate to lower levels of PTS symptoms, whereas negative emotionality and lower effortful control were hypothesized to moderate the effects of parenting. Specifically, we expected acceptance and consistency to be more strongly associated with lower levels of PTS symptoms (i.e., be more helpful) for children lower in negative emotionality and higher in effortful control. This moderation model highlights the ways in which parenting and temperament work together to determine a child's risk for subsequent symptom development (Kraemer, Kiernan, Essex, & Kupfer, 2008).

METHOD

Participants

Participants were 137 children and their parents who were participants in an ongoing longitudinal study of child, family, and contextual influences on children's development. Participants in the ongoing study were recruited through public school classrooms in a major metropolitan area in the Pacific Northwest (Seattle, WA; see Lengua et al., 2005, for additional information). By 9/11/2001, 207 of 214 families in the larger study had completed either their first or second of three annual interviews as part of the larger study (preattack interview). All 207 families were contacted to participate in

phone interviews regarding children's responses to the 9/11 terrorist attacks. Of the 151 parents who agreed to participate, 6 agreed to be interviewed but elected not to have their children participate, resulting in a sample of 145 for child report. Seven families had paternal but not maternal report of parenting at 9/11 and were dropped from analyses because a measure of pre-9/11 father parenting was not available for the majority of these families. This resulted in a final sample of 137. In a previous study published from this same data set we describe PTS symptoms in this sample of 145 children (Lengua et al., 2005). Although the majority of children did not report clinical levels of PTS symptoms, 39% reported having upsetting thoughts about the attacks, 68% reported being upset by reminders, and 26% reported having flashbacks of the events. The average total score and the range on the Child PTSD Symptom Scale (CPSS) were lower for this Seattle sample ($M = 5.61$, $SD = 5.35$) than for the sample of children experiencing the Northridge earthquake used in CPSS development ($M = 7.6$, $SD = 8.1$). The level of impairment was quite low on a scale of 0 to 7 ($M = .36$), and 7.3% were above the symptom severity cutoff for a diagnosis of PTSD with functional impairment (Lengua et al., 2005). A description of PTS outcomes can be found in Table 1. In the current sample, 3 children reported knowing someone who had died in the attacks, specifically a "mom's friend's husband," an "aunt's cousin's husband," and a "father's friend."

Postattack interviews were started 2 weeks after 9/11 and completed 2 months after the attacks ($M = 28.89$ days, $SD = 11.29$). Children's mean age at the postattack interview was 10.94 years ($SD = 1.01$, range = 9.13–13.65). The average time between the preattack and postattack interviews was 6.69 ($SD = 3.04$) months. Fifty-three percent of children were girls (47% boys). According to parental report, 67% of children were Caucasian or European American, 13% were African American, 5% were Asian American, 4% were Hispanic or Latino, 1% was Native American, and 4% reported multiple ethnic or racial backgrounds. Sixty-six percent ($n = 91$) of families consisted of two biological-, adoptive-, or stepparent married or partnered families. Thirty-three percent ($n = 46$) were single-parent families headed by female caregivers. Average annual family income was $53,250 and ranged from less than $10,000 ($n = 8$) to more than $150,000 ($n = 5$). The average level of mothers' educational attainment was college or university graduate, ranging from 6 mothers having high school education or less to 7 mothers with doctoral degrees.

Families who elected to participate in postattack interviews and had complete data ($n = 137$) were compared to those who declined to participate on preattack sociodemographic (child age, child gender, mother and father education, income, family configuration) and child adjustment variables (parent- and child-report depression, anxiety, conduct problems). One significant difference was observed among 12 total comparisons. Fathers in families who did not participate had a lower average education level (technical or professional school) than fathers of families who participated (college or university graduate), $t(176) = 2.08$, $p < .05$.

TABLE 1
Descriptive Statistics for Preattack Variables and Postattack PTS Variables

	Range	*M*	*SD*	*Skewness*
Preattack Covariates				
Child Age	9.13–13.65	10.93	1.01	.20
Time Since Previous Interview (Months)	1.61–20.34	6.69	3.04	1.05
Time Since 9/11 (Days)	13.00–62.00	28.89	11.29	1.19
Maternal Depression	3.00–53.00	18.42	10.14	.81
Child Total Problems	2.00–69.00	25.28	13.68	.73
Preattack Parenting				
Acceptance/Rejection	26.00–70.00	57.01	7.18	−.84
Consistency	12.00–32.14	23.78	4.25	−.54
Preattack Temperament				
Negative Emotionality	27.36–63.21	42.50	5.92	.34
Effortful Control	45.50–88.00	70.60	8.54	−.18
Postattack Child PTS				
PTS Symptom Severity[a]	0.00–26.00	5.50	5.34	1.65
PTS Functional Impairment[b]	0.00–7.00	.36	1.01	4.16

Note: PTS = posttraumatic stress.

[a]7.3% of the sample scored above 11, the suggested clinical cutoff score.

[b]20.4% of the sample reported functional impairment in one or more areas.

Procedures

All study procedures were approved by the Institutional Review Board. Written informed consent was obtained from parents and assent was given by children for participation in the larger study. Preattack interviews were conducted using scripted 2-hr interviews in family homes. Parents and children were interviewed privately. Trained interviewers read scripted instructions and items from questionnaire measures, and recorded responses in writing. Families received $50 compensation. Post-9/11 data were collected using structured, scripted 1-hr phone interviews. Families who had completed either their first or second of three interviews as part of the larger research project were contacted by phone and asked whether they would participate in interviews regarding children's response to the terrorist attacks. Scripts were used to obtain parental consent and child assent to participate. Confidentiality was explained to parents and children, indicating that children's responses would not be shared with parents unless there was concern about child safety (i.e., high level of depression, suicidal

ideation, or child abuse). Interviewers read scripted instructions, open-ended and close-ended questionnaire items, and recorded responses in writing. Interviewers were trained in how to conduct a structured interview over the phone and had previous interview experience. Families received $20 compensation.

Measures

Covariates. Information regarding the age and sex of the child, child ethnicity, and family income was obtained from the mother's preattack structured questionnaire interview. Due to the small numbers of children in some ethnic groups limiting the ability to examine differences across ethnic or racial groups, ethnic minority status was used as a covariate in analyses.

Pre-9/11 child problems. Mother report of children's pre-9/11 problems was obtained from the mother's preattack interview ratings on the Child Behavior Checklist for children 6–18 (Achenbach, 1991), a 113-item questionnaire measure designed to assess a range of psychological problems. The raw Child Behavior Checklist for children 6–18 total problems score was used in the current study. This includes the sum of all items contained in the Withdrawn, Anxious/Depressed, Delinquent Behavior, Aggressive Behavior, Somatic Complaints, and Attention Problems scales. Alpha of this total problems scale in the current sample was .93.

Pre-9/11 maternal depression. Preattack mother-report of depression symptoms was obtained using the total score from the Center for Epidemiological Studies–Depression scale, a commonly used measure of depression in adults. Alpha in this sample was .83.

Pre-9/11 parenting. Preattack parenting was assessed using parent and child reports on questionnaire measures collected during the family's preattack interview. Two dimensions of maternal parenting were included: Acceptance/rejection and consistent discipline. Mother and child reports of the dimensions were combined to address the effects of shared method variance and reporter bias and to reduce the number of analyses conducted (Biesanz & West, 2004). Mother- and child-report of maternal acceptance/rejection and consistent discipline were assessed using the Child Report of Parenting Behavior Inventory (CRPBI; Schaefer, 1965; Teleki, Powell, & Dodder, 1982). Alphas on the CRPBI have been reported in the literature to be .80 or higher. The acceptance and rejection scales for the CRPBI were combined to create a measure of acceptance/rejection, including items such as, "My parent makes me feel better after talking over my worries with them." Items loading on the original rejection scale were reverse coded and then summed with the acceptance scale items to create a scale ranging from 0 to 18. The alpha for this combined scale in the current sample was .83 for mother report and .88 for child report. The acceptance/rejection scale was also combined across mother and child reports by calculating the mean of the z score of mother-report and the z score of child-report acceptance/rejection. Mother- and child-reports were correlated ($r = .32$, $p < .01$).

Mother and child reports of consistent discipline were taken from the CRPBI inconsistent discipline scale, which includes items such as, "My parents punish me for doing something one day but ignore it the next." Items were reverse scored to create a consistency scale. This eight-item scale had an alpha of .80 for both mothers and children in the current sample. A combined mother- and child-report consistency score was created by calculating the mean of the z score of mother-report consistent discipline and the z score of child-report consistent discipline. Mother- and child-report consistent discipline were significantly correlated ($r = .19$, $p < .05$).

Child temperament. Children's preattack negative emotionality and effortful control were assessed via mother and child report on the Early Adolescent Temperament Questionnaire (EATQ; Capaldi & Rothbart, 1992) and the Child Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fisher, 2001). Subscale internal consistency reliabilities ranging from .65 to .79 have been reported for these measures. Mother and child reports of the dimensions were combined to address the effects of shared method variance and reporter bias and to reduce the number of analyses conducted (Biesanz & West, 2004). Negative emotionality was assessed by combining mother and child reports on the fear and irritability subscales of the EATQ (Capaldi & Rothbart, 1992), which includes items such as, "gets angry when told she has to go to bed" and "is afraid of loud noises." Composite alpha in the current sample was .63. The questionnaire measure of effortful control included mother and child report on the attention regulation subscale of the EATQ (Capaldi & Rothbart, 1992) and the inhibitory control subscale of the Child Behavior Questionnaire (Rothbart et al., 2001). Example items include "easily shifts from one task to another" and "can wait before entering into new activities if he or she is asked to." Reports were combined by averaging standardized mother- and child-report scores. Composite alpha in the current sample was .77. Mother- and child-report negative emotionality were significantly correlated ($r = .26$, $p < .01$), as were mother- and child-report effortful control ($r = .20$, $p < .01$).

9/11-specific parenting responses. Parenting responses specific to the events of 9/11 were assessed during the postattack interview using child and parent responses to open-ended and close-ended questions. The 9/11-specific parenting responses included parent and child report of media restriction, perceived parental helpfulness, and explanatory response type (passive, fact based, emotional, reassuring, and self-focused). Parent and child report of 9/11-specific parenting were examined separately, as previous research has shown discrepancies in children's and parent's reports of events and symptoms following a disaster (e.g., Shemesh et al., 2005).

Two close-ended items were used to assess parent report of media restriction. Positive responses for two items ("Did you try to protect your child from the information and images of the attack in the week following the attack?" and "Did you limit TV viewing?" 1 = *yes*; 0 = *no*) were summed to assess parent report. Child report of parental media restriction was assessed using children's response to a single close-ended item ("In the week after the attack, did your parent(s) limit how much you watched the news about the attack on TV?" 1 = *yes*; 0 = *no*). Parent and child report of media restriction were significantly correlated ($r = .21$, $p < .05$).

Parent report of perceived helpfulness after the attacks was assessed on a 5-point scale based on responses to two items ("Have you talked with your child about the attack?" 0 = *no*, 1 = *yes*; "How helpful do you think you have been when talking with your child?"). Parents reporting not talking to their children received a score of 0, and parents who reported talking with their children received the following scores corresponding to their response to the item "How helpful do you think you have been when talking with your child?": 1 = *hardly at all*, 2 = *a little*, 3 = *pretty much*, 4 = *a lot*. Child report of parent's helpfulness was assessed using the same ratings based on parallel items ("Have you talked with your parent(s) about it?" and "How helpful has it been to talk with your parent(s)?"). Parent and child report of perceived helpfulness were not significantly correlated ($r = .14$, $p < .10$).

A coding system was developed to assess explanatory responses based on a review of a sub-set of responses from 15 families that were randomly selected after data collection was complete. Two research assistants independently generated lists of the most frequently occurring responses and met with the principal investigator to identify consensus on codes for each open-ended item. Ninety percent agreement between research assistants was achieved prior to independent coding. Ten percent of independently coded cases were coded twice to assess for interrater reliability, and kappas ranged from .68 to .97. Mean reliability was a kappa of .82. Each response that was coded was assigned a single code. The number of responses given was not considered in the coding system, and individuals might be coded on multiple categories.

Parents' responses to open-ended questions about how they told their child about the attacks were used to assess explanatory response. Maternal responses to three open-ended items ("If you told your child about it, what did you say/how did you tell him/her?"; "If your child found out on the TV news or other media, what did you say to him or her about it?"; "How did you explain the attack to your child (if you did)?") were coded using 19 possible coded responses. The parent received a 0 (*not present*) or a 1 (*present*) for each of the possible responses. The 19 codes were grouped into five broad categories. *Passive* explanatory response included three responses (e.g., "Did not talk about it"; "Just watched"). *Fact-based* explanatory response included eight responses (e.g., "Explained basic facts"; "Explained terrorism"). *Emotional* explanatory response included four responses (e.g., "Talked about the child's emotions"; "Talked about the feelings of others"; "Acknowledged the gravity of the event"). *Reassuring* explanatory response included two responses (e.g., "Gave reassurances of safety"; "Said everything was going to be OK"). *Self-focused* responses included two responses (e.g., "Didn't know what to say"; "Was too upset to explain anything"). The same 19 coded responses were used for child-report explanatory response scores. However, children's responses to a single open-ended interview item ("How did your parents explain the attacks to you?") were used, resulting in more limited ranges (see Table 2). Parent and child reports were correlated as follows: Passive, $r = .28$, $p < .001$; Fact based, $r = .22$, $p < .01$; Emotional, $r = .13$, *ns*; Reassuring, $r = -.05$, *ns*; Self-focused, $r = .44$, $p < .001$.

PTS symptoms. PTS symptoms were assessed using children's responses to the 17-item CPSS (Foa, Johnson, Feeny, & Treadwell, 2001). The CPSS assesses PTSD symptom domains of re-experiencing (five items, e.g., "having upsetting thoughts or images about the event"), avoidance (seven items, e.g., "trying not to think about, talk about the event"), and arousal (five items, e.g., "being jumpy or easily startled"). This scale is administered in relation to an identified index event, and "the terrorist attacks on 9/11" was used as the index event. Children rated whether the symptom occurred not at all or 1 time (0), once a week or less, or once in a while (1), 2 to 4 times a week or a lot (2), or 5 or more times a week or almost always (3). The measure correlates strongly with an existing measure of PTSD and has a reported alpha of .89 (Foa et al., 2001). The Cronbach's alpha in the current sample was .82. A seven-item scale assesses the degree of functional impairment in areas

TABLE 2
Descriptive Statistics for 9/11-Specific Parenting Variables

9/11 Specific Parenting Variable	*Possible Range*	*Observed Range*	*M*	*SD*
Media Restriction				
Mother-Report	0.00–2.00	0.00–2.00	1.19	.92
Child-Report	0.00–1.00	0.00–1.00	.23	.42
Perceived Helpfulness				
Mother-Report	0.00–4.00	0.00–4.00	2.9	.92
Child-Report	0.00–4.00	0.00–4.00	2.6	1.28
Explanatory Response				
Mother-Report				
Passive	0.00–9.00	0.00–4.00	.51	.75
Fact Based	0.00–24.00	0.00–4.00	1.46	1.01
Emotional	0.00–12.00	0.00–3.00	.55	.70
Reassuring	0.00–6.00	0.00–2.00	.24	.49
Self-focused	0.00–6.00	0.00–3.00	.20	.52
Explanatory Response				
Child-Report				
Passive	0.00–4.00	0.00–2.00	.37	.53
Fact Based	0.00–8.00	0.00–2.00	.63	.57
Emotional	0.00–4.00	0.00–2.00	.17	.40
Reassuring	0.00–2.00	0.00–1.00	.05	.22
Self-Focused	0.00–2.00	0.00–1.00	.03	.17

such as relationships, schoolwork, chores, and hobbies (e.g., ''Have the problems you just told me about gotten in the way of doing... your chores and duties at home?''). Responses were scored 1 (*yes*) and 0 (*no*) and summed to create the functional impairment score. Foa et al. (2001) reported a correlation of .42 between functional impairment and PTS symptoms. In this study, the correlation was .41 ($p < .001$).

Data Analyses

Multiple linear regressions were used to test several potential models of how pre-9/11 and 9/11-specific parenting were related to children's subsequent PTS symptom severity and functional impairment. Pre-9/11 child temperament was also considered as a direct predictor of PTS outcomes and was tested as a moderator of the relations of pre-9/11 parenting to PTS outcomes. Models were tested separately for mother and child report of 9/11-specific parenting. Significant interactions were probed and simple slope terms were tested (as per Aiken & West, 1991).

RESULTS

Descriptive Statistics

Descriptive statistics for preattack covariates, parenting, and temperament, as well as postattack PTS symptoms and functional impairment are outlined in Table 1. Children reported relatively low levels of PTS symptoms and functional impairment, lower than what was seen in a sample of children directly experiencing an earthquake (e.g., Foa et al., 2001). With regards to PTS symptom severity, 7.3% of the sample reported scores in the clinical range. PTS symptom severity scores were somewhat skewed, with a mean of 5.50 and a median of 3.91 (skewness = 1.65). As functional impairment scores were non-normally distributed (skewness = 4.16), multiple regression analyses predicting functional impairment were also conducted with a transformed variable, the square root of impairment scores (range = 0–2.65, $M = .26$, $SD = .55$, skewness = 2.20). Patterns of direct and interaction effects were nearly identical using this transformed outcome, thus the original functional impairment score is presented in all analyses reported next.

9/11-specific parenting responses. Participants reported that mothers engaged in a range of parenting responses following the attacks (see Table 2). The majority of mothers indicated that they restricted their children's media exposure following the attacks, although a smaller portion of children reported that their mother restricted media. Maternal perceived helpfulness was slightly higher for mother-report than for child-report. The vast majority of mothers and children reported talking with each other about the attacks (98.9% of mothers; 95.3% of children). Mothers and children reported that mothers used a variety of explanatory responses when talking with their children about the attacks. Fact-based explanations were most frequently reported (see Table 2). Thus, mothers seemed to focus on providing children with factual information about the events when talking with their children, and made efforts to protect children from media exposure. Overall, mothers felt their parenting responses were helpful.

Correlations Among Study Variables

Correlations among the study variables are reported in Table 3. To reduce the likelihood of Type I errors, significance level was adjusted to .02 utilizing a family-wise Sidak's correction accounting for intercorrelation among variables. First we considered potential covariates for subsequent analyses. Younger children reported higher PTS symptom severity. Child gender, minority status, and family income were each related to at least one of the predictors. Pre-9/11 child problems were associated with PTS functional impairment. Therefore, child age, gender, ethnic minority status, family income, and pre-9/11 problems were included as covariates in subsequent analyses.

TABLE 3
Correlations Among Pre-9/11 Variables and PTS Outcomes

	Pre-9/11											*Post-9/11*	
	Gender	*Ethnic Minority*	*Family Income*	*Time Since PI*	*Time 9/11*	*Maternal Depression*	*Child Problems*	*Accept/ Reject*	*Consistency*	*Negative Emotion*	*Effortful Control*	*PTS Symptom Severity*	*PTS Impairment*
Pre-9/11													
Child Age	.06	−.01	−.05	−.04	−.07	−.10	.05	.01	.23**	−.25**	.14	−.20*	−.09
Child Gender[a]		−.04	−.01	−.08	−.08	.07	.14	−.08	−.04	−.04	−.19*	−.08	.08
Ethnic Minority Status[b]			−.40**	−.08	.03	.07	.01	−.11	−.30**	.14	−.13	.10	−.01
Family Income				−.03	.02	−.33**	−.28**	.20*	.33**	−.21*	.18	−.14	−.13
Time Since PI					−.20*	−.04	.06	.01	−.04	.10	−.05	.07	−.08
Time Since 9/11						−.05	−.08	.12	.11	.04	−.05	−.03	−.05
Maternal Depression							.32**	−.19	−.34**	.22**	−.18	−.04	−.05
Child Problems								−.32**	−.37**	.39**	−.51**	.16	.27**
Accept/Reject[c]									.42**	−.18	.41**	−.23**	−.12
Consistency													−.18
Negative Emotion											−.38**	.20*	.06
Effortful Control												−.24**	−.24**
Post-9/11 PTS Symptom Severity													.41**

Note: PTS = posttraumatic stress; PI = previous interview.
[a]Coded female = 1 male = 2.
[b]Coded 0 = nonminority, 1 = minority.
[c]Higher scores indicate more acceptance.
*$p \leq .02$. **$p \leq .01$ (Significance level adjusted for Type I error).

Maternal acceptance/rejection was negatively correlated with PTS symptom severity. Pre-9/11 consistency was negatively associated with PTS symptom severity. Pre-9/11 negative emotionality was positively associated with PTS symptom severity, whereas pre-9/11 effortful control was negatively associated with both PTS symptom severity and impairment. Therefore, both pre-9/11 parenting and child temperament were plausible predictors of PTS outcomes.

Predicting PTS Symptoms: Does 9/11-specific Parenting Predict PTS above the Contribution of Pre-9/11 Parenting?

Multiple regressions were used to test whether (a) pre-9/11 parenting predicted children's PTS symptoms and impairment above the contributions of covariates and maternal depression symptoms, and (b) whether 9/11 specific parenting predicted PTS symptoms and functional impairment above the effects of pre-9/11 parenting (see Table 4). Of the Step 1 covariates, child age was associated with PTS symptom severity, with younger children reporting higher levels of symptoms. In Step 2, pre-9/11 maternal depression and pre-9/11 child problems did not contribute significantly to PTS symptom severity. In Step 3, pre-9/11 consistency did not make a significant contribution to children's PTS symptoms. However, pre-9/11 maternal acceptance was associated with PTS symptom severity in the final step of some regressions. Neither mother nor child report of 9/11-specific media restriction entered in Step 4 predicted PTS outcomes. Total R^2 in these models was .13 and .12, respectively. Mother and child report of 9/11-specific perceived helpfulness was related to children's PTS symptom severity, although the direction of association was not the same across reporters (mother-report, $\beta = -.20$, $p < .01$; child-report, $\beta = .19$, $p < .05$). Higher levels of mother-report perceived helpfulness were associated with lower levels of PTS symptom severity, whereas higher levels of child-report maternal helpfulness predicted higher symptom severity. Total R^2 in both models was .15.

All mother-report explanatory style variables were entered together as a block in the final step of the regressions, as were child-report variables in a separate regression. The majority of mother- and child-report explanatory response variables, passive, fact based, emotional, and reassuring were not significant predictors

TABLE 4
Predicting PTS Symptom Severity: 9/11-Specific Parenting

			Media Restriction		*Perceived Helpfulness*		*Explanatory Style*	
		β at Entry	*Mother-Report*	*Child-Report*	*Mother-Report*	*Child-Report*	*Mother-Report*	*Child-Report*
Step 1: Covariates: ΔR^2	.07^t							
Child Age		−.19*	−.16	−.18*	−.19*	−.18*	−.21*	−.16
Child Gender[a]		−.08	−.11	−.11	−.12	−.06	−.13	−.11
Child Ethnic Minority Status[b]		.04	.03	.02	.01	.02	.04	.04
Family Income		−.13	−.08	−.09	−.06	−.08	−.12	−.10
Step 2: Pre-9/11 Symptoms: ΔR^2	.02							
Maternal Depression		−.06	−.08	−.08	−.10	−.06	−.09	−.04
Child Total Problems		.17	.11	.11	.14	.08	.12	.09
Step 3: Pre-9/11 Parenting: ΔR^2	.03							
Acceptance/Rejection		−.17^t	−.20*	−.17	−.09	−.21*	−.16	−.20*
Consistency		−.05	−.05	−.05	−.06	−.05	−.04	−.05
Step 4: 9/11-Specific Parenting: ΔR^2			.01	.00	.03*	.03*	.07	.07
Media Restriction (Mother)			.10					
Or Media Restriction (Child)				.01				
Or Perceived Helpfulness (Mother)					−.20**			
Or Perceived Helpfulness (Child)						.19*		
Or Explanatory Style:								
Passive							−.01	−.06
Fact Based							.00	.09
Emotional							−.04	.06
Reassuring							−.16	−.07
Self-Focused							.22**	.19*

Note: Values are standardized beta coefficients at final step. Step 4 was conducted separately for each variable for a total of six regressions.
[a]Coded female = 1, male = 2.
[b]Coded nonminority = 0, minority = 1.
$^*p \le .05$. $^{**}p \le .01$. $^t p < .10$.

of PTS symptom severity. Mother- and child-report of mothers' self-focused explanatory style predicted higher PTS symptom severity ($\beta = .22$, $p < .01$, $\beta = .19$, $p < .05$, respectively). Thus, when mothers and children reported higher levels of self-focused maternal explanatory styles after 9/11, children's reports of their own PTS symptoms were also higher. Total R^2 in mother and child explanatory style models was .19.

In the prediction of PTS functional impairment, the effects of the covariates and pre-9/11 maternal depression were not significant. Pre-9/11 child problems was a significant predictor in Step 2 of the regression ($\beta = .26$, $p < .01$), with higher levels of pre-9/11 problems predicting higher functional impairment. In Step 3, pre-9/11 parenting variables were not significant predictors of functional impairment. In Step 4 of the regressions, 9/11-specific parenting variables did not predict functional impairment. Variance accounted for in regression models predicting PTS functional impairment was low, with total R^2 statistics ranging from .09 to .14.

The Direct and Moderating Effects of Pre-9/11 Temperament

Next, the direct effects of pre-9/11 temperament and their interactions with pre-9/11 parenting were tested (see Table 5). Covariates were entered in Step 1, followed by pre-9/11 maternal depression and child problems in Step 2 and pre-9/11 parenting in Step 3. Pre-9/11 negative emotionality and effortful control entered in a fourth step did not make any significant additional contribution to PTS outcomes. All parenting by temperament interaction terms were entered in a fifth and final step. Pre-9/11 maternal acceptance and child negative emotionality interacted significantly in the prediction of PTS symptom severity, above the direct effects of pre-9/11 temperament and parenting (see Figure 1). For children with low levels of negative emotionality, higher levels of maternal acceptance were associated with lower levels of PTS symptoms ($b = -1.23$, $t = -1.97$, $p < .05$). Maternal acceptance was less strongly associated with PTS symptoms when children were at mean or high levels of negative emotionality, and children higher in negative emotionality had higher levels of PTS regardless of the level of maternal acceptance. There was also a significant interaction between maternal acceptance and effortful control (see Figure 2). Acceptance was more strongly negatively related to PTS symptoms for children low in effortful control ($b = -1.01$, $t = -3.26$, $p < .01$) than for children at higher levels, who had lower levels of PTS regardless of maternal levels of acceptance. Children low in effortful control had the highest levels of PTS when mothers were low in acceptance. Thus, maternal acceptance appears to be more helpful for children low in negative emotionality, and low acceptance is more detrimental for children low in effortful control. Total R^2 for this model was .19.

Pre-9/11 maternal consistency interacted with negative emotionality and effortful control in the prediction of PTS functional impairment. At low levels of negative emotionality, lower consistency predicted higher levels of PTS functional impairment ($b = -.20$, $t = -2.68$, $p < .01$). Consistency was less strongly associated with functional impairment at mean and high levels of negative emotionality. Children lower in negative

TABLE 5
Predicting PTS Outcomes: Contribution of Temperament

		PTS Symptom Severity			*PTS Functional Impairment*	
		β at Entry	*β at Final Step*		*β at Entry*	*β at Final Step*
Step 1: Covariates: ΔR^2	.07			.03		
Step 2: Pre-9/11 Symptoms: ΔR^2	.02			.06*		
Step 3: Pre-9/11 Parenting: ΔR^2	.03			.00		
Acceptance/Rejection		−.17	−.15		−.02	.03
Consistency		−.05	−.05		−.07	−.09
Step 4: Pre-9/11 Temperament: ΔR^2	.01			.02		
Negative Emotionality		.07	.12		−.11	−.08
Effortful Control		−.09	−.05		−.14	−.16
Step 5: Parent × Temperament: ΔR^2	.07*			.06		
Accept × Negative Emotionality			.22*			−.01
Accept × Effortful Control			.23*			−.06
Consistent × Negative Emotionality			−.07			−.26*
Consistent × Effortful Control			.05			−.27*
Total R^2	.19			.17		

Note: Values are standardized beta coefficients. PTS = posttraumatic stress.
*$p \leq .05$. **$p \leq .01$.

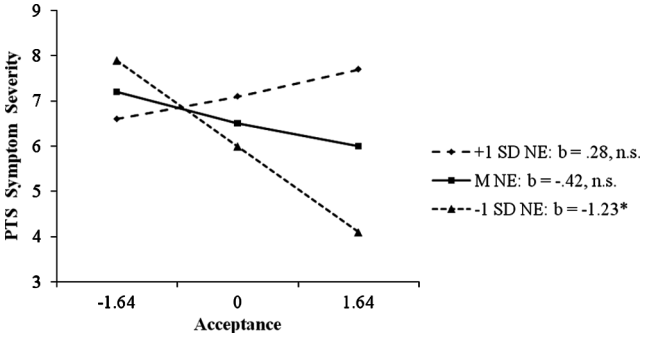

FIGURE 2 Acceptance × Negative Emotionality predicting posttraumatic stress (PTS) symptom severity.

emotionality had higher levels of functional impairment when mothers were low on consistency. At low levels of effortful control, lower consistency predicted higher PTS impairment ($b = -.23$, $t = -2.91$, $p < .01$). Consistency was less strongly associated with functional impairment at mean and high levels of effortful control. Children lower in effortful control had higher levels of impairment when mothers were low in consistency. Thus, low consistency appears to be more detrimental for children low in negative emotionality and for children low in effortful control. Total R^2 for this model was .17.

Post Hoc Power Analyses

The level of power present to detect direct effects in multiple regression analyses was calculated. With a sample size of 137 ($a = .05$), regression models with 9 to 14 predictors and observed R^2 values ranging from .12 to .19, the observed power was adequate, ranging from .85 to .97. The power available to detect interaction effects was somewhat limited for detecting small effect sizes. Observed power with a sample size of 137 was estimated between .47 and .60, thus, some small interaction effects might have gone undetected.

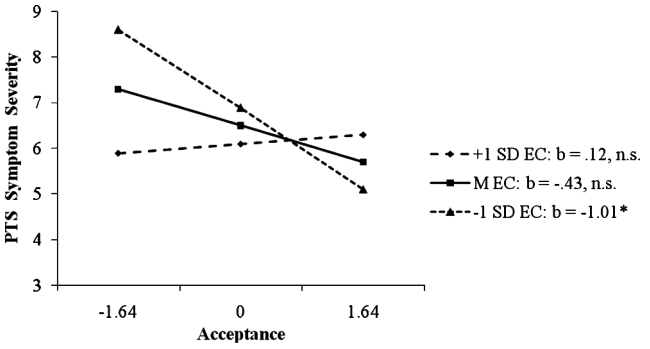

FIGURE 3 Acceptance × Effortful Control predicting posttraumatic stress (PTS) symptom severity.

DISCUSSION

This study examined pre-9/11 parenting and child temperament, as well as parental responses following the terrorist attacks of September 11, 2001, as predictors of children's PTS symptoms among children geographically distant from the events. Results may not generalize to the experiences of children who are more proximal to such events or who experience higher levels of threat to their physical well-being. Researchers have called for greater attention to prospective predictors of children's PTS symptoms following disasters (e.g., Silverman & La Greca, 2002). The attacks presented a unique opportunity to examine the role of prospective predictors and Parenting × Temperament interactions in post-9/11 adjustment. These types of models can help determine which children may be most susceptible to indirect exposure to traumatic events (Kraemer et al., 2008). Research considering parenting as a prospective predictor of child PTS symptoms is limited, and this study provided information about the role that parenting and parent responses play in predicting children's PTS symptoms.

Pre-9/11 Parenting

Specifically, acceptance/rejection predicted PTS symptom severity, and some 9/11-specific parent responses contributed to PTS symptoms beyond the effects of pre-9/11 parenting. Mothers' self-focused responses following 9/11, which appeared to reflect their emotional distress, were related to greater PTS symptom severity. Our findings are also relevant to the parenting and temperament literature. Pre-9/11 parenting and temperament interacted with each other to predict PTS outcomes. For instance, maternal acceptance appeared to be more helpful for children low in negative emotionality, whereas children higher in negative emotionality demonstrated higher PTS symptoms despite levels of maternal acceptance. Also, low levels of maternal acceptance seemed to be more detrimental for children low in effortful control.

Results indicate that pre-9/11 maternal acceptance, but not consistent discipline, was related to lower levels of PTS symptoms, supporting the idea that the existing parent-child relationship contributes to children's responses to stressful events (e.g., Grant et al., 2004; Wolchik et al., 2000). Accepting parenting may have a salient role to play in the prevention of PTS symptoms, which is supported by recent research indicating that positive parenting helps children learn how to regulate their emotions (Eisenberg et al., 2005). In the case of an event such as 9/11, an ongoing accepting and warm relationship may facilitate children's processing and regulation of emotions. Higher levels of maternal

acceptance may engender a context of security and comfort for children when major stressors occur.

Parenting responses specific to 9/11 were associated with PTS symptoms. Mother-report perceived helpfulness was associated with lower PTS symptom severity above the effects of pre-9/11 parenting, suggesting that when parents feel they are being helpful, this is likely to be accurate. Parents might be instructed to seek additional psychological help for their children when they feel their efforts to assist their children are not working. Unexpectedly, children who reported their mothers were more helpful after 9/11 reported higher levels of PTS symptoms. This result likely reflects the fact that children who were more distressed required more support and recognized that their mothers were doing more to help them manage distress. It is also possible that children perceived their mothers' extra attention as out of the ordinary, emphasizing that something was wrong, which might contribute to PTS symptoms.

In addition, self-focused maternal responses were related to higher levels of PTS symptoms. Self-focused explanatory responses may be capturing mothers' negative affect or distress in response to the stressful event. It might be particularly frightening for children to see their parents seemingly lacking in emotional control, further intensifying the children's own distress. Parents might be advised that the reactions they display in their children's presence can impact their children and to seek help or talk privately with other adults if they are so distraught that they cannot modulate their responses around their children. This finding is also consistent with other PTS research and theory that indicates parental modeling of emotional and coping responses is important in promoting children's natural recovery after a stressful or traumatic event (e.g., Green et al., 1991; Pine et al., 2005). As has been suggested by other researchers, many of the changes made by parents following stressors may be adaptive (Henry et al., 2004). In addition, some of the existing advice that is provided to parents, such as the advice provided by the Federal Emergency Management Agency (2004) indicating that children take their cues for how to respond from parents, is strongly supported by the findings of this study, and could be more widely disseminated. Interventions designed to train parents in media literacy and encourage positive coping have shown initial efficacy at reducing children's perception of threat from terrorist attacks in laboratory settings (Comer et al., 2008). These types of interventions hold promise for improving the positive influence of parents.

Our findings support the interactive nature of parenting and temperament (e.g., Belsky, 2005), suggesting that these interactions play a role in the development of PTS symptoms and related functional impairment. These findings are also commensurate with disaster response models that posit child temperament makes a contribution to PTS symptoms, as temperament was correlated with PTS outcomes and moderated the effects of parenting. This work is consistent with findings in the context of other major stressors such as divorce (e.g., Lengua et al., 2000). Our findings indicate that protective effects of maternal acceptance are most beneficial for children low in negative emotionality and not as beneficial for children high in negative emotionality. Children high in negative emotionality had higher levels of PTS symptoms regardless of maternal acceptance. These children may have difficulty focusing on positive aspects of their social context and might have higher levels of negative affect in the face of stressful events, regardless of the level of acceptance provided by parents. Children low in negative emotionality are not likely to develop PTS symptoms unless mothers fail to provide a warm, accepting relationship, perhaps because mothers are not supporting their emotional responses. Our findings also suggest that children high in effortful control are less likely to develop PTS symptoms regardless of maternal acceptance. This is consistent with literature suggesting that children high in effortful control are likely to be able to inhibit and regulate their emotional responses in order to process negative events successfully (e.g., Salmon & Bryant, 2002). For children low in effortful control who are less able to regulate emotions following a stressor, low levels of acceptance may further contribute to symptoms while accepting parenting may assist in regulating negative affect and stress responses (e.g., Scheeringa et al., 2004).

It should be noted that the level of functional impairment was low, which was expected given the indirect exposure and nonclinical nature of the sample. Other studies of clinical and directly exposed samples have found higher levels of impairment (e.g., Foa et al., 2001). In this sample, positive endorsement of many of the impairment items (e.g., interfering with chores or friendships) may reflect children's general poor adjustment rather than a PTS-specific outcome. Additional research into PTS functional impairment is warranted, as the variables predicting impairment were different from those that predicted symptom severity. Impairment related to PTS symptoms appears to be less common and may be cause for additional concern and attention, particularly in the context of indirect exposure to a community-level disaster.

Functional impairment results should be interpreted with caution given their low levels in this sample. Low levels of maternal consistency were related to higher levels of functional impairment for children low in negative emotionality, whereas consistent discipline was unrelated to functional impairment for children with medium and high levels of negative emotionality. This finding was not in the expected direction, as

children high in negative emotionality were expected to be more impaired in the context of less consistent parenting. This finding may be spurious, as functional impairment had a limited range and was very low in this sample and may not best represent PTS outcomes. Rather, functional impairment was related to preexisting problems in this sample, and after controlling for pre-9/11 problems, there may have been little reliable variance in impairment remaining to be predicted. In the interactions with effortful control, the relations with functional impairment were in the expected direction. The findings suggest that children who are low in effortful control are more likely to be impaired in the context of inconsistency. If functional impairment is conceptualized as a marker for general impairment, this finding is consistent with work showing that consistency is more important in the prediction of problems for children with difficulties in self-regulation (e.g., Lengua, 2008).

There are several limitations to consider when interpreting findings from this study. First, no information was available about potential trauma exposure prior to 9/11 in this sample. Prior trauma experiences have been shown to increase children's PTS symptoms in response to traumatic events (e.g., Pfefferbaum et al., 2003). Information about prior traumas may have explained additional variance in PTS symptom outcomes in this sample. In addition, the timeframe for post-9/11 data collection may have influenced the results. A diagnosis of PTSD requires that symptoms persist for at least a month. Children reporting symptoms related to the events more than a month later may be more likely to be experiencing clinically relevant PTSD symptoms than children assessed earlier, whose responses might be reflecting normative levels of distress. However, the timing of the interview (i.e., time since 9/11) was not correlated with PTS outcomes in this sample, suggesting that the passing of time did not systematically influence symptom reporting in this sample.

Furthermore, analyses did not include a standardized measure of indirect exposure to the events of 9/11. Questionnaire measures of indirect exposure have been developed for specific types of disasters, (e.g., hurricanes; La Greca, Silverman, & Wasserstein, 1998), but further development of indirect exposure measures is needed. Factors that might be relatively easy to standardize include disruption of routines, as well as knowing people affected. Development of measures of the quantity and quality of media exposure is also crucial, as problems with these measures have been noted (Comer & Kendall, 2007). The measure used in the current study asked parents whether they had "protected" their child from media images, which may have biased parental responses. Thus, the lack of effects of media exposure in this study may reflect problems in measurement rather than a true lack of an effect of media on children's PTS symptoms. Another limitation is the lack of a standardized measure of 9/11-specific parenting. There may have been parenting behaviors that mothers engaged in that were not captured using the open-ended response method. Additional development of measures may be informed by this study. In particular, the level of distress that parents express in front of their children would be important to assess, as well as parental negative affect. The results of this study suggest that it is also important to assess postdisaster parenting from the perspectives of parents and children.

In addition, sample size may have limited power to detect effects. A number of associations approached significance and may have reached significance with a larger sample size. This study is one of the first studies to examine associations between parenting and children's responses to a disaster, and although parenting made significant contributions to children's PTS responses, the amount of variance accounted for by the models tested in this study was relatively small. However, the magnitude of the associations between parenting and PTS outcomes in this study was similar to those reported in past studies (e.g., Green et al., 1991). Identifying other parenting variables or family factors that may contribute to PTS responses will be an important next step in this research area. Examining potential mediators and moderators in the theoretical model will also be an important future step. For instance, it may be that parental responses have more of an impact when children have higher levels of indirect exposure, or that prior parenting is more or less helpful depending on exposure.

Implications for Research, Policy, and Practice

Studies of prospective predictors of children's response to traumatic events or disasters are critical for several reasons. First, they enhance conceptual understanding of PTS symptoms and the development of problems following a disaster (e.g., La Greca et al., 1998). Second, the examination of prospective predictors of children's posttrauma responses facilitates the identification of children who are most likely to develop problems, allowing for targeted interventions aimed at those most in need. This study suggests that an existing positive parent–child relationship may reduce PTS symptoms. However, the extent to which parenting relates to stress responses depends on children's temperament. A lack of warm parenting in the context of stress might be more of a problem for children low in negative emotionality, as they may receive less assistance with regulation of emotions during negative events. In contrast, when parents are rejecting and inconsistent, children low in effortful control may be particularly vulnerable, as stressful experiences might highlight difficulties they already have with emotion regulation, putting them at risk for

developing intrusive thoughts or heightened negative affect. Third, prospective studies inform potential interventions aimed at facilitating adaptive responses to trauma (La Greca & Silverman, 2009). Providing specific strategies for parents may increase resilience to indirect trauma exposure (Comer et al., 2008; Pine et al., 2005). Improving parent–child interactions, assisting parents with their own responses, and building children's effortful control skills, might be targets of future interventions.

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