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Effects of Parents' Experiential Avoidance and PTSD on Adolescent Disaster-Related Posttraumatic Stress Symptomatology

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Abstract

Despite the importance of family context to adolescents' reactions following disaster, little research has examined the role of parents' functioning on adolescents' disaster-related posttraumatic stress disorder (PTSD) symptoms. Using data from 288 adolescents (ages 12 to 19 years) and 288 parents exposed to a series of severe tornadoes in a rural Midwestern community, this study tested a conceptual model of the interrelationships between individual and parental risk factors on adolescents' disaster-related PTSD symptoms using structural equation modeling. Results showed that the psychological process of experiential avoidance mediated the relationship between family disaster exposure and PTSD for both adolescents and their parents. Parents' PTSD symptoms independently predicted adolescents' PTSD symptoms. Further, parents' postdisaster functioning amplified the effects of adolescent experiential avoidance on adolescents' disaster-

related PTSD symptoms. Findings highlight the importance of family context in understanding adolescents' postdisaster reactions. Clinical implications are discussed.

Keywords

disaster; posttraumatic stress disorder; adolescents; parents; experiential avoidance

Natural disasters can be life threatening experiences capable of producing devastating losses and disruptions in the lives of those exposed. Although most adults and children are resilient in the aftermath of disasters (Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Norris et al., 2002), a considerable proportion develop posttraumatic stress disorder (PTSD; Neria, Nandi, & Galea, 2008). Adolescents appear to be particularly vulnerable to developing PTSD compared to both adults (Norris et al., 2002) and younger children (Green et al., 1991). Trauma exposure and the onset of PTSD symptoms during adolescence, an already turbulent developmental period (Yule et al., 2000), can lead to other lasting negative consequences such as diminished academic performance and interpersonal problems (Pat-Horenczyk et al., 2007) as well as the development of substance abuse (Reijneveld, Crone, Schuller, Verhulst, & Verloove-Vanhorick, 2005; Schroeder & Polusny, 2004). Given PTSD's detrimental impact, it is critical to identify factors that heighten or reduce adolescents' risk following disaster exposure. Such knowledge can help identify those adolescents most vulnerable to developing PTSD as well as inform prevention and treatment development efforts. Unfortunately, little is known about psychological risk factors associated with PTSD in adolescents. Moreover, it is unclear how parents' responses and functioning following disaster influence adolescents' disaster-related PTSD symptoms. Thus, the purpose of this study was to test a conceptual model, adapted from previous theory and research (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; La Greca, Silverman, Vernberg, & Prinstein, 1996; Vernberg, Silverman, La Greca, & Prinstein, 1996), examining the interplay of adolescents' and their parents' disaster-related PTSD symptoms.

Studies across a range of events (e.g., fire, flood, hurricane, tsunami, earthquake) have shown a direct relationship between natural disaster exposure and the development of PTSD symptomatology (Norris et al., 2002). Therefore, our conceptual model assumes disaster exposure is reflected by survivors' subjective (e.g., perceptions of life threat during the event) and objective (e.g., extent of home damage, loss, other disruption) disaster experiences (La Greca et al., 1996; Lonigan, Shannon, Taylor, Finch, & Saltee, 1994).

Because the majority of adolescents exposed to trauma do not develop PTSD (Breslau, Davis, Andreski, & Peterson, 1991), the identification of psychological risk factors predictive of postdisaster distress in adolescents might point to fruitful targets for early intervention and prevention research. Experiential avoidance, defined as the tendency to attempt to alter the form or frequency of unwanted internal experiences (e.g., thoughts, emotions, physiological sensations) even when doing so causes behavioral difficulties, has been proposed as a fundamental mechanism in the development and maintenance of a wide range of psychological disorders (Hayes et al., 1996). Although avoidance of trauma related thoughts and feelings is a core diagnostic feature of PTSD, experiential avoidance is

conceptualized more broadly as a regulatory process that functions to control or suppress distressing internal experiences in general (Orsillo & Batten, 2005; Polusny & Follette, 1995; Walser & Hayes, 2006). Experiential avoidance may reduce immediate distress in the short run and, therefore, is negatively reinforced; however, chronic efforts to control unwanted thoughts and feelings may contribute to increased symptoms and behavioral problems over time.

A growing body of literature has examined the role of experiential avoidance in posttraumatic functioning in adults. For example, experiential avoidance has been shown to predict the severity of PTSD symptoms after controlling for trauma severity (Plumb, Orsillo, & Luterek, 2004). Studies have shown that experiential avoidance mediates the relationship between trauma exposure and posttraumatic distress in adults (Marx & Sloan, 2002; Orcutt, Pickett, & Pope, 2005; Polusny, Rosenthal, Aban, & Follette, 2004), and one longitudinal study identified experiential avoidance as a significant predictor of PTSD in adults (Marx & Sloan, 2005). However, to our knowledge, no studies have examined the contribution of experiential avoidance in the development of PTSD among adolescents or in postdisaster reactions among any population. Thus, based on findings from other trauma populations, our conceptual model posits that experiential avoidance mediates the impact of disaster exposure on both adolescents' and their parents' PTSD symptomatology.

Our conceptual model also assumes that aspects of the adolescents' family system—a primary context of learning and source of social support—influence adolescents' risk for PTSD. Within the family context, each family member's responses (e.g., experiential avoidance, distress) in the aftermath of disaster may interact with the responses of other family members to influence an individual's experience in important ways. Parents' experiential avoidance and their current suffering from disaster-related PTSD symptoms are both conceptualized as potential moderators of the association between adolescent experiential avoidance and PTSD.

According to Hayes et al. (1996), adolescents may learn experiential avoidance through modeling, family processes, or poor parenting practices. Research has shown that unsupportive parental responses (e.g., minimizing, punishing) to children's negative emotions have been associated with higher levels of avoidance coping and lower levels of social competence in children (Eisenberg, Fabes, & Murphy, 1996; S. Jones, Eisenberg, Fabes, & MacKinnon, 2002). In the stressful aftermath of a natural disaster, parents prone to engage in experiential avoidance may have difficulties helping their child use effective emotion regulation strategies to cope with distress (Rosenthal, Polusny, & Follette, 2006). Parents high in experiential avoidance may respond to their adolescent's negative disaster-related emotions (e.g., anxiety, fear) in minimizing, punitive, and unsupportive ways (Coyne & Murrell, 2009), thus amplifying the influence of adolescents' experiential avoidance on disaster-related PTSD symptoms. Parental psychological acceptance (e.g., low experiential avoidance) may be alternatively an important resilience family factor for disaster exposed adolescents.

Finally, our model posits that parental PTSD is a second family factor influencing adolescents' risk for disaster-related PTSD. Research has demonstrated direct relationships

between the severity of parents' PTSD symptoms and their children's postdisaster PTSD symptoms (Earls, Smith, Reich, & Jung, 1988; Green et al., 1991; R. T. Jones, Ribbe, Cunningham, Weddle, & Langley, 2002; Kilic, Ozguven, & Sayil, 2003; Mirzamani & Bolton, 2002). Although some evidence supports the moderating influence of parents' post-disaster distress on association between adolescent disaster exposure and PTSD (Bokszczanin, 2008; Spell et al., 2008; Wickrama & Kaspar, 2007), to our knowledge, studies have not examined the influence of parents' PTSD symptoms on the link between adolescent experiential avoidance and PTSD. Parents suffering PTSD symptoms (e.g., avoidance, emotional numbing, irritability) may have difficulties assisting their children with effective coping in the aftermath of disaster (Prinstein, La Greca, Vernberg, & Silverman, 1996). As a result, parents' PTSD symptoms may strengthen associations between adolescents' own tendencies to avoid negative internal experiences and their post-traumatic distress. For example, an experientially avoidant adolescent who is sensitive to their parents' posttraumatic distress may attempt to control or suppress their own thoughts and feelings to prevent expressing distress that would subsequently evoke emotional upset in their parent. This response might temporarily reduce distress for both the adolescent and parent, but over time experiential avoidance may interfere with exposure to thoughts and other reminders of the trauma that would otherwise lead to natural recovery (Orcutt et al., 2005).

In summary, this study evaluated the utility of our conceptual model in predicting adolescents' PTSD symptoms in a large sample of adolescents and their parents exposed to a natural disaster. We hypothesized the following: Hypothesis 1 (H1): Experiential avoidance will mediate relationships between family disaster exposure and PTSD symptoms for both adolescents and their parents. Hypothesis 2 (H2): Parental PTSD will independently contribute to adolescent PTSD such that higher levels of parent PTSD will be associated with higher levels of adolescent PTSD. Hypothesis 3 (H3): Poor parental functioning will exacerbate adolescents' postdisaster reactions such that parent experiential avoidance and PTSD will each moderate the effect of adolescent experiential avoidance on adolescent PTSD.

Method

Participants and Procedures

We conducted a large, cross-sectional mailed survey of adolescents and their parents from a rural southern Minnesota community who were exposed to series of severe tornadoes on March 29, 1998, resulting in the death of two individuals and hospitalization of 38 others. The region was declared a federal disaster area (Powers, 1998). All students enrolled in Grades 7 through 12 ($n = 1,368$) during the 1997 to 1998 school year in two public school districts in southern Minnesota and their parents/guardians were invited to participate in this study. Data collection began 6 months postdisaster and continued for a 10-week period. To increase participation rates, a single reminder postcard was sent approximately 5 weeks after the initial mailing. Each student's household was mailed a package containing a cover letter addressed to parents, informed consent forms for parents, assent forms for adolescents, separate envelopes containing research questionnaires for parents and adolescents, and

separate return envelopes for parents and adolescents. Respondents were compensated \$10 for their participation.

A total of 401 adolescents (58.6% girls) and 288 parents (84.3% mothers) returned research materials (response rate = 29%). Families were included in the present set of analyses if both an adolescent and parent responded ($n = 394$ adolescents with 288 parents; 59% girls). On average, adolescents and parents were 15.3 (range = 12 to 19) and 43.0 years old (range = 30 to 62), respectively, and 99% were White, consistent with the disaster effected community (Polusny, Dickinson, Murdoch, & Thuras, 2008). Most parents were married (81.5%) and many reported at least a bachelor's degree (45.6%). Nine percent of parents reported earnings of \$20,000 or less, 46% reported \$20,001 to \$50,000, and 45% reported \$50,001 or greater. This study was approved by the Minnesota State University, Mankato Institutional Review Board.

Measures

PTSD symptoms.—The Impact of Event Scale–Revised (IES–R; Weiss & Marmar, 1997), a 22-item self-report measure, was used to assess adolescents' and parents' disaster-related PTSD symptoms. Respondents were asked to rate each item on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*) to indicate how much they were distressed or bothered during the past week by each symptom in relation to the tornado disaster. The IES–R has demonstrated high internal consistency (Creamer, Bell, & Failla, 2003) and convergent validity with other measures of PTSD (Baumert, Simon, Gundel, Schmitt, & Ladwig, 2004; Creamer et al., 2003; Joseph, 2000). For this study, alpha was .95 for the parent sample and .94 for the youth sample.

Disaster exposure.—A modified version of the Hurricane-Related Traumatic Experiences Questionnaire (HURTE; Vernberg et al., 1996) was used to assess adolescents' and parents' tornado-related traumatic disaster exposure. Adolescents and parents were each asked to self-report (“yes” or “no”) whether they had been exposed to life-threatening experiences during the tornado (“Did you get hurt in the storm?”; “Were you afraid that you would be injured in the storm?”; and “Were you afraid that you would be killed in the storm?”). Items were summed and recoded on a 0 to 2 scale because few participants endorsed sustaining injury in the storm. Parents were asked to report (“yes” or “no”) on their family's objective experiences of disaster related loss/disruption using a sum of three items adapted from the HURTE assessing whether the family home was damaged, the family relocated, or the family lost income as a result of the disaster. Research using these items with people exposed to hurricanes has shown that greater disaster exposure is associated with more PTSD symptoms (Vernberg et al., 1996).

Experiential avoidance.—The nine-item version of the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) was used to assess adolescents' and parents' experiential avoidance. AAQ items measure the extent to which individuals' self-report attempts to control, escape, or avoid negatively evaluated thoughts, feelings, or memories. Respondents are asked to rate each item on a 7-point scale ranging from 1 (*never true*) to 7 (*always true*). Higher scores reflect greater experiential avoidance, whereas lower scores

reflect greater psychological acceptance. The AAQ has demonstrated good internal consistency (Chronbach's $\alpha = .70$; present sample, parent $\alpha = .58$, adolescent $\alpha = .50$). Confirmatory factor analysis suggests that the scale captures key aspects of experiential avoidance, including control, escape, or avoidance of negatively evaluated internal experiences as well as taking behavioral action despite experiencing aversive internal experiences (Hayes et al., 2004). The AAQ also demonstrates convergent validity with the White Bear Suppression Inventory (Wegner & Zanakos, 1994) and discriminant validity with the worry and punishment subscales of the Thought Control Questionnaire (Wells & Davies, 1994).

Analytic Strategy

We randomly selected one adolescent per family to conduct analyses ($n = 288$ adolescents and 288 parents). The main hypotheses were tested with structural equation path modeling (SEM) in the MPlus 6 program (Muthen & Muthen, 2010). With the exception of family disaster exposure, all variables were treated as observed rather than latent. For family environmental constructs, latent constructs provide greater reliability and validity in prediction models by reducing potential threats of monomethod bias (Bank & Patterson, 1992). Thus, confirmatory factor analysis was used to create a multi-informant family disaster exposure latent construct. For H1, we followed recommended steps for testing experiential avoidance as a mediator of disaster exposure (MacKinnon, 2008; Preacher & Hayes, 2008). We also employed the INDIRECT program for multiple-mediation tests in SPSS to assess the significance of indirect effects (Preacher & Hayes, 2008). For H2, we examined significance tests for path coefficients in the final SEM model. For H3, we first followed the procedures outlined by Cohen, Cohen, West, and Aiken (2003) for testing moderation by entering cross-product interaction terms. Next, we followed procedures recommended by Preacher, Rucker, and Hayes (2007) for testing moderated mediation. To evaluate parent functioning as a moderator of the indirect effect of disaster exposure on PTSD through adolescent experiential avoidance, we employed the MODMED program in SPSS (Preacher et al., 2007). This program simultaneously estimates the path coefficients in a mediational model and generates bootstrap confidence intervals for indirect effects at varying levels of the moderator. In addition, using the MODMED program, we generated values of the moderator for which the mediation effect is just significant or the region of significance. Analyses controlled for age and gender of participants. These covariates have been associated with PTSD symptoms following disaster (Norris et al., 2002). Before proceeding with analyses, we evaluated patterns of missing data (Schafer & Graham, 2002). Little's test failed to reject the null hypothesis that data were missing completely at random, $\chi^2(37) = 42.75, p = .24$. Therefore, we incorporated missing data using full information maximum likelihood (FIML).

Results

Descriptive Analyses

Over one third (37%) of adolescents were afraid they would be injured and 22% were afraid they would be killed in the storm. Similarly, 39% of parents perceived the tornado as life threatening to oneself (were afraid they would be injured or killed), and nearly three fourths

of parents (74%) feared their family members may be injured or killed by the tornado. Thirteen percent of adolescents and 18% of parents had scores that exceeded the recommended clinical cutoff of 33 on the IES-R (Creamer et al., 2003), indicating a positive screen for PTSD.

Descriptive statistics and intercorrelations for study variables are presented in Table 1. Significant bivariate correlations were found between adolescent PTSD scores and adolescent perceived life threat, experiential avoidance, and gender, with greater PTSD among girls. Parent PTSD was significantly associated with parent reports of family loss/disruption, perceived life threat, experiential avoidance, age, and gender, with mothers and younger parents reporting higher levels of PTSD. Adolescent and parent PTSD and experiential avoidance scores were significantly associated.

Family Disaster Exposure Confirmatory Factor Analysis (CFA)

We first evaluated the family disaster exposure construct specified as a multi-informant latent variable SEM. The latent factor obtained significant loadings for each indicator, a factor mean significantly different from zero ($M = 1.10$), and observed individual family differences in disaster exposure (variance = .15, $p < .001$). The CFA provided excellent fit to the data with a nonsignificant chi-square minimization, $\chi^2(1) = 96$, $p = .62$; a high comparative fit index (CFI = 1.00); a root mean square error of approximation less than .10 (RMSEA = .00); and a chi-square ratio less than 2.00 ($\chi^2/df = .48$).

Direct Effects of Disaster Exposure on Adolescent and Parent PTSD

The first hypothesis focused on experiential avoidance as a potential mediator of disaster exposure on PTSD symptoms for adolescents and parents respectively. Mediation is established when: (1) family disaster exposure has a direct effect on PTSD in an unconditional model with no mediator (family disaster $\rightarrow$ PTSD), (2) family disaster exposure has an effect on the hypothesized mediator, and the mediator in turn predicts the outcome (family disaster exposure $\rightarrow$ experiential avoidance $\rightarrow$ PTSD) thus serving as an intervening variable linking disaster exposure effects to PTSD symptoms, and (c) on entering the mediator in the model, the direct effect of family disaster exposure on PTSD is rendered nonsignificant (MacKinnon, 2008).

Thus, as a first step, examining the direct effects of disaster exposure, we specified an SEM model with adolescent and parent PTSD as outcomes predicted by the family disaster exposure factor (model not shown). We freely estimated residual error variances among the respective adolescent and parent reported indicators of family disaster exposure and their respective endogenous measures to reduce threats of monomethod reporter bias (Bank, Dishion, Skinner, & Patterson, 1990; Melby, Conger, Ge, & Warner, 1995). Standardized beta paths showed that disaster exposure significantly predicted PTSD for both adolescents (standardized $\beta = .40$, $p < .05$) and parents ($\beta = .35$, $p < .05$), controlling for age and gender for both adolescents and parents, model fit $\chi^2(9) = 16.02$, $p = .07$, CFI = .96, RMSEA = .04, $\chi^2/df = 1.78$. Adolescent and parent PTSD remained significantly associated (residual $r = .23$, $p < .001$).

Indirect Effects and Moderated Indirect Effects (Figure 1: Hypotheses 1, 2, and 3)

In the next step, we specified an SEM model that simultaneously evaluated whether (a) experiential avoidance mediated the effect of disaster exposure on PTSD (H1), (b) parents' PTSD independently predicted adolescent PTSD (H2), and (c) parent postdisaster functioning (parent experiential avoidance and parent PTSD) moderated the effects of experiential avoidance on PTSD for adolescents (H3). Final model specification and the full information estimates are shown in Figure 1 in the form of standardized paths. For visual clarity, control variable paths are not shown.

Results supported H1. Disaster exposure was significantly associated with higher levels of adolescent experiential avoidance ($\beta = .47, p < .001$) and parent experiential avoidance ($\beta = .34, p < .01$). Experiential avoidance, in turn, predicted PTSD for adolescents ($\beta = .24, p < .05$) and parents ($\beta = .17, p < .01$). Results also indicated that the direct effects of disaster exposure on adolescent and parent PTSD were rendered nonsignificant. Using the INDIRECT program for multiple-mediation tests in SPSS (entering a saved SEM factor score for disaster exposure), we employed a resampling method with 1,000 bootstrapped samples to evaluate the overall indirect effects of disaster exposure on PTSD via experiential avoidance (Preacher & Hayes, 2008). The indirect effect via experiential avoidance to PTSD was .05 ($p < .05$) for adolescents and .03 ($p < .05$) for parents.

Results also supported H2. Parent PTSD symptoms predicted adolescent PTSD ($\beta = .25, p < .001$), controlling for adolescent and parent responses, disaster exposure, parent and adolescent age and gender. Therefore, parental PTSD provided an independent contribution to their children's disaster response. Parent experiential avoidance was not associated with adolescent PTSD in the bivariate correlations or multivariate analyses.

Results partially supported H3. Parent PTSD moderated the effect of adolescent experiential avoidance on adolescent PTSD indicated by the significant interaction path for Parent PTSD $\times$ Adolescent Experiential Avoidance ($\beta = .14, p < .01$). Parent experiential avoidance was not a significant moderator. The overall model explained 20% of the variance in adolescent PTSD and obtained good fit to the data, $\chi^2(34) = 43.17, p = .14$, CFI = .96, RMSEA = .03, $\chi^2/df = 1.26$. As a final step, we estimated the H3 moderated indirect effect (i.e., the degree to which the strength of the indirect effect from disaster exposure to adolescent PTSD via experiential avoidance was contingent on level of parents' PTSD symptoms). The moderated indirect effect is plotted in Figure 2. The y axis is the significant indirect effect or mediation pathway from disaster exposure to adolescent PTSD via adolescent avoidance. The x axis is -1 to $+1$ standard deviations of parent PTSD. Dashed lines are 95th percentile confidence intervals estimated with 1,000 bootstrap samples in the MODMED program (Preacher et al., 2007). Horizontal line denotes indirect effect of 0. Vertical line denotes region of significance or lower boundary for parent PTSD conditioning effect. Using raw scores, parent PTSD significantly moderated the adolescent's response at values of roughly 14 and above on the IES-R, which was also the median split for this study. Therefore, the upper 50% of parent PTSD responses significantly amplified effects of experiential avoidance for adolescents in this sample.

Discussion

The results of the present study largely supported the utility of the proposed conceptual model of individual (experiential avoidance) and parental (parent PTSD) factors predicting adolescents' disaster-related PTSD. First, we found support for the hypothesis that experiential avoidance mediates the relationship between family disaster exposure and PTSD for both adolescents and their parents. Second, parent PTSD symptoms independently contributed to the prediction of adolescents' PTSD symptoms. In addition to this direct effect of parent PTSD symptoms, parents' postdisaster functioning moderated the effects of adolescents' experiential avoidance on their disaster-related PTSD symptoms. However, results did not support the hypotheses that parents' tendency to engage in experiential avoidance would directly or indirectly contribute to predicting adolescents' PTSD symptoms as a main effect or moderator.

This study adds further to mounting evidence showing experiential avoidance contributes to the development and maintenance of PTSD in adults (Batten, Follette, & Aban, 2001; Marx & Sloan, 2002; Marx & Sloan, 2005; Tull & Roemer, 2003), and extends the literature by demonstrating the deleterious effects of experiential avoidance among adolescents in the aftermath of disaster. To date, studies investigating the effects of experiential avoidance have been limited to adults. Our results indicate that experiential avoidance is related to similar negative outcomes in disaster-exposed adolescents as well. As a general response style that distances the person from negative thoughts, memories, or feelings, experiential avoidance may interfere with disaster survivors making contact with internal or external trauma cues that would otherwise lead to processing, habituation, and natural recovery, thereby contributing to the development and maintenance of PTSD (Orcutt et al., 2005). These findings suggest experiential avoidance may provide an important target for intervention with trauma exposed adolescent populations.

Consistent with previous research, the results of this study support the hypothesis that parents' PTSD symptoms independently contribute to adolescents' postdisaster PTSD symptomatology. However, results of moderated mediational analyses also indicated that parents' PTSD exacerbates adolescent postdisaster symptomatology by moderating the impact of adolescent experiential avoidance on adolescent PTSD. In families with a parent suffering greater PTSD symptoms, adolescent experiential avoidance mediated the effects of disaster exposure on adolescent PTSD. Together, these findings indicated that parents' posttraumatic functioning plays an important role in how adolescents respond to disasters.

Although our results are cross-sectional, one interpretation of these findings is that parental PTSD is a family factor catalyst for adolescents engaging in experiential avoidance in the aftermath of trauma exposure, whereas low parental PTSD may defuse the detrimental process of experiential avoidance in adolescents. Within families with a parent suffering PTSD, adolescents may engage in greater attempts to control or suppress their own thoughts and feelings to prevent triggering emotional upset in their parent. Although this response may provide initial reductions in distress, over time adolescents' experiential avoidance may lead to more severe PTSD symptoms. Past studies have demonstrated that parents suffering from posttrauma distress show difficulties in effective parenting (Appleyard & Osofsky,

2003; Gewirtz, Forgatch, & Wieling, 2008). It is possible that parents with high levels of their own posttraumatic distress are less available to adolescents in making sense of or dealing with the emotional aftermath of disaster. Similarly, parents suffering PTSD may be less able to provide support or encourage emotional acceptance in response to fears and anxiety, thus exacerbating adolescent distress.

We did find, as one would expect, a modest relationship between adolescent and parent experiential avoidance. This may represent shared biological traits, the effects of parental modeling on adolescent behavior, or similar levels of trauma exposure within families. However, in contrast to the evidence for the direct effects of experiential avoidance on disaster related PTSD in adolescents and their parents, the results of this study did not support the hypothesis that parents' experiential avoidance directly contributes to adolescents' PTSD. Moreover, the results of this study do not support the notion that parents' tendency to engage in experiential avoidance amplifies the effect of adolescents' experiential avoidance on their disaster-related PTSD symptoms. Rather, parent experiential avoidance appears to impact adolescents' postdisaster reactions through contributions to poorer parental postdisaster functioning, which adds unique effects to the prediction of adolescent PTSD. Because this study was the first to examine the influence of parent experiential avoidance on adolescents' risk for PTSD in a community, nonclinical sample, these findings should be considered preliminary. Future studies examining these relationships within distressed or treatment seeking families may clarify how parent experiential avoidance may contribute to adolescent distress.

Nonetheless, these results are consistent with a number of existing treatment programs and approaches. Acceptance-based interventions, such as Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), which target experiential avoidance may be a useful approach for treating adolescents suffering PTSD. Recently, advances have been made in adapting ACT for children and adolescents in developmentally appropriate and effective ways across a range of problems including anxiety (Greco, Blackledge, Coyne, & Ehrenreich, 2005; Murrell & Scherbarth, 2006). Furthermore, the results of this study suggest that it may be helpful to employ interventions at the family level, as opposed to focusing solely on individual therapy, after a natural disaster—especially in families characterized by high levels of PTSD symptoms among parents and experiential avoidance among adolescents. Given that it is often difficult or distressing for a parent to see their child experience fear or anxiety, a parent's attempts to reduce their child's anxiety, and subsequently reduce their own discomfort, may inadvertently reinforce experiential avoidance in their child by communicating it is bad to feel distress. Thus, when involving parents in treatment of anxious youth, Greco et al. (2005) recommended assessing and addressing parents' responses to their child's struggle with anxiety. In addition, because the family context is the primary source of social support for adolescents (Klingman, 2001) and social support is related to lower PTSD symptoms following natural disasters (La Greca et al., 1996; Vernberg et al., 1996), family therapies that increase support and decrease general distress may also result in better psychological outcomes.

Results of this study also highlight the need for parent training programs that can equip parents, especially those suffering PTSD, with the skills to help facilitate their children's

recovery following disasters (Carr, 2004). Extensive evidence supports the effectiveness of the Parent Management Training–Oregon Model, which incorporates effective positive parenting practices and builds parents’ emotion regulation skills (Gewirtz et al., 2008). By supporting parents to provide a social environment characterized by structure, security, emotional warmth, parental monitoring, skills encouragement, limit setting, and positive involvement, Gewirtz and colleagues (2008) suggested that parenting interventions may serve as an effective population-based approach to promoting youth recovery following disasters.

There are a few limitations to this investigation. First, findings related to experiential avoidance should be interpreted with caution in light of the performance of the AAQ in this study. We found that the internal consistency of the AAQ was lower in this sample than previously reported suggesting that the effects of experiential avoidance may have been underestimated. Consequently, an important direction for future research is the development and refinement of measurement tools for assessing experiential avoidance in both adults and youth. Although no measures of experiential avoidance had been adapted for youth at the time of this study, Greco and colleagues (2008) recently developed the Avoidance and Fusion Questionnaire for Youth, an adaption of the AAQ for youth, which appears to be a promising alternative.

Second, the cross-sectional nature of the data prevents causal conclusions about the variables involved. Thus, although we speculate that experiential avoidance leads to PTSD symptoms, it is possible that greater disaster-related PTSD symptoms stimulate the development of experiential avoidance as a general response style. However, prior longitudinal findings have demonstrated that experiential avoidance has a temporal association with PTSD among adults (Marx & Sloan, 2005). Similarly, although we posited parents’ postdisaster responses influenced the development of their adolescent’s PTSD, it is also plausible that bidirectional and reciprocal influences exist between parent and adolescent PTSD (Silverman, Kurtines, Jaccard, & Pina, 2009). Future research using longitudinal designs that allow for cross-lagged modeling of parent and child variables may help to understand the directionality of parent–child influences.

Third, although the study’s response rate (29%) was consistent with previous studies conducted in the postdisaster environment (e.g., Arata, Picou, Johnson, & McNally, 2000), the sample may not be representative of the community exposed to the disaster and findings may not generalize to other disaster exposed communities. Because only 13% of adolescents and 18% of parents endorsed symptoms consistent with a diagnosis of PTSD, findings may not generalize to clinical populations. It is possible that respondents’ experiences with the disaster influenced their willingness to participate because of the saliency of the research. Furthermore, the survey protocol requested only one parent fill out a survey per household, and it is unclear whether more or less distressed parents tended to fill out the survey. Because we did not have access to information about nonresponders, the presence of potential selection or response biases cannot be ruled out. Finally, although age was included as a covariate in analyses, the broad age range of the sample (Grades 7 through 12) is a limitation of the study in that it does not allow for an examination of the role of development in understanding the impact of disaster on youth.

In conclusion, this study found that experiential avoidance served as an important predictor of disaster related PTSD for both adolescents and their parents. Individuals' tendency to engage in experiential avoidance mediated the relationship between family disaster exposure and PTSD symptomatology. Not only did parents' PTSD symptoms directly predict their children's PTSD symptoms, but parents' disaster-related PTSD symptoms amplified the impact of adolescent experiential avoidance on youths' postdisaster reactions. The findings of this study support the need for further research evaluating the efficacy of acceptance-based therapies targeting experiential avoidance applied to trauma exposed youth and their families. Such interventions may be relevant to other trauma-exposed populations as well, including families of combat veterans returning from deployment with PTSD and related psychopathology.

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Figure 2.

Plot of parent posttraumatic stress disorder (PTSD) as a moderator conditioning the standardized significant indirect effect of family disaster exposure on adolescent PTSD via adolescent experiential avoidance. The y axis is the significant indirect effect or mediation pathway from disaster exposure to adolescent PTSD via adolescent avoidance. The x axis is -1 to $+1$ standard deviations of parent PTSD. Dashed lines are 95th percentile confidence intervals estimated with 1,000 bootstrap samples in the MODMED program (Preacher, Rucker, & Hayes, 2007). Horizontal line denotes indirect effect of 0. Vertical line denotes region of significance or lower boundary for parent PTSD conditioning effect. Using raw scores, parent PTSD significantly moderated the adolescent's response at values of roughly 14 and above on the Impact of Event Scale-Revised.

Table 1

Descriptive Statistics and Pearson Correlations Among Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. Gender (male)	0.38	0.49	—									
2. Age	15.32	1.78	.05	—								
3. Parent gender (male)	0.15	0.36	.08	-.04	—							
4. Parent age	42.98	5.35	.09	.32***	.16*	—						
5. Adolescent PTSD	14.89	14.43	-.13*	-.07	.06	-.03	—					
6. Parent PTSD	17.52	15.22	.04	.03	-.22**	-.17**	.27***	—				
7. Adolescent perceived life threat	0.60	0.81	-.22***	-.11	.06	-.14*	.50***	.13*	—			
8. Parent perceived life threat	1.15	0.08	-.09	.01	-.17**	-.17**	.10	.26***	.19**	—		
9. Family loss/disruption	0.93	0.93	.00	-.00	-.01	-.12	.10 [†]	.38***	.09	.15*	—	
10. Adolescent experiential avoidance	33.96	6.84	-.12*	-.08	-.12	-.09	.27***	.07	.26***	.14*	.02	—
11. Parent experiential avoidance	27.97	5.77	.06	.03	-.13*	-.09	.07	.27***	.05	.10	.10	.17**

Note. N = 288 with randomly selected adolescent. PTSD = posttraumatic stress disorder.

[†] $p < .10$.* $p < .05$.** $p < .01$.*** $p < .001$.