

Articles

Families Coping with Natural Disasters: Lessons from Wildfires and Tornadoes

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Even though parents are the most significant socialization influence during childhood, there has been little study of how parents model and promote their children's adaptive coping in natural disasters. In-depth semi-structured interviews of 56 parents whose families were evacuated from their homes due to wildfires (n = 24, San Diego County, California, October 2007) or multiple deadly tornadoes (n = 32, Tennessee towns of Lafayette and Gallatin, February 2008) were conducted within four days of each disaster. The current study assessed prior and current disaster exposure levels and parents' reports of preparedness or problem solving, emotion regulation, social support, distraction, religious, and family-level coping activities with their children in response to each disaster. By examining parents' rich and complex responses to their disaster experiences, we lay the foundation for the development of models of parental socialization of children's coping effectively during disasters. Findings offer direction for intervention policy and programs that assist parents in managing children's developing competence in response to disasters.

Keywords: children; coping; family; natural disasters; socialization; tornadoes; wildfires

Natural disasters have a significant psychological impact on children, including symptoms of posttraumatic stress disorder (PTSD), anxiety, and depression (Hoven et al. 2005; Stein et al. 2004). As many as half of children in surveys after hurricane, earthquake, and flood disasters report some level of PTSD symptoms (Saylor et al. 2003), and even more may express nonclinical adjustment difficulties, such as interpersonal alienation or interference with daily functioning (Evans & Oehler-Stinnett 2008). The few studies that have been conducted on wildfires and tornadoes generally have focused on children's postdisaster adjustment (Houlihan et al. 2008; Jones, Ribbe & Cunningham 1994; Lack & Sullivan 2008; McDermott, Gibbon & Lee 2005) or have examined the impact of intervention efforts on adjustment (McDermott & Palmer 2002).

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Much less work has been done documenting the strategies children use that may promote successful adaptation (Saylor, Belter & Stokes 1997). Coping strategies appear to play a key role in mediating or mitigating the impact of disaster stress on children's adjustment (Coyne & Racioppo 2000). In some research, as much as 20% of the variance in PTSD symptomatology has been attributed to coping strategies (Vernberg et al. 1996). In the immediate aftermath of a hurricane, both positive coping strategies (e.g., distraction, cognitive restructuring, problem solving, emotional calming, and social support) and negative coping strategies (e.g., self criticism, blaming others, social withdrawal, or emotional escalation) have been associated with the severity of PTSD symptomatology (Belter, Dunn & Jeney 1991; Lack & Sullivan 2008; Vernberg et al.). Over the long-term, however, only negative coping strategies such as anger, blame, and social withdrawal appear to be associated with children's symptomatology (La Greca et al. 1996). Conversely, children who receive multiple sources of social support (e.g., from family, teachers, and peers) tend to exhibit the lowest levels of PTSD symptomatology (La Greca et al. 1996). Thus, determining how to minimize negative coping and promote positive coping is important for children's immediate coping and longer-term mental health.

While there is some research on the association between children's coping strategies and their postdisaster adjustment, researchers have yet to examine *how* children learn strategies for coping effectively with natural disasters. In the nondisaster literature, *coping socialization* refers to parental goals and practices that influence children's use of strategies to manage stressful events that are perceived by either the parent or the child to exceed the child's resources (Miller, Kliewer & Partch 2010). To date, we know little about either parents' modeling of coping behavior or how they might socialize their children's use of coping strategies in response to natural disasters. Such research is vital, as neither developmental models of children's age-related coping processes (Losoya, Eisenberg & Fabes 1998) nor models of coping socialization (Skinner & Edge 2002; Skinner & Zimmer-Gembeck 2007) have been applied in the context of stressors of this magnitude. Given the primacy of parents' influence on children's developing competency in health and safety contexts (Tinsley 2003, 2012), parents likely have an influential role in children's learning how to cope effectively with natural disaster events.

Children's acquisition of coping strategies may take place either directly, such as when parents encourage children to engage in specific strategies for managing a stressor or one's reactions to it (Kliewer, Fearnow & Miller 1996; Miller et al. 2010), or indirectly, when children observe their parents' own emotional, cognitive, and behavioral strategies for coping with stressful events (Kliewer, Sandler & Wolchik 1994). From a learning theory perspective, children's ability to respond adaptively to catastrophes depends upon the degree to which they observe their parents' adaptive (or maladaptive) coping under stressful situations as well as their proclivity to model their own coping after that of their parents (Gauvain 2009). Muris, Steerneman, Merckelbach, and Meesters (1996) have found, for example, that children's self-reports of anxiety and fears were associated with the levels of anxiety and fear expressed by their parents. Consistent with this view, Saylor et al. (2003) reported that the severity of children's symptomatology after a natural disaster varied with the degree to which parents themselves had difficulty coping with these events. Thus, parents' coping in natural disaster situations may implicitly or explicitly model less adaptive behaviors, which subsequently influence their own children's adaptive choices (Bokszczanin 2008; Friedman, Stevens & Morris 2008).

The comparative assessment of natural disasters is relevant to coping socialization, as variations in stressor characteristics likely influence the types of coping activities parents enact and the ways in which they attempt to facilitate their children's coping. In their

discussion of children's adaptation to natural disasters, Saylor et al. (1997) classified common and unique characteristics among hurricanes, floods, and earthquakes but provided less information on wildfires and tornados. As noted by McDermott and colleagues (2002, 2005), wildfires involve intense sensory cues (e.g., dense, thick smoke, fast moving flames, strong winds, and blowing embers), uncertainty about fire proximity and progression, media alerts and images of fire direction, damage and injury reports, immediacy and urgency of evacuation preparation and notices, lack of information about and separation from significant others, and the presence of fire and emergency personnel and equipment. Although there has been no detailed assessment of stressors associated with tornados as far as we are aware, the characteristics that tornadoes would appear to share in common with wildfires would be intense sensory cues (e.g., dark storm clouds, debris whirling in the air, roaring wind gusts, large hail impacting the home, and windows rattling or breaking) associated with immediate or close impact, uncertainty and unpredictability regarding proximity or direction of fast-moving multiple storm fronts with tornado cells, media tracking alerts, threats to the health and safety of family and neighbors, including separation from loved ones, and disruptions in the daily routines of children and families.

In both kinds of events, the threatening images and unpredictable course can generate emotional and psychological reactions in children and families such as fear, anxiety, despair, denial, and insecurity (Hock et al. 2004). Even if there is not an immediate threat of a fire or tornado, the smell of smoke or the noise and thunderstorm activity may generate distress, especially among younger children (Sandoval & Brock 2002) who are less capable of cognitively weighing the geographic and weather factors that indicate the degree of danger. Similarly, even if evacuation or taking shelter is ultimately unnecessary, the potential threat to one's personal and family welfare and the preparation to leave behind one's routines and sense of place can elicit lingering fears and anxiety.

Another feature that wildfires and tornados may share is the frequency of children's and families' exposure to them. Much of the existing natural disaster research has focused on children's short- and long-term reactions to severe hurricanes, earthquakes, wildfires or tornados as single events (Lack & Sullivan 2008; La Greca et al. 1996; McDermott & Palmer 2002). In certain geographic regions of the United States, however, children and families can be exposed frequently, if not on a seasonal basis, to tornados (e.g., tornado alley in the southern and midwestern states) and wildfires (e.g., coastal areas of southern California). The research suggests that children and adolescents may show residual trauma symptoms years after even a single natural disaster (Dirkzwager, Kerssens & Yzermans 2006; La Greca et al. 1996; McDermott & Palmer; McFarlane, Policansky & Irwin 1987). Consequently, children who are exposed repeatedly to disasters events may be at even greater adjustment risk, but there is little information on the emotional and behavioral reactivity of these children in subsequent disaster events.

Although wildfires and tornadoes have elements in common, there also are differences that may have implications for parents' coping activities and what children learn about coping. In all disaster events, parents' first priority naturally involves the health and safety of family members. In wildfire events this generally means determining when and how best to evacuate the fire prone area. Evacuation environments often lack predictable routines, can be chaotic, and are shared with other evacuated families. Children therefore may witness a range of adaptive and maladaptive emotional and behavioral reactions by other adults and children. In spite of the greater risk in terms of exacerbating children's fears and anxieties and interfering with parents' efforts to promote their children's coping, however, there is also the potential to access social support assistance from professionals and provide activities that distract children from ongoing stress.

Conversely, given the fast moving and unpredictable nature of tornados, insuring the safety of family members usually does not involve evacuating from the areas of likely impact. Rather, families seek the safest shelter in the home (e.g., central room, crawl space, or cellar). Even when sheltered, however, children and families are at risk for exposure to the highly threatening auditory and visual sensations associated with such storms. Thus, parents in tornado areas are more likely to have to enact coping strategies to manage their own, and their children's, fears and anxieties as the storm cells pass over their homes.

Another difference between the two disasters is their duration (excluding the consequences of lasting property destruction). Families in wildfires can be under "alert" conditions for several days, and once evacuated, are typically out of their homes for up to a week or more. Families in tornado areas, however, usually are affected no more than several hours to half a day as the storm system passes through their area, after which many are able to resume their everyday activities. Moreover, although both are seasonal, tornados are likely to occur more often even within the same "season" in areas like "tornado alley" (i.e., U.S. southern and midwestern states) than wildfires in the coastal areas of California. Thus, the differences in time course of these two disasters may create different degrees of stress and require adjustments in parents' coping behaviors and the types of coping strategies they use to facilitate their children's adaptation.

Finally, geographic location not only may influence types of disasters that occur but also may reflect regional or cultural differences in parents own coping and coping socialization efforts. There has been little study of regional or cultural differences in the ways in which individuals or their communities respond to natural disasters (La Greca & Silverman 2009). Awareness of such differences would be essential in planning site-specific, post-disaster recovery interventions.

Thus, our objectives in the present study were to document and describe through semi-structured interviews (1) parents' coping activities in response to wildfire and tornado disaster events, (2) their actions to facilitate their children's coping during these events, and (3) variations in parents' modeling and facilitation of their children's coping that were (a) disaster-specific and/or (b) reflected regional or cultural differences.

Method

Our study focused on a wildfire disaster in San Diego County occurring in fall 2007 and a tornado outbreak in Tennessee in early spring 2008. A brief description provides a sense of their scale and their impact on local communities

San Diego County Fires

In October 2007, eight wildfires burned nearly 369 000 acres and destroyed or damaged 1 350 homes and more than 100 businesses in San Diego County, California. More than 515 000 people evacuated their homes and more than 6 200 fire personnel fought the fires. Seven people died as a direct result of the fire and 128 were injured, including at least 105 firefighters. Major roads, including two major interstates, were closed which posed challenges to evacuating residents. The wildfire areas were declared a federal disaster area, and 45 shelters (including churches, schools, fairgrounds, Qualcomm stadium) were created to accommodate evacuated families. Officials estimated that 12 000 people evacuated to Qualcomm stadium alone. Seven thousand volunteers affiliated with the International Red Cross and the Federal Emergency Management Agency provided services to families in need.

Tennessee Tornadoes

In February 2008, eighty-seven tornadoes affected a four-state area in the south-central United States. The greatest damage occurred in one day in Tennessee. Thirty-two people were killed and hundreds of others were injured. Widespread damage occurred northeast of Nashville, including that caused by a single tornado that stayed on the ground for nearly 40 miles and destroyed 260 homes. This portion of Tennessee was declared a major disaster area, and federal funds were distributed to remove debris and facilitate recovery efforts.

Participants

Parents in San Diego and Tennessee were recruited for interviews if they (1) were at least 18 years of age, (2) had one or more children under the age of 18, and (3) experienced the wildfires or tornadoes at home with at least one child. Interviews took place within four days following the disaster experiences. Twenty-four parents (3 fathers and 21 mothers) between the ages of 21 and 46 years ($M = 33.7$ years) were interviewed in San Diego during their evacuation, and 32 parents (10 fathers and 22 mothers) between the ages of 20 and 40 years ($M = 31.0$ years) were interviewed in Tennessee. Data were collected in Fayette and Gallatin in southwestern and north-central Tennessee. Twenty-one of 24 families in the San Diego sample consisted of two-parent households (the remaining three were single-mother households). In all but two cases, both parents were present at the time of the evacuation. Twenty-one of 32 families in Tennessee consisted of two-parent households, and the remaining 11 included nine single-mother and two single-father households. San Diego parents were from middle-and upper-middle class households while Tennessee parents were from lower-middle and middle class households. Self-reported ethnicity of San Diego parents was predominately Caucasian ($n = 19$) with two Latino, two Asian American, and one African American parent. In the Tennessee sample, 28 parents were Caucasian and four were African American. There were 44 children (25 male, 19 females) ranging in age from 5 months to 17 years ($M = 9.5$) in the San Diego sample and 63 children (39 males, 24 females) ranging from 6 weeks to 18 years ($M = 9.36$) in the Tennessee sample. The number of children in San Diego families ranged from 1 to 4 ($M = 1.4.0$) and from 1 to 8 ($M = 2.1$) in Tennessee families.

Measures

A semi-structured interview script was developed to guide participants through the interviews. This format allowed for probes to encourage participants to elaborate on their responses that could not be predicted in advance of the interview (e.g., "Can you tell me more about that?," or "Is there anything else about that (issue) that you can remember?"; Banister et al. 2001). The structured interview included the following questions: (1) Can you begin by telling me what has happened to you and your family in the past few days? (2) Had your family taken any steps beforehand to prepare for something like this? (3) What information, if any, did you withhold from your children regarding the fire/tornado? (4) How did your child(ren) react and cope with what has happened? (5) What did you, as a parent, do to help your child(ren) handle the situation or their feelings about it? (6) How did you handle your own feelings about the situation? (7) Do you know what happened to your home/property/animals?

Procedure

All aspects of this study were approved by the university's Institutional Review Board. Two graduate research assistants with interviewing experience went to evacuation centers and public gathering places (e.g., cafes, outdoor public sitting areas) in the hardest-hit areas of San Diego and Tennessee county. A female graduate student conducted interviews at the San Diego County site, and two graduate students, one male and one female, conducted the interviews in Tennessee. Prior to departing, interview procedures were reviewed to promote consistency in interviewing method across sites. Families were approached with information about participation in the study and were told that no identifying information would be collected. All the interviews were conducted confidentially. When the interviews were conducted in public places, the interviewer ensured that other individuals were not in the immediate vicinity. The sequence of questions was based on the interview script described above, except when the respondent had already answered a question in a previous answer. The length of time spent discussing each question varied, depending upon participant responsiveness and follow-up probes. Due to the sensitive nature of the interview topic, interviewers raised questions and conducted the interview in a casual and empathic manner (e.g., expressing regret for an interviewee's evacuation status). This technique allowed participants to discuss emotionally sensitive experiences in a comfortable, informal manner. All interviews were recorded with a small digital audio recorder and were transcribed verbatim by a team of trained undergraduate research assistants. The research assistants were trained as a group and followed a standardized set of transcription rules. The training included practice sessions to validate transcriptions across all transcribers. All transcripts were reviewed for accuracy by a second transcriber.

Coding and Analysis

The qualitative analysis software package *NUD*IST* (Richards & Richards 1997) was used to facilitate data management, organization, and identification of relevant coding narratives from parent interviews. Guided by the existing (but limited) research on parents and children's coping with natural disasters (Jeney-Gammon et al. 1993; Lack & Sullivan 2008; Prinstein et al. 1996; Saylor et al. 1997), coping with stressful events in general (Skinner et al. 2003), and family interaction research (Melby & Conger 2001), we developed six categories of coping activities. They included:

- *Problem solving*: planning and implementing preparedness and recovery activities;
- *Distraction*: using various social and physical activities to keep children's focus away from disaster-related events;
- *Religious*: praying and conveying messages of faith in a superior power for protection from, and acceptance of, disaster outcomes;
- *Social support*: using social support networks (i.e., friends and relatives), providing children informational support (e.g., disaster-related explanations), emotional support (e.g., physical affection and reassurances about their safety and other concerns), and using professionally based resources for themselves or their children during postdisaster recovery;
- *Emotion regulation*: inhibiting displays of their own anxiety and minimizing expressions of negative emotions in the presence of their children; and
- *Family coping*: encouraging role flexibility, coordinating responsibilities, and involving children and adolescents in coping activities throughout the course of the disaster.

- Finally, while not considered coping, due to the importance of the intensity of disaster exposure to children's subsequent adjustment (La Greca & Silverman 2009), we coded passages in the narratives related to level of exposure, including parents' (1) limiting their children's exposure to disaster-related news and media images, (2) taking children to impact areas, and (3) whether children viewed disaster impacts during evacuation.

During the coding process we observed multiple instances in which parents commented on their own and their children's prior natural disaster exposure experiences. As this appeared to represent a heretofore unexamined aspect of natural disaster research, we added a category to code whether parents and children had been exposed to wildfire or tornado disasters previously.

Graduate and undergraduate coders were trained in the aforementioned coping coding categories using examples from other coping research studies, and information from extant disaster literature. Subsequently, coders reviewed each transcript and categorized parents' statements into one of the coding categories. Inter-rater reliabilities were established by calculating coder agreement using Cohen's Kappa on 25% of the transcripts. Kappa coefficients for each coding category in the San Diego and Tennessee samples, respectively, were: problem solving (.74, .66), distraction (.91, .66), religiosity (N/A, .80), support seeking (1.00, .94), emotion regulation (.84, 1.00), and family coping (.71, .80). Kappa coefficients in the San Diego and Tennessee samples for overall exposure to the current disaster were .71 and .80, and for children's prior disaster exposure, .92 and .88, respectively.

Results

We first review parents' comments about their children's exposure to the current and prior disasters, after which we describe the parents' coping activities for each disaster.

Child Disaster Exposure

While all children were exposed to the disaster simply by virtue of being in the disaster impact areas, 29% of San Diego but only 3% of Tennessee parents indicated that they limited their children's exposure to news and other media reports on disaster events (Table 1). The lower number for the Tennessee parents appeared to be due in part to the necessity of using weather radios and local media to monitor the rapidly developing movement of the tornados in the area. Also, parents in both samples tended to simply not inform or provided limited information about the ongoing events to very young children (i.e., preschool age) so as not to overly alarm or frighten them. For example, Tennessee parents let their children sleep through the passing storm, or moved them to sleep in a central room, closet or cellar with little commotion. This option, of course, was not as available to San Diego parents, given their need to evacuate their homes, sometimes with very short notice. Older adolescents tended to be fully informed of ongoing events, as most were reported to have helped with preparedness or recovery activities and generally were relatively calm emotionally. As one San Diego mother explained,

My (younger) son was asking questions when we were watching the television, seeing the fires, saying 'is that our house is that our street, that looks like our house. We kept saying, 'no, that is not our house that is not our street.' We just thought they don't need to know. Let's figure out if it burned first, so that is the only information we kept from them.

Table 1
Frequencies and percentages of disaster exposure levels and coping activities

Coding Categories	San Diego Wildfires (<i>n</i> = 24)	Tennessee Tornadoes (<i>n</i> = 32)
Exposure		
Limited access to news/media	7 (29) ¹	1 (3)
Children taken to impact areas	1 (4)	7 (22)
Children see impact in transit	9 (38)	3 (9)
Prior disaster experience		
Parent	15 (62)	18 (56)
Child	11 (46)	12 (38)
Coping Strategies		
Problem solving		
Pre-preparation plan	5 (21)	25 (78)
Preparedness activities	24 (100)	13 (40)
Monitor danger status	18 (75)	24 (75)
Monitor impact	21 (88)	1 (3)
Repair property	5 (21)	1 (3)
Relief effort	7 (29)	13 (44)
Distraction		
Play games, toys, cards, tell stories, and sing songs	10 (42)	5 (16)
Text friends on cell phones	3 (13)	2 (6)
Watch movies/media	3 (13)	0
Work on school work and art activities	2 (8)	0
Visit malls and museums	5 (21)	0
Swim and walk at the beach	7 (29)	0
Emotion Regulation (Parent)	8 (33)	18 (56)
Religiosity		
Fatalism (“It’s their time.”)	1 (4)	20 (62)
Pray to God for good outcome	0	3 (9)
Disaster is God’s will	1 (4)	9 (28)
God protects and provides	0	7 (22)
Safety	0	9 (28)
Social Support		
Social network	5 (21)	12 (38)
Emotional	11 (46)	17 (53)
Informational	19 (79)	16 (50)
Professional/post event	6 (25)	2 (6)
Family Coping		
Coordinating coping activities among family members	8 (33)	5 (16)

¹Percentage of parents scored in the category, divided by total sample.

Children in San Diego were quite aware of fire cues, either in the distance or, for some, the high winds, ash and embers of a rapidly approaching fire wall. During their evacuation, 38% of San Diego parents reported that their children observed fire-destroyed properties while 9% of Tennessee children observed the tornado destruction. Twenty-two percent

of Tennessee parents compared with just 4% of San Diego parents reported taking their children to view areas destroyed by the fires or tornadoes. Several Tennessee parents said they let their children see the impact to educate them about the danger of, and to instill a sense of respect for, tornados. Even in these cases, however, these parents avoided directly exposing their children to circumstances involving the death of individuals or animals.

We would let them see you know, buildings that had been damaged or whatever. We let them see that kind of stuff. Just to know that, to take it seriously. (Father, Tennessee)

. . . and he (the father) said that you know they do need to see and this is their community and they have many friends who have lost houses, and they need to see this. They don't need to go to the funeral home with me, and see people that are upset because they lost lives, (although) they need to realize that people did die . . . (Father, Tennessee)

With regard to prior disaster experience, 62% of San Diego and 56% of Tennessee parents indicated that they had been through previous wildfires or tornadoes, respectively (and several also had experienced earthquakes or hurricanes). Also, 44% of San Diego and 38% of Tennessee parents indicated that their children had been exposed to a wildfire or a tornado previously. Even though these events occurred years earlier, parents reported that a number of these children tended to be more alert and express higher levels of fear and anxiety to disaster cues at even modest levels of intensity and were inclined to want to evacuate or seek shelter earlier than siblings without prior exposure.

Back in 2003 (she was 5) it was really horrible because of the smoke . . . she was afraid if she went outside she was gonna die; this time she says 'I don't want to go in the smoke', and she would say, 'Mommy hurry back (from the store), I don't want you to die.' (Mother, San Diego)

My 12-year old is very apprehensive about storms now ever since the tornado came through in 2006. So anytime it gets windy or whatever he starts getting paranoid, 'Are we okay?'. And so we kind of gather him and, just make sure he's feeling safe. The other (older) adolescents are just going about their own way and doing what their doing. They'll come down and check, 'Hey do we need to be worried?' No, it doesn't look like it or well maybe. (Mother, Tennessee)

Coping Activities Associated with Each Disaster

The frequencies and types of coping activities within each of the six coping categories are separately reported for the San Diego and Tennessee samples (Table 1). Results are presented comparatively for each sample within each coping category, and are illustrated with parental comments from both communities. In a few cases, an example for one coping category demonstrates multiple coping codes.

Problem-Solving Coping Strategies. We assessed eight dimensions of parents' problem solving activities regarding the disaster events. These included: pre-disaster planning, preparedness activities, assigning children responsibilities for preparedness activities,

monitoring disaster progress or threat status, activities to repair one's property, and participation in relief efforts for family, friends and members of the larger community.

More Tennessee parents (78%) than San Diego families (21%) reported having a pre-preparation plan in place prior to any immediate warning of a tornado or evacuation notice. Generally, their plan took the form of discussions with their children about where to find shelter within the home (i.e., closet, central room, basement, crawl space), safety drills at school for children, plans for where to meet should they be separated, and stocking of minimal supplies (e.g., games, water, flashlights/candles) in their shelter area. San Diego parents' pre-planning activities involved storing and organizing important documents and family possessions (i.e., items essential for dealing with potential disaster recovery issues, such as insurance, business-related responsibilities, and child and family health needs) for easy access and transport:

Well, you just pre-plan, you know. You go through the tornado drill form. I made him up a card with everyone's phone numbers that he keeps in his jacket pocket. (Mother, Tennessee)

I started a good 24 hours (beforehand). I packed my favorite books, family-life books, irreplaceable heirlooms, basic necessities, clothes, important papers and documents, children's best clothes, like their most important stuff like Halloween costumes, favorite trinkets and books, movies, stuffed animals. (Mother, San Diego)

As noted above, Tennessee parents who had experienced tornadoes previously were more likely to have such a plan in place and San Diego parents were more likely to engage in preparedness activities or to evacuate their homes before mandatory evacuations were declared:

I think probably after the Cedar fire (2 years ago) we had this five minute and 30 minute plan of what you really want to take out of your room and that was a big difference because you can take a lot more stuff (on short notice) . . . we have friends who had five minutes to walk out of the house that took nothing. (Mother, San Diego)

Finally, as might be expected, preparedness activities that took place before mandatory evacuation notices were issued improved the overall effectiveness of parents' readiness and evacuation efforts. Some families, although aware of the encroaching fires, did not begin packing until the smoke and fire were in closer proximity (e.g., smoke burning their eyes, worried calls from friends). Parents who were less proactive in preparedness activities reported more stress, fear and anxiety in their children:

We saw the fire coming over the hill, right off of our balcony, as we were leaving . . . My husband put her (daughter) in the van and then our electricity went out, so it was pitch dark and we were trying to get stuff down the steps and she was in the van by herself and when I opened the door of the car to get in she was in the back seat crying, so I'm sure she was pretty scared. We just wanted to put her somewhere safe and (yet) it was pretty scary for her. (Mother, San Diego)

It came through about 2:30 in the morning, we woke up. The house was shaking; our son woke up screaming, not like him. The house was under a pretty good wind, . . . pretty tremendous rain . . . a little alarming so (we) took children in basement and having kids under the pool table . . . and in about 15 minutes pretty, big thick hail came down, and some terror in a sense, for a little bit. . . .blessed that it kinda passed over us. (Father, Tennessee)

Seventy-five percent of families in both communities monitored the status of the wildfires or tornadoes, using local media or weather radios, or calling family and social networks living in the area:

I got five calls in half an hour telling me our area, like the smoke is really bad and you shouldn't go back home, or if you do, don't take the children & just grab the important stuff you need. (Mother, San Diego)

We have a weather radio that goes off and lets us know if something's going in the area so in the middle of the night if it were to come through, it wakes you and lets you know that you need to start preparing. (Mother, Tennessee)

Regardless of when they started, all the San Diego families who were interviewed engaged in some level of preparedness activities prior to evacuation. San Diego parents gathered family possessions, business and personal documents, photos/heirlooms, clothing, children's games, toys, trinkets, clothing, and pets. In addition, some families also prepared their homes to minimize fire or smoke damage by sealing vents and watering rooftops and yards. As might be expected, Tennessee families were much less involved in gathering family documents, photos, and belongings, as they generally were not evacuating their homes. Also, because Tennessee families were more likely to have a plan in place, their preparedness activities were less involved. They described moving children from their bedrooms to sleep near or in their safety area, having pillows, blankets and even a mattress ready to protect them from flying debris, cell phones for contacting others, and easy access to media/weather radios. Families with a storm cellar or basement were more likely to have minimal supplies (e.g., games, water, flashlights, and candles) at hand:

We had plenty of food on hand, so that if we can't get out we are ok at home. We have a back up generator in case the electricity goes out. We watch the weather (on TV) to see if it's coming our way because the Doppler radio seems to tell you exactly what time it's going to hit. Just trying to see, okay, do we need to get in a safe place, or is this going to go over us, kind of thing. (Mother, Tennessee)

Twenty-one percent of San Diego parents interviewed were involved in contracting assistance to remove ash and smoke damage to their homes (no homes were lost among these families) while none of the Tennessee families interviewed had suffered serious property damage. Both communities rallied to assist those most affected, especially at the lower range of income. San Diego families (29%) reported contributing food, clothing and gift cards for necessities. In Tennessee, assistance (44%) involved more volunteer activity among family members in the distribution of needed supplies, clearing of affected properties, organizing relief efforts for families, and there was more report of children and adolescents being permitted or encouraged to assist these efforts. These parents reported

that adolescent involvement taught important values, demonstrated the seriousness of the situation, and helped keep children's focus away from personal concerns.

Distraction Coping. San Diego parents reported using a variety of strategies to distract children from thinking about the disaster-related events. Parents from both communities indicated that they played cards, sang songs, and told stories to engage children's time and attention (San Diego, 42%, versus Tennessee, 16%). Some San Diego families were able to stay with relatives and family friends during the evacuation. Parents found that the children or adults in these families were a positive distraction for their own children. Among families who evacuated to a hotel or a relative's home nearer the coast, parents reported taking their children to the beach because it was one of the few places where the air quality was not as poor as it was inland (29%). Parents in San Diego also had the opportunity to visit museums, visit shopping malls, watch movies, and work on school activities with their children (8–21%). According to parents' reports, these child-directed activities also allowed them time to monitor and make informed decisions about the next steps in recovery:

I think they [the girls] thought it was a big field trip because we did a lot of fun stuff. We got [our] nails done. We went to the movies, and they got a toy from the store downtown just so they would have something at the hotel to play with, and they were with their cousins, so they had fun." But we felt like we had to turn off the TV, and let them rent a movie, but at the same time you're dying to know where the fire is at. (Mother, San Diego)

We sat out and played cards, got a bunch of candles lit, (used) a crank lantern and the radio, and we played cards till it was over. (Mother, Tennessee)

Emotion Regulation Strategies. A number of San Diego (33%) and Tennessee (56%) parents articulated the importance of managing their anxiety and minimizing the expression of their own negative emotions in the company of their children. In both disaster events, parents emphasized that they tried to remain calm throughout, so as not to either elicit or exacerbate negative emotional reactions in their children. One father from Tennessee explained why he controlled his emotions in the presence of his three children:

Kids can sense from the time they are born stress from their parents. And same thing throughout life and situations, kids can feel stress of their parents and can sense it. If I am calm I think I can keep him calm. If they have someone there, they continue to be strong and keep things under control. (Father, Tennessee)

I had to stay calm (for them), even though, you could see it (i.e., fires) coming and the winds were just howling. (Mother, San Diego)

Parents reported that some children had more difficulty than others in regulating their emotions and behavior:

... my 7-year-old, he just spiraled down ... the sky got more and more red, you could see the black [smoke] coming – that panicked him, hearing and seeing the sheriffs come by, that just panicked him. He was hysterical, screaming in the front yard 'we're gonna die, our house is gonna burn, we're gonna burn,

we gotta go, the fires coming.’ Then he started freaking out, throwing stuff in the car. (Mother, San Diego)

It’s just that some kids are different than others, some it will bother and some it will not. My youngest (age 11), whenever it starts thunder and lightening and wind is blowing, he feeds of his mother who is terrified, and so he’s like ‘we need to go to the basement.’ (Father, Tennessee)

Religious Coping Strategies. One of the largest differences between the San Diego and Tennessee parents was the use of religious coping. Parents in the Tennessee sample (compared to a single San Diego parent) mentioned God, prayer, and their faith when discussing the causes and consequences of the disasters with their children. These messages conveyed beliefs that individuals pass away according to God’s timing (e.g., “if it’s your time, it’s your time,” 9%), comfort and hope comes through prayer (28%), outcomes are accepted fatalistically as part of God’s will or plan (22%), and God protects and provides to those in need (28%). Conversely, one San Diego parent mentioned religion as a coping mechanism (i.e., the parent reported saying a prayer for the safety of the family before evacuating their home). Three Tennessee parents’ comments capture the essence of this approach:

‘I was trying to explain, just telling them you know it’s all in God’s hands. I said, just pray that God will keep us safe, things will, you know, work out. I mean if worst comes to worst we will go where we need to go and take cover, but I said this is all in God’s hands and we’ll just have to pray that he will keep us safe no matter what.’ (Mother, Tennessee)

Tornadoes definitely wreak havoc like nothing you’ve ever seen before in your life. It kinda comes with living in the area. When you live in Tennessee, where we’re at, it’s kind of like tornadoes are like God’s will. There’s really not much you can do. (Father, Tennessee)

We’re prepared to die too which is a real common thing you know, our hearts are ready with Christ, if we die, we die. I think that’s where we are, most of our family is too. My grandma says, the book was written and when the page is turned you can’t go before your time. (Mother, Tennessee)

Social Support Strategies. Tennessee parents reported more use of social networking, such as calling relatives, friends, coworkers or their children (i.e., who were living with ex-spouse) to check up on them after the tornado (33% versus 21%). Conversely, San Diego parents provided more informational support to their children (79% versus 48%). In one instance, a Tennessee mother used TV weather report information to explain where the storm was to allay her children’s concerns regarding their grandmother.

And so I, kind of like the same thing when they showed the radar, you know they’ll show cities, and they’ll (the children) be like that’s Nani’s city. I’m like ‘yes it is and look at where this is and it’s (the tornado) already gone passed her house. (Mother, Tennessee)

I showed her the fire, and I told her look, you see the helicopters putting it out, and it was like she wasn’t worried (or) scared at all. So I think what I told her and how I kept her informed made sure that she understood that it was okay, cause I didn’t want to freak the kids out (or) be worried. (Mother, San Diego)

Two mothers' comments, one in Tennessee, the other in San Diego, reflected the views of multiple parents regarding developmentally appropriate levels of information in response to their children's questions:

. . . you don't over dramatize it and you don't gore it up, you just answer their questions. Kids are simple. And so you answer straight forward questions with straight forward answers without going overboard (too much detail). (Mother, San Diego)

You don't overload their senses, so many times the questions they have are simple questions, and you just don't elaborate . . . You answer truthfully as you can without focusing on the negative . . . (Mother, Tennessee)

Parents of both groups provided approximately the same amount (46% versus 53%) of emotional support in response to their children's concerns, including physical affection (e.g., holding and hugging), verbal reassurances (e.g., about their own and others safety), and encouragement to remain calm:

I told them that there was a fire and that they would be safe. We would make sure they were safe, but that we had to leave our house to make sure we were all safe, because we didn't know how close the fire might get. (Mother, San Diego)

. . . and let them know, 'okay we just need to get to a safe place and everything is going to be fine. (Mother, Tennessee)

Finally, 25% of San Diego County parents (versus 6% of Tennessee parents) reported that they or their children saw a professional counselor while staying at a federally declared shelter or evacuation center or at a counseling session at a local school. One Tennessee parent also stated that they found professional counseling from the clergy at their church:

They're really good at school. They've been talking a lot about it with teachers and teachers have been talking to classes and a few of the kids in their classes have lost their homes so they've been you know giving gift cards to those who need stuff, like groceries, just stuff like that. (Mother, San Diego)

Family Cohesion and Role Flexibility. One of the patterns that emerged from the interview data was coping at the family level; that is, coordinating and organizing the coping activities of multiple family members simultaneously. The majority of this coordinated activity involved problem solving in preparation for evacuation or seeking shelter. Thirty-three percent of San Diego parents involved their children and adolescents in preparedness activities, such as selecting personal belongings, games, memorabilia, and assisting parents' evacuation activities. Some parents gave their children the opportunity and autonomy to decide what was important to bring with them. For example, one mother reported giving her children large trash bags and telling them to place things they "could not live without" in the bags. Children packed trophies and other personal keepsakes, in addition to hand held computer games, while others packed only a few personal items. More than one parent commented on the fact that even adolescents, whom one would think would know what things to take, still needed supervision. In one case, an older adolescent packed all of her

personal belongings, only to leave all of her nightclothes behind. Younger children tended to pack items of emotional rather than practical significance:

He only packed his favorite toy. When I asked if he wanted to take anything else he just sighed and said, 'No.' (Mother, San Diego)

I said, Get the things that you would like to take, just take with us right now . . . it was kind of a weird situation because she was more concerned about her cat, and her dolls, and her animals, and toys. (Mother, San Diego)

Tennessee families generally involved children in the pre-planning activities for tornadoes (e.g., drills at home and school), so there were fewer instances of children being assigned specific responsibilities during preparedness activities immediately prior to a tornado warning. However, one Tennessee mother reported:

I have eight children, I have to really watch for storms, and I can't wait until it comes to life. When it hit Gallatin, which is probably 30 minutes away, I was prepared for it. We were already in our safe place. Everyone has their own person they're supposed to get.

In some cases, these responsibilities required children to perform activities not done previously, like driving to pick up siblings from school or preparing the home to minimize damage.

We got a phone call at 9:20AM to come pick them up (at school), and I sent my 16 year old to get my other (10 year-old) son and it was chaos here . . . the parents panicking, the smoke started getting bad . . ." My 16 year-old was watering everything down, but my 7 year-old was in a panic. (Mother, San Diego)

Discussion

The parents' interviews provided a rich, contextually grounded description of their coping activities in two different natural disasters and suggested that there were variations in their activities as a function of child, cultural, and disaster-related characteristics. To the extent that parents play a role in mediating children's experience of distress in natural disaster events (Proctor et al. 2007), parental modeling of coping and facilitating their children's cognitive, emotional, and behavioral coping skills may be an important mechanism through which children learn to adapt successfully to such stressors.

The parents' narratives illustrated several key ways in which they facilitated their children's coping. When children and adolescents were involved in various preparedness activities prior to actual evacuation notices, they showed less fear and anxiety and more positive emotional and psychological adaptation to different evacuation environments (e.g., hotels, homes of relatives). This accords well with Williams et al.'s (2008) recommendation that models of care for children need to incorporate children's needs in disaster pre-preparation and preparedness activities. On the other hand, parents' narratives revealed more fear and anxiety among children when they hurried to evacuate at the last minute or when they did not track tornado warnings and sought shelter only once the storm winds were rattling their home. Given that one of the major factors in predicting PTSD symptomatology is the intensity of exposure to the disaster (La Greca et al. 2002), these

proactive problem-solving and family-level coping activities may play a critical role in mitigating the psychological impact of disasters on children.

Apart from preparedness and problem solving, social support was the most frequently modeled and facilitated activity across parent groups. The prevalence of parents' social support is consistent with research showing that family support and learning to seek social support from others reduces children's post disaster adjustment problems (Jeney-Gammon et al. 1993; Pina et al. 2008; Saylor et al. 1997). We documented four sources: structural or social networks, informational, emotional, and professional or community support. As might be expected, parents relied on social networks (e.g., friends, relatives, co-workers) to provide and receive assistance and to establish the well-being of significant others during wildfire evacuation and posttornado recovery. We observed, further, that a number of parents emphasized the need to provide age-appropriate levels of informational support (e.g., explanations for disaster events and outcomes) to their children. With preschool or early elementary-aged children, parents indicated that they provided nonthreatening explanations of disaster phenomena, minimized the threat level of disaster cues, and did not discuss potential consequences. Preteens and adolescents were given factually based information without overly dramatizing the severity of potential consequences to life or property and some parents engaged them in support for others through recovery activities. Finally, parents addressed the needs of anxious and fearful children through physical affection (e.g., hugs, holding), emotional comfort, and reassurance about their safety and the well-being of significant others. The relative contribution of parents' informational and emotional support strategies for children's subsequent adjustment remains an important area for further research (Saylor et al. 2003), as little is known about how these forms of support may influence children's acquisition of strategies for regulating their affective states in stressful circumstances.

We also documented that one-third of the San Diego and over half of the Tennessee parents emphasized the importance of regulating the expression of their own fears and emotional distress in the presence of their children. Consistent with both social learning theory and social referencing theory (Morris et al. 2007), they reported that their children looked to them for cues on how to interpret and react to the disaster. They described how they consciously dampened expression of their own negative emotions and modeled calmness so as not to exacerbate their children's fears and anxieties. This is consistent with MacFarlane's (1987) finding that children's long-term posttraumatic symptoms to a wildfire disaster were predicted less by their direct exposure than by their mothers' responses to the disaster. Similarly, for children victimized by a devastating earthquake in El Salvador, parents' exhibition of positive emotions appeared to have a buffering effect. That is, children of those parents who expressed more positive emotion exhibited fewer PTSD consequences than children whose parents expressed more negative emotions (Vasquez et al. 2005).

Parents in both samples explained their use of other coping activities functionally, that is, to serve the purpose of helping their children modulate negative emotional states. Parents provided informational and emotional support, encouraged active involvement in preparedness and recovery efforts, positively reframed potentially negative outcomes (e.g., explaining they had insurance to rebuild homes), and adjusted their parenting style to accommodate variations in children's reactivity to the disaster. Other researchers have reported similar findings: that soothing self-talk, parental reframing, discussing emotions, and acceptance lowered children's distress levels after a disaster (Gil-Rivas et al. 2007). In research on interventions with children affected by a wildfire disaster, McDermott et al. (2005) have suggested that helping children, especially younger children, regulate their internal emotional states may be more important to their adjustment than the objective

characteristics of the disaster event itself. Thus, a key role for parents in children's successful coping and adaptation to natural disasters would be to effectively model self-regulation of negative emotional states, and to help their children learn strategies to regulate negative arousal.

Away from the security of home and familiar routines and activities, San Diego parents engaged their children in various activities to keep their focus away from the status of their homes and other issues of concern. The ability to engage in activities that distract children and adolescents appears to play an important role in helping children deal with PTSD symptoms after a hurricane (Prinstein et al. 1996), and it was used by a majority of evacuated San Diego families. Among Tennessee parents, distraction activities occurred with the onset of taking shelter and lasted only until the tornado alert lifted. After the tornado, some children and adolescents engaged in volunteer assistance activities for affected families, which some parents believed served to distract them from their personal concerns.

Unlike other types of stressful events, natural disasters affect the entire family, neighborhood, and community; require coping with multiple stressors simultaneously that are both acute and potentially chronic; and may demand a diverse set of interventions to promote an effective adaptation to the event (Saylor et al. 1997). We have proposed the concept of "family coping," in contrast to traditional theoretical models of coping that focus on the development or use of strategies by individuals (Connor-Smith et al. 2000; Skinner et al. 2003). The demand characteristics of a natural disaster represent and require a conceptualization of coping responses from the entire family, including the organization and coordination of coping activities among all members simultaneously. At times, parents actively debated the "best" response to the stressor (such as how early or when to evacuate or prepare), who was in the best position to perform certain activities, who would manage which aspect of preparedness activities, and how to distribute family members' responsibilities.

One advantage of conceptualizing coping at the level of the family is that it brings into view how the coping of one family member affects the coping options of other members. Although parents did vary expectations of their children depending on their age, the great stress of the disaster event sometimes challenged these standards. Under the duress of disaster events, parents may be vulnerable to expecting more mature behavior or be unaware of the maturity demands they place upon even young children that are beyond normative expectations (e.g., such as placing a young child in a dark car and leaving them there while getting the car packed). Our analysis of parents' narratives indicated that some parents reported elevated role expectations of their older children during the evacuation, particularly in the San Diego sample. Flexibility in family role relationships may be helpful in times of severe distress (Uszynska-Jarmoc 2001), and even may help children adapt successfully to disaster stress (Hamilton & Figley 1983). Whether such actions promote children's acquisition of effective coping skills, however, depends upon matching these expectations to the adaptive capacity of children by age, personality or other child-and situation-specific characteristics. Some parents' narratives revealed their awareness of age and personality characteristics of their children as important limiting factors, while other parents' statements did not. Thus, parents may need assistance in learning family-level coordination of coping activities, developing expectations appropriate to the personality and coping skills of their children, how to coach children when asking them to take on new and unexpected responsibilities, and developing skills in group communication.

We also observed that parents' descriptions of their coping activities varied with characteristics of the child, and with region. First, age appeared to moderate children's reactions to the wildfire and tornado circumstances, consistent with reviews of the effects

of hurricane and tsunami disasters on children (Murray & Hudson-Barr 2006). Generally, but not always, preteens and adolescents were described as more nonchalant (e.g., “let me know if I need to be concerned”), more proactive and cooperative in coping (i.e., actively involved in evacuation or shelter preparation), and willing to engage in recovery activities for affected families or friends. Preschool and early elementary aged children younger children were more likely to express concerns for the safety of self and others and to seek or maintain proximity with attachment figures, consistent with the developmental literature (Murray & Hudson-Barr 2006).

San Diego and Tennessee parents both indicated that their children manifested disaster-related fears and anxieties similar to that expressed by children exposed to wildfire and other natural disasters (e.g., fear of disaster cues, anxiety about death or injury to self or significant others, destruction or loss of valued possessions and home; La Greca et al. 1996; McDermott et al. 2005). The critical factor that we noted among these families, however, was parents’ accounts of their children who had been experienced a wildfire or tornado disaster previously. Although we did not clinically assess children’s symptomatology, these children were depicted as more being anxious, displaying lingering nonclinical levels of social and emotional adjustment, and needing alterations in the everyday parent-child relationship, such as increased emotional support (Evans & Oehler-Stinnett 2008).

Now that they were exposed again to a natural disaster situation, some children manifested cognitive, attentional, emotional, and motivational changes in functioning. Children were depicted by their parents as more sensitized and alerted quickly to potential disaster information (e.g., “they’re very quiet cause you know . . . we turn the TV on really loud cause they’ll tell you when the storm has cleared the area”), easily apprehensive and expressing a sense of dread (e.g., “oh, no, it’s going to happen again”), exhibiting lasting fears to disaster-related cues (e.g., “she’s terrified of tornados”), and they were much more likely to press for proactive coping activities (e.g., to seek shelter or evacuate) prematurely, such as to nontornado thunderstorms or fire alerts.

We are unaware of studies investigating the psychological impact on children with repetitive exposure to natural disasters. The few accounts that exist of exposure to repetitive trauma have focused on children’s long-term adjustment to war experiences (e.g., Durakovic-Belko, Kulenovic & Dapic 2003; Dyregrov, Gjestad & Raundalen 2002). In these studies, children are reported to exhibit depressive reactions, posttraumatic stress symptoms, sadness, fears about losing their family, intrusive thoughts, and avoidance reactions for at least two years after the end of the war. Their findings and the descriptions of the parents in our samples suggest that repetitive and intense stress experiences occurring in natural disaster-prone regions of the country could pose significant psychological risk for children and need to be a focal point for further research and intervention.

Aside from age and prior exposure, religious coping was prominent in the narratives among Tennessee but not San Diego parents. In their narratives, fathers and mothers used religious messages to cognitively reframe and foster acceptance of disaster outcomes by attributing disaster outcomes to God’s will, relying upon a higher power to guide, protect, and provide safety, and interpreting death as not to be feared as it was God’s decision when one would join the faithful with Him. In coping theory, these messages represent a way of cognitively reframing the event and represent secondary control coping, in which individuals focus on adapting themselves to the situation (Connor-Smith Compas et al. 2000). Such explanations may be helpful to the extent that they provide one way in which to interpret and understand consequences of disaster events that are otherwise uncontrollable and unpredictable (Benore & Park 2004). In a recent meta-analysis, Ano and Vasconcelles (2005) found that some forms of religious coping led to positive

psychological adjustment, while other forms were associated with maladjustment. Further research on the attributional components of religious coping could identify messages associated with exacerbating or facilitating children and families' adaptation to natural disaster outcomes. In the development and implementation of disaster recovery interventions, faith-based organizations and local churches may be an important resource for individuals or communities with strong religious traditions.

There are a number of important limitations to this study that deserve mention. First, participants represented only a small sample of the very many families who were evacuated or otherwise affected by the wildfires in San Diego County and the tornados in Tennessee. The parents represent a convenience sample, and their volunteering to participate may reflect their willingness or eagerness to discuss their personal reactions as well as those of their families. Consequently, their narratives may or may not generalize to other families affected by wildfires and tornados.

Another limitation is that our study was not designed to collect diagnostic information on children's adjustment, nor could we explore the effects of various levels of disaster exposure on children's coping or adjustment. Although the actions of the parents with their children are consistent with what researchers generally indicate reduce children's symptomatology after natural disasters (Jeney-Gammon et al. 1993; Pina et al. 2008; Prinstein et al. 1996; Vasquez et al. 2005), we cannot speculate on their contribution to children's adaptation in these samples. Moreover, due to time and resource constraints, we did not interview children regarding their reactions, interpretations and coping activities in the two disasters. Studies using interview-based assessments have found that children's own stress perceptions can differ from those that parents provide (Earls et al. 1988). Further, the above-mentioned findings have suggested several consistent patterns in parents' coping activities as a function of disaster, child and regional characteristics. Given our semi-structured interview methodology, San Diego and Tennessee parents may or may not have uniformly reported their coping activities. As a result, we may have over- or underestimated the frequency or importance of any given coping activity in either group. Thus, assessing children's self-reported coping efforts and using a mixed-methodology design (i.e., coping questionnaires and interviews) to examine relations among parent and child coping activities and children's adjustment is a necessary next step for research

Finally, our observations suggest that a stronger emphasis on training parents' own coping and skills for facilitating their children's coping might be of benefit to disaster intervention models (e.g., Brymer et al. 2009; LaGreca et al. 2009; McDermott et al. 2005). Specifically, the training components could include

1. preparedness coping activities at the parent, child, and family level which specifically addresses children's needs;
2. developmentally appropriate pre-preparation and preparedness activities at different ages;
3. the short- and long-term emotional benefits to children of early evacuation and preparedness;
4. distraction techniques for different age groups;
5. techniques for parents to regulate their own emotional distress and that of their children, especially for children with repetitive disaster exposure;
6. strategies for informational and emotional support messages targeted to children's threat appraisals in wildfire versus tornado events; and
7. how and when to utilize external social support networks that integrate regional or cultural traditions known to mitigate stress responses, such as religious coping.

Increasing the skill levels of parents for discussing disaster-related issues with their children (e.g., Bauer et al. 2007; Sales et al. 2005) would amplify the impact of professional interventions as it would coach them, in real time, to use cognitive, emotional and behavioral strategies that promote resilience and successful adaptation to such challenging events and their aftermath.

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References

- Ano, GG & Vasconcelles, EB 2005, 'Religious coping and psychological adjustment to stress: a meta-analysis', *Journal of Clinical Psychology*, vol. 61, no. 4, pp. 461–80.
- Banister, P, Burman, E, Parker, I, Taylor, M & Tindal, C 2001, *Qualitative methods in psychology: a research guide*, Open University Press, Maidenhead, UK.
- Bauer, PJ, Burch, MM, Van Abbema, DL & Ackil, JK 2007, 'Talking about twistlers: relations between mothers' and children's contributions to conversations about a devastating tornado', *Journal of Cognition and Development*, vol. 8, no. 4, pp. 371–99.
- Belter, RW, Dunn, SE & Jeney, P 1991, 'The psychological impact of Hurricane Hugo on children: a needs assessment', *Advances in Behaviour Research & Therapy*, vol. 13, no. 3, pp. 155–61.
- Benore, ER & Park, CL 2004, 'Death-specific religious beliefs and bereavement: belief in an after-life and continued attachment', *International Journal for the Psychology of Religion*, vol. 14, pp. 1–22.
- Bokszczanin, A 2008, 'Parental support, family conflict, and overprotectiveness: predicting PTSD symptom levels of adolescents 28 months after a natural disaster', *Anxiety, Stress & Coping: An International Journal*, vol. 21, no. 4, pp. 325–35.
- Brymer, MJ, Steinberg, AM, Vernberg, EM, Layne, CM, Watson, PJ, Jacobs, AK, Ruzek, JI & Pynoos, RS 2009, 'Acute interventions for children and adolescents', in EB Foa, TM Keane, MJ Friedman & JA Cohen (eds.), *Effective treatments for PTSD: practice guidelines from the International Society for Traumatic Stress Studies*, 2nd edn, pp. 106–16, Guilford Press, New York.
- Connor-Smith, JK, Compas, BE, Wadsworth, ME, Thomsen, AH & Saltzman, H 2000, 'Responses to stress in adolescence: measurement of coping and involuntary stress responses', *Journal of Consulting and Clinical Psychology*, vol. 68, no. 6, pp. 976–92.
- Coyne, JC & Racioppo, MW 2000, 'Never the twain shall meet? Closing the gap between coping research and clinical intervention research', *American Psychologist*, vol. 55, no. 6, pp. 655–64.
- Dirkzwager, AJE, Kerssens, JJ & Yzermans, CJ 2006, 'Health problems in children and adolescents before and after a man-made disaster', *Journal of the American Academy of Child & Adolescent Psychiatry*, vol. 45, no. 1, pp. 94–103.
- Durakovic-Belko, E, Kulenovic, A & Dapic, R 2003, 'Determinants of posttraumatic adjustment in adolescents from Sarajevo who experienced war', *Journal of Clinical Psychology*, vol. 59, no. 1, pp. 27–40.
- Dyregrov, A, Gjestad, R & Raundalen, M 2002, 'Children exposed to warfare: a longitudinal study', *Journal of Traumatic Stress*, vol. 15, no. 1, pp. 59–68.
- Earls, F, Smith, E, Reich, W & Jung, KG 1988, 'Investigating psychopathological consequences of a disaster in children: a pilot study incorporating a structured diagnostic interview', *Journal of the American Academy of Child & Adolescent Psychiatry*, vol. 27, no. 1, pp. 90–5.
- Evans, LG & Oehler-Stinnett, J 2008, 'Validity of the OSU post-traumatic stress disorder scale and the behavior assessment system for children self-report of personality with child tornado survivors', *Psychology in the Schools*, vol. 45, no. 2, pp. 121–31.

- Friedman, AH, Stevens, SB & Morris, TL 2008, 'Posttraumatic stress disorder', in M Hersen & D Reitman (eds.), *Handbook of psychological assessment, case conceptualization, and treatment, Vol. 2: children and adolescents*, pp. 264–91, John Wiley & Sons, Hoboken, NJ.
- Gauvain, M 2009, 'Social and cultural transactions in cognitive development: a cross-generational view', in A Sameroff (ed.), *The transactional model of development: how children and contexts shape each other*, pp. 163–82, American Psychological Association, Washington, DC.
- Gil-Rivas, V, Silver, RC, Holman, EA, McIntosh, DN & Poulin, M 2007, 'Parental response and adolescent adjustment to the September 11, 2001, terrorist attacks', *Journal of Traumatic Stress*, vol. 20, no. 6, pp. 1063–8.
- Hamilton, HI & Figley, CR (eds.) 1983, *Stress and the family: Coping with catastrophe*, Brunner/Mazel, New York.
- Hock, E, Hart, M, Kang, MJ & Lutz, WJ 2004, 'Predicting children's reactions to terrorist attacks: the importance of self-reports and preexisting characteristics', *American Journal of Orthopsychiatry*, vol. 74, no. 3, pp. 253–62.
- Houlihan, D, Ries, BJ, Polusny, MA & Hanson, CN 2008, 'Predictors of behavior and level of life satisfaction of children and adolescents after a major tornado', *Journal of Psychological Trauma*, vol. 7, no. 1, p. 53.
- Hoven, CW, Duarte, CS, Lucas, CP, Wu, P, Mandell, DJ, Goodwin, RD, Cohen, M, Balaban, V, Woodruff, BA, Bin, F, Musa, GJ, Mei, L, Cantor, PA, Aber, JL, Cohen, P & Susser E 2005, 'Psychopathology among New York city public school children 6 months after September 11', *Archives of General Psychiatry*, vol. 62, no. 5, pp. 545–52.
- Jeney-Gammon, P, Daugherty, TK, Finch, AJ, Belter, RW & Foster, KY 1993, 'Children's coping styles and report of depressive symptoms following a natural disaster', *Journal of Genetic Psychology*, vol. 154, no. 2, pp. 259–67.
- Jones, RT, Ribbe, DP & Cunningham, P 1994, 'Psychosocial correlates of fire disaster among children and adolescents', *Journal of Traumatic Stress*, vol. 7, no. 1, pp. 117–22.
- Kliewer, W, Fearnow, MD & Miller, PA 1996, 'Coping socialization in middle childhood: tests of maternal and paternal influences', *Child Development*, vol. 67, no. 5, pp. 2339–57.
- Kliewer, W, Sandler, I & Wolchik, S 1994, 'Family socialization of threat appraisal and coping: coaching, modeling, and family context', in K Hurrelmann & F Nestmann (eds.), *Social networks and social support in childhood and adolescence*, pp. 271–91, De Gruyter, Oxford.
- Lack, CW & Sullivan, MA 2008, 'Attributions, coping, and exposure as predictors of long-term posttraumatic distress in tornado-exposed children', *Journal of Loss & Trauma*, vol. 13, no. 1, pp. 72–84.
- La Greca, AM & Silverman, WK 2009, 'Treatment and prevention of posttraumatic stress reactions in children and adolescents exposed to disasters and terrorism: what is the evidence?', *Child Development Perspectives*, vol. 3, no. 1, p. 6.
- La Greca, AM, Silverman, WK, Vernberg, EM & Prinstein, MJ 1996, 'Symptoms of posttraumatic stress in children after Hurricane Andrew: a prospective study', *Journal of Consulting and Clinical Psychology*, vol. 64, no. 4, pp. 712–23.
- La Greca, AM, Silverman, WK, Vernberg, EM & Roberts, MC 2002, *Helping children cope with disasters and terrorism*, American Psychological Association, Washington, DC.
- Losoya, S, Eisenberg, N & Fabes, RA 1998, 'Developmental issues in the study of coping', *International Journal of Behavioral Development*, vol. 22, no. 2, pp. 287–313.
- McDermott, BM, Gibbon, P & Lee, EM 2005, 'Infant school children and natural disasters: results from the early childhood trauma self-report', in TA Corales (ed.), *Focus on post-traumatic stress disorder research*, pp. 71–93, Nova Science Publishers, Hauppauge, NY.
- McDermott, BM & Palmer, LJ 2002, *Wilderness area and wildfire disasters: insights from a child and adolescent screening program*, American Psychological Association, Washington, DC.
- McFarlane, AC 1987, 'Posttraumatic phenomena in a longitudinal study of children following a natural disaster', *Journal of the American Academy of Child & Adolescent Psychiatry*, vol. 26, no. 5, pp. 764–9.
- McFarlane, AC, Policansky, SK & Irwin, C 1987, 'A longitudinal study of the psychological morbidity in children due to a natural disaster', *Psychological Medicine*, vol. 17, no. 3, pp. 727–38.

- Melby, JN & Conger, RD 2001, 'The Lowa family interaction rating scales: instrument summary', in P Kerig & KM Lindhal (eds.), *Family observational coding systems: resources for systemic research*, pp. 33–58, Lawrence Erlbaum, Mahwah, NJ.
- Miles, MB & Huberman, AM 1994, *Qualitative data analysis: an expanded sourcebook*, 2nd edn, Sage, Thousand Oaks, CA.
- Miller, PA, Kliever, W & Partch, J 2010, 'Socialization of children's recall and use of strategies for coping with interparental conflict', *Journal of Child and Family Studies*, vol. 19, no. 4, pp. 429–43.
- Morris, AS, Silk, JS, Steinberg, L, Myers, SS & Robinson, LR 2007, 'The role of the family context in the development of emotion regulation', *Social Development*, vol. 16, no. 2, pp. 361–88.
- Muris, P, Steerneman, P, Merkelbach, H & Meesters, C 1996, 'The role of parental fearfulness and modeling in children's fear', *Behavior Research Therapy*, vol. 34, no. 3, pp. 265–8.
- Murray, JS & Hudson-Barr, D 2006, 'Understanding the effects of disaster on children: a developmental-ecological approach to scientific inquiry', *Journal for Specialists in Pediatric Nursing*, vol. 11, no. 3, pp. 199–202.
- Pina, AA, Villalta, IK, Ortiz, CD, Gottschall, AC, Costa, NM & Weems, CF 2008, 'Social support, discrimination, and coping as predictors of posttraumatic stress reactions in youth survivors of Hurricane Katrina', *Journal of Clinical Child and Adolescent Psychology*, vol. 37, pp. 564–74.
- Prinstein, MJ, La Greca, AM, Vernberg, EM & Silverman, WK 1996, 'Children's coping assistance: how parents, teachers, and friends help children cope after a natural disaster', *Journal of Clinical Child Psychology*, vol. 25, no. 4, pp. 463–75.
- Proctor, LJ, Fauchier, A, Oliver, PH, Ramos, MC, Rios, MA & Margolin, G 2007, 'Family context and young children's responses to earthquake', *Journal of Child Psychology and Psychiatry*, vol. 48, no. 9, pp. 941–9.
- Richards, L & Richards, T 1997, *NUD*IST 4*, Qualitative Solutions & Research Pty Ltd, Melbourne, Australia.
- Sales, JM, Fivush, R, Parker, J & Bahrack, L 2005, 'Stressing memory: long-term relations among children's stress, recall and psychological outcome following Hurricane Andrew', *Journal of Cognition and Development*, vol. 6, no. 4, pp. 529–45.
- Sandoval, J & Brock, SE 2002, 'School violence and disasters', in J Sandoval (ed.), *Handbook of crisis counseling, intervention, and prevention in the schools*, 2nd edn, pp. 249–70, Lawrence Erlbaum, Mahwah, NJ.
- Saylor, CF, Belter, R & Stokes, SJ 1997, 'Children and families coping with disaster', in I Sandler & S Wohlchik (eds.), *Handbook of children's coping: linking theory and intervention*, pp. 361–83, Plenum Press, New York.
- Saylor, CF, Cowart, BL, Lipovsky, JA, Jackson, C & Finch, AJ, Jr. 2003, 'Media exposure to September 11: elementary school students' experiences and posttraumatic symptoms', *American Behavioral Scientist*, vol. 46, no. 12, pp. 1622–42.
- Skinner, E & Edge, K 2002, 'Parenting, motivation, and the development of children's coping', in LJ Crockett (eds.), *Motivation, and the life course*, vol. 48, pp. 77–143, Nebraska symposium on motivation, University of Nebraska Press, Lincoln, NE.
- Skinner, EA, Edge, K, Altman, J & Sherwood, H 2003, 'Searching for the structure of coping: a review and critique of category systems for classifying ways of coping', *Psychological Bulletin*, vol. 129, no. 2, pp. 216–69.
- Skinner, EA & Zimmer-Gembeck, MJ 2007, 'The development of coping', *Annual Review of Psychology*, vol. 58, pp. 119–44.
- Stein, BD, Jaycox, LH, Elliott, MN, Collins, R, Berry, S, Marshall, GN, Klein, DJ & Schuster, MA 2004, 'The emotional and behavioral impact of terrorism on children: results from a national survey', *Applied Developmental Science*, vol. 8, no. 4, pp. 184–94.
- Tinsley, BJ 2003, *How children learn to be healthy*, Cambridge University Press, New York.
- Tinsley, BJ 2012, 'Parent socialization of children's risk attitudes and behavior: positive and negative effects on children's development', Manuscript under review.

- Uszynska-Jarmoc, J 2001, 'The image of a child in his parents' minds and self-image of six-year-old children', *Early Child Development and Care*, vol. 169, pp. 1–19.
- Vasquez, C, Cervell, P, Perez-Sales, P, Vidales, D & Gaborit, M 2005, 'Positive emotions in earthquake survivors in El Salvador 2001', *Journal of Anxiety Disorders*, vol. 19, no. 3, pp. 313–28.
- Vernberg, EM, La Greca, AM, Silverman, WK & Prinstein, MJ 1996, 'Prediction of posttraumatic stress symptoms in children after Hurricane Andrew', *Journal of Abnormal Psychology*, vol. 105, no. 2, pp. 237–48.
- Williams, R, Alexander, DA, Bolsover, D & Bakke, FK 2008, 'Children, resilience and disasters: recent evidence that should influence a model of psychosocial care', *Current Opinion in Psychiatry*, vol. 21, no. 4, pp. 338–44.

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