

Identifying Psychosocial Variables Related to Child and Adolescent Adjustment Following a  
Residential Fire: The Role of Appraisal, Coping, and Family Environment

by

Rachel M. Moore

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Russell T. Jones, Committee Chair,  
Jack W. Finney, Committee Member,  
Angela Scarpa, Committee Member,

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ABSTRACT

The substantial emotional impact of trauma on children, adolescents and their caregivers has been amply documented within the general disaster literature. However, research addressing the specific psychological impact of residential fire on child and family functioning is still considered to be in its infancy. The present study adapted the Transactional Stress and Coping (TSC) model for this purpose. This was an extension of the TSC model from the child chronic health to the trauma literature. The TSC model proposes that child and adolescent adjustment (i.e., in the present study, symptoms levels of PTSD, depression, anxiety) following a residential fire will be mediated by both child and adolescent adaptational processes (i.e., cognitive appraisal and coping methods), as well as family processes (i.e., family conflict and parent psychopathology). While the TSC was not supported, several preliminary results were found. Results indicated that family conflict ( $\beta = .289, p < .05$ ) may have mediated the relationship between children's overall adjustment at 4-months and parent-report of child internalizing symptoms at 11-months post-fire ( $\beta = .235, p > .05$ ). Avoidant coping strategies ( $\beta = .294, p < .05$ ) also may have mediated the relationship between child anxiety/depression at 4-months and PTSD symptoms at outcome ( $\beta = .246, p > .05$ ). Furthermore, an interaction effect was found between parent report of child and adolescent internalizing symptoms and children and adolescents' self-reports of religious avoidance. Finally, a moderation effect was also found between children and adolescents' self-reports of their overall adjustment and self-reports of their active coping strategies. These results suggest a transactional relationship among family

environmental variables and individual child adaptational processes which may predict adjustment outcomes.

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## Introduction

Exposure to trauma and stressful situations has become a common experience in the lives of children, adolescents, and families around the world. A moment of reflection brings to mind many recent examples of trauma occurring both at the local and national level in the United States, including exposure to wildfires, hurricanes, and acts of terrorism. Among these various traumatic exposures, residential fires stand as one of the more common, but least studied, traumatic events that can impact individuals and families.

Deaths from fires and burns are the fifth most common cause of unintentional injury deaths in the United States (CDC, 2005) and the third leading cause of fatal home injury (Runyan & Casteel, 2004). On average in the United States, someone dies in a fire every 162 minutes, and someone is injured every 32 minutes (Karter, 2007). In addition, four out of five fire deaths occur in the home (Karter 2007). Residential fires result in loss of life, property, and displacement from one's neighborhood. Grief experienced in the aftermath of residential fires can be expected to have a significant impact on the survivor's recovery and reintegration into the community (Keane, Pickett, Robinson, Lowery, & McCorkle, 1998). Although there is some research on psychological responses to community-wide fires and large scale disasters, very little is known about such responses among survivors of residential fires, despite their frequent occurrence. Most trauma research has focused on mental health outcomes after the experience of trauma, while comparatively fewer studies have focused on risk factors and coping strategies that make a person more resilient in times of crisis.

There is also a noticeable lack of research addressing child adjustment following residential fire. Within the larger trauma literature, although a significant body of work is devoted to understanding child trauma generally (e.g., natural disasters, abuse, chronic illness),

the impact of disasters on children is only beginning to be understood. More significantly, research specifically addressing the psychological impact of fire disasters on children and family functioning is conspicuously limited and still considered to be in its infancy (Greenberg & Keane, 1997; Jones & Ribbe, 1991; Jones, Ribbe, & Cunningham, 1994). The relative lack of attention to the adjustment of children following trauma has occurred in part because of the earlier belief that children's reactions to disasters were mild and transient (Vogel & Vernberg, 1993). This conclusion was based upon studies that relied on teacher or parent reports without including child measures. In contrast, later research began examining children more individually, using self-report and observational methods. Results were at first equivocal, with some evidence suggesting that a significant percentage of children exposed to disasters experience psychological distress, at least immediately following the disaster (e.g., Dollinger, 1986; McFarlane, 1987; Seroka, Knapp, Knight, Siemon, & Starbuck, 1986), while other research failed to show maladaptive responses (Compas & Epping, 1993). More recent research has now documented the substantial emotional impact of disasters on children and highlighted the need for more developmentally specific research and interventions (Pynoos, Goenjian, Tashjian, & Karakashian, 1993; Vernberg, LaGreca, Silverman, & Prinstein, 1996).

Based on the general trauma literature, various child adjustment outcomes have been documented, ranging from mild (e.g., sleep difficulties, irritability, decreased school performance, fears, and somatic complaints), to severe outcomes (e.g., oppositional behavior, depression, anxiety, regression, separation anxiety, and posttraumatic stress disorder). Various risk factors have been examined to account for these wide-ranging adaptive outcomes, including developmental level and demographic variables (preexisting factors), as well as exposure and parental response (trauma-related factors), and finally, social support, coping styles, appraisal,

and parental functioning (post-trauma factors) (Jones & Ollendick, 2005). Among these risk factors, several emerge as well-supported in the literature. For adults, negative *cognitive appraisal* about oneself and the world can lead to more exaggerated maladaptive responses (Ehlers & Clark, 2000). However, cognitive appraisal has been studied very minimally in children. In addition, many researchers have reported strong associations between *coping methods* and differential outcomes (Matheny, Aycock, Pugh, Curlette, et al., 1986). As a result it is widely agreed that the ability to cope effectively plays an important role in determining adjustment following disaster. Again, this has only been modestly studied in children. The *family environment* has been shown to provide resources (e.g., social support) and also function as an example for the child (e.g., modeling coping strategies), thus impacting child adjustment outcomes (Compas & Epping, 1993).

#### *Theoretical Framework*

Within the stress and coping literature, a variety of theories and models have been posited. In 1984, Lazarus and Folkman presented a seminal perspective, a transactional model of stress and coping, from which many other theories in the field have been derived. Within their model, appraisal and coping are the major underpinnings. Coping is a complex process involving an array of invoked strategies that serve to regulate an individual's stress response and mediate their psychological outcome. Lazarus and Folkman defined coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). This model also makes the distinction between emotion- and problem-focused coping. When using emotion-focused coping, an individual attempts to alleviate or regulate the emotional impact of a stressful situation; for example, strategies would include escape-avoidance, denial, seeking social support and positive reappraisal. In contrast, problem-focused coping involves managing or altering the

problem causing the distress, which would include confrontive coping and planful problem solving.

The Lazarus-Folkman model describes a categorical process which requires an individual's coping style to be classified as either emotion- or problem-focused (i.e., a person would not be considered to use both forms of coping). Also problematic, some coping strategies do not appear to fit simply into either the emotion- or problem-focused categories. For example, distraction, avoidance, and support-seeking strategies would seem to fit equally well into either category. Furthermore, the underlying assumption is that problem-focused coping is active, resulting in a positive outcome, whereas emotion-focused coping is not adaptive, leading to negative outcomes (Quittner et al., 1996). While, these notions are not supported uniformly in the literature, most studies have indicated that problem-focused coping efforts lead to decreased psychological distress more so than emotion-focused strategies (Billings & Moos, 1981). When applied generally to the daily-hassle genre of problems, problem-focused strategies may be quite adaptive. In contrast, controllability of more complex stressors (e.g. fire) can moderate this tendency, so that coping may or may not be adaptive. However, other research indicates that in some situations, emotion-focused efforts are adaptive and facilitate adjustment (Wertlieb, Weigel, & Feldstein, 1987). Finally, it is noteworthy that the emphasis is on cognition and behavior, excluding other important influences that may contribute to outcome, most notably the influence of family environment.

As a result of these inconsistencies, several alternative models have been proposed. It has been suggested that coping is best conceptualized as a dynamic process, rather than as a categorical behavioral response to a specified situation. With a process orientation, it is not necessary to choose between the use of problem-focused versus emotion-focused coping; rather,

both strategies can be employed in an interactive way to regulate when experiencing a stressor. In this view, coping emerges both as an important player and product of the complex interplay between situational and person variables (Carver, Scheier, & Weintraub, 1989).

A prominent example of a process-oriented model is the *Transactional Stress and Coping Model (TSC)*, put forth by Thompson and colleagues (1993) and adapted from Lazarus and Folkman's model. Thompson and colleagues followed Bronfenbrenner's ecological systems theory (1977) in the creation of the TSC model, by highlighting the interaction of person (e.g., demographic, cognitive and coping processes) and situation variables (e.g. family functioning/environment). In marked contrast to Lazarus and Folkman's model, both individual and contextual influences are viewed as important contributors to adjustment following traumatic events. The TSC model also emphasizes the role of appraisal and coping processes in mediating differential outcomes to stressors. Traditionally, trauma literature has followed Lazarus and Folkman's model to capture differences in child adjustment, while the TSC model has been utilized primarily within the child health literature, to demonstrate the impact of family environment on a child and family's adjustment to a chronic illness. The TSC model provides an important contribution by building upon an existing theory that is limited in scope. By widening the lens to consider not only individual or contextual factors, a more holistic approach merges individual and situational factors to consider the cumulative outcomes of these processes.

This holistic approach demonstrates utility for capturing the processes associated with a child's adjustment to residential fire (see Figure 1 for the TSC model adapted for residential fire). In this perspective, residential fire is a potential stressor to which the child and family, as a dynamic system, must attempt to adapt. Following this, the pivotal factors which mediate child adjustment are divided into two broad categories, child processes (i.e., cognitive appraisal and

coping methods) and family processes (i.e., family environment). Child adjustment to a residential fire is not simply the direct function of the fire, but is mediated by the exchanges between the child's appraisal and coping processes and the family environment.

### *Cognitive Appraisal*

Cognitive appraisal has been shown to play an important role in children's adjustment to traumatic events. A critical aspect of the experience of an event as stressful or traumatic is the individual's cognitive appraisal of the event as "taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). In emotion research, appraisals (sometimes referred to as attributions) are also defined as the evaluations that individuals make about events that occur in the environment (Lazarus, 1999). Given that the TSC model highlights the dynamic process of coping (e.g., the process of encounter and exchange between the person and the environment); the key to the person-environment transaction is the appraisal of a situation as threatening, harmful, or challenging. Individuals make appraisals and attributions about the causes of their experiences (sometimes unconsciously), which then influence the valence (positive versus negative) and intensity of their feeling states (Keltner & Beer, 2005). Therefore, appraisals and attributions shape how an individual interacts with the environment. Examining both negative and positive appraisals is important, since the way a child views an event (i.e., as a threat or challenge) plays a role in predicting both the coping responses and adjustment. In addition, there seems to be no single best way of coping with all situations. Depending on the child's primary and secondary appraisals, different coping strategies may be more or less successful in promoting psychological adjustment (Vitaliano, DeWolf, Maiuro, Russo, & Katon, 1990; Zakowski, Hall, Klein, & Baum, 2001).

Lazarus and Folkman proposed two appraisal processes. *Primary appraisal* involves the evaluation of harm or benefit in an event, that is, the evaluation of the potential consequences of

the event. It includes evaluations of risk to one's self-esteem, values or goals, or to the well-being of a loved one (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Central to this primary appraisal process is the evaluation of the situation as a loss, a threat, or a challenge (Lazarus & Folkman, 1984). Appraisals of loss involve an individual's thoughts that harm has already occurred; threat appraisal is the anticipation of harm in the future, while challenge appraisal is the thought that, although events were stressful, the result can be positive, in that there is the potential for gain or growth inherent in the encounter (Lengua & Long, 2002). In *secondary appraisal*, the individual evaluates what can be done to overcome or prevent harm, or to improve the prospects for beneficial outcomes. Secondary appraisal involves the individual evaluating their coping options, the potential effectiveness of their coping options, and their sense of efficacy in coping with the traumatic event (Folkman, Lazarus, Gruen, & DeLongis, 1986; Lazarus & Folkman, 1984). Furthermore, Mulilis and Duval (1997) suggest that secondary appraisal processes involve attributions of responsibility, whether to self or others, for dealing with a threatening event, as well as an evaluation of what can and might be done (Lazarus & Folkman, 1984). For example, when an individual believes he or she lacks the resources or skills to cope with an event, the event may be perceived as more stressful. On the other hand, when an individual feels he or she may possess the resources necessary to deal with the traumatic event, the event may be interpreted as an opportunity for growth.

The tendency to appraise events negatively is associated with more adjustment problems in various stressful situations (Gamble, 1994; Lengua & Long, 2002). Threat appraisals (e.g., the thought that something important is at risk of being taken away or lost, along with the associated feelings of fear) have been shown to predict children's report of their own depression, anxiety, and conduct problems, following parental divorce (Sandler, Kim-Bae, & MacKinnon, 2000).

Appraisals of other stressful situations, such as conflicts with parents, are also associated with adolescent's coping responses and subsequent adjustment (Gamble, 1994). Children's threat appraisals of medical events have been shown to predict higher levels of anxiety and depression (Fearnow-Kenney & Kliwer, 2000). Threat appraisals and secondary appraisals have also been shown to mediate the relationship between interparental conflict and children's internalizing problems (Grych, Finchman, Jouriles, & McDonald, 2000). Thus, evidence demonstrates that both primary and secondary appraisals are related to coping strategies and subsequent adjustment.

Less is known about positive (or challenge) appraisals in children. Because of limited research in the child literature some insight may be gleaned from adult studies. Evidence from the adult literature suggests that challenge appraisals can lower anxiety about a situation (Hale & Whitehouse, 1998), and that challenge appraisals are related to more active coping responses like planful problem solving and positive reappraisal (Santiago-Rivera, Bernstein, & Gard, 1995). Jackson and Warren (2000) investigated negative and positive appraisals of life events, in school age children. They found that children who reported more life events as positive, had fewer internalizing and externalizing problems.

In the adult literature, there is convincing evidence that posttraumatic stress disorder (PTSD) is mediated, in part, by how an individual appraises their reaction to a traumatic experience (Smith & Bryant, 2000). More specifically, negative appraisals (or negative attributions) of the self, about the world, and that blame others are all characteristic of PTSD development and maintenance (Ehlers, Mayou, & Bryant, 1998). Whereas depression is associated with appraisals of hopelessness and low self-esteem, PTSD is characterized by an individual's catastrophic interpretations of the environment as threatening and their inability to

cope. Despite increasing evidence for the role of appraisals in posttraumatic adjustment in adults, there has been little application to understanding development of childhood PTSD. There is evidence that children's posttraumatic stress is associated with perceptions of threat and elevated estimates of future harm (Dalgleish et al., 2000; Ehlers, Mayou, & Bryant, 2003). Ehlers et al. (2003) found that children's PTSD symptoms (intrusive memories, alienation from others, and anger), at 3- and 6-months following a motor vehicle accident, were associated with negative appraisals 2 weeks after the trauma. Meiser-Stedman et al. (2005) found that adolescent appraisal, assessed 2- to 4-weeks after trauma (motor vehicle accidents and assaults), predicted posttraumatic stress at 6-months post-trauma, over and above initial levels of posttraumatic stress. The significant cognitive variables were trauma-related rumination, thought suppression, and the sense of being permanently changed. Bryant and colleagues (2007) also assessed the predictors of childhood PTSD, with particular focus on the predictive role of negative appraisals after trauma, in 7 to 13 year-olds within four weeks of hospital admission after traumatic injury, with follow-up 6-months later. The major finding was that the tendency to engage in negative appraisals about one's vulnerability immediately after the trauma significantly predicted chronic PTSD severity. In other words, children's appraisal following a traumatic event contributed to their subsequent PTSD beyond the influence of their initial stress reaction. This finding is in accord with evidence of the effects of negative appraisal in childhood acute stress (Salmon, Sinclair & Bryant, 2007), and of chronic PTSD in older children (Ehlers et al., 2003; Meiser-Stedman et al., 2005).

The role of appraisals (or attributions) in the adult depression and anxiety literature is also informative. Within the depression literature, the manner in which the individual explains the causes of negative and positive life events is critical in determining whether the events

produce negative or positive outcomes (see Gladstone & Kaslow, 1995, for review). Not unlike their depressed counterparts, fearful and anxious individuals (particularly adults) frequently report a negative attributional style for life events; that is, they report internal, stable, and global attributions for negative events, but external, unstable, and specific attributions for positive events (Ollendick, Langley, Jones, & Kephart, 2001). In this regard, negative attributional style cannot be said to be specific to depression; rather this cognitive style appears to characterize fearful and anxious adults as well (Ollendick et al., 2001). Whether fearful children report similar attributional styles is currently undetermined (Bell-Dolan & Wessler, 1994). However, one study (Ollendick et al., 2001) has demonstrated that negative life events and negative attributional style significantly predicted levels of fear in children and adolescents following residential fire. As a result, it seems highly probable that fearful children would report attributional styles similar to adults.

### *Coping Methods*

The second child process of interest involves individual coping methods. Research on children's coping following residential fires is virtually nonexistent. Given the lack of prior research in this area, predictions about child coping responses and adaptive health outcomes following residential fire are inherently challenging. However, there is considerable utility in drawing upon an existing body of research devoted to children's coping with other traumatic events (e.g., natural disasters, chronic illness). The major focus of literature addressing natural disasters has been concentrated on posttraumatic stress disorder (PTSD), describing factors related to child coping strategies, with a primary focus on health outcomes. Research examining chronic illness has considered family processes, in addition to coping strategies and child outcomes. Each of these literatures will be briefly examined below.

A large body of research has been devoted to understanding individual characteristics of PTSD. For example, there is evidence to suggest that girls initially report more PTSD symptoms than boys, following natural disasters (Bokszczanin, 2007; Chen, Lin, Tseng, & Wu, 2002; Green et al., 1991; Lonigan, Shannon, Finch, Daugherty, & Taylor, 1991; Shannon, Lonigan, Finch, & Taylor, 1994; Vernberg et al., 1996), although these gender effects may not persist over time (Vernberg et al., 1996). In addition, African American youth report more PTSD symptoms than their European American or other minority counterparts (Brewin, Andrews, & Valentine, 2000; Lonigan et al., 1991; Shannon et al., 1994). Lastly, findings concerning age differences in PTSD symptoms following natural disasters have been inconsistent. Some studies report significant age differences in PTSD symptoms (Bokszczanin, 2007; Chen et al., 2002; Lonigan, et al., 1991; Shannon et al., 1994), while others report no age differences (e.g., Green et al., 1991).

Coping processes have been the focus of research on PTSD. LaGreca and colleagues found coping to be predictive of children's PTSD symptoms following hurricanes and related disasters (La Greca, Silverman, Vernberg, & Prinstein, 1996; Vernberg et al., 1996). La Greca and colleagues also examined the specific ways that parents provided support for their children following disasters, particularly, coping assistance (which refers to actions taken to help children cope with stressful events). Three common forms of assistance include activities that facilitate emotional processing, reinstatement of familiar roles and routines, and distraction. However, children with more severe levels of PTSD symptomatology reported more emotional processing and distraction coping assistance (e.g., emotion-focused coping strategies) (La Greca et al., 1996).

Vernberg and colleagues (1996) examined the emergence of PTSD symptoms and coping strategies in 568 elementary school age children, 3 months after Hurricane Andrew. Overall, the vast majority of children (86%) reported at least mild disaster-related psychological symptoms falling within the PTSD spectrum at 3 months post-hurricane. More than 55% reported moderate to very severe symptoms levels, suggesting that the majority of children were still struggling to cope with the events brought about by the storm. Importantly, all four coping variables that were examined (positive coping, blame-anger, wishful thinking, social withdrawal) were positively correlated with overall PTSD symptoms. This finding suggests that a variety of coping strategies (both positive and negative) are utilized following exposure to trauma and that these coping strategies are differentially related to outcomes (i.e., in this case levels of PTSD symptomatology).

Children have been shown to use a variety of coping strategies in the face of adversity (Sandler, Wolchik, MacKinnon, Ayers, & Roosa, 1997; Spirito, Stark, & Williams, 1988). Although coping methods have been categorized in a variety of ways, there is agreement that coping strategies include those that are active efforts (also referred to as problem-focused strategies) and avoidant efforts (or emotion-focused strategies) to deal with stress. *Active efforts* are strategies such as positive reappraisal, problem solving, and cognitive decision making. Most of the research on coping in children has found that overall, active coping strategies such as attempting to solve the problem and thinking more positively about problems, are related to lower levels of psychological symptoms (Eisenberg et al., 2000; Sandler, Tein, & West, 1994). After controlling for other forms of coping, active coping has been found to have a significant relationship to children's adjustment, leading to lower symptomatology and higher self-esteem (Ayers, Sandler, West, & Roosa, 1996). In addition, several studies have found cognitive

decision making (e.g., wishful thinking, self-talk, reinterpretation) to be related to better adjustment (Causey & Dubow, 1992; Ebata & Moos, 1991; Willis, 1986). Conversely, *avoidant efforts*, strategies such as escape or cognitive repression (Ayers et al., 1996; Compas, 1998), are related to higher levels of internalizing and externalizing problems (Causey & Dubow, 1992). Avoidant coping significantly predicts higher symptomatology over and above other forms of coping (Ayers et al., 1996).

Children and adolescents with chronic illnesses are confronted with different medical conditions and a variety of stressful situations that require coping responses. However, within the health literature, only a few studies have prospectively examined the associations between coping strategies and psychosocial adjustment in pediatric patients. Results from these studies have been contradictory, as the inconsistent findings have been related to methodological issues (Hampel, Rudolph, Stachow, Lab-Lentzsch, & Petermann, 2005). In sum, there is a growing body of evidence that most children and adolescents with chronic illness are able to adjust to their chronic condition, although a subset of children have been identified with impaired functioning. Focusing on children and adolescents with cancer, Sanger and colleagues (1991) indicate that although the prevalence and severity of psychological disturbances is controversial, coping strategies play a significant role in children and adolescents psychological functioning. For example, for children with diabetes, avoidance strategies appear to have an unfavorable effect on social adjustment, school achievement and depressive symptoms (Reid, Dubow, & Carey, 1995). Frank and colleagues also found an association between avoidance, anxiety and depression in children with cancer (Frank, Blount, & Brown, 1997). In another study of pediatric patients, Zehnder and colleagues evaluated the effects of various coping strategies on children's posttraumatic stress symptoms and behavioral problems 1 month and 1 year after an accidental

injury or diagnosis of a chronic disease (Zehnder, Prchal, Vollrath, & Landolt, 2006). Between 12% and 15% of children had clinically relevant post-traumatic stress symptoms 1 month and 1 year post-hospitalization. Lastly, chronically ill children showed a significant increase in internalizing symptoms both at 1 month and 1 year follow-up (Zehnder et al., 2006). Avoidance and distraction were the most frequently used coping strategies, while support seeking was the coping strategy most rarely used. This is consistent with research from both healthy populations and pediatric cancer patients.

Although there are even fewer studies on coping strategies used following residential fire, a limited number have examined post-fire functioning in adults, and a smaller number have examined functioning in adolescents and children. Jones and Ollendick (2001) systematically investigated the adjustment of children and their families' following residential fires. Avoidant coping (e.g., behavioral strategies to evade the stressor or reminders of the stressor, to repress thoughts about the stressor, or engage in wishful thinking) was found to increase the likelihood of distress in the context of disaster situations. That is, children using maladaptive avoidance coping strategies were more likely to experience more negative outcomes. Furthermore, Ollendick et al. (2001) also demonstrated that avoidant coping was predictive of higher levels of fear in 99 children who had survived residential fire.

*Religious Coping.* Among the various coping strategies, religious coping has emerged as a distinct area of study. Religious coping has been defined by Pargament (1997, p. 90) as “a search for significance in times of stress” and by Tix and Frazier (1998, p. 411) as “the use of cognitive or behavioral techniques, in the face of stressful life events, that arises out of one’s religion or spirituality.” Research indicating that religion can aid an individual’s adaptation to both physiological and psychological stress has led to the suggestion that religion can be

conceptualized in terms of a cognitive schema through which individuals may interpret and cope with stressors (Koenig, 1995). Within this framework, religiosity among survivors of residential fire can be conceptualized as a form of emotion-focused coping, as it is primarily aimed at lessening the emotional distress associated with the traumatic event (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992). However, this perspective is somewhat inconclusive. Factor analyses of a widely used coping measure that includes spiritual/religious coping (Carver, 1997) has found that spirituality does not fall into either emotion-focused or problem-focused coping factors, but rather is a separate construct, a factor that is distinct from all other coping strategies.

It should be noted that religion is a complex phenomenon that takes many shapes and forms (Pargament, 1997). It has been defined in a myriad of ways. Although religion and spirituality have often been used interchangeably in the literature, there is a general consensus that religion emphasizes an organized system of tradition, beliefs, and practices, whereas spirituality expresses a more universal experience and includes religion and relationships with others in a faith community (Josephson & Dell, 2004). However, within the present paper, religion and spirituality will be used interchangeably.

Given that the majority of studies on religious coping have focused primarily on adults, both child and adult studies will be briefly reviewed to provide a context for the present investigation. A number of studies have examined variables that predict adults' religious coping. Pargament (1997) conducted a comprehensive review of this research and classified the predictors of religious coping into three categories: situational forces (e.g., high levels of stress, appraisals of loss, harm or threat, and health-related concerns), cultural forces (e.g., local culture and culture of origin), and individual forces (e.g., demographic variables). With respect to demographic variables, the adult religious coping literature has consistently shown that females

(Ellison & Taylor, 1996; Ferraro & Koch, 1994; Gurin, Veroff, & Feld, 1960), older individuals (Ferraro & Koch, 1994; Gurin, Veroff, & Feld, 1960; Koenig et al., 1992), those less educated (Baron & Koenig, 1990; Gurin, Veroff, & Feld, 1960), and those with lower income (Gurin, Veroff, & Feld, 1960) report a higher frequency of religious coping. Some studies have also found that African Americans report a more frequent use of religious coping compared to other ethnic groups (Baron & Koenig, 1990; Ellison & Taylor, 1996; Koenig et al., 1992). Lastly, in a national sample of 3,417 adults, religious coping was found to be more frequent among people living in the South, supporting the influence of culture on religious coping (Ferraro & Koch, 1994).

Many studies have found that religious coping is typically related to more positive outcomes to stressful events. For example, Pargament (1997) found that people were more likely to turn to religion, and use higher levels of religious coping, when they appraised the situation as more stressful, especially if it involved loss. Overall, in response to both hypothetical and real events, greater use of religious coping has been associated more with threat or loss appraisals, compared to challenge appraisals. (Bjorck & Cohen, 1993; McCrae, 1984). Also, Pargament, et al. (1990) found that religious coping efforts involving the belief in a just and loving God, the experience of God as a supportive partner, and the search for spiritual and personal support were significantly related to better outcomes, such as recent mental health status and spiritual growth (see also Pargament, 1997, for a review).

In a recent meta-analysis of forty-nine adult religious coping studies, Ano and Vasconcelles (2005), found that religious coping strategies were significantly associated with psychological adjustment to stress. More specifically, a moderate positive relationship existed between positive religious coping strategies and positive outcomes to stressful events. That is,

individuals who used religious coping strategies such as benevolent religious appraisals, collaborative religious coping, or seeking spiritual support, typically experienced more stress-related growth, spiritual growth, positive affect, and had higher self-esteem. Ano and Vasconcelles also reported that positive religious coping strategies were inversely related to negative psychological adjustment. That is, individuals who used positive religious coping strategies experienced less depression, anxiety, and distress. Finally, negative religious coping strategies were positively associated with negative psychological adjustment to stress. That is, individuals who reported using negative forms of religious coping experienced more depression, anxiety, and distress (Ano & Vasconcelles, 2005). Consistent with previous research, the results of this meta-analysis indicate that positive religious coping strategies (as opposed to negative religious coping strategies) may serve adaptive functions in the lives of people dealing with stressful or traumatic events. Of the studies Ano and Vasconcelles examined, only two found religious coping to be related to more negative outcomes. Although the identification of situation specific religious coping strategies has helped to clarify the functional role of religion in the coping process, implications for people managing stressful situations are still somewhat unclear.

Research on children's religious coping has been sparse. However, the last decade has witnessed an increasing recognition of the importance of religion/spirituality in the mental health of children and adolescents (Houskamp, Fisher, & Stuber, 2004). Moreover, developmental differences in cognition and psychosocial functioning between children and adults justify the need to study the religious and spiritual aspects of children in their own right. It has been suggested that children may be more open to spirituality than adults, in that their perception of reality is less constricted by social conventions (Garbarino & Bedard, 1996). In addition, the manifestation of religion may differ for children and adolescents compared to adults. From

childhood to adulthood there seems to be a shift from concrete and external religious rules to more internally based religion (Fowler, 1981; Fowler & Dell, 2004).

Only a few studies have empirically examined religious experiences in childhood and adolescence. A study of coping strategy selections among pediatric patients in Switzerland suggests that patients of lower socioeconomic status used religious coping strategies significantly more often than those with higher SES (Landolt, Vollrath, & Ribi, 2002). Landholt et al.(2002) examined children coping with stressful life events, such as accidents, being diagnosed with cancer, or being diagnosed with diabetes mellitus. In their sample of 179 hospitalized children (average age of 10.2 years), use of religious coping was found to be a common response. Sixty-one percent of the children in the accident group reported using religious coping. Landolt and colleagues also found that children of lower SES used religious coping significantly more often than those with higher SES. Britt (1995) conducted one of the few studies examining the role of religion in coping with everyday hassles. Fourth and fifth grade children reported using their faith to cope with everyday stressful situations. In addition, parent-reported religious involvement was positively related to their children's use of religion as a coping strategy. Moreover, the more threatening the child appraised a situation to be, the more likely the child was to use religion to cope. This study further revealed a positive relationship between use of religious coping and use of social support and positive appraisal.

Religious coping strategies have been addressed in at least two studies of residential fire trauma. Wang, Ollendick, and Jones (in preparation) examined 140 children and adolescents between the ages of 8 and 18 across five states in the southwestern portion of the United States, to assess the predictors of children's use of religious coping following residential fire. Different predictors were found for children and adolescent use of religious coping approximately four

months following the residential fire. Children's religious coping was predicted by parents' own religious coping, resource loss, and child's age and days since the fire. Wang et al. (in preparation) also found family support to be significantly associated with children's adaptive ways of religious coping, namely spiritually based coping. Another primary finding was that children endorsed a significantly higher level of religious coping than did adolescents. In a follow-up study, Parelkar (2005) examined children's religious coping and religious discontent (e.g. which is a negative form of coping, defined as an expression of "anger or distance from God/church and questions about one's faith" Pargament et. al, 1990, p. 802) in response to loss of resources in residential fires. Religious discontent was found to be positively associated with greater levels of loss and PTSD symptoms. Religious coping was found to be significantly predicted by loss, race, age, and family religious environment. African Americans and children reported greater religious coping than European Americans and adolescents.

In summary, coping strategies have been demonstrated to have strong and consistent associations with adult and child adjustment. Most notably, clear results have been obtained between problem-focused coping strategies and positive outcomes, and emotion-focused coping and negative outcomes. In contrast, research on religious coping and psychological adjustment to stress has yielded slightly more mixed results. Despite the progress in understanding adult coping and adjustment, research examining child outcomes has been much slower to emerge. In addition, religious coping and adjustment have not been well addressed in adults and even more inconsistently studied in children. Finally, none of these processes have been well applied to child victims of residential fire.

*Relationship between Appraisal and Coping.* Lengua and Long (2002) examined both appraisal and coping. Positive appraisals and positive cognitive coping strategies both involve

viewing oneself as having the resources and ability to deal with the event, making judgments about control regarding the event, or recognizing the potential for a beneficial outcome. The primary theoretical distinction between positive appraisals and cognitive coping strategies is the timing of their implementation. Positive appraisals would occur almost instantaneously in response to the event. Cognitive coping involves an effortful appraisal or “re-appraisal” of the event, which occurs later in the process as an effort to control or replace an earlier appraisal. Lengua and Long focused on the role of emotionality and self-regulation in predicting appraisal, coping styles, and adjustment to stress in a community sample of children. Negative life events included moving, loss of a friend, serious illness or injury, and parental arrest. Results suggested that negative emotionality was heightened in relation to negative life events, predicting greater use of threat appraisals and avoidant coping. These in turn predicted child adjustment problems. More specifically, negative life events predicted greater internalizing and externalizing problems. This is consistent with previous research which has demonstrated that threat appraisal and avoidant coping separately predict greater adjustment problems in children (Jackson & Warren, 2000; Lengua & Long, 2002). Furthermore, Lengua and Long demonstrated that positive appraisals predicted greater use of active coping and lower internalizing problems, consistent with evidence from other studies (Jackson & Warren, 2000).

### *Family Environment*

The third key focus in the TSC model is the family environment. Appraisal and coping with general life stress, as well as with catastrophic events, occurs in a socio-environmental context. As a result, contextual factors may serve both as resources that aid and facilitate appraisal and coping and as impediments or blocks to adequate adjustment. Family characteristics and dynamics may be related to these processes in a variety of ways. First, family members can serve as resources for children and adolescents who are coping with a disaster

through provision of social support and information. Second, at the opposite end of the continuum of the provision of social support, family members can be impediments to the coping process. This may occur when family members interrupt or constrain the coping efforts of a child or adolescent, or even when a caregiver turns to the child or adolescent for help in their own coping process (i.e., particularly if parental psychopathology is evident) in a way that exceeds the child's developmental capacity. Third, family members, especially caregivers, can serve as models for coping strategies that may be employed by the child. Of course, this caregiver model may be either positive or negative. Fourth, families generate rules and enact regulatory processes that influence the coping strategies used by the individual family members. Finally, families operate as systems in which the coping efforts of individual family members may affect and be affected by the coping efforts of other family members, as they address common problems (Compas & Epping, 1993).

A review of the literature indicates that trauma and stress theory and research has focused almost entirely on individual stress and coping processes, to the exclusion of family-level processes. Research on stress and coping at the family level has gradually involved various disciplines, and more recently, researchers have begun systematic assessment of whole-family responses (Nesteruk & Garrison, 2005). DeMarco et al. (2000) emphasize that coping is embedded in family processes and that coping represents the entire family process as it unfolds day after day. Thus, coping is not a response to a stimulus, but is rather a series of strategies used by members of the entire system to respond to changes within or from the environment.

The indirect effect of parents' reaction to trauma has previously been noted to be of importance in clinical reports. Rosenbeck and Nathan (1985) described a child who developed the same posttraumatic imagery as his Vietnam father, although the child himself had never been

exposed to war. In addition to processes of modeling and observational learning, it is possible that this developed by way of transmission of family rules and regulatory mechanisms. Fiese and Sameroff (1989) have discussed the importance of family paradigms, family stories, and family rituals in the regulation of the family and in shaping the experiences and behaviors of individual family members. Most pertinent to the process of appraisal and coping with disaster, these family regulatory mechanisms provide rules for acceptable or preferred strategies in the family (Compas & Epping, 1993). These rules may be as specific as defining prescribed coping behaviors and roles for individual family members. For example, in some families, children might be encouraged to share their feelings with a family member. In other families, however, emotional expression might be prohibited. As identified within studies of parental conflict and divorce, a child's history of exposure to conflict in the family, and the emotional qualities of family interactions and relationships, can shape how a child perceives or appraises parental conflict and disagreement in the future. For example, a disagreement occurring in a family characterized by warm and supportive relationships would likely be less threatening to children, compared to conflict occurring in a family marked by critical or hostile interactions, which are more likely to be perceived as jeopardizing the harmony and stability of the family.

Consequently, it is widely assumed that the family provides the primary context in which children naturally acquire ways of coping with stress. Since disasters often strike parents as well as their children, in many instances parents may be affected psychologically by the event. For example, McFarlane (1987) found that children's adjustment to a devastating brush fire was related to the degree of psychological distress experienced by their parents. In further support of this perspective, separation from parents in the days immediately after the fire, maternal preoccupation with the disaster, and changed family functioning were all powerful determinants

of posttraumatic phenomena in children. This suggests that children's ability to maintain a barrier against psychological trauma is critically dependent upon their parents' response to the event.

Few authors have examined the factors that protect children from persistent symptomatology or that facilitate adaptation after a traumatic event. Six months following the Scud missile attacks of the Gulf War, Israeli preschool children and mothers directly exposed experienced persistent stressful reactions (fear, anxiety, regressive symptoms) and externalizing symptoms, as a direct function of mother's symptomatology, cohesion of the family, and other environmental factors (displacement, destruction of house, level of exposure to the event) (Laor, Wolmer, Mayes, & Gershon, 1997). Furthermore, when the authors attempted to elucidate the variability in PTSD symptoms among displaced children, only the mother's level of avoidant symptoms was statistically significant (Laor et al., 1997). Avoidant symptoms reflect not only the mothers' attempts to steer clear of stimuli that reminded them of the traumatic event, but also their state of emotional numbing, which restricted their capacity for closeness with their children. A high level of avoidant symptoms may undermine the mother's capacity to buffer and process the trauma for her young child (Pynoos, Steinberg, & Wraith, 1995). This finding is not intended to place blame on the mother, but rather to emphasize the important role she plays, among other genetic or environmental factors, in regulating the child's well-being. Green et al. (1991) have suggested that the family's reaction and integration after the stressful event is the best predictor of PTSD symptoms in the child. As such, the presence of a stable and caring parent has been identified as a crucial form of support for child adjustment (Benedeck, 1985).

Another characteristic of family environment important in a child's adjustment is the communication style of the family. More specifically, the lack of supportive family

communication has been shown to moderate the relationship between immediate post-disaster stress and children's problems years later (Bromet, Hough, & Connel, 1984). In both the Three Mile Island (Bromet et al., 1984) and Vicksburg's tornado disasters (Perry, Silber, & Bloch, 1956), a relatively small group of parents were described as showing strong emotional distress, not taking charge of the situation, and being unable to help their children. Instead these parents tended to depend on their children. As a result, these families were more likely to have children with more severe disaster reactions.

Solomon, Bravo, Rubio-Stipec, and Canino (1993) examined the role of other family factors, namely marital and parental status, as potential moderators of psychological disturbance in disaster victims. The finding emerged that family role did influence the level of symptomatology on respondents. More specifically, single parents' anxiety levels following trauma significantly exceeded that of most other victim subgroups, including those who were married. This was interpreted to be the result of lower social support among parents. It appears that the condition of being a single parent may be a chronic stressor by itself (i.e., lower social support was associated with higher symptoms of PTSD and anxiety). On the other hand, being a married parent became burdensome in the presence of a disaster stressor in a different way (e.g., family responsibility increases, changes in marital relationship, decision making abilities decrease, and conflict increases).

Generally, family environment has been shown to have a direct and indirect effect on child adaptive outcomes. The importance of family flexibility and caregiver nurturing in effecting children's symptomatic reactions to traumatic stress has been amply documented (Laor et al, 1996; McFarlane, 1987). Also important to consider is that the variability in child outcome may also differ as a function of developmental considerations.

### *Developmental Considerations*

Children of different developmental stages interpret the world differently and at their own distinctive pace (Beauchesne, Kelley, Patsdaughter, & Pickard, 2002). Developmental stage uniquely influences a child's response to traumatic events, which consequently places them at great vulnerability in adjustment subsequent to traumatic events. Newman's (1976) work on childhood PTSD indicated that the psychological effects of disasters on children are predicted by the child's developmental level and the child's perception about the family's response to the disaster. It should be noted that developmental level has been shown to influence the use of coping strategies as well (Brown, O'Keeffe, Sanders, & Baker, 1986). Theoretically, it is expected that older children will use more sophisticated approaches managing their distress. In the following section, based on the focus of the present study, the developmentally related experiences of children and adolescents will be discussed.

*School Age Children.* During the school age years (ages 7 to 12), children can grasp the seriousness of a disaster, remember it more vividly, and imagine what the impact may be for their families (Deering, 2000). As a result, the response of younger children to disaster is dominated by mood, depression, anxiety, oppositional behavior, and behavioral symptoms (Pine & Cohen, 2002; Deering, 2000). A recent study of 5,687 children ages 9 to 19, exposed to Hurricane Hugo in South Carolina, showed that younger, female children were more likely than older, male children to report PTSD symptoms, such as intrusive memories, nightmares, and re-experiencing the event (Shannon et al., 1994). Additionally, high levels of trait anxiety and emotional reactivity were the strongest predictors of PTSD symptoms in this age group.

Given age-related increases in cognitive development (e.g., logical thinking, taking the viewpoint of another), school age children become increasingly attuned to the viewpoints of the adults around them. Children will observe their parents carefully for cues about how to interpret

the impact of the disaster (Deering, 2000). Young children tend to reflect the concerns of their parents, making parental response a critical factor in the development of pathology (Wilkinson & Vera, 1989). Consequently, parental anxiety after disasters appears to have more of a contagion effect for younger children than older children and adolescents (Coffman, 1998). As such, for the school age child, the influence of parental reactions and family cohesiveness may be equal to, or greater than, the impact of specific aspects of the trauma itself (Cornely & Bromet, 1986). Furthermore, parents are frequently cited as the single most important source of social support to elementary school age children following disasters (Pynoos & Nader, 1988). Therefore, parents serve the functions of modeling coping behavior, giving comfort and nurturance, and providing a sense of physical safety (McFarlane, 1987).

*Adolescents.* In contrast, the psychological response to disaster among adolescents more closely resembles that of adults, with symptoms of depression and anxiety predominant (Pine & Cohen, 2002). Unlike adults, adolescents' anxiety may take on specific and perhaps unrealistic forms and fears, and their behavioral reactions may be complicated by anger or despair (Hagan, 2005). Adolescents are a particularly vulnerable group, because they are experiencing a period of complex transitions (Swick, Dechant, Jellinek, & Belluck, 2002). Adolescents within this developmental stage may differ greatly in their interpretation and reactions to disasters, depending on whether or not they have developed abstract reasoning abilities. Adolescents might also attempt to protect other family members who may also be upset (Hagan, 2005). As a result, parents are at risk of underestimating the effects of disaster on their adolescents and may be in a disadvantageous position to recognize and provide their children with the help they need (Hagan, 2005). Green et al. (1991) examined the relationship between PTSD and parental response to the Buffalo Creek dam collapse in West Virginia in 1972. Two years after the disaster, both irritable

and depressed family atmosphere predicted PTSD symptoms in children, with irritable atmosphere having the most impact on parental symptomatology.

School age children and adolescents both appear to be strongly affected by parental functioning post-disaster, although this may occur in different ways. School age children and adolescents may be equally vulnerable to negative parental adaptation, however, in some cases, adolescents may have to bear the extra burden of assuming parental responsibilities. Importantly, the Buffalo Creek study suggests that the atmosphere in the home should be carefully examined, as it contributes to risk perhaps over and above how the individual caregivers are functioning.

Along the same line of thought, recent research has demonstrated the importance of asking children directly about their post-disaster reactions, rather than relying exclusively on parent report, or using such reports as the primary source of information. By school age, children generally report higher levels of post-disaster distress than parents report for them (Vogel & Vernberg, 1993). This result is not surprising. In general, there is only limited parent-child agreement on child symptoms; average correlations for diverse problem behaviors are only .25 (Achenbach, McConaughy, & Howell, 1987). Agreement is generally better for externalizing symptoms than for internalizing symptoms such as those related to anxiety and depression. Internalizing symptoms, including many PTSD symptoms, often concern mental states about which parents may be unaware. Indeed, children may try to “protect” parents from knowledge of their distress after a disaster. Another complication of relying on parent report could involve their accurate assessment of their child symptoms. For example, a parent’s own distress may preclude their accurate evaluation of their child, possibly increase the stress experienced by the child, or may disrupt optimal parenting (e.g. failure to protect the child from adverse reactions) (Bryant, Salmon, Sinclair, & Davidson, 2007).

### *Present Study*

The focus of the present study, building upon existing literature, was to apply the Transactional Stress and Coping (TSC) model to understand a child's adjustment following a residential fire. Fire related trauma represents tremendous challenges to its survivors, including children and adolescents. However, to date, little is known about children's appraisal and coping efforts, and the influence of family environment on child adjustment following residential fires. Within the TSC framework, child appraisal and coping, and family environment stand as the focus for research efforts.

Importantly, while these processes have been integrated to some extent (by considering child appraisal and coping together, or family environment and coping), the more necessary holistic approach is lacking in the existing literature. Also noticeable is the absence of a developmentally informed perspective. The present study aims to address these deficits by taking an ecological and developmental approach to the study of child adjustment following residential fire. More specifically, the role of child appraisal and coping, and family environment was explored as mediators of child adjustment outcomes.

### *Hypotheses*

The TSC model (Thompson et al., 1993), adapted from the health literature, was applied to child traumatic experiences, specifically residential fire. Following relationships demonstrated among children with chronic illness, it was anticipated that a child's adjustment outcomes following a residential fire (11-months post-trauma) would be mediated by the child's cognitive appraisals (or attributions) and coping methods, and family environment.

## Methods

### *Participants*

The participants in the present study are 144 children and adolescents (ages 7-18 years), with a mean age of 11.97 (SD=2.89), whom were significantly impacted by a residential fire in the southeastern United States (Jones & Ollendick, 2001). Of these, 79 participants (55 percent) were girls and 65 (approximately 45 percent) were boys. Also, 76 participants (53 percent) were African Americans and 68 participants (47 percent) were European Americans. (See Table 1). There was a higher proportion of African Americans in this sample compared to the national population (12.3% for African American) as well as populations of the four States where the participants resided (ranged 19.6% to 29.5%) (U.S. Census Bureau, 2000). Ninety-five of the 144 children (66% of the original sample) participated in the Time 2 interviews approximately 11 months after the fire. At a power level of .80 and an alpha level of .05, to detect medium and large effects, sample sizes of respectively 176 and 70 participants would be needed (Cohen, 1992). Therefore, the current sample was appropriate for detecting a moderately large effect size.

The children, adolescents, and their parents were recruited from areas in and surrounding Atlanta, Georgia; Blacksburg and Richmond Virginia; Charlotte, North Carolina; and Charleston, South Carolina. Recruiting criteria included: 1) the residential fire was severe enough such that the family lost at least 15% of their home or personal belongings, and 2) the family had a child between 7 and 18 years of age. When there was more than one child in the family who met the inclusion criteria, only one child with the closest birthday would be identified as a potential participant.

### *Procedures*

Families who recently experienced fires in their homes were identified through incident reports forwarded to the investigators by fire departments, news reports in the newspaper or on television, and information given out to fire victims about the project by Red Cross agencies. Potential participants were informed about the project through letters and telephone calls. A brief screening survey was then conducted on the telephone. Families who met inclusion criteria were asked if they would be interested in participating; subsequently, interviews were arranged for the families who agreed to participate.

One child and one parent or primary caretaker from each family were interviewed approximately 4, 11, and 18 months following a residential fire. Each of the participants was interviewed separately by advanced graduate clinicians, trained in the administration of the measures. The interviews were carried out in several locations, such as the participant's home or in public places such as Red Cross offices, neighborhood churches, libraries, or mental health clinics. The measures included in the present study were part of a larger National Institute of Mental Health (NIMH) study of responses to residential fire. The total interview lasted approximately three hours for parents and one and one-half hours for children. Informed consent for the assessment was obtained from parents or primary caregivers, as well as the child the adolescent. Each of the measures was self-administered following instructions from and continued supervision by the graduation clinician. Each family received \$75 for their participation in the study.

### *Measures*

*Demographic Information.* Child's age, gender, ethnicity, socio-economic status and other demographic information was obtained via parent report (primarily mother's report) (see Tables 1 and 2). Age was categorized as children (ages 7 to 12 years, coded as 0) or

adolescents (ages 13-18, coded as 1). Gender was classified as female or male, coded as 0 and 1 respectively. Race was grouped as European American or African American, coded as 0 and 1 respectively. And, socio-economic status was organized as low or high, again coded as 0 and 1 respectively. Here, socioeconomic status was the parent's educational level. Parental education information was coded on a scale of 1-7 based on the Educational Factor classification of Hollingshead's (1975) Index of Social Status where 1 = less than 7<sup>th</sup> grade, 2 = junior high school (9<sup>th</sup> grade), 3 = partial high school (10<sup>th</sup> or 11<sup>th</sup> grade), 4 = high school graduate, 5 = partial college (at least one year) or specialized training, 6 = college or university graduation, and 7 = graduate degree. Mean parental education level of the total sample was 4.41 (SD = 1.15) as measured by the Hollingshead's (1975) Index of Social Status, suggesting that the average education level of the families fell between high school graduation and partial college or specialized training. There was no significant difference in parental education between the African American and European American groups. The criterion of whether the participants had completed high school or not was taken as the cutoff for high or low respectively.

*Appraisal.* The Appraisal and Coping Questionnaire (ACQ) was developed by Jones & Ollendick (2001) for the present study. Items for the scale were derived from open-ended interviews with children following other traumatic events. The ACQ is comprised of a total of 8 self-report items, which assess overall appraisal and coping style, for children between the ages of 8 and 18 years. Threat appraisal is determined from 2 items from the ACQ. For these items, children and adolescents report what they thought and felt when a specific stressful event occurred (i.e., residential fire). The threat appraisal questions were as follows: "How much fear did you feel when [the fire] happened?" and "When [the fire] happened, how much could you do about it? That is, how much could you control it?" The children and adolescents were asked to

check one of the following responses; *none*, *some*, or *a lot*. For the present study, the 2-items identified as assessing threat appraisal were standardized into z-scores for comparison. The cronbach's alpha for internal consistency of threat appraisal (2-items) was modest, 0.51, in this study.

KASTAN Children's Attributional Style Questionnaire-Revised (KASTAN-R-CASQ; Kaslow, Tanenbaum, & Seligman, 1978) will be employed to assess attributional style for children and adolescents in the present sample. The CASQ is a 48-item forced-choice scale measuring causal attributions to 24 positive and 24 negative hypothetical events or situations. The scale yields positive and negative composite scores as well as a total difference score (positive – negative composite). For purposes of the current analyzes only the negative attribution scores were used. Internal consistency reliabilities for the negative composite were estimated at a cronbach's alpha of 0.52. Although modest, this reliability estimate is somewhat consistent with those reported for this measure in previous studies (alpha's ranging from 0.42-0.67; see Gladstone & Kaslow, 1995, for review).

*Coping.* The How I Cope Under Pressure Scale (HICUPS; Ayers, Sandler, West, & Roosa, 1996) is a 45-item self-report inventory in which children report the extent to which they used various coping strategies to deal with a specific event, in this case a residential fire, based on a 4-point Likert-type scale (1 = Not at all; 2 = A little; 3 = Somewhat; 4 = A lot). These items form 11 subscales of 3-5 items each, which are grouped into four factors of coping styles: Active, Avoidant, Distraction, and Support Seeking. Ayers et al. (1996) showed that the scale possessed acceptable internal consistencies, with coefficient alphas ranging from 0.57 to 0.74 for the 11 subscales. In addition, participants' responses in the original study did not vary as a function of age or gender. The children in this study were asked to complete the questionnaire

with reference to the strategies they used to cope with the fire they had experienced. Internal consistency for the current sample, as measured by cronbach's alpha, ranged from 0.77 to 0.86 for the 4 factors scales.

The Religious Coping Activities Scale (RCAS; modified by Wang, Ollendick, & Jones, in preparation) is a 32-item self-report scale originally developed by Pargament et al. (1990) for use with adults. This measure asks participants to rate the extent to which they used each item in their coping with the fire on a 4-point Likert-type scale (1 = Not at all; 2 = Somewhat; 3 = Quite a bit; 4 = A great deal; re-scaled to be 0-3). Wang et al. (in preparation) found different item loadings for children on the same six factors of religious coping as seen in adults (see Table 3). These factors include Spiritually Based Coping, Good Deeds, Religious Support, Plead, Discontent, and Religious Avoidance. Internal consistency estimates ranged from 0.61 to 0.92 for the six sub-scales in the original study (Pargament et al., 1990), and from 0.69 to 0.94 in the Wang et al. (in preparation) study. In the current sample, internal consistencies ranged from 0.67 to 0.93 for the six subscales. The Wang et al. modified version of this scale for children will be used in the present study.

*Family Environment.* The Family Environmental Scale (FES; Moos & Moos, 1981) is a widely used instrument that assesses a child and adolescents' family environment. The FES consists of 10 subscales, each with 9 true-false items that cover three conceptual domains: relationship, personal growth, and systems maintenance. The parents or primary caregivers were asked to respond to these questions. The 10 subscales have adequate internal consistency (range from 0.61 to 0.78) and good test-retest reliabilities (range from 0.52 to 0.89) (Moos & Moos, 1986). For the present study, only the conflict subscale was selected as it demonstrated the most consistent association with appraisal, coping, and child and adolescent outcomes in the present

study. The conflict subscale reflects high conflict, poor organization, and a lack of mutual commitment and support within the family. This higher order FES factor has been replicated and demonstrated significant associations with families with chronically ill children (Thompson et al., 1993). For the current sample, internal consistency reliabilities for the conflict subscale were estimated at a cronbach's alpha of 0.69.

The Anxiety Disorder Interview Schedule for the DSM-IV (ADIS-IV; Brown, Di Nardo, & Barlow, 1994) is a semi-structured diagnostic interview that focuses primarily on the anxiety and mood disorders. The ADIS-IV uses a Likert-type scaling procedure for symptoms, and as such is capable of being analyzed in multiple ways to determine the extent to which a symptom is present or absent. The PTSD section of the ADIS-IV includes continuous ratings of frequency and intensity of distress for symptoms of re-experiencing, avoidance, and arousal related to the traumatic event. The ADIS-IV has demonstrated good to excellent interrater reliability, with kappa coefficients ranging from 0.67 to 0.86 for the various anxiety disorders. However, psychometric properties of the ADIS PTSD module have only been assessed in two separate studies and the results were mixed. In the first study a small group of combat veterans were assessed by two independent interviewers. Blanchard, Gerardi, Kolb, and Barlow (1986) found excellent sensitivity (1.0) and specificity (.91) for the original ADIS. An early version of the ADIS, the ADIS-R, demonstrated moderate interrater reliability ( $k = .46$ ) for individuals with a primary diagnosis of PTSD. However, there were only three individuals in this sample (Di Nardo, Moras, Barlow, Rapee, et al., 1993). Given that this measure is most frequently used as a continuous measure of intensity and frequency of PTSD symptoms, a standardized z-score for intensity and frequency of these symptoms was derived for comparison.

The Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982) is a 53-item assessment tool used extensively to assess global psychological distress, which is determined by the individual's score on the global severity index. The global severity index for each subject is obtained by averaging the 53 symptom ratings. The test-retest reliability of the global severity index ranges from 0.68 to 0.91. The measure has nine specific subscales (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism). The raw scores are converted to T scores. The accepted cutoff point for psychopathology is a global severity index of 63 or scores of 63 on three of the subscales. The internal reliability (Cronbach's alpha) of the global severity index in the present study was 0.97.

*Child Adjustment.* The Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) is a 118-item checklist of children's behavior problems that parents rate as 0=not true, 1=sometimes true, or 2=often true. This instrument can be used with 4- to 18-year-old children and adolescents. T-scores can be derived for both internalizing and externalizing problems as well as total behavior problems. T-scores of 60 to 63 (84<sup>th</sup> to 90<sup>th</sup> percentile), and 64 or above (greater than the 90<sup>th</sup> percentile) for total behavior problems, internalizing and externalizing problems are considered to be in the borderline to clinically significant range of functioning. Numerous studies have established its reliability and validity. In particular, good test-retest reliabilities (range from 0.95 to 1.00) and inter-rater reliabilities (range from 0.93 to 0.96), and adequate internal consistencies (range from 0.78 to 0.97) were reported (Achenbach & Edelbrock, 1983).

The Children's Reaction to Traumatic Events (CRTES; Jones, Fletcher, & Ribbe, 2002) is a 15-item self-report checklist assessing children's PTSD symptoms (Intrusion and

Avoidance) in the past week. A 4-point Likert-type scale is used (0 = Not at all; 1 = Rarely; 3 = Sometimes; 5 = Often). The sum of points on each item yields the total CRTES Score. Jones, Fletcher, and Ribbe (2002) suggested the following criteria to distinguish different levels of distress based on the total CRTES score: 0-14 indicates a low distress level; 15-27, moderate distress, and 28 and higher, high distress. For the current sample, internal consistency reliabilities for Intrusion, Avoidance, and the Total score at time 1, were reported at cronbach's alpha of 0.84, 0.76, and 0.86, respectively. In addition, at time 2 for the present study, internal consistencies range from 0.78 to 0.85.

The Children's Depression Inventory (CDI; Kovacs, 1985) is a 27-item self-administered questionnaire for children and adolescents to assess cognitive, affective, behavioral, and interpersonal symptoms of depression for the previous two weeks. This instrument can be used with 6- to 17-year-old children and adolescents. For each item the child has three possible answers; 0= absence of symptoms, 1= mild symptoms, and 2=definite symptoms. The CDI consists of 5 subscales that include Negative Mood, Interpersonal Difficulties, Negative Self-Esteem, Ineffectiveness, and Anhedonia. T-scores of 60 to 70 and 70 or greater are considered to be in the borderline and clinically significant range of functioning. Kovacs (1985) found that this scale can discriminate reliability between clinically depressed and non-depressed psychiatric patients. The internal consistency coefficients range from 0.71 to 0.89 and the test-retest coefficients range from 0.74 to 0.83 (Kovacs, 1985). Internal consistency for the current sample was 0.84 at time 1, and 0.81 at time 2.

The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) is a 34-item self-report questionnaire that examines children's anxiety and fears. The RCMAS can be used with 6- to 18-year-old children and adolescents. The children respond "yes" or "no"

to each item. Factor analysis of the RCMAS generated three factors (physiological, worry/oversensitivity, and concentration), as well as a lie scale. It has been recommended that an overall cut-off point of 19 to 28 be used to identify children experiencing clinically significant levels of anxiety. The RCMAS has been shown to have an internal consistency reliability greater than 0.80 and good convergent reliability (Reynolds & Richmond, 1978). Internal consistency for the current sample was 0.90 at time 1, and 0.89 at time 2.

### *Statistical Analyses*

According to Baron and Kenny (1986), a test of mediation requires four regression equations: (a) The independent variable and the dependent variable first must be significantly related, (b) there must be a significant path between the independent variable and the mediating variable, (c) there must be a significant relationship between the dependent variable and the mediating variable, and (d) the relation between the independent variable and the dependent variable should be significantly lower when the mediating variable is statistically held constant. In this study, mediational analyses examined each of these four conditions.

First, it was tested whether child adjustment outcomes (i.e., Overall Adjustment Index of Internalizing symptoms) at time 1 (4-months post-fire) were related to child adjustment outcomes (i.e., Overall Adjustment Index of Internalizing symptoms) at time 2 (11-months post-fire). Second, it was examined whether child adjustment outcomes at time 1 were related to the child cognitive appraisals and coping methods, and family environment (mediating variables). Third, it was examined whether child adjustment outcomes at time 2 were related to the child cognitive appraisals and coping methods, and family environment (mediating variables). Finally, using only those paths that were found to be significant in the first two steps, it was tested

whether child adaptational processes and/or family processes accounted for the relationships between child adjustment outcomes at time 1 and child adjustment outcomes at time 2.

## Results

### *Descriptive Statistics*

Despite efforts to interview the families at one month and six months after the fire, various reasons prevented this, such as family relocation, and difficulties contacting and scheduling the interviews. As such, the average duration between the fire and the Time 1 interview was close to 4 months (approximately 16 weeks). On average, Time 2 interviews were conducted approximately 11 months after the fire. Given this variability as well as evidence from previous research that symptoms (particularly PTSD) tend to diminish as time passes (e.g., La Greca et al., 1996; Jones & Ollendick, 2005), it is important to take this time factor into account in subsequent analyses in predicting children's symptom levels (or overall psychological adjustment) following the fire.

Means and standard deviations for each measure (presented in Table 4) were found to be consistent with their previously established norms. Acceptable internal consistency coefficients were obtained for each scale. Cronbach's alpha ranged from 0.51 to 0.97. Factor loadings based on exploratory analysis pertaining to religious coping are presented in Table 3. Rates of missing data from the sample are presented in Table 5.

Bonferroni adjustments to control for experiment-wise error rates were applied to the mediational and moderational analyses in the present study. Using the Bonferroni approach to control for Type I error across the four mediational regressions, a p-value of less than .0125 (.05/4) was required for significance. Furthermore, a p-value of less than .0167 (.05/3) was required for significance across the moderational regressions. None of the present hypotheses or

findings (mediational or moderational) were significant when the Bonferroni adjustments were applied. However, the Bonferroni approach demands a highly stringent criterion for rejecting the null hypotheses and drastically increases the risk of Type II error. Therefore, given the explanatory nature of the present study, interpretations will be made independent of the Bonferroni corrections.

To examine potential differences across the demographic variables of gender, race, age, and socio-economic status in the measures used, a series of independent t-tests were calculated. Gender differences approached significance on one measure. Parent's reported greater internalizing symptoms for boys than girls at 11-months [ $t(29) = -1.852, p = .069$ ] (see Table 6). With respect to race, a significant difference was found on children and adolescents' ratings of religious avoidance (a negative coping strategy) (see Table 7). African Americans reported greater religious avoidance [ $t(117) = -2.439, p = .016$ ] than European Americans. In addition, race differences approached significance for parent report of internalizing symptoms. Parents reported more internalizing symptoms for European Americans than African Americans [ $t(132) = 1.899, p = .060$ ]. With respect to age, no significant differences were found, although some differences approached significance. Parent's reported more internalizing symptoms for children at 4-months [ $t(132) = 1.787, p = .076$ ], and children reported using religious avoidance [ $t(117) = 1.918, p = .058$ ] more than adolescents (see Table 8). Lastly, with respect to socio-economic status (SES), there were no significant SES differences found on any of the measures used (see Table 9).

#### *Attrition Analyses*

Given the delays and difficulties of recruitment, particularly longitudinally, some of the participants only completed the Time 1 (4-months) interview, while others completed both Time

1 and Time 2 (11-months) interviews. Therefore, t tests were conducted to compare the means of the longitudinal variables (e.g., independent and dependent variables only) for those participants who did and did not complete the study. As shown in Table 10, two significant group differences emerged. Compared to children and adolescents who completed both Time 1 (4-months) and Time 2 (11-months), children and adolescents completing only the Time 1 assessment (4-months post-fire) scored higher on the CDI (higher on symptoms of depression) and on the CRTES (higher on symptoms of PTSD).

#### *Relationships among Measures*

Relationships among symptom measures were compared next. Zero-order correlations were calculated for children and adolescents adjustment (at 4- and 11-months post-fire) using the total scores for the independent and dependent variables (see Table 11). These included child and adolescent symptoms of PTSD (CRTES), anxiety (RCMAS), and depression (CDI). The relationships between variables at 4- and 11-months were moderately correlated (ranging from  $r = .192$  to  $r = .699$ ). Since the correlations among the three separate measures that were used to assess children and adolescent levels of adjustment (symptoms of PTSD, depression, and anxiety) were moderate (median  $r = .384$ ), the raw scores for each of the three separate symptoms dimensions were standardized into z scores and summed to create an aggregate (i.e., overall adjustment) index. In addition, correlations of total scores for parent's reports of child and adolescent internalizing symptoms (CBCL) at 4- and 11-months were also calculated (see Table 11). (All of the correlational analyses that were conducted were one-tailed with the purpose of assessing their hypothesized predictive relationships.)

Relationships between proposed mediational variables and initial and outcome variables were examined next. Correlations were calculated for children's adjustment, at both 4- and 11-

months, with the potential mediating variables, which included family conflict, general parent psychopathology, parent PTSD symptoms, threat appraisals, negative attributions, active coping, avoidant coping, religious discontent, and religious avoidance (see Tables 12 and 13). Child and adolescent PTSD symptoms were examined first. At 4-months PTSD symptoms were significantly correlated with their threat appraisals ( $r(101) = .235, p < .01$ ), active coping ( $r(99) = .393, p < .01$ ) and avoidant coping ( $r(99) = .401, p < .01$ ), as well as with their parent's PTSD symptoms ( $r(87) = .229, p < .05$ ). These findings indicate that children and adolescents who reported more initial PTSD symptoms reported using threat appraisals, as well as both active and avoidant coping strategies. In addition, higher initial PTSD (child report) was also associated with greater levels parent PTSD symptoms (parent report). At 11-months, child and adolescent PTSD symptoms were significantly correlated with their use of threat appraisal ( $r(61) = .237, p < .05$ ), active coping ( $r(61) = .254, p < .05$ ), and avoidant coping ( $r(61) = .330, p < .01$ ). In other words, children and adolescents who reported more PTSD symptoms at 11-months also reported the greater use of threat appraisals, and both positive (active) and negative (avoidant) coping strategies. Higher PTSD symptoms at 11-months was negatively correlated with religious discontent ( $r(71) = -.234, p < .05$ ), indicating that both children and adolescents who reported greater PTSD symptoms also reported lower levels of religious discontent.

Child and adolescent reports of anxiety symptoms were examined next. Self-report of anxiety symptoms at 4-months was significantly correlated with child and adolescent threat appraisals ( $r(96) = .207, p < .05$ ), negative attributions ( $r(128) = .317, p < .01$ ), avoidant coping ( $r(96) = .203, p < .05$ ), and religious avoidance ( $r(113) = .172, p < .05$ ); anxiety symptoms were also significantly related to family conflict ( $r(124) = .202, p < .05$ ) and parent PTSD symptoms ( $r(82) = .207, p < .05$ ). These findings indicate that children and adolescents initial anxiety was

associated with greater use of threat appraisals, negative attributions, avoidant coping, and religious avoidance coping strategies. In addition, parents of children with higher initial anxiety levels reported greater levels of family conflict and parent PTSD symptoms. At 11-months, child and adolescent anxiety levels were significantly correlated only with religious avoidant coping strategies ( $r(72) = .242, p < .05$ ). This indicates that initial reports of religious avoidance (a negative religious coping strategy) were associated with greater levels of child and adolescent anxiety at 11-months post-fire.

Third, child and adolescent reports of depressive symptoms were examined. Child and adolescent depressive symptoms at 4-months were significantly correlated with negative attributions ( $r(126) = .278, p < .05$ ), as well as family conflict ( $r(121) = .161, p < .05$ ). These findings indicate that children and adolescents with higher initial levels of depression were more likely to report negative attributions; parents of children with higher initial depression were also more likely to report greater family conflict. At 11-months, child and adolescent depressive symptoms demonstrated the same pattern of relationships with negative attributions ( $r(79) = .292, p < .01$ ) and family conflict ( $r(78) = .278, p < .01$ ).

Fourth, the correlations between the overall adjustment index (at both 4- and 11-months) was compared to the hypothesized mediational variables. At 4-months, child and adolescent overall adjustment was found to have a significant positive relationship with their threat appraisals ( $r(92) = .188, p < .05$ ), negative attributions ( $r(125) = .270, p < .01$ ), active coping ( $r(94) = .022, p < .05$ ), and avoidant coping ( $r(94) = .000, p < .01$ ); family conflict ( $r(120) = .187, p < .05$ ) and parent PTSD symptoms ( $r(81) = .008, p < .01$ ) were also significantly related to child and adolescent initial overall adjustment. These findings indicate that children and adolescents with less positive overall adjustment (initially) were more likely to report the greater

use of threat appraisals, negative attributions, and general coping strategies. In addition, among these children and adolescents, parents were more likely to report higher family conflict and parent PTSD symptoms. At 11-months however, no significant relationships were found among these variables.

Finally, intercorrelations were calculated among the potential mediating variables (see Table 14). Family conflict was significantly correlated with general parent psychopathology ( $r(127) = .201, p < .05$ ), indicating that greater levels of family conflict is associated with more reports of general parent psychopathology. In addition, parent symptoms of PTSD demonstrated a significant positive correlation with general parent psychopathology ( $r(85) = .499, p < .01$ ), active coping ( $r(54) = .382, p < .01$ ) and avoidant coping strategies ( $r(54) = .334, p < .01$ ). These findings indicate that parents of children and adolescents who used avoidant coping strategies, reported higher PTSD symptoms and general psychopathology.

Children and adolescents' threat appraisals were significantly correlated with their active coping strategies ( $r(76) = .260, p < .05$ ). This finding indicates that children and adolescents who reported a greater use of threat appraisals also reported using more active coping strategies. Children and adolescents' negative attributions were significantly correlated with religious discontent ( $r(109) = .317, p < .01$ ), indicated that children and adolescents who reported more negative attributions also reported more religious discontent. Avoidant coping also demonstrated a significant positive correlation with religious avoidance ( $r(90) = .257, p < .01$ ), indicating that children and adolescents', who reported greater use of avoidant coping strategies, also reported a greater use of religious avoidance. Furthermore, religious discontent was significantly correlated with religious avoidance ( $r(119) = .194, p < .05$ ). This finding indicates that children and adolescents reporting greater religious discontent also reported greater use of religious avoidance

(a negative religious coping strategy). Finally, with regards to coping, children and adolescents' reports of active coping demonstrated significant positive relationships with avoidant coping ( $r(99) = .671, p < .01$ ), religious discontent ( $r(90) = .221, p < .05$ ), and religious avoidance ( $r(90) = .267, p < .01$ ). These findings indicate that children and adolescents who reported using a general coping strategy (i.e., non-religious coping, either avoidant or active strategies), reported using negative religious coping strategies (religious discontent and avoidance).

Comparisons between parent and child report of symptomology were also conducted. Parent's report of their children and adolescent's internalizing symptoms (as measured by the Child Behavior Checklist (CBCL)) at 4- and 11-months was significantly correlated ( $r(66) = .520, p < .01$ ). This finding indicates that parent's who reported more initial internalizing symptoms for their children and adolescents also reported more internalizing symptoms at 11-months. Parent's reports of their children and adolescents' internalizing symptoms demonstrated a significant correlation with children and adolescent's initial self-reports of anxiety ( $r(134) = .249, p < .01$ ), depression ( $r(126) = .199, p < .05$ ), and their overall adjustment ( $r(125) = .233, p < .01$ ). These finding indicate that parents reporting more internalizing symptoms for their children and adolescents, also had children and adolescents who self-reported greater adjustment difficulties at 4-months. Therefore, parents' were accurate reporters of their children and adolescents' initial internalizing symptoms. At 11-months, parent and child report was only consistent for depressive symptoms ( $r(81) = .210, p < .05$ ). This finding indicates that parent's report of children and adolescents' initial internalizing symptoms was associated with children and adolescents' own reports of depressive symptoms at 11-months.

Parent reports of children and adolescent's internalizing symptoms demonstrated a significant positive correlation with family conflict ( $r(127) = .368, p < .01$ ), general parent

psychopathology ( $r(131) = .500, p < .01$ ), and child and adolescent religious avoidance ( $r(109) = .218, p < .05$ ). These findings indicate that parents who reported more internalizing symptoms for their children and adolescents also reported higher family conflict, general parent psychopathology, and children and adolescents' use of religious avoidance as a coping strategy. At 11-months, parent's reports of children and adolescents' internalizing symptoms was significantly correlated with family conflict ( $r(63) = .336, p < .01$ ), general parent psychopathology ( $r(64) = .508, p < .01$ ), and avoidant coping ( $r(40) = .301, p < .05$ ). These findings indicate that parent's who reported more internalizing symptoms for their children and adolescents also reported more family conflict, general parent psychopathology, and children and adolescents' use of avoidant coping strategies.

#### *Test of the TSC Model*

To examine the main hypothesis that child and adolescent adjustment outcomes (11-months after a residential fire) are mediated by family environment, child cognitive appraisals (or attributions) and coping methods, four separate regression analyses were conducted. The first regression analysis tested the relationship between the independent variable (overall adjustment index at 4-months) and the dependent variable (overall adjustment index at 11-months). As shown in Figure 2, the model indicated a significant path between overall adjustment at 4-months and overall adjustment at 11-months ( $\beta = .715, p < .001$ ).

Next, Figure 3 shows the regression analyses that examined the relationship between the independent variable (overall adjustment index at 4-months) and the mediator variables (family environment and child appraisal and coping). Overall adjustment at 4-months demonstrated a significant path with family conflict ( $\beta = .187, p < .05$ ), parent PTSD symptoms ( $\beta = .268, p < .05$ ); overall adjustment was associated with child and adolescent measures of negative

attributions ( $\beta = .270$ ,  $p < .01$ ), active coping ( $\beta = .209$ ,  $p < .05$ ), and avoidant coping ( $\beta = .341$ ,  $p < .001$ ). Third, the regression analyses examined the relationships between the mediator variables that had previously demonstrated significant paths (family conflict, parent PTSD symptoms, negative attributions, active and avoidant coping) and the dependent variable (overall adjustment index at 11-months). However, as shown in Figure 4, no significant paths emerged between the mediator variables and the dependent variable. Therefore, the criterion for mediation was not met. As such, children and adolescents overall adjustment at 11-months was not mediated by any of the proposed mediating variables (family environment or child adaptational processes).

### *Regression Analyses*

*Mediation Analyses.* To assess if parent reports of child and adolescent internalizing symptoms at 11-months, after a residential fire, were mediated by the family environment and child adaptational processes, four separate regression analyses were conducted. The first regression analysis examined the relationship between the independent variable (overall adjustment index at 4-months) and the dependent variable (parent reports of child and adolescent internalizing symptoms at 11-months). The model indicated a significant path between children and adolescents' overall adjustment at 4-months and parent reported internalizing symptoms for children and adolescents at 11-months ( $\beta = .304$ ,  $p < .05$ ).

Next, regression analyses examined the relationship between the independent variable (overall child and adolescent adjustment at 4-months) and the mediator variables (family environment and child adaptational processes). The model indicated that children and adolescents overall adjustments at 4-months demonstrated a significant path with family conflict ( $\beta = .187$ ,  $p < .05$ ), parent PTSD symptoms ( $\beta = .268$ ,  $p < .05$ ); overall adjustment was also

significantly predictive of child and adolescent negative attributions ( $\beta = .270, p < .01$ ), active coping ( $\beta = .209, p < .05$ ), and avoidant coping ( $\beta = .341, p < .01$ ). Third, the regression analyses examined the relationships between the mediator variables that had previously demonstrated a significant path (family conflict, parent PTSD symptoms, negative attributions, active and avoidant coping) and the dependent variable (parent reports of child and adolescent internalizing symptoms at 11-months). Parent reports of internalizing symptoms at 11-months demonstrated a significant path only with family conflict ( $\beta = .336, p < .01$ ).

Mediation was also tested with regression analyses by examining the change in magnitude of the relation between the independent/predictor variable (overall adjustment index at 4-months) and the dependent/criterion variable (parent reports of child and adolescent internalizing symptoms at 11-months) by adding the hypothesized mediator variable (family conflict) to the equation. As such, the significant association between the overall adjustment index and parent reports of child and adolescent internalizing symptoms became non-significant when family conflict was added to the model ( $\beta = .235, p > .05$ ). Family conflict ( $\beta = .289, p < .05$ ), however, remained a significant and unique predictor of parent report of child and adolescent internalizing symptoms at 11-months (see Figure 5). This pattern of results indicates that family conflict mediates the relationship between children and adolescents' overall adjustment at 4-months and parent reports of child and adolescent internalizing symptoms at 11-months post-fire.

To assess if children and adolescents PTSD symptoms at 11-months was mediated by the family environment and child adaptational processes, four separate regression analyses were conducted. For these analyses, an anxiety/depression adjustment index was created (by taking the mean of the standardized z scores) in order to examine the separate contribution of PTSD

symptoms. The first regression analysis tested the relationship between the independent variable (anxiety/depression adjustment index) and the dependent variable (child and adolescent reported PTSD symptoms). The model indicated a significant path between the anxiety/depression adjustment index at 4-months and self-reported PTSD symptoms at 11-months ( $\beta = .260$ ,  $p < .05$ ).

Next, regression analyses examined the relationship between the independent variable (anxiety/depression adjustment index) and the mediator variables (family environment and child adaptational processes). The model indicated that children and adolescents' anxiety/depression adjustment index at 4-months demonstrated a significant path with family conflict ( $\beta = .203$ ,  $p < .05$ ), negative attributions ( $\beta = .328$ ,  $p < .001$ ), and avoidant coping ( $\beta = .211$ ,  $p < .05$ ). Third, the regression analyses examined the relationships between the mediator variables that had previously demonstrated a significant path (family conflict, negative attributions, and avoidant coping) and the dependent variable (child and adolescent reported PTSD symptoms at 11-months). PTSD symptoms at 11-months only demonstrated a significant path with avoidant coping ( $\beta = .330$ ,  $p < .01$ ).

When testing mediation, the significant association between the child and adolescent anxiety/depression adjustment index and PTSD symptoms became non-significant when avoidant coping was added to the model ( $\beta = .246$ ,  $p > .05$ ). Avoidant coping ( $\beta = .294$ ,  $p < .05$ ), however, remained a significant and unique predictor of PTSD symptoms at 11-months (see Figure 6). This pattern of results indicates that avoidant coping strategies mediate the relationship between children and adolescents anxiety/depression adjustment index at 4-months and PTSD symptoms at 11 months.

To assess if parent report of child and adolescent internalizing symptoms at 11-months was mediated by the family environment and child adaptational processes, four separate regression analyses were again conducted. The first regression analysis tested the relationship between the independent variables (child and adolescent anxiety/depression adjustment index) and the dependent variable (parent report of internalizing symptoms for children and adolescents). The model indicated a significant path between child and adolescent anxiety/depression adjustment index at 4-months and parent report of child and adolescent internalizing symptoms at 11-months ( $\beta = .340, p < .01$ ).

Next, regression analyses examined the relationship between the independent variable (child and adolescent anxiety/depression adjustment index) and the mediator variables (family environment and child adaptational processes). Child and adolescent anxiety/depression adjustment index at 4-months had a significant path with family conflict ( $\beta = .203, p < .05$ ), negative attributions ( $\beta = .328, p < .001$ ), and avoidant coping ( $\beta = .211, p < .05$ ). Third, the regression analyses examined the relationships between the mediator variables that had previously demonstrated a significant path and the dependent variable (parent report of internalizing symptoms for children and adolescents at 11-months). Parent reported symptoms of child and adolescent internalizing symptoms at 11-months demonstrated a significant path with family conflict ( $\beta = .336, p < .01$ ).

As such, the significant association between children and adolescents' reports of the anxiety/depression adjustment index and parent report of child and adolescent internalizing symptoms became non-significant when family conflict was added to the model ( $\beta = .244, p > .05$ ). However, family conflict ( $\beta = .279, p < .05$ ) remained a significant and unique predictor of internalizing symptoms at 11-months, as reported by children and adolescents primary caregivers

(see Figure 7). This pattern of results indicates that family conflict mediates the relationship between children and adolescents' self-reported anxiety/depression adjustment index at 4-months and parent report of child and adolescent internalizing symptoms at 11-months.

*Summary of Mediation Analyses.* In summary, several mediators were found to be significant. Results indicate that family conflict ( $\beta = .289, p < .05$ ) mediates the relationship between children's overall adjustment at 4-months and parent reports of child internalizing symptoms at 11-months post-fire ( $\beta = .235, p > .05$ ). Results also indicate that avoidant coping strategies ( $\beta = .294, p < .05$ ) mediate the relationship between child anxiety/depression at 4-months and PTSD symptoms at 11-months ( $\beta = .246, p > .05$ ). Finally, family conflict ( $\beta = .279, p < .05$ ) also mediates the relationship between children's self-reported anxiety/depression at 4-months and parent report of child internalizing symptoms at 11-months ( $\beta = .244, p > .05$ ).

*Post-hoc analyses.* MacKinnon et al. (2002) argue that the Baron and Kenny (1986) criteria may be a conservative estimate of mediation because it is possible to have mediation without a direct effect between the independent and dependent variable because of opposing mediators in the model. Furthermore, MacKinnon et al. assert that variables with significant relationships between the independent and the mediator variable and between the mediator and the dependent variable can show significant mediation even without a direct effect between an independent and dependent variables. Thus, in the present study post-hoc mediational analyses were conducted in order to test the significance of the indirect effect, which is mathematically equivalent to a test of whether the drop in the total effect is significant upon inclusion of the mediator in the model (cf. Holmbeck, 2002).

First, a Sobel test was conducted to test whether family conflict significantly mediated the relationship between child and adolescent overall adjustment at 4-months and parent reports

of child internalizing symptoms at 11-months post-fire. The standardized coefficients of child and adolescent overall adjustment on parent-report of child internalizing symptoms are as follows: a direct effect of 0.235 and an indirect effect of 0.069 with a nonsignificant z-value of 1.53 (an approximate z-value above 1.96 is considered significant). Thus, mediation is not present.

Next, to test whether avoidant coping significantly mediated the relationships between child anxiety/depression at 4-months and PTSD symptoms at 11-months another Sobel test was conducted. The standardized coefficients of child and adolescent anxiety/depression adjustment on their own reports of PTSD symptoms are as follows: direct effect of 0.246 and an indirect effect of 0.023 with a nonsignificant z-value of 1.54. Thus, mediation is not present for these relationships.

*Moderation Analyses.* Hierarchical multiple regression analyses were conducted to test whether family environment and child adaptational processes moderated the relationship between parent report of child and adolescent internalizing symptoms at 4-months and their anxiety/depression adjustment index at 11-months. In each of these analyses, parent report of child and adolescent internalizing symptoms was entered in the first step; in the second step, either the family environment or child adaptational variable was entered; finally, in the third step the interaction between parent report of child and adolescent internalizing symptoms at 4-months and the respective moderator variable was entered. According to Barron and Kenney (1986) and Holmbeck (1997) a moderation effect would be evident if the interaction effect was found to be a significant predictor of children and adolescents' anxiety/depression adjustment index when the main effects of parent report of child and adolescent internalizing symptoms and the moderator variable(s) were controlled for.

No significant interaction effects for parent report of child and adolescent internalizing symptoms were found for the following variables: family conflict; parent PTSD symptoms; and child and adolescent threat appraisals, negative attributions, general coping strategies (active nor avoidant), and religious discontent. However, a significant interaction was found for parent report of child and adolescent internalizing symptoms and children and adolescents' self-reports of religious avoidance (a negative religious coping strategy) ( $\beta = 1.257, t = 2.354, p < .05$ ) (see Table 15). This finding indicates parent report of internalizing symptoms varies as a function of children and adolescents' self-reported use of religious avoidance as a coping strategy. The full model accounted for 16% of the variance in children and adolescents' anxiety/depression adjustment index ( $R^2 = .16, F(3, 63) = 4.094, p = .010$ ). Furthermore, the interaction found between parent report of child and adolescent internalizing symptoms and general parent psychopathology approached significance ( $\beta = -1.699, t = -1.976, p = .05$ ) (see Table 16). This interaction indicates that lower levels of parent psychopathology (according to parent report) were associated with higher levels of parent-reported child and adolescent internalizing symptoms, as evidenced by the negative sign of the standardized Beta. The full model accounted for 12% of the variance in children and adolescents' anxiety/depression adjustment index ( $R^2 = .12, F(3, 72) = 3.342, p = .024$ ).

Hierarchical multiple regression analyses were also conducted to test whether family environment and child adaptational processes moderated the relationship between children and adolescents' overall adjustment index at 4-months and parent report of child and adolescent internalizing symptoms at 11-months. In each of these analyses, children and adolescents' overall adjustment index was entered in the first step; in the second step, the family environment or child adaptational variable was entered; finally, in the third step, the interaction between

children and adolescents' overall adjustment index at 4-months and the respective moderator variable was entered. As previously discussed, a moderational effect is seen if the interaction term were a significant predictor of parent reported child and adolescent internalizing symptoms when the two main effects had been controlled for (Holmbeck, 1997). Therefore, the hierarchical regression would indicate moderation if the interaction term contributed significantly to the internalizing symptom variable.

No significant interaction effects with children and adolescents' overall adjustment index at 4-months were found for the following variables: family conflict; general parent psychopathology and parent PTSD symptoms; child and adolescent threat appraisals, negative attributions, avoidant coping, and negative religious coping strategies (neither religious discontent nor religious avoidance). However, a significant interaction was found for child and adolescents' overall adjustment and children and adolescents' self-reports of active coping ( $\beta = 1.621$ ,  $t = 2.554$ ,  $p < .05$ ) (see Table 17). This finding indicates that children and adolescents' overall adjustment varies as a function of self-reported active coping strategies. The full model accounted for 24% of the variance in parent reports of child and adolescent internalizing symptoms ( $R^2 = .24$ ,  $F(3, 32) = 3.381$ ,  $p = .030$ ).

*Summary of Moderator Analyses.* In summary, moderation analyses yielded a few significant findings. First, a moderation or interaction effect was found between parent report of child and adolescent internalizing symptoms and children and adolescents' self-reports of religious avoidance. However, this only accounted for 16% of the total variance. Second, a moderation effect was also found between children and adolescents' self-reports of their overall adjustment and self-reports of their active coping strategies. This interaction accounted for 24% of the total variance.

*Post-hoc analyses.* Further analyses were done in order to examine the specific effect of the moderation (cf. Holmbeck, 2002). Post-hoc moderational analyses were conducted to examine the impact of religious avoidance on the relationship between parent reports of children and adolescent internalizing symptoms and children and adolescents' self-reported anxiety/depression adjustment index. When graphically plotted (see Figure 8) the interaction effect of religious avoidance and the anxiety/depression adjustment index is observed. This relationship can be interpreted to mean that the positive relationship between internalizing symptoms and anxiety/depression is strongest for those children and adolescents who also reported high religious avoidance.

Furthermore, the significant moderational role of active coping strategies on the relationship between children and adolescents' overall adjustment and parent report of their internalizing symptoms was examined. When plotted (see Figure 9) the interaction effect of active coping and overall adjustment as reported by children and adolescents is observed. In other words, the positive relationship between internalizing symptoms and children and adolescents' overall adjustment is strongest for those who also reported a higher use of active coping strategies.

## Discussion

This study represents a first attempt to apply the Transactional Stress and Coping (TSC) model to the trauma literature, in order to understand child and adolescent adjustment following residential fire. The present application is grounded upon the concepts of appraisal and coping, first proposed by Lazarus and Folkman (1984), and guided by the family process approach of the TSC model (Thompson et al., 1993). More specifically, the present study has identified significant factors that may impact children and adolescents' adjustment following residential fires. Importantly, these findings build upon the existing literature on child chronic health, by taking an ecologically and developmentally informed approach to examine child and adolescent adjustment following fire trauma.

The overall aim of the present study was to holistically examine individual and family processes that influence child and adolescent outcomes following residential fire. As a first step in this process, the role of demographic variables was explored in order to capture potential differences in child and adolescent outcomes. In general, demographic variables were found to contribute minimally to the study outcomes. Specifically, African American children and adolescents reported a significantly greater use of religious avoidance (a negative religious coping strategy) compared to European Americans. This finding is consistent with the existing literature which has reported that African Americans tend to use more religious coping compared to other racial groups (Baron & Koenig, 1990; Ellison & Taylor, 1996; Wang et al., in preparation). In comparison, age, socio-economic status, and gender differences were not statistically significant.

The present study was intended to provide a developmentally informed approach to consider child and adolescent outcomes following residential fire. Developmental theories would

suggest that child and adolescent outcomes following trauma are likely to be different as a function of parental reactions, cognitive abilities, and family roles (Deering, 2000; Pine & Cohen, 2002) (note that in the present study, only internalizing outcomes were measured). When child and adolescent reports of internalizing symptoms were compared in the present study, significant differences were not found. Since children and adolescents (by parent- and child-report) did not differ significantly on internalizing symptoms, the developmental differences between these two age groups could not be examined. For this reason, children and adolescents were collapsed into a single group for all analyses. The expected developmental differences may not have emerged for several reasons. It may be that children and adolescents are less likely to differ in their self-report of internalizing symptoms (e.g., both may be equally accurate), and instead might differ in their report of the family environment. For example, children's reactions have been shown to more closely resemble their parents' outcomes (Laor et al., 1997; McFarlane, 1987; Pynoos, Steinberg, & Wraith, 1995), while adolescents appear to be less dependent and more concerned about their parents' reactions (e.g., wanting to protect their parents, assuming more adult-like responsibilities) (Hagan, 2005). However, child and adolescent report of the family environment was not obtained in the present study.

A second consideration of the present study was to examine concordance between parent and child reports of internalizing symptoms. In general, for non-distressed children, adolescents, and their families there is only limited parent-child agreement on child internalizing symptoms (Achenbach, McConaughy, & Howell, 1987). Furthermore, the general disaster literature (e.g., traumas including shootings, hurricanes, earthquakes, plane crashes, etc.) has demonstrated that children report more severe disaster reactions than reported by parents or teachers (Vogel & Vernberg, 1993). It is typically harder for parents to recognize internalizing symptoms, and a

parent's own distress may preclude accurate evaluations of the child or adolescent. As such, it seems particularly important to directly ask children and adolescents about their post-disaster reactions instead of relying exclusively on parent reports. In the present study, when child/adolescent and parent report of internalizing symptoms was compared, no significant differences were found. Thus, in this sample, parents were accurate reporters of their children and adolescents' internalizing symptomatology. While this finding is somewhat inconsistent with previous studies, it should be noted that in the present study parent's were generally low on their report of their own distress (e.g., approximately 3 out of 87 parents met full criteria for PTSD). It may be that when parents are less distressed, they are able to more accurately recognize their children and adolescents' symptoms of internalizing difficulties. Furthermore, given the more personal and direct effect of a residential fire, as compared to the community disasters highlighted in Vogel and Vernberg's (1993) review, it is probable that parents' in these circumstances may be more vigilant and sensitive to their child and adolescents' needs.

In support of the ecological approach of the TSC model, individual and contextual variables of interest were significantly related to child and adolescent outcomes. First, child and adolescent individual variables were considered. Consistent with previous research, the present study demonstrated that child and adolescent threat appraisals and negative attributions were significantly associated with self-reported PTSD, anxiety, and depression (Dalglish et al., 2000; Ehlers, Mayou, & Bryant, 2003; Fearnow-Kenney & Kliwer, 2000; Ollendick et al., 2001; Sandler, Kim-Bae, & MacKinnon, 2000). As predicted, more negative attributions and greater use of threat appraisal were associated with more internalizing symptoms of PTSD, anxiety and depression.

Child and adolescent general and religious coping strategies were also significantly associated with adjustment outcomes. Consistent with previous research, greater use of avoidant coping was significantly related to higher levels of PTSD and anxiety symptoms (Causey & Dubow, 1992; Jones & Ollendick, 2005; La Greca et al., 1996; Ollendick et al., 2001; Vernberg et al., 1996), and religious avoidance strategies were associated with higher levels of anxiety (Ano & Vasconcelles, 2005; Wang, Ollendick, & Jones, in preparation). An unexpected finding was that children and adolescents who reported greater use of active coping strategies and lower levels of religious discontent also reported higher symptoms of PTSD. In other words, in this sample, children and adolescents with more symptoms of PTSD reported more active coping strategies (i.e., a positive coping strategy) and reported less religious discontent (i.e., less anger with God, questions about their faith, etc.). In contrast, children and adolescents with fewer symptoms of PTSD reported using less active coping strategies (i.e., fewer positive coping strategies) and indicated higher levels of religious discontent. These findings are inconsistent with what would have been predicted from previous research (Ano & Vasconcelles, 2005), although two studies have found religious coping to be more related to negative outcomes (Pargament et al., 1998; Thompson & Vardaman, 1997). As such, the research on religious coping and psychological adjustment to stress has yielded mixed results. It is important to note that all of the coping variables (general and religious strategies) were positively correlated, suggesting that high levels of distress following residential fire may initially elicit a variety of coping strategies, both positive and negative. Other research has also found that individuals typically use several types of coping strategies to cope with stressful events (Sandler et al., 1997; Spirito, Stark, & Williams, 1988). In the present study, the independent contribution of each coping strategy was not separately considered. As such, it is likely that children and adolescents

were using a variety of coping strategies, although the specific composition of their coping strategies was not explored in the present study.

As a contextual variable, family environment (i.e., parent psychopathology and family conflict) was significantly related to child and adolescent outcomes. As expected, parent psychopathology was significantly associated with child and adolescent self-report of internalizing symptoms (PTSD, anxiety, and depression), as well as with parent-report of child and adolescent internalizing symptoms. This is consistent with previous literature which has reported similar results (Benedeck, 1985; Laor et al., 1997; McFarlane, 1987). Furthermore, as shown in previous literature, family conflict was also associated with child and adolescent self-reported internalizing symptoms (PTSD, anxiety, and depression) and with parent report of child and adolescent internalizing symptoms (Bromet et al., 1984; Green et al., 1991). Finally, parent psychopathology and family conflict were associated with child and adolescent use of religious avoidance and avoidant coping strategies (both negative coping styles). It is possible that parents' who are highly distressed (high in psychopathology) and families with high conflict may be likely to engage in negative coping strategies (either general or religious). In turn, the negative coping strategies may have an indirect effect on children and adolescents, as parent's poor communication style and negative coping strategies may function as models for their children (Compas & Epping, 1993; Laor et al., 1997; Pynoos, Steinberg, & Wraith, 1995; Rosenbeck & Nathan, 1985).

The above relationships are generally consistent with previous studies which have documented these associations separately. The aim of the present study was to extend the existing literature by incorporating a holistic framework of individual and contextual factors to examine child and adolescent outcomes following trauma. Importantly, the mediational factors

proposed in the TSC model (i.e., child and adolescent cognitive appraisal and coping strategies and family environment) show a significant pattern of associations with child and adolescent outcomes (i.e., internalizing symptoms). For this reason, further analysis of this model is considered next.

### *Summary of TSC Model*

The primary aim of the present study was to apply the TSC model (Thompson et al., 1993), primarily used in the health literature, to child and adolescent traumatic experiences (i.e., residential fire). It was hypothesized that a child or adolescent's adjustment outcomes following a residential fire would be mediated by the child or adolescent's cognitive appraisals and coping methods, as well as by their family environment. In the present study, the overall TSC model was not supported in its entirety.

The fact that overall support for the TSC model was not obtained could be a function of the very strong association between criterion and predictor measures of child and adolescent adjustment. It may be that the time period between measures of initial adjustment (at 4-months) and outcome adjustment levels (at 11-months) is not sufficient to detect the mediation effect. In other words, given the good test-retest reliability of the measures (used at both 4- and 11-months), the amount of time that elapsed from 4- to 11-months may not have been enough to detect significant changes in symptomatology. Furthermore, it is important to note that the children and adolescents most significantly affected by the residential fire (i.e., those with higher levels of depression and PTSD) only participated at 4-months and did not return for follow-up assessments. This attrition result notwithstanding, avoidant coping strategies and family conflict still emerged as significant mediators, suggesting that these may be especially powerful predictors of child and adolescent adjustment.

### *Supplemental Mediation Analyses*

While the TSC model was not supported in its entirety, several of the proposed individual and contextual variables may have emerged as significant mediators for child and adolescent adjustment. It should be noted however, that mediators were only significant using Baron and Kenny's criteria, and did not maintain significance using the more stringent post hoc analyses. It is possible that these results were not obtained given that the effect size may not have been adequate to detect in the limited sample size. Therefore, the interpretation of these results must be cautiously considered. Although the subsequent discussion will consider the potential implications of the relationships obtained, it should be clear that these results are largely inconclusive, and may have been obtained by chance given the high number of regression analyses.

There was some suggestion that parent report of child and adolescent internalizing symptoms (anxiety and depression) may be mediated by family conflict. This would indicate that higher levels of family conflict may predict higher levels of (parent-reported) internalizing symptoms at outcome for children and adolescents. In addition, there was some suggestion that children and adolescents' own report of PTSD symptoms may be mediated by their avoidant coping strategies. In other words, children and adolescents' greater use of avoidant coping strategies may predict higher levels of (self-reported) PTSD symptoms at outcome.

If further supported by additional research, these results would make sense to the extent that families characterized by high conflict would be expected to have more strained relationships and interactions. As such, children with a history of conflict in the home may perceive traumatic events as more threatening, and thus they may experience more internalizing symptoms. Second, parents in homes high in conflict may be overly sensitive in their perception

of the problems experienced by their children and adolescents. In other words, parents may over-report on their children's internalizing symptoms. On the other hand, families high in conflict are also typically low in cohesion, which may in turn directly affect the presence of internalizing symptoms (Laor et al., 1997). Finally, long-lasting hardships, such as property damage that takes a long time to repair, can lead to a family climate of irritability and distress. An irritable family climate, in turn, is associated with more persistent symptoms of adjustment difficulties in children (McFarlane, 1987).

The second potential mediational finding, that children and adolescents' greater use of avoidant coping strategies may predict higher levels of PTSD symptoms, if reported in other studies would extend previous findings in the general trauma literature to the experience of residential fire. More specifically, research has documented that avoidant coping strategies are related to higher levels of internalizing problems within the trauma literature (Causey & Dubow, 1992). Within the residential fire literature, one previous study has demonstrated that avoidant coping strategies were found to increase the likelihood of distress in the context of disaster situations (Jones & Ollendick, 2005). The present finding may extend this research by demonstrating that avoidant coping strategies could predict distress, specifically children and adolescents' PTSD symptoms.

#### *Supplemental Moderational Analyses*

Because previous research has demonstrated some inconclusive results regarding the mediational and/or moderational role of the proposed variables in the TSC model (i.e., cognitive appraisal, coping strategies, and family environment), moderational analyses were also conducted. It was found that religious avoidance may moderate the relationship between parent-report of children and adolescents' internalizing symptoms and their anxiety/depression

adjustment index at outcome. More specifically, the positive relationship between internalizing symptoms and anxiety/depression is strongest for those children and adolescents who also reported high religious avoidance. Second, it was found that active coping strategies may moderate the relationship between children and adolescents' overall adjustment index and parent reports of their internalizing symptoms. In other words, the positive relationship between internalizing symptoms and children and adolescents' overall adjustment is strongest for those who also reported a higher use of active coping strategies.

The results of the first moderational analysis may extend previous research, as children and adolescents' who reported using negative forms of religious coping experienced more depression, anxiety, and PTSD (Ano & Vasconcelles, 2005). In addition, parents emerged as accurate reporters of their children's adjustment difficulties when high levels of negative religious coping strategies were apparent. However, for children who reported using less negative coping strategies, parent-child agreement was no longer evident. In other words, parents reported these children and adolescents to have higher adjustment difficulties, although these children reported better outcomes. It may be that the use of any form of negative religious coping is perceived by parents as indicative of adjustment difficulties. However, since family religiosity was not assessed in the present study, such a conclusion is merely speculative.

The second moderational analysis was an unexpected finding, in that the use of active coping strategies did not predict better psychological adjustment. In addition, active coping seemed to be associated with higher levels of internalizing symptoms (PTSD, anxiety, and depression). This is in contradiction to the general adult and child coping literature. However, one study has previously demonstrated a negative relationship between active coping and psychological adjustment in children with different medical conditions (Zehnder et al., 2006). An

explanation of this may relate to the time interval between the two assessment points in the present study. It is possible that active coping strategies only have short-term positive effects on adjustment, and that the effect may dissipate 11-months later. Furthermore, characteristics of the situation may also influence coping effectiveness. It has been suggested that active coping strategies could be maladaptive in uncontrollable situations, such as residential fire. Lazarus and Folkman (1984) note that problem-focused (e.g., active) strategies are only effective in controllable situations, whereas emotion-regulative strategies are adaptive in uncontrollable situations. Finally, the concurrent use of other coping strategies was not controlled for in the present study. In other words, children and adolescents may have been using a variety of coping strategies, such as avoidant and negative religious methods (which is suggested by the high correlations among all of these coping strategies), making it difficult to tease apart the specific role of active strategies (which only accounted for 24% of the total variance in their adjustment).

### *Summary of Findings*

In summary, although the overall TSC model was not supported, some associations were found among the expected contextual and family environment factors, and child and adolescent adjustment outcomes following residential fire. When examined in light of previous research, which indicates that the role of children and adolescents' general and religious coping strategies play a critical role (both as a direct cause and influence) on children and adolescents' outcomes following residential fire, the results of the present study may be interpreted more liberally. Such findings highlight the need to continue to address individual and contextual factors in the treatment of psychological difficulties following residential fire. Furthermore, these findings may have implications for treatment and intervention efforts following trauma. It is possible that immediate intervention following traumatic events may prevent some of these long-term

adjustment difficulties by alleviating family conflict, by addressing individual (and perhaps family) maladaptive coping strategies, and by providing individual and family support.

### *Limitations*

Along with the contributions of the present study, several limitations should be considered. First, there was a high attrition rate over the two assessment waves. This was primarily due to family relocation, a frequent consequence of residential fires. As a result, a smaller sample size was obtained at Time 2, particularly for specific measures. Hence, the power of the statistical analyses was limited, especially with Time 2 data. On the other hand, attrition analyses indicated differences in the severity of symptoms for the children and adolescents who only completed Time 1 assessment versus those who also completed the Time 2 assessment. In particular, children and adolescents who only completed the first assessment scored significantly higher on PTSD and depressive symptomatology than those who completed both Time 1 and Time 2 assessments. This may be understandable, in that children and adolescents who are more distressed may be less willing to participate in follow-up assessments that would necessarily ask them to process the impact of the residential fire.

A second limitation was encountered in the way of missing data for primary variables, including children and adolescents' threat appraisals, general coping and religious coping measures, as well as parent PTSD psychopathology measures. In the regression analyses, the standard listwise deletion approach was employed. This led to a significantly reduced sample size in these analyses, which further decreased their power. Given that missing data is a common phenomenon in longitudinal research, more efforts are needed to explore appropriate statistical techniques to address this issue.

Third, given the high number of regression analyses conducted, it is inevitable that the probability of Type I error increased. As a result, caution should be taken when interpreting the statistical significance of the findings in the present study. Fourth, interpretation of the findings must take into account the self-report nature of the measures used (excluding the ADIS interview). Self-reports may be a biased measure of symptoms, as they require relying upon the subjective experience of children, adolescents, and parents.

Finally, care should be taken when applying these findings to other populations who have experienced residential fire, given that participants in the present study all came from four adjacent Southeastern states in the United States. As suggested by Pargament (1997) and Ferraro and Koch (1994) different geographic locations may bear different cultural influences on the beliefs, values and practices of families, children and adolescents. For example, in the present study, African Americans reported greater use of religious coping strategies (e.g., religious avoidance) than European Americans. This particular effect may have been observed not only because of racial factors, but also due to unique cultural influences (e.g., geographic area) that shaped child, adolescent, and family religious experiences. Moreover, African Americans were over-represented in this study, compared to national and state census data. The higher than expected proportion of African Americans may have been because residential fires occur more often in the homes of African Americans than in the homes of European Americans. A number of factors may contribute to this racial difference, such as lower levels of income associated with poorer living condition and fire safety equipment (e.g., the lack of smoke alarms). Thus, while the sample in this study may be well representative of the population of residential fire victims, it may not be as representative of the general population. Therefore, caution should be taken in generalizing the findings of the present study to other populations.

### *Future Directions*

Based on the suggested findings of the present study, some recommendations for future directions are offered. Investigations into the coping and adjustment process of children and adolescents following residential fire remain in need of novel explorations. It is important for the field to continue to broaden the understanding of how children, adolescents, and their families adjust to trauma by testing innovative additions to current models. Another important area of investigation is the longitudinal psychological adjustment of children and adolescents following trauma. Empirical findings can be translated into greater practical utility with a deeper understanding of the time course of and composition of cognitive appraisal, coping methods, and the role of family processes, and how these may impact adjustment over time. Several possible targets for clinical intervention may include not only individual processes such as coping strategies, but also contextual variables such as the family environment. As has been shown in the child chronic health literature, family-based cognitive-behavioral interventions and behavioral family systems therapy show promise in improving family communication, problem solving strategies, and family and structural interventions (improvements in parent-child or – adolescent relationships) (Hocking & Lochman, 2005). These interventions may be equally promising strategies for children and families who have experienced trauma. Furthermore, trauma-focused coping skills training that targets problem solving, cognitive behavioral modification, and conflict resolution may be other avenues to explore. Finally, while the TSC model shows utility in identifying the psychosocial processes comprising adaptive outcomes to trauma, a similar application to treatment processes remains unexplored. Relatively few studies have empirically tested the effects of interventions for children and adolescent's following

residential fire. Future studies employing large sample sizes are needed to establish the treatment approaches that effectively improve adjustment to residential fire.

### *Conclusions*

Results of the present study address several gaps in the existing literature on children and adolescents experiencing trauma. First, the findings shed more light on psychosocial variables that influence children and adolescents' adjustment to fire, particularly internalizing symptoms which are characteristically difficult to identify. Second, a holistic approach was taken to examine the impact of the family environment (i.e., conflict, parent psychopathology) as well as child and adolescent adaptational processes (i.e., cognitive appraisal, general and religious coping strategies). Avoidant coping and family conflict may serve as mediators for child and adolescent adjustment outcomes, while religious avoidance and active coping strategies appeared to moderate adjustment outcomes. Third, developmental differences that might emerge in symptom reporting were examined between parent and child and adolescent reports of symptoms. However, in the present study, parents were accurate reporters of their children and adolescents' internalizing symptomatology. Finally, this longitudinal study examined the contribution of individual and contextual variables in predicting short-term and more lasting internalizing symptoms in children and adolescent following residential fire. By addressing these four issues, this study advances our understanding of the dynamic interplay between situation and person variables in children and adolescents' adjustment in the aftermath of a significant traumatic event.

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Table 1

*Demographic variables of Sample size (N), Age, Sex, Race, and Socio-Economic Status (SES)*

		African Americans			European Americans			
		Boys	Girls	Subtotal	Boys	Girls	Subtotal	Total
Children (7-12yrs)	<b>N</b>	<b>24</b>	<b>17</b>	<b>41</b>	<b>18</b>	<b>22</b>	<b>40</b>	<b>81</b>
	SES	4.20	4.13	4.17	4.12	4.28	4.30	4.24
Adolescents (13-18 yrs)	<b>N</b>	<b>12</b>	<b>23</b>	<b>35</b>	<b>11</b>	<b>17</b>	<b>28</b>	<b>63</b>
	SES	4.50	4.86	4.73	5.43	4.44	4.88	4.81
Subtotal	<b>N</b>	<b>26</b>	<b>40</b>	<b>76</b>	<b>29</b>	<b>39</b>	<b>68</b>	<b>144</b>
	SES	4.29	4.47	4.38	4.87	4.33	4.51	4.46

Table 2

*Means and Standard Deviations of Age, Sex, Race, and Socio-Economic Status*

Variable	N	Mean	SD	Range
<i>Age</i>				
Total	144	11.97	2.89	7 – 18
Children	81	9.80	1.44	7 – 12
Adolescent	63	14.75	1.49	13 – 18
<i>Sex</i>				
Total	144	---	---	---
Males	65			
Females	79			
<i>Race</i>				
Total	144	---	---	---
African Americans	76			
European Americans	68			
<i>Socio-Economic Status</i>				
Total	72	4.46	1.16	2 – 7
High	57	4.89	.86	4 – 7
Low	15	2.80	.41	1 – 3

Table 3

*Reproduction of Wang et al. (in preparation) New Factor Loadings of RCAS Children Responses*

	Alpha	Factor loading
Spiritually Based Coping	.94	
Item 2		.42
3		.46
4		.70
5		.56
6		.66
7		.67
8		.81
9		.67
10		.60
11		.70
12		.81
<b>13</b>		<b>.40</b>
<b>14</b>		<b>.41</b>
<b>15</b>		<b>.36</b>
Good Deeds (Religious participation)	.81	
16		.71
17		.87
18		.35
Religious Support	.85	
19		.43
20		.66
21		.52
Plead	.84	
<b>1</b>		<b>.48</b>
22		.50
23		.67
24		.66
25		.54
26		.64
Discontent	.69	
27		.72
28		.63
29		.54
Religious Avoidance	.83	
30		.84
31		.64
32		.56

Note: Item numbers in bold for each factor indicates the new items that loaded on that factor.

Table 4

*Measure Means and Standard Deviations*

<b>Measures</b>	<b>M</b>	<b>SD</b>
<b>Child Adjustment - Time 1</b>		
PTSD (CRTES)	24.35	16.71
Anxiety (RCMAS)	9.93	7.51
Depression (CDI)	8.72	7.02
Internalizing Symptoms (CBCL)	49.57	12.99
<b>Family Environment</b>		
Conflict (FES)	3.05	2.12
Global Severity Index (BSI)	58.18	11.84
<b>Child Adaptational Processes</b>		
Negative Attributions (CASQ)	8.08	3.25
Active Coping (HICUPS)	2.40	.66
Avoidant Coping (HICUPS)	2.73	.71
Religious Discontent (RCAS)	1.24	2.00
Religious Avoidance (RCAS)	3.96	2.98
<b>Child Adjustment – Time 2</b>		
PTSD (CRTES)	17.75	14.71
Anxiety (RCMAS)	7.99	12.29
Depression (CDI)	6.34	5.59
Internalizing Symptoms (CBCL)	52.12	11.73

Note: Mean scores and standard deviations are not reported for the following measures that were standardized into z-scores; *ADIS*, *ACQ*, and the *Overall Adjustment Index*.

Table 5

*Rates of Missing Data*

<b>Variables</b>	<u>Time 1</u> N = 144		<u>Time 2</u> N = 95	
	n	%	n	%
<b>Child Measures</b>				
Depression symptoms (CDI)	133	7.6	84	11.6
Anxiety symptoms (RCMAS)	144	0	84	11.6
PTSD symptoms (CRTES)	136	5.6	84	11.6
Threat Appraisal (ACQ)	101	29.9		
Negative Attributions (CASQ)	130	9.7		
General Coping (HICUPS)				
Active Coping	99	31.3		
Avoidant Coping	99	31.3		
Religious Coping (RCAS)				
Religious Discontent	119	17.4		
Religious Avoidance	119	17.4		
<b>Parent Measures</b>				
Internalizing Symptoms (CBCL)	134	6.3	66	30.5
Family Environment (FES)				
Conflict	129	10.4		
Parent Psychopathology (ADIS)	87	39.6		
Brief Symptom Inventory (BSI)				
Global Severity Index	137	4.9		

Note: † Rate of missing values is given in percent.

Table 6

*t* tests for Gender group differences across measures

Measures	Females		Males		t	<i>p</i> 2-tailed
	N	Mean (SD)	N	Mean (SD)		
<b>Time 1</b>						
Depression Symptoms (CDI)	75	9.23 (7.11)	58	8.04 (6.90)	.970	.334
Anxiety Symptoms (RCMAS)	77	10.02 (7.07)	59	9.82 (8.10)	.157	.875
PTSD symptoms (CRTES)	79	25.89 (15.89)	65	22.48 (17.60)	1.207	.225
Internalizing Symptoms (CBCL)	75	49.16 (12.16)	59	50.10 (14.05)	-.415	.678
Family Conflict (FES)	72	2.98 (2.22)	57	3.13 (2.01)	-.411	.682
General Parent Psychopathology (BSI)	74	57.14 (12.37)	63	59.40 (11.16)	-1.112	.268
†Parent PTSD Symptoms (ADIS)	49	.045 (1.02)	38	-.06 (.99)	.477	.635
†Threat Appraisals (ACQ)	61	.05 (.99)	40	-.08 (1.03)	.640	.524
Negative Attributions (CASQ)	74	8.09 (3.30)	56	8.06 (3.21)	.057	.955
Active Coping (HICUPS)	55	2.42 (.67)	44	2.39 (.69)	.325	.746
Avoidant Coping (HICUPS)	55	2.80 (.68)	44	2.66 (.74)	.948	.345
Religious Discontent (RCAS)	65	1.29 (2.12)	54	1.19 (1.87)	.289	.773
Religious Avoidance (RCAS)	65	3.97 (2.92)	54	3.94 (3.09)	.045	.964
<b>Time 2</b>						
Depression Symptoms (CDI)	48	6.40 (5.92)	36	6.25 (5.20)	.121	.904
Anxiety Symptoms (RCMAS)	48	8.99 (6.69)	37	6.69 (6.44)	.853	.396
PTSD Symptoms (CRTES)	45	17.76 (14.81)	39	17.74 (14.78)	.004	.997
Internalizing Symptoms (CBCL)	28	49.84 (10.51)	29	55.10 (12.74)	-1.804	.069

Note:  $p < .05$ ,  $p < .01$ ,  $p < .001$ , 2-tailed

Females were coded as 0 and males were coded as 1

† Measures were converted to z scores for analyses

Table 7

*t* tests for Race group differences across measures

Measures	European Americans		African Americans		t	p 2-tailed
	N	Mean (SD)	N	Mean (SD)		
<b>Time 1</b>						
Depression Symptoms (CDI)	63	9.02 (7.81)	70	8.44 (6.27)	.475	.635
Anxiety Symptoms (RCMAS)	64	9.92 (7.54)	72	9.95 (7.52)	-.021	.983
PTSD symptoms (CRTES)	68	25.90 (17.13)	76	22.96 (16.31)	1.055	.293
Internalizing Symptoms (CBCL)	64	51.78 (13.24)	70	47.56 (12.50)	1.899	.060
Family Conflict (FES)	63	3.04 (2.40)	66	3.05 (1.83)	-.012	.990
General Parent Psychopathology (BSI)	68	58.84 (12.53)	69	57.53 (11.16)	.646	.519
†Parent PTSD Symptoms (ADIS)	44	.08 (1.05)	43	-.08 (.95)	.744	.459
†Threat Appraisals (ACQ)	48	.03 (.92)	53	-.02 (1.08)	.251	.802
Negative Attributions (CASQ)	63	7.94 (3.30)	67	8.21 (3.23)	-.480	.632
Active Coping (HICUPS)	44	2.44 (.66)	55	2.39 (.66)	.415	.679
Avoidant Coping (HICUPS)	44	2.68 (.76)	55	2.78 (.67)	-.698	.487
Religious Discontent (RCAS)	54	1.17 (1.68)	65	1.31 (2.25)	-.381	.704
Religious Avoidance (RCAS)	54	3.24 (2.63)	65	4.55 (3.14)	-2.439	<b>.016</b>
<b>Time 2</b>						
Depression Symptoms (CDI)	43	6.54 (5.41)	41	6.13 (5.85)	.331	.742
Anxiety Symptoms (RCMAS)	42	7.00 (6.72)	43	8.95 (16.01)	-.727	.469
PTSD Symptoms (CRTES)	40	19.35 (14.73)	44	16.30 (14.70)	.950	.345
Internalizing Symptoms (CBCL)	32	53.66 (13.02)	35	50.71 (10.41)	1.026	.309

Note:  $p < .05$ ,  $p < .01$ ,  $p < .001$ , 2-tailed

European Americans were coded as 0 and African Americans were coded as 1

† Measures were converted to z scores for analyses

Table 8

*t* tests for Age group differences across measures

Variables	Children		Adolescents		t	<i>p</i> 2-tailed
	N	Mean (SD)	N	Mean (SD)		
<b>Time 1</b>						
Depression Symptoms (CDI)	71	8.58 (6.76)	62	8.87 (7.36)	-.232	.817
Anxiety Symptoms (RCMAS)	74	10.48 (7.34)	62	9.28 (7.70)	.933	.353
PTSD symptoms (CRTES)	81	24.67 (16.31)	63	23.94 (17.33)	.258	.797
Internalizing Symptoms (CBCL)	74	51.36 (14.12)	60	47.37 (11.16)	1.787	.076
Family Conflict (FES)	73	3.02 (2.05)	56	3.08 (2.22)	-.165	.870
General Parent Psychopathology (BSI)	77	58.89 (11.74)	60	57.27 (12.00)	.795	.428
†Parent PTSD Symptoms (ADIS)	47	.04 (.99)	40	-.04 (1.02)	.353	.725
†Threat Appraisals (ACQ)	60	.01 (.88)	41	-.01 (1.17)	.114	.910
Negative Attributions (CASQ)	75	7.72 (3.43)	58	8.52 (2.99)	-1.395	.166
Active Coping (HICUPS)	55	2.39 (.70)	44	2.43 (.62)	-.290	.773
Avoidant Coping (HICUPS)	55	2.81 (.73)	44	2.64 (.68)	1.128	.262
Religious Discontent (RCAS)	65	1.12 (2.03)	54	1.39 (1.99)	-.719	.474
Religious Avoidance (RCAS)	65	4.43 (2.88)	54	3.39 (3.04)	1.918	.058
<b>Time 2</b>						
Depression Symptoms (CDI)	42	6.83 (6.01)	42	5.85 (5.17)	.806	.423
Anxiety Symptoms (RCMAS)	44	7.83 (7.11)	41	8.15 (16.21)	-.117	.907
PTSD Symptoms (CRTES)	46	19.50 (14.71)	38	15.63 (14.61)	1.203	.232
Internalizing Symptoms (CBCL)	32	54.09 (12.23)	35	50.31 (11.12)	1.325	.190

Note:  $p < .05$ ,  $p < .01$ ,  $p < .001$ , 2-tailed

Children was coded as 0 and Adolescents was coded as 1

† Measures were converted to z scores for analyses

Table 9

*t* tests for Socio-Economic Status (SES) group differences across measures

Variables	Low SES		High SES		t	<i>p</i> 2-tailed
	N	Mean (SD)	N	Mean (SD)		
<b>Time 1</b>						
Depression Symptoms (CDI)	15	9.68 (5.94)	51	8.60 (7.76)	.496	.622
Anxiety Symptoms (RCMAS)	15	12.20 (7.55)	54	9.49 (7.37)	1.252	.215
PTSD symptoms (CRTES)	15	24.20 (15.40)	57	22.93 (17.20)	.259	.797
Internalizing Symptoms (CBCL)	15	46.93 (10.22)	54	51.07 (14.02)	-1.066	.290
Family Conflict (FES)	14	2.08 (2.33)	52	2.81 (1.94)	-1.190	.239
General Parent Psychopathology (BSI)	15	57.87 (12.93)	56	57.78 (12.45)	.025	.980
†Parent PTSD Symptoms (ADIS)	6	.55 (1.39)	40	-.01 (1.02)	1.199	.237
†Threat Appraisals (ACQ)	13	.02 (.93)	42	-.01 (.99)	.096	.924
Negative Attributions (CASQ)	15	7.05 (2.84)	51	8.23 (3.41)	-1.220	.227
Active Coping (HICUPS)	10	2.38 (.57)	28	2.46 (.75)	-.312	.757
Avoidant Coping (HICUPS)	10	2.83 (.78)	28	2.73 (.74)	.351	.727
Religious Discontent (RCAS)	10	.90 (1.29)	45	1.04 (1.85)	-.234	.816
Religious Avoidance (RCAS)	10	4.60 (2.91)	45	4.13 (3.20)	.423	.674
<b>Time 2</b>						
Depression Symptoms (CDI)	9	4.67 (4.00)	40	6.18 (5.99)	-.719	.476
Anxiety Symptoms (RCMAS)	9	3.89 (5.78)	40	9.72 (16.75)	-1.023	.312
PTSD Symptoms (CRTES)	8	11.75 (14.75)	39	18.54 (15.31)	-1.149	.257
Internalizing Symptoms (CBCL)	7	48.71 (15.33)	40	51.53 (10.69)	-.601	.551

Note:  $p < .05$ ,  $p < .01$ ,  $p < .001$ , 2-tailed

Low SES was coded as 0 and High SES was coded as 1

† Measures were converted to z scores for analyses

Table 10

*Attrition Analyses of Time 1 Data*

<b>Variables</b>	<b>T1<sup>†</sup></b> M (SD)	<b>T12</b> M (SD)	<b>T1 vs. T12</b> t
<b>Child Measures</b>			
Depression symptoms (CDI)	8.72 (7.02)	6.36 (5.69)	3.83**
Anxiety symptoms (RCMAS)	9.93 (7.51)	8.05 (12.50)	.93
PTSD symptoms (CRTES)	24.35 (16.71)	17.75 (14.71)	3.18**
<b>Parent Measure</b>			
Internalizing symptoms (CBCL)	49.57 (12.99)	52.12 (11.73)	-1.34

Note: <sup>†</sup> T1 = Participants who only completed Time 1 assessment (4-months);  
 T12 = Participants who completed Time 1 and Time 2 assessments (4- and 11-months).

\*t-score is significant at the 0.05 level; \*\*t-score is significant at the 0.01 level.

Table 11

*Zero-Order Correlations Between Child and Adolescent Adjustment at Time 1 and Time 2*

<b>Variables</b>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
<i>Time 1</i>										
1. PTSD (CRTES)	—									
2. Anxiety (RCMAS)	.265** .001	—								
3. Depression (CDI)	.257** .001	.622** .000	—							
4. Internalizing Symptoms (CBCL)		.249** .002	.199* .013	—						
5. Adjustment Index	.663** .000	.827** .000	.818** .000	.233** .004	—					
<i>Time 2</i>										
6. PTSD (CRTES)	.431** .000	.320** .002			.405** .000	—				
7. Anxiety (RCMAS)	.294** .003	.384** .000	.406** .000		.471* .000	.231* .022	—			
8. Depression (CDI)	.192* .040	.699** .000	.655** .000	.210* .030	.691** .000	.268** .010	.330** .001	—		
9. Internalizing Symptoms (CBCL)		.219* .041	.388** .001	.520** .000	.304** .009			.278* .016	—	
10. Adjustment Index	.420** .000	.618** .000	.605** .000		.715** .000	.702** .000	.730** .000	.722** .000		—

Note: N ranges from 51 to 144 for available data.

\*Correlation is significant at the 0.05 level; \*\*Correlation is significant at the 0.01 level. (One-tailed)

Non-significant correlations were not reported.

Table 12

*Zero-Order Correlations Between Child and Adolescent Adjustment Time 1 and Mediators*

<b>Variables</b>	<b>PTSD (CRTES)</b>	<b>Anxiety (RCMAS)</b>	<b>Depression (CDI)</b>	<b>Adjustment Index</b>	<b>Internalizing Symptoms (CBCL)</b>
Conflict (FES)		.202*	.161*	.187*	.368**
Parent Psychopathology (ADIS)	.229*	.012	.039	.021	.000
Global Severity Index (BSI)	.016	.207*		.268**	.500**
Threat Appraisal (ACQ)		.031		.008	.000
Negative Attributions (CASQ)	.235**	.207*		.188*	
Active Coping (HICUPS)	.009	.021		.036	
Avoidant Coping (HICUPS)		.317**	.278**	.270**	
Religious Discontent (RCAS)	.393**	.000	.001	.001	
Religious Avoidance (RCAS)	.000			.209*	
	.401**	.203*		.022	
	.000	.024		.314**	
		.172*		.000	.218*
		.035			.011

Note: N ranges from 81 to 137 for available data.

\*Correlation is significant at the 0.05 level; \*\*Correlation is significant at the 0.01 level.

Non-significant correlations were not reported.

Table 13

*Zero-Order Correlations Between Child and Adolescent Adjustment Time 2 and Mediators*

<b>Variables</b>	<b>PTSD (CRTES)</b>	<b>Anxiety (RCMAS)</b>	<b>Depression (CDI)</b>	<b>Adjustment Index</b>	<b>Internalizing Symptoms (CBCL)</b>
Conflict (FES)			.278**		.336**
Parent Psychopathology (ADIS)			.007		.004
Global Severity Index (BSI)					.508**
Threat Appraisal (ACQ)	.237*				.000
Negative Attributions (CASQ)	.033		.292**		
Active Coping (HICUPS)	.254*		.005		
Avoidant Coping (HICUPS)	.024				.301*
Religious Discontent (RCAS)	.330**				.030
Religious Avoidance (RCAS)	-.234*				
	.025	.242*			
		.020			

Note: N ranges from 37 to 81 for available data.

\*Correlation is significant at the 0.05 level; \*\*Correlation is significant at the 0.01 level.

Non-significant correlations were not reported.

Table 14

*Zero-Order Correlations Among Mediators*

<b>Variables</b>	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Conflict (FES)	—								
2. Parent Psychopathology (ADIS)		—							
3. Global Severity Index (BSI)	.201*	.499**	—						
4. Threat Appraisal (ACQ)	.012	.000		—					
5. Negative Attributions (CASQ)					—				
6. Active Coping (HICUPS)		.382**		.260*		—			
7. Avoidant Coping (HICUPS)		.002		.012			—		
8. Religious Discontent (RCAS)		.334**				.671**		—	
9. Religious Avoidance (RCAS)		.007			.317**	.221*			—
					.000	.018			
						.267**	.257**	.194*	
						.005	.007	.017	—

Note: N ranges from 54 to 137 for available data.

\*Correlation is significant at the 0.05 level; \*\*Correlation is significant at the 0.01 level.

Non-significant correlations were not reported

Table 15

*Hierarchical regression analysis for parent report of child and adolescent internalizing symptoms and children and adolescents' self-reported anxiety/depression adjustment index.*

Steps	Predictors	R <sup>2</sup> Change	<i>p</i>	R <sup>2</sup>	Beta †	<i>p</i> †
Step 1	Internalizing symptoms (CBCL)	.076	.024	.076	-.093	.622
Step 2	Religious Avoidance (RCAS)	.014	.050	.090	-1.00	.045
Step 3	Internalizing Symptoms x Religious Avoidance	.074	.010	.163	1.257	<b>.022</b>

Note:  $p < .05$ ,  $p < .01$

†  $\beta$  and  $p$  were obtained at the last step when all variables were entered into the regression equation.

Table 16

*Hierarchical regression analysis for parent report of child and adolescent internalizing symptoms and children and adolescents' self-reported anxiety/depression adjustment index.*

Steps	Predictors	R <sup>2</sup> Change	<i>p</i>	R <sup>2</sup>	Beta †	<i>p</i> †
Step 1	Internalizing symptoms (CBCL)	.042	.076	.042	1.441	.018
Step 2	General Parental Psychopathology (BSI)	.033	.059	.075	.627	.156
Step 3	Internalizing Symptoms x General Parental Psychopathology	.048	.024	.122	-1.699	<b>.052</b>

Note:  $p < .05$ ,  $p < .01$

†  $\beta$  and  $p$  were obtained at the last step when all variables were entered into the regression equation.

Table 17

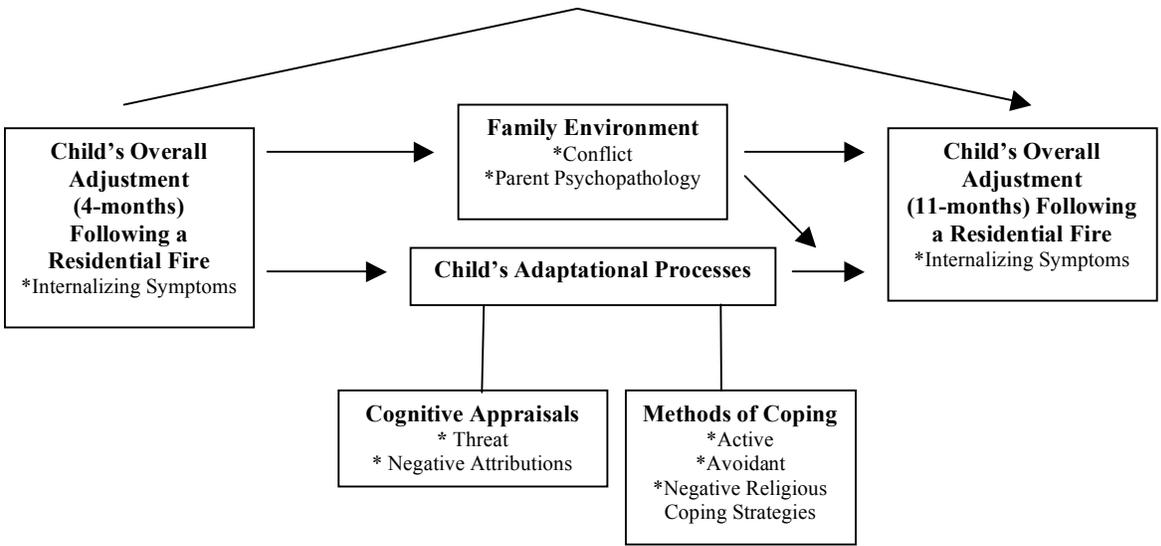
*Hierarchical regression analysis for children and adolescents' overall adjustment index and parent report of child and adolescent internalizing symptoms.*

Steps	Predictors	R <sup>2</sup> Change	<i>p</i>	R <sup>2</sup>	Beta †	<i>p</i> †
Step 1	Overall Adjustment Index	.085	.085	.085	-1.301	.050
Step 2	Active Coping (HICUPS)	.001	.227	.086	.072	.658
Step 3	Overall Adjustment Index x Active Coping	.155	.030	.241	1.621	<b>.016</b>

Note:  $p < .05$ ,  $p < .01$

†  $\beta$  and  $p$  were obtained at the last step when all variables were entered into the regression equation.

Figure 1. TSC model of child and adolescent adjustment following residential fire.



Note: Model adapted from Thompson, Gil, Burbach, Keith, and Kinney (1993).

Figure 2. Model illustrating the relationship between children and adolescent's overall adjustment at 4-months and 11-months post-fire. (Mediation Step 1)

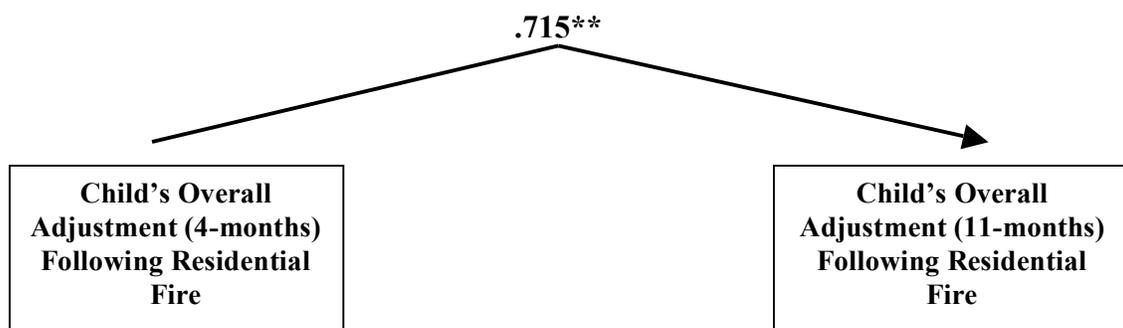


Figure 3. Model illustrating the relationship between children and adolescents' overall adjustment at 4-months, family environment, and children's adaptational processes. (Mediation Step 2)

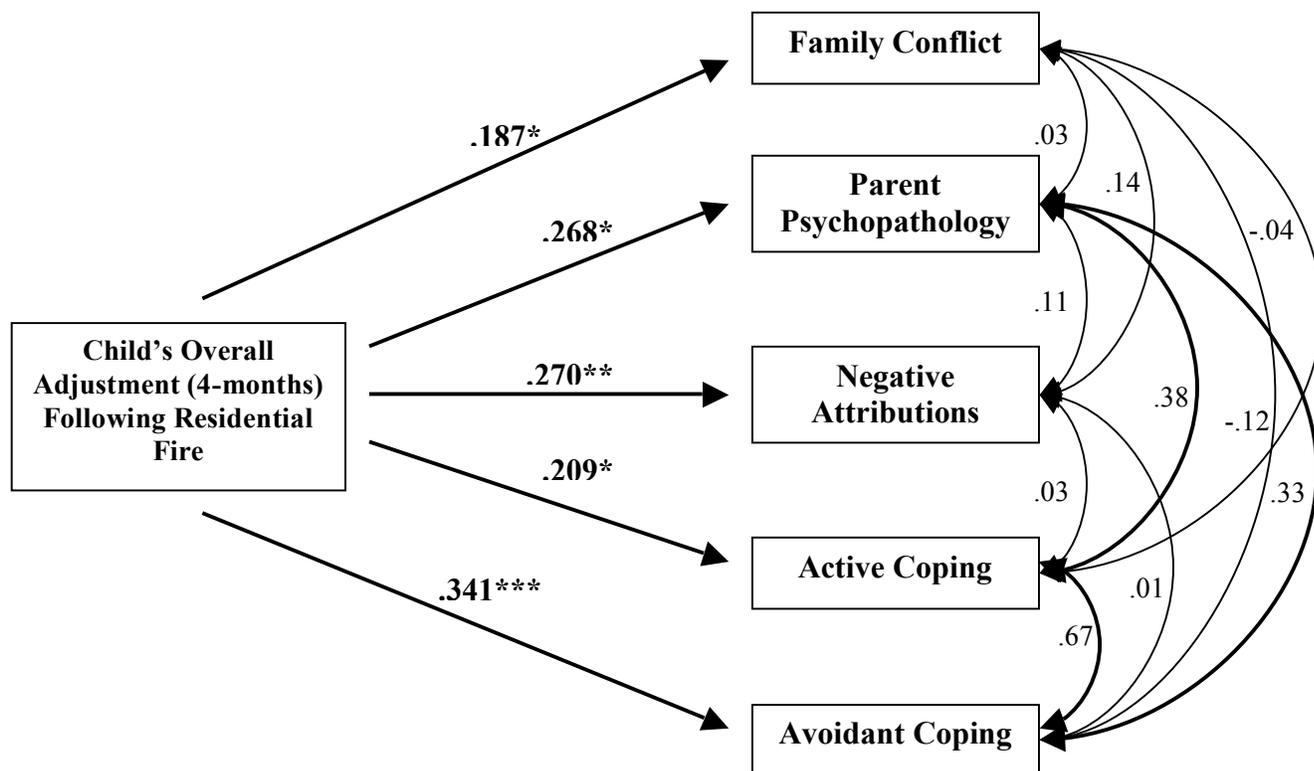


Figure 4. Model illustrating the relationship between family environment, children's adaptational processes, and children and adolescents' overall adjustment at 11-months post-fire. (Mediation Step 3)

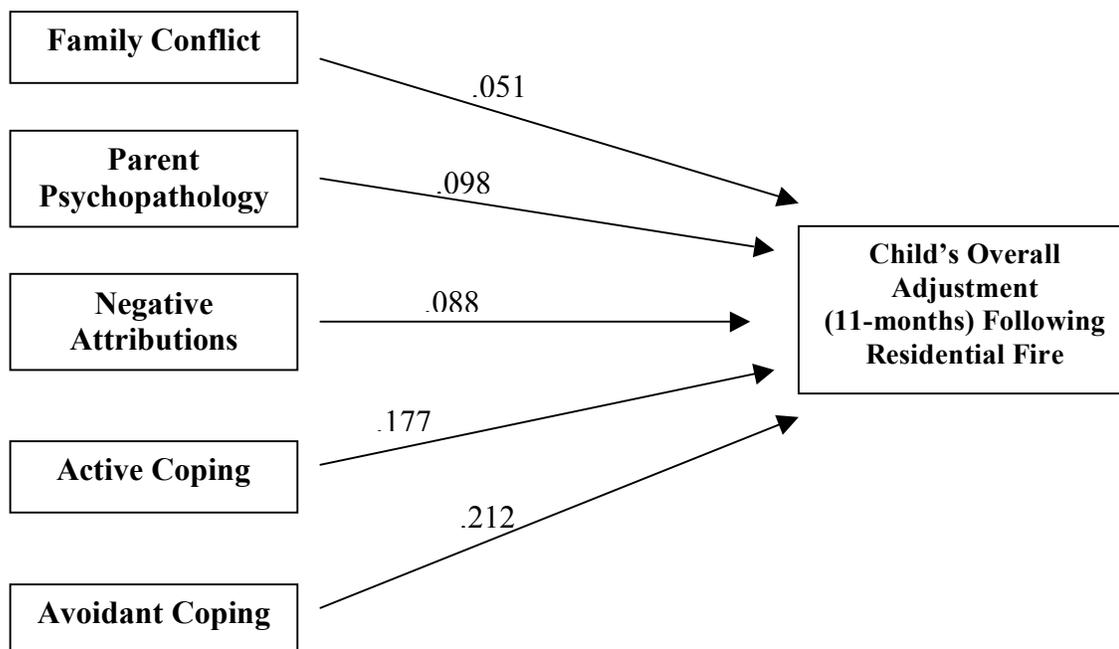
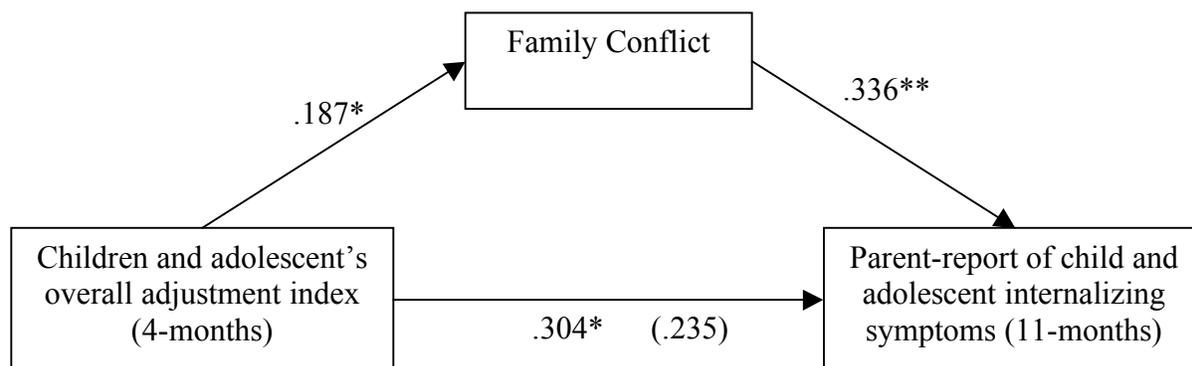


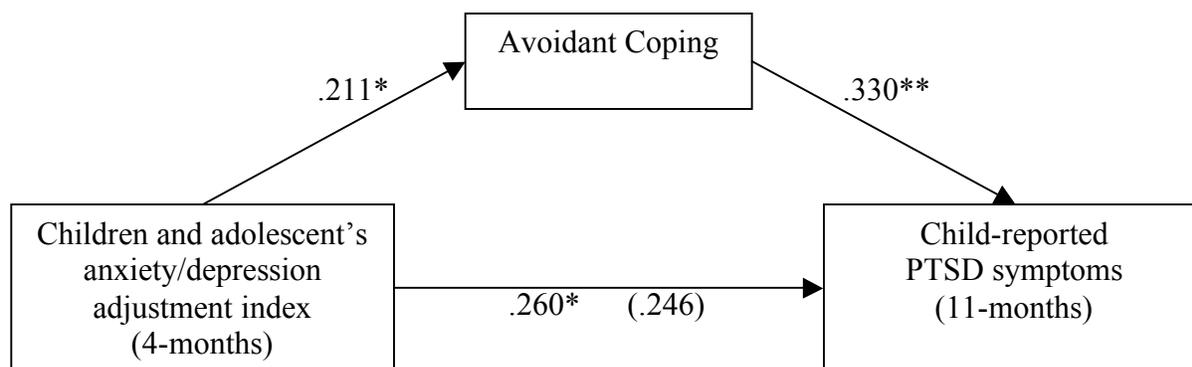
Figure 5. Full mediational model testing family conflict as a mediator of the effects of children and adolescents' overall adjustment and parent report of child and adolescent internalizing symptoms.



Note: Standardized regression coefficients for the relationships between child and adolescent overall adjustment index and parent report of child and adolescent internalizing symptoms as mediated by family conflict. The standardized regression coefficient between overall adjustment index and internalizing symptoms controlling for family conflict is in parentheses.

\* $p < .05$ , \*\* $p < .01$

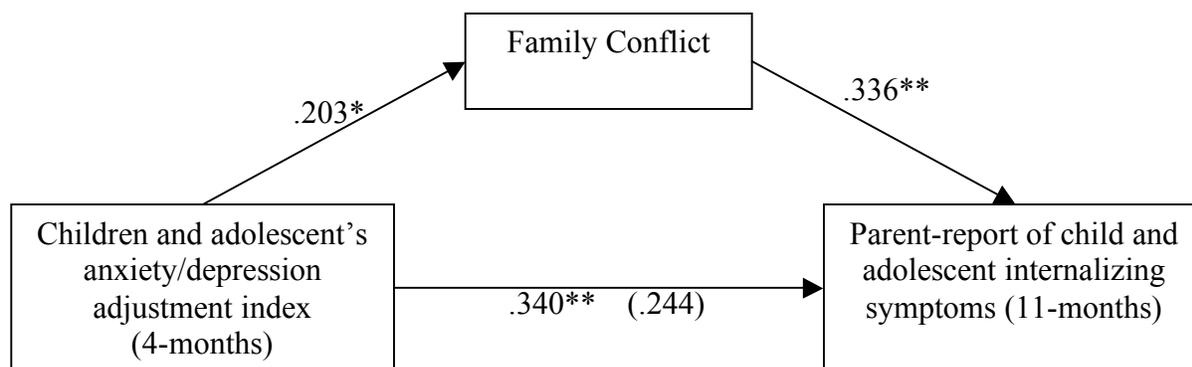
Figure 6. Full mediational model testing avoidant coping as a mediator of the effects of children and adolescents' anxiety/depression adjustment index and children and adolescents' self-reported PTSD symptoms.



Note: Standardized regression coefficients for the relationships between children and adolescents' anxiety/depression adjustment index and child-reported PTSD symptoms as mediated by avoidant coping. The standardized regression coefficient between anxiety/depression adjustment index and child-reported PTSD symptoms controlling for avoidant coping is in parentheses.

\* $p < .05$ , \*\* $p < .01$

Figure 7. Full mediational model testing family conflict as a mediator of the effects of children and adolescents' anxiety/depression adjustment index and parent report of child and adolescent internalizing symptoms.



Note: Standardized regression coefficients for the relationships between children and adolescents' anxiety/depression adjustment index and parent-reported internalizing symptoms as mediated by family conflict. The standardized regression coefficient between anxiety/depression adjustment index and parent-reported internalizing symptoms controlling for family conflict is in parentheses.

\* $p < .05$ , \*\* $p < .01$

Figure 8. Interaction between parent report of child and adolescent internalizing symptoms and children and adolescents' self-reported use of religious avoidance as a coping strategy predicting children and adolescents' self-reported anxiety/depression adjustment.

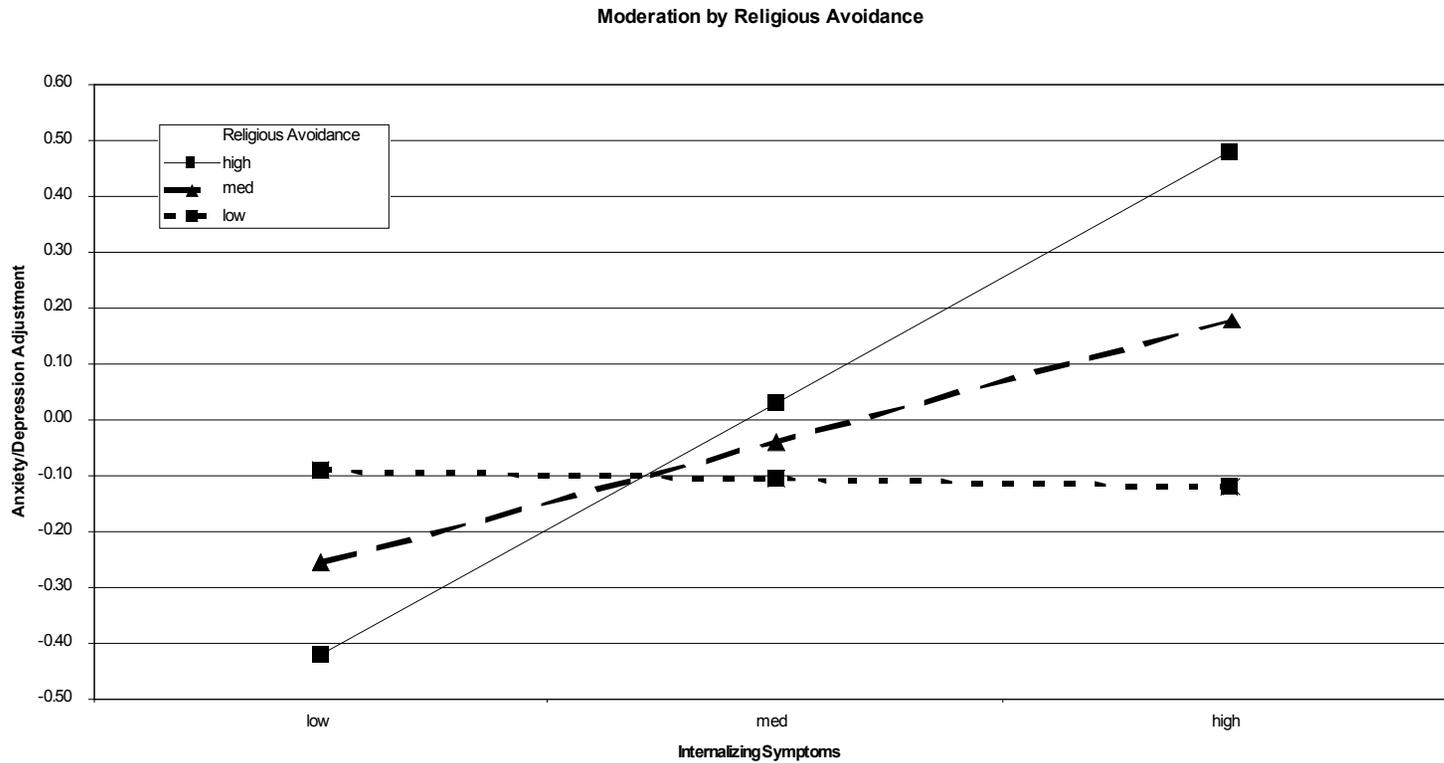


Figure 9. Interaction between children and adolescents' overall adjustment and their self-reported active coping strategies predicting parent report of child and adolescent internalizing symptoms.

