EFFECTS OF PARENTAL OPTIMISM ON PSYCHOSOCIAL OUTCOMES OF PEDIATRIC BURN PATIENTS AND THEIR PARENTS

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EFFECTS OF PARENTAL OPTIMISM ON PSYCHOSOCIAL OUTCOMES OF PEDIATRIC BURN PATIENTS AND THEIR PARENTS

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Abstract

Effects of Parental Optimism on Psychosocial Outcomes of Pediatric Burn Patients and Their Parents

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Prior research has identified pediatric burn survivors and their parents as at risk for the development of posttraumatic stress symptoms (PTSS) following the burn event. However, a large number of patients are still able to experience appropriate adjustment post-burn. Optimism has been shown to influence better psychological adjustment in a variety of populations, including parents of children experiencing a medical event. The following study investigated the influence of parental optimism as a potential resiliency factor against the development of parent and child PTSS following pediatric burn. The current study also investigated whether level of optimism influenced the coping styles used by parents, and whether any coping styles were associated with lower reported PTSS. Participants included parents of 50 children under the age of 6 who experienced
either a burn or abrasion injury, with an average burn size of 4.77% total body surface area (Range= 1% to 36%; SD=7.28) and an average 90.10 (SD= 174.55) days since burn. Dispositional and situational optimism were not found to be predictors of fewer PTSS in parents of pediatric burn patients. Parental optimism was also not found to be associated with fewer PTSS in their children. However, unexpectedly, greater parental optimism was found to be associated with greater symptoms of avoidance in children at least one month post-burn. Relationships between parental level of optimism and the coping styles utilized by parents were also found. Greater dispositional optimism was associated with less use of self-distraction and behavioral disengagement for coping, while greater situational optimism was associated with greater use of positive reframing. Interesting relationships between parental coping style and parent and child PTSS were observed, with greater use of the majority of coping styles being associated with greater symptoms of stress. Future research should investigate whether optimism is a predictor of better adjustment in other burn samples with larger burns or higher reported PTSS.
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Effects of Parental Optimism on Psychosocial Outcomes of Pediatric Burn Patients and Their Parents

Approximately 1 million children in the United States experience a burn injury each year (American Academy of Pediatrics, 2000). About 92,500 children under the age of 14 were treated for burn injuries in emergency rooms in 2002 (Connecticut Safe Kids, 2004), and an estimated 10,000 children in the United States are hospitalized due to a burn injury annually (Shields, Cornstock, Fernandez, Xiang & Smith, 2000). The study of adjustment following burn injury is particularly important as recent advances in medical procedures have led to higher survival rates among burn victims, even those experiencing massive burns (Fratianne & Brandt, 1995; Wolf, Rose, Desai, Mileski, Barrow, & Herndon, 1997). Considering that more than half of burn patients are under the age of 5 (Centers for Disease Control and Prevention, 2008; Tarnowski & Brown, 2003), questions regarding maladjustment become particularly important.

The following study investigated the adjustment of young burn patients and their parents, including the potential influence of parental optimism and coping on the development of post-traumatic stress symptoms (PTSS). To begin, this paper will review past research on child adjustment and predictors of child outcomes post-burn. The literature on parent adjustment and coping will also be reviewed, followed by a discussion of the construct of optimism. This section will conclude with statements about the present study and research hypotheses.
Child Adjustment Following Burn Injury

Although it appears many children recover successfully following burn injury and do not experience maladjustment (Blakeney & Meyer, 1996; Sheridan et al., 2000; Tarnowski & Rasnake, 1994), many children do experience psychosocial problems. Sadly, some studies suggest as many as 20-50% of pediatric burn survivors may experience psychological maladjustment following injury (e.g. Meyer, Blakeney, LeDoux, & Herndon, 1995; Meyer, Robert, Murphy, & Blakeney, 2000; Piazza-Waggoner, Dotson, Adams, Joseph, Goldfarb, & Slater, 2005; Stoddard & Saxe, 2001; Tarnowski, Rasnake, Gavaghan-Jones, & Smith, 1991; Thomas, Blakeney, Holzer, & Meyer, 2009). Children experiencing large burns (greater than 30% TBSA) are at increased risk of experiencing psychosocial problems in adulthood (Meyer et al., 2007). Nearly half of adults experiencing large burns as children were found to meet criteria for an Axis I psychiatric diagnosis, even at an average of 14 years post-burn. Further, the majority of these individuals meeting criteria for diagnosis reported no current mental health care. Research suggests adults experiencing smaller burns as children may be less likely than those with severe burns to experience these long-term psychological outcomes, despite the fact that the majority of children can recall memories of either the burn injury or hospitalization regardless of burn size (Zeitlin, 1997).

Difficulties with adjustment following burn injury have also been demonstrated in young victims. Meyer and colleagues (2000) compared the behaviors of 33 pediatric burn survivors aged 2-and 3-years old, with an average TBSA of 50% and average length
of time since burn of 1.2 years, to a normative sample of children. Behaviors were assessed through maternal completion of the Child Behavior Checklist (CBCL), and the children’s behavior was compared to reference population scores for the CBCL. The study found that 2- and 3-year-old children suffering burns exhibited more internalizing behaviors, depressive symptoms, somatic complaints, and sleep problems than children in the normative sample.

Children suffering burns are also at risk for developing symptoms of acute stress or posttraumatic stress (e.g. Alfred, 1999; Stoddard et al., 2006). Acute stress disorder (ASD) and posttraumatic stress disorder (PTSD) are characterized by similar symptomology (American Psychiatric Association, 2000). The distinction between disorders is based on the time at which symptoms develop and the length of time for which they persist. The term ASD is used when symptoms both develop and resolve within one month of the traumatic event. Posttraumatic stress disorder is used to describe symptoms that either develop or persist past one month following the stressful event. These symptoms include reexperiencing the event, such as through dreams, illusions, or flashback episodes, avoidance of stimuli that lead the person to recall or think about the traumatic event, and anxiety or increased arousal, such as exaggerated startle response or difficulty sleeping (American Psychiatric Association, 2000). Dissociative symptoms such as depersonalization or a reduction of awareness of surroundings may also be present. In young children, symptoms of posttraumatic stress or acute stress may include repetitive play expressing the trauma, direct reenactment of the specific trauma, or
frightening dreams that may not appear to directly represent the trauma (American Psychiatric Association, 2000).

Stoddard and colleagues (2006) found that young children experiencing burn injuries are at risk for experiencing acute stress symptoms. Children experiencing burns between 1- and 4-years of age with an average TBSA of 14% were found to exhibit a full range of acute stress symptoms, and almost 30% of children displayed such symptoms (Stoddard et al., 2006). Two pathways yielding these symptoms were identified. Acute stress symptoms were linked either to the burn size leading to changes in pulse rate, leading to acute stress or the child’s pain triggering parental acute stress, which subsequently led to children’s acute stress. Further work with children under the age of 5 and experiencing burns has found that these children experience less symptoms of PTSD in comparison to older burn victims but they do experience significantly more problems than their normative peers (Alfred, 1999). Children experiencing burns have also been shown to display anxiety symptoms, such as PTSD, into adulthood. Meyer and colleagues (2007) found that anxiety related symptoms were the most commonly displayed amongst adults surviving large childhood burns. Presence of PTSD symptoms in pediatric burn survivors has been associated with poorer health-related quality of life. Landlot, Buehlmann, Maag, & Schiestl (2009) examined PTSD symptoms and health-related quality of life in 7-16 year old burn survivors (average TBSA 13%) an average of 4.4 years post-burn. Greater number of PTSD symptoms was found to be associated with poorer health-related quality of life in the domains of physical, motor, cognitive, and
emotional functioning. Individuals meeting the criteria for PTSD reported impaired
overall quality of life, as well as impairments in physical and emotional functioning,
specifically.

Predictors of Child Outcomes Following Burn

Given that many children are able to recover from burn injury while a smaller
subset is not, it is pertinent to investigate resiliency factors promoting proper recovery
and functioning absent of psychological problems. Demographic variables, child factors,
and parent variables have all been identified as predictors of functional outcomes in
children following a burn (e.g., Noronha & Faust, 2007; Tyack & Ziviani, 2003). Tyack
& Ziviani (2003) found that demographic factors of child age, gender of child, number of
hospitalizations, and socioeconomic status accounted for 30% of the variance in
outcomes when considered as a whole. However, only age of child was found to be a
unique predictor of functioning, with younger children experiencing better outcomes.
Further, pre-morbid child factors (i.e., behavior problems, psychological or psychiatric
problems, and learning disability or developmental delay) and parent factors (i.e.,
anxiety, depression, coping, and social support) served as predictors of functional
outcomes 6-months post-burn when child and parent factors were each considered as a
whole (Tyack & Ziviani, 2003). Several of these child and parent factors also explained a
significant unique portion of the variance in outcomes. Child learning disability and
parent state anxiety predicted poorer outcomes, while parental use of social support and
planful problem solving to cope predicted better outcomes.

Kaslow, Koon-Scott, & Dingler (1994) found that a burn patient’s adaptation following injury was related to family functioning. Further, a variety of family factors are associated with greater social competency in children suffering burns (Bryne, Love, Browne, Brown, Roberts, Streiner, 1986). More socially competent children came from families with greater interest in political, intellectual, and cultural activities and greater participation in recreational activities. Higher socioeconomic status and larger number of members in the home were also predictors of better social outcomes. Positive maternal views of child adjustment were also a predictor of greater social competency in children following burn injury (Bryne et al., 1986). Lower levels of family control have also been linked to increased internalizing problems in pediatric burn survivors (Liber, List, Van Loey, & Kef, 2006).

Contradictory evidence has been obtained for whether burn variables (e.g., source of the burn or burn size) serve as predictors of functional outcomes (e.g., Blakeney, Meyer, Moore, Broemeling, et al., 1993; Noronha & Faust, 2007; Tyack & Ziviani, 2003). For example, Tyack & Ziviani (2003) found that injury factors such as total body surface area (TBSA) of the burn, number of operative procedures, and source of burn (e.g. flame, scald, contact) did not predict functional outcomes in children. However, other research has found that burn-injury related variables are related to psychological adjustment (e.g., Baker, Jones, Sanders, Sadinski, Martin-Duffy, & Berchin 1996; Rusch, 1998). For example, a meta-analysis found that location of burn and a general burn
variable (comprised of treatment environment, length of hospital stay, medical complications, burn severity, patient compliance, and pain) were associated with functional outcomes in children (Noronha & Faust, 2007).

**Parent Adjustment Following Child Injury**

Following burn injury, not only the child but also their parents may be at risk for psychological maladjustment (Hall, et al., 2006; Rizzone, Stoddard, Murphy, & Kruger, 1994). Rates of PTSD in parents of burn patients have been demonstrated to range between about 18% and 52% (e.g. Fukunishi, 1998; Hall et al., 2006; Rizzone et al., 1994). Hall and colleagues (2006) found that nearly half of parents reported experiencing symptoms of posttraumatic stress three months post-burn, in a sample of parents whose children had a mean TBSA of 16.9%. A study involving mothers of children with severe burns found that approximately 70% of mothers experienced symptoms of PTSD within the first 6 months following injury and 50% of parents were still experiencing symptoms one year after injury. Although research suggests maternal PTSD symptoms decrease with time (Bakker, Van Loey, Van Son, Van der Heijden, 2010), about 30% of mothers may still be displaying symptoms 7 years post-burn (Rizzone et al., 1994). Size of the child’s burn has been found to be a predictor of parental symptoms of PTSD (Bakker et al., 2010; Rizzone et al., 1994). Rizzone and colleagues (1994) found size of burn was the strongest predictor of parental symptoms, having even greater influence than physical proximity to the child during the event and perceived social support and stress. Maternal
feelings of guilt have also been shown to predict the mother’s PTSD symptoms following a child’s burn (Bakker et al., 2010). Parents of children experiencing burns may also be at risk for the development of physical problems. For example, parents of adolescents experiencing severe burns have been found to experience greater rates of cardiovascular health problems in comparison to controls, for up to four years following their child’s injury (Dorn, Yzermans, Spreeuwenberg, van der Zee, 2007).

Parents may be even more at risk of experiencing distress following their child's burn than the child themselves (Kent, King, & Cochrane, 2000). Although the children in the sample of Kent and colleagues (2000) did not experience significant psychological or behavioral problems following injury, the mothers of these individuals did experience higher levels of anxiety. These mothers displayed greater anxiety in comparison to a non-ill and non-injured control group as well as a group of mothers whose children had experienced a bone fracture. This anxiety was found to decrease with time. Blakeney, Meyer, Moore, Murphy, and colleagues (1993) also found that parents of children with severe burns experienced greater stress than a control group, although the children experiencing the burns did not display greater problems. Mothers have been found to be at greater risk for experiencing the particular symptoms of intense distress at similar events, restricted range of affect, and hypervigilance in comparison to their child experiencing the burn (Fukunishi, 1998).

Development of such symptoms not only impacts the parent but it may also increase likelihood of maladjustment of the pediatric burn patient (e.g. Phillips, Fussell,
Rumsey, 2007; Rizzone et al, 1994). For example, parental symptoms of ASD following their child’s burn are a predictor of later child PTSD symptoms (Saxe et al., 2005). Further, Stoddard and colleagues (2006) identified parental symptoms of ASD in response to child pain as a pathway for the development of child ASD symptoms. Parental symptoms of PTSD following child burn injury also predict increased parental conflict with child as well as other family members (Hall et al., 2006). Maternal symptoms of avoidance and reexperiencing have also been associated with general levels of internalizing problems in children under the age of four experiencing a burn within 30 days post-burn and then again at three months post-burn (Boot, 2009).

**Parent Coping**

Given the risk of mental health problems in parents following a child’s burn injury and the potential influence of this parental distress on the child, it is important to consider the ways in which parents cope with their child’s injury. Coping can be defined as a person’s response following a stressor that is aimed at minimizing the resulting physical, emotional, or psychological burden (Snyder & Dinoff, 1999). Coping strategies are usually classified into two major types, problem-focused coping and emotion-focused coping (Snyder & Dinoff, 1999). Problem-focused coping is a strategy that attempts to change or control the situation, while emotion-focused coping attempts to manage the emotional repercussions of the stressors, such as seeking social support or avoiding the stressor. Both coping strategies can be effective depending on the individual and the
situation, and both problem-solving and emotion-focused coping may be used in combination (Snyder & Dinoff, 1999).

**Coping Styles Used By Parents of Pediatric Populations**

While current research on coping strategies among parents of pediatric burn survivors is limited, numerous studies have examined coping among parents of children with other health conditions, such as injury or chronic illness. For example, coping strategies used by parents of children experiencing either a traumatic brain injury or an orthopedic injury have been examined (Wade, Borawski, Taylor, Drotar, Yeates, & Stancin, 2001). The most frequently used coping strategies used were religion and acceptance, with many parents also using active coping and emotional support. Parents were less likely to use humor or denial in coping with their child’s injury.

Coping has also been assessed in parents of children experiencing other medical conditions (e.g. Manne et al., 2003; Martin, Wolters, Klaas, Perez, & Wood, 2004). For example, Martin and colleagues (2004) found that families of HIV-infected children most frequently used passive coping and spiritual support. Passive coping strategies included passive appraisal, characterized by avoidance of problem situations and deferment of control over problems, and reframing, characterized by passive acceptance and tendency to not seek external assistance in problem solving. Parents were found least likely to use social support as a coping mechanism. Child medical variables did not influence use of any particular coping style by parents (Martin et al., 2004). Illness and demographic variables have also been found to not impact coping strategies of parents of pediatric
cancer patients (Greening & Stoppelbein, 2007). Research involving mothers of children with sickle cell disease investigated predictors of either an engagement or disengagement maternal coping style (Sharpe, Brown, Thompson, & Eckman, 1994). Engagement coping was predicted by greater family adaptability, while disengagement coping was predicted by child internalizing behavior symptoms and child use of a negative attributional style. Disease severity was not found to predict the use of either coping style (Sharpe et al., 1994).

**Outcomes of Coping Styles**

Parental use of maladaptive coping styles has been associated with the presence of parental psychiatric symptoms (Wade, Taylor, & Drotar, 1996). For example, maladaptive coping in response to a child’s traumatic brain injury was found to account for 18% of the variance on a measure of parental psychiatric symptom severity. Specifically, mental or behavioral disengagement and venting of emotions were associated with greater parental psychological distress (Wade et al., 1996). Further, use of acceptance and humor by mothers of children undergoing a bone marrow transplant (BMT) has been associated with less depressive symptoms (Manne et al., 2003). Oppositely, planning and alcohol or substance abuse have been related to increases in maternal depressive symptoms in mothers of children undergoing a BMT. Greening & Stoppelbein (2007) investigated coping strategies of parents of pediatric cancer patients and found coping strategies accounted for 31-48% of the variance in parents’ symptoms of depression, anxiety, and PTSD. For example, more frequent use of social support,
religious coping, and optimism was associated with fewer anxiety symptoms. The use of emotional regulation of negative self-blame was actually related to increased depressive, PTSD, and anxiety symptoms. Further, parents who more frequently used substances to cope displayed greater depressive and PTSD symptoms, while users of problem-solving strategies experienced increased anxiety symptoms. Avoidant coping strategies accounted for the most variance in PTSD symptoms, which the authors suggested may result due to the interference of avoidant coping in resolving traumatic experiences (Greening & Stoppelbein, 2007).

Wade and colleagues (2001) also investigated the outcomes of coping strategies used by parents of traumatic brain injury and orthopedic injury patients. Parental acceptance of the injury was associated with lower burden among parents of both groups, and using a denial strategy for coping was associated with higher parental distress. Interestingly, a reliance on religion for coping following the injury was actually associated with increased injury-related burden at six months post-injury. Some differences in the outcomes of certain coping strategies were found for the different injury groups. For example, active coping was found to lead to higher stress following a child’s traumatic brain injury but not following an orthopedic injury. Further, humor was found to be beneficial in reducing stress following traumatic brain injury but such effects were not found following orthopedic injury (Wade et al., 2001).

Parental coping style may also relate to the family’s adjustment or functioning following injury. In children with sickle cell disease, maternal use of a disengagement
coping style was correlated with greater behavior problems, delays in functioning, and a pessimistic attributional style by the child (Sharpe et al., 1994). A child’s strategies for coping with sickle cell disease may also be impacted by parental coping style or parental suggestions to children about coping (Kliewer & Lewis, 1995). For example, children who received more active coping suggestions from parents were shown to have a greater level of hope. Further, avoidance coping among children with sickle cell disease was related to parental use of less restructuring coping methods and more parental active coping strategies (Kliewer & Lewis, 1995). Greater difficulties in adjustment have also been found for pediatric cancer patients whose parents use fewer effective coping mechanisms (Sanger, Copeland, & Davidson, 1991). However, some findings suggest children’s specific level of distress may not be impacted by parental method of coping (e.g. LaMontagne, Wells, Hepworth, Johnson, & Manes, 1999). For example, child distress related to an invasive medical procedure for cancer was not influenced by their parental coping strategy (LaMontagne et al., 1999).

There is some support for the influence of family coping styles on child and family outcomes in injury populations, specifically. For example, use of emotional support by parents of children experiencing a traumatic injury has been associated with less family dysfunction (Wade at al., 2001). A review by Stoddard and Saxe (2001) investigating physical injuries as whole found families that supported active and engaged coping had children who adjusted better than children of families encouraging a passive or disengaged style of coping. Parental use of social support and planful problem solving
as coping strategies has also been found to predict better functioning among pediatric burn survivors 6 months post-burn (Tyack & Ziviani, 2003).

The extent to which these prior results regarding coping strategies are generalizable to the families of children experiencing a burn injury is tentative. As mentioned by Wade and colleagues (2001), different coping strategies are more commonly used and more effective for coping with different types of injury. For example, as presented earlier, active coping was found to lead to higher stress in parents of traumatic brain injury patients but not parents of orthopedic patients, and while humor is effective when coping with a traumatic brain injury, it is not in dealing with an orthopedic injury. These differences may be due to injury-specific differences and variables. Traumatic brain injury differs from other injuries in that the cognitive and behavioral outcomes resulting from neurological damage are difficult to alter or change. In other injury cases, such as with burn injuries, active efforts to participate in physical rehabilitation and proper wound care can be influential on outcomes. Therefore, it is unclear whether problem-oriented coping styles may be more beneficial in dealing with certain types of childhood injuries. However, the demands and ability to potentially alter outcomes following orthopedic injuries, experienced by a subgroup in Wade and colleagues (2001) work, may be similar to that experienced by parents of children with a burn injury.
Optimism and Pessimism

One factor that can influence a person’s reactions and responses to adversity is their expectations for the future (Carver, Scheier, Miller & Fulford, 2009). Dispositional optimism is defined as the global expectation that good things will happen in the future (Carver, et al., 2009). A person’s expectations for one particular event or context is referred to as situational optimism (Norem & Chang, 2001). In contrast to optimism, pessimism is the expectation that bad things will happen (Carver, et al., 2009).

Optimism has been shown to impact the level of distress in people experiencing a variety of stressors, including medical events (e.g. Carver et al., 1993; Curbow, Somerfield, Baker, Wingard, & Legro, 1993; Fitzgerald, Tennen, Affleck, & Pransky, 1993; Litt, Tennen, Affleck, & Klock, 1992). Scheier and colleagues (1989) investigated the association between optimism and psychological health in adults undergoing coronary artery bypass surgery, both before surgery and after the procedure. Before surgery, optimistic patients reported lower levels of depression than pessimists, and following surgery they reported feeling happier, greater relief, and greater satisfaction with the social support and medical care they received than pessimists did. At 6 month and 5 year follow-ups after surgery, the optimists in this group reported higher quality of life than pessimists (Scheier & Carver, 1992). Oppositely, pessimism has been linked with poorer psychological outcomes in both healthy adults and adults with health concerns (e.g. Mroczek, Spiro, Aldwin, Ozer, & Bosse, 1993; Robinson-Whelen, Kim, MacCallum, & Kiecolt-Glaser, 1997). For example, Mroczek and colleagues (1993) found pessimism to
be a significant predictor of self-reported psychological symptoms in a large sample of men participating in a longitudinal study on aging.

Optimism has also been found to influence adjustment to burn injury, specifically (e.g. Fauerbach, Lawrence, Munster, Palombo, & Richter, 1999; Gilboa, Bisk, Montag, & Tsur, 1999). For example, optimism has been linked to better adjustment to the injury, as measured by satisfaction with life, in a group of adult male Israeli patients with burns (Gilboa et al., 1999). High levels of optimism were also related to shorter recovery times following the burn injury. Optimism may also moderate the impact of Acute Posttraumatic Distress on physical adjustment in adults suffering burns (Fauerbach et al., 1999). In a small sample of Chinese adult burn patients, optimistic personality was also found to make a significant contribution to psychological adjustment post-burn (Wu, Zhai, & Liu, 2009). However, the relationship between optimism and better psychological outcomes in burn patients has not been investigated in a pediatric population.

Optimism has also been linked to better psychological adjustment of parents of children experiencing a medical condition (e.g. Fotiadou, Barlow, Powell, & Langton, 2007; McIntosh, Stern, & Ferguson, 2004). For example, optimism has been found to predict less distress among mothers of infants hospitalized in a Neonatal Intensive Care Unit (McIntosh et al., 2004). The work of Fotiadou and colleagues (2007) investigated the association between optimism and psychological health and adjustment in parents of children with cancer. Higher levels of optimism were associated with greater satisfaction
with life and lower anxiety and depression symptoms. Optimism was also associated with parental perceptions of their own health, with more optimistic parents experiencing greater health (Fotiadou et al., 2007). Interestingly, medical variables, such as type of cancer or prognosis, were not related to parental levels of optimism.

Optimism and pessimism may influence the amount of psychological distress occurring following a stressor by influencing the coping strategies used in response to these stressors. The construct of optimism has been found to influence both situational coping responses and general coping strategies (e.g., Scheier, Carver, & Bridges, 2001). Bandura (e.g., 1977, 1986) has suggested an individual’s expectancies regarding specific situations may be even more likely to influence their behavior than their more general or overall expectancies. The general premise of the influence of optimism on coping is that individuals who view positive outcomes as likely or obtainable and who are confident about their future continue trying even in the face of adversity (Carver et al., 2009). Pessimists, however, try to escape the adversity, due to their doubt about the future (Carver et al., 2009). Therefore, optimism is associated with greater use of active and problem solving coping strategies and less associated with an avoidant coping style (Aspinwall, Richter, & Hoffman, 2001). In addition to situations where active problem solving is effective, optimists may also respond better even when the reality of an event cannot be changed. For example, optimism is related to acceptance and positive reframing, and individuals high in optimism are less likely to be in denial regarding the reality of the stressor (Scheier, et al., 2001; Scheier, Weintraub, & Carver, 1986).
The influence of optimism on coping styles has been explored in medical populations. For example, optimistic coronary artery bypass surgery patients are more likely to set goals for their recovery and to seek out information from physicians, while being less likely to focus on negative aspects of the situation (Scheier et al., 1989). Several studies have also investigated whether parental level of optimism influences the coping strategies used by parents of children with a medical condition or experiencing a medical event (e.g., Lamontagne, Hepworth, Salisbury, & Riley, 2003; McIntosh et al., 2004). For example, McIntosh and colleagues (2004) found optimistic mothers of hospitalized infants were more likely to use active and cognitive coping strategies. Further, these mothers were less likely to use avoidant coping strategies.

Some research suggests parental optimism and positive expectations may not only influence parental adjustment but also the adjustment of their children (e.g., Bryne et al., 1986; Sanger, Copeland, & Davidson, 1991). Sanger and colleagues (1991) found that children whose parents adopted optimistic definitions of their child’s cancer showed better adjustment. Parental use of less effective coping skills was also associated with poorer adjustment amongst the pediatric cancer patients (Sanger et al., 1991). Positive maternal views of child adjustment have also been found to be a predictor of greater social competency in children following a burn injury (Bryne et al., 1986). Although the influence of optimism by proxy is yet to be well-validated in the research, the impact of family functioning on child outcomes has been well validated (Robinson, Gerhardt, Vannatta, & Noll, 2007). For example, parental distress is predictive of child distress in
pediatric cancer patients (Robinson, et al., 2007). This suggests parental characteristics, such as level of optimism, may also be a predictor of child adjustment as well.

**Present Study**

The aim of the present research study was to determine whether levels of parental dispositional and situational optimism predict the number of posttraumatic stress symptoms experienced by young children under the age of 6 experiencing burns and their parents. Although younger children have been shown to display better adjustment (Tyack & Ziviani 2003), it was still considered important to investigate this population as they represent the largest number of pediatric burns (Centers for Disease Control and Prevention, 2008). It was also assessed whether levels of parental optimism were associated with the use of particular coping styles, and whether use of any particular coping style predicted less parent or child acute or posttraumatic stress symptoms. A preliminary analysis of the effects of parental pessimism on psychological outcomes of the parent and child was also conducted. Study hypotheses were as follows:

1. Greater levels of parental dispositional and situational optimism would predict fewer symptoms of parent and child posttraumatic stress.

2. Greater levels of parental dispositional and situational optimism would be associated with greater parental use of adaptive and active coping styles (e.g. planning) and infrequent use of maladaptive and avoidant coping styles (e.g. self-distraction).
3. Parental use of maladaptive coping styles (e.g. substance abuse) would be associated with greater parent and child symptoms of posttraumatic stress.

This study was particularly important because it has been suggested that optimism can be learned, particularly through modeling (Peterson, 2000). Therefore, if a link between parental optimism and parent or child adjustment following burn injury was validated, quality of life for these individuals could be improved by incorporating interventions that promote parental optimism into post-burn care programs.
Methods

Participants

Participants were parents of pediatric burn and abrasion patients attending the outpatient burn clinic of Nationwide Children’s Hospital in Columbus, Ohio. To meet study criteria, parents were required to have a child under the age of 6 who experienced a burn or abrasion injury at least 2 weeks prior to study participation. It was also necessary that participants have an understanding of the English language that allowed them to complete study measures. One parent of each child was asked to participate in this study, and if both parents were present with the child, the parent who spends the most time with the child was asked to independently complete study measures. Fifty-nine parents met criteria for study participation on days researchers were present at the clinic. Seven additional parents met study criteria for child age and days since burn but were not recruited for participation because they were not fluent in the English language and therefore could not complete study measures. Of the 59 families recruited for participation, 55 caregivers (93.22%) consented to study participation and 4 (6.78%) declined to participate. Three of the 55 participants (5.45%) were not used for data analyses because they did not complete study measures besides the demographic form. One participant was excluded because they had not yet adopted their child at the time of the child’s burn, and another participant was excluded because the participant completing
the forms was the child’s grandparent rather than a parent. Therefore, data from 50 participants were used to complete data analysis.

Forty mothers and 10 fathers completed study measures ($M$ age= 28.58, $SD$=7.29). Thirty-three caregivers (66%) self-identified as Caucasian, 13 (26%) as African American, 2 (4%) as biracial, and 1 (2%) as Asian American. One participant chose to not report their ethnicity. Caregivers also reported on their highest level of education. Eight participating parents (16%) completed some high school, 7 (14%) completed high school, 16 (32%) attended some college, and 13 (26%) had a college degree. One participant (2%) had completed trade school, and 4 (8%) participants attended graduate school. Additionally, information on family income was obtained. Fifteen participants (30%) had a family yearly income under $30,000 and 7 (14%) had an income between $30,000- $60,000. Eight families (16%) had an income between $60,000- $90,000, and 7 (14%) families had an income over $90,000. Thirteen (26%) caregivers did not provide their family’s income. The children on which parents reported were 19 (38%) females and 31 (62%) males, with a mean age of 23.96 months ($SD$= 13.72). Parents reported 29 children (58%) as Caucasian, 14 (28%) as African American, and 7 (14%) as biracial. Days since burn ranged from 14 days to 1,035 days, with a mean of 90.10 ($SD$= 174.55). Twenty (40%) children experienced a scald burn, 19 (38 %) a contact burn, 3 (6%) a flame burn, and 8 (16%) an abrasion. TBSA for the sample ranged from less than 1% to 36% with a mean of 4.77% ($SD$= 7.28). Fifty percent of participants experienced a burn of equal to or less than 1% TBSA, 36% experienced a burn between
2- 10% TBSA, and 10% of children had a burn greater than 12% TBSA. Regarding location of burn, 10 children (20%) experienced burns on the face, 30 (60%) experienced hand burns (60%), and 16 (32%) had burns affecting their joints. Thirty-three (66%) of the children’s injuries occurred in their homes, 11 (22%) in the homes of family or friends, and 3 (6%) at a campground. One of the burns occurred at a cookout (2%), 1 (2%) in childcare, and 1 at a hotel (2%). Thirty-two (64%) of the children were hospitalized for their burn injury, with a mean hospitalization of 6.22 days ($SD= 13.66$).

**Measures**

*Life Orientation Test, Revised* (LOT-R; Scheier, Carver, & Bridges, 1994).

The *LOT-R* was used to assess levels of parental dispositional optimism. The *LOT-R* is a self-report measurement of dispositional optimism as assessed by outcome expectancies. The test consists of 10 statements to which participants responded: 0) strongly disagree; 1) disagree ; 2) neutral; 3) agree; 4) strongly agree. The measure took about five minutes to complete. Three of the test items are worded in the positive direction (e.g., “In uncertain times, I usually expect the best.”), three of the items are worded in the negative direction (e.g., “I hardly ever expect things to go my way.”), and the remaining four are filler items (See Appendix A for full measure). Traditionally, the scores on positive items and the inverse of scores on negative items are summed to obtain a score of dispositional optimism. This scoring method is built on the assumption that optimism and pessimism are polar ends of one bipolar construct. However, it has been
suggested that items worded in the positive direction may assess optimism while items worded in the negative direction measure pessimism, and that optimism and pessimism represent two separate constructs (e.g., Scheier et al., 1994). Investigation of the items on the original *Life Orientation Test* has demonstrated that positive and negative items represent different factors due to meaningful differences between the constructs of pessimism and optimism, rather than simply a methodological artifact or result of question framing (Kubzansky, Kubzansky, & Maselko, 2004). The authors of the *LOT-R* suggest that until more conclusive evidence regarding the nature of the constructs assessed by the test is obtained, two separate data analyses with *LOT-R* as a single score and as two separate scores may be warranted. Following these suggestions, the current study used one score derived from the *LOT-R* for initial analysis, with a subsequent exploratory analysis in which positively and negatively worded items were scored and examined separately.

The *LOT-R* has been shown to possess good psychometric properties (Scheier & Carver, 1985). The *LOT-R* has been shown to have a Cronbach’s alpha of .78. Test-retest reliability for the measure is .68 at 4 months, .60 at 12 months, .56 at 24 months, and .79 at 28 months. However, it should be noted that these reliabilities were calculated under the model that the *LOT-R* assesses one bipolar construct of optimism-pessimism. Significant positive correlations have also been demonstrated between the *LOT-R* and measures of characteristics known to be associated with optimism (Scheier et al., 1994), such as the original *Life Orientation Test* (Scheier & Carver, 1985). *Self-Mastery Scale*
(Pearlin & Schooler, 1978), and Rosenberg’s Self-esteem Scale (Rosenberg, 1965). In the current study sample, Cronbach’s alpha for the total LOT-R was .78. Cronbach’s alpha for positively worded items was .56 and for negatively worded times was .78.

**Brief COPE (Carver, 1997).**

The *Brief COPE* was used to assess the coping strategies used by the parent following their child’s injury. Situational coping styles used in dealing with the child’s burn injury, specifically, were assessed. Participants rated on a scale of 1 to 4 (i.e. 1= I haven’t been doing this at all; 2= I’ve been doing this a little bit; 3= I’ve been doing this a medium amount; 4= I’ve been doing this a lot) for 28 items regarding a variety of behaviors, such as “I’ve been turning to work or other activities to take my mind off things.” (See Appendix B for full measure). The scale assesses participant’s use of the following behaviors for coping: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. The original COPE has been used previously to assess coping strategies among parents of children experiencing an injury (Wade et al., 2001). Psychometrics for this measure were established with a group of participants recovering after Hurricane Andrew (Carver, 1997). For individual items, primary factor loadings were all above .40, and 22 of the 28 items had a factor loading of at least .60. The factor analysis of the *Brief COPE* is very similar to that of the original COPE. Despite that there are only 2 items per scale, the internal consistency of each scale was at least .50 (Carver, 1997). Cronbach’s alphas
were also computed as a measure of internal reliability of the two item subscales of the *Brief COPE* in the current sample. The Cronbach’s alphas for each subscale are listed in Table 1. Alphas for 12 of the 14 subscales exceeded .60. The only subscales with alphas below .60 were humor (α=.43) and self-distraction (α=.59).

Table 1

*Cronbach’s Alphas for Brief COPE Subscales for Current Study*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Coping</td>
<td>.737</td>
</tr>
<tr>
<td>Planning</td>
<td>.829</td>
</tr>
<tr>
<td>Positive Reframing</td>
<td>.709</td>
</tr>
<tr>
<td>Acceptance</td>
<td>.732</td>
</tr>
<tr>
<td>Humor</td>
<td>.427</td>
</tr>
<tr>
<td>Religion</td>
<td>.849</td>
</tr>
<tr>
<td>Emotional Support</td>
<td>.851</td>
</tr>
<tr>
<td>Instrumental Support</td>
<td>.745</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.592</td>
</tr>
<tr>
<td>Denial</td>
<td>.689</td>
</tr>
<tr>
<td>Venting</td>
<td>.789</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>.884</td>
</tr>
<tr>
<td>Behavioral Disengagement</td>
<td>.670</td>
</tr>
<tr>
<td>Self-blame</td>
<td>.806</td>
</tr>
</tbody>
</table>

Although the original article publishing the *Brief COPE* did not provide information regarding validity (Carver, 1997), the measure has been validated with breast cancer patients (Fillion, Kovacs, Gagnon, & Endler, 2002). Fillion and colleagues (2002) computed correlations between the scales of the *Coping with Health Injuries and*
Problems (CHIP; Endler & Parker, 1999) and the Brief COPE factors obtained during a factor analysis performed with their sample. Findings supported the convergent validity of the measure. For example, the Brief COPE construct of disengagement was correlated with the CHIP subscale of emotional preoccupation ($r = .64$), and the distraction subscales of both measures were correlated ($r = .49$).

Authors of the Brief COPE suggest two approaches for scoring the measure (Carver, n.d.). One approach is to sum scores on each of the two item subscales individually. Additionally, the measure can be scored by performing a factor analysis to identify second order constructs (Carver, n.d.). The authors did not identify second order factors, such as emotion-focused or problem-focused coping, and it is suggested that these factors be determined for each specific study sample. Although some past research has used the two item subscales of the Brief COPE during analysis (e.g. Baum, 2004), the approach of performing factor analyses is the most predominantly used in the literature (e.g. Greening & Stoppelbein, 2007; Wade et al., 2001) For the current study, both approaches to scoring were used. This decision was made due to the desire to remain consistent with the frequent use of factor analyses in past research but also the degree of caution that must be used in performing a factor analysis with such a small sample size.

An exploratory factor analysis (with principal-axis factor extraction and direct oblimin rotation) was conducted on the Brief COPE items. The Kaiser-Meyer-Olkin measure of sampling adequacy statistic was low, suggesting the sample size was smaller than desirable for performance of the factor analysis, based on the recommendations discussed by Field (2005). When determining the test items loading on each factor, items loading on a
factor at a .50 level and lacking other cross-loadings above .30 were considered to represent the factor. Items 7, 13, 14, 26, and 27 (See Appendix B for items) were not included in any factor structure because they did not load highly on any factor. Items 2, 8, 10, and 16 were excluded from any factor due to high cross-loadings with other factors. Eight factors were obtained through the initial factor analysis, four of which were identical to original two item subscales on the Brief COPE. One of these eight factors was eliminated due to a poor Cronbach’s Alpha= -.07 that resulted due to a negative factor loading. The final seven factors were cognitions (α = .85), avoidance (α = .68), comfort seeking (.76), and the original subscales of emotional support, substance abuse, humor, and venting. Table 2 displays the items loading on the factors obtained in the unique factor analysis that were not identical to original subscales on the Brief COPE. The third factor obtained through the factor analysis was termed “comfort seeking” for the present study, as these were all ways of obtaining comfort, either by gathering information, by reframing the situation, or by participating in activities that were enjoyable.
Table 2

*Item Loadings on the Brief COPE Factors*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Items</th>
</tr>
</thead>
</table>
| Cognitive         | I’ve been trying to see it in a different light to make it seem more positive.  
                          I’ve been accepting the reality of the fact that it has happened.  
                          I’ve been learning to live with it.  
                          I’ve been thinking hard about what steps to take.                         |
| Avoidance         | I’ve been saying to myself “this isn’t real.”  
                          I’ve been giving up trying to deal with it.                                 |
| Comfort Seeking   | I’ve been looking for something good in what is happening.  
                          I’ve been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.  
                          I’ve been trying to get advice or help from other people about what to do. |

*PTSD Checklist Stressor Specific Version* (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993).

The *PCL* was used to assess parental symptoms of posttraumatic stress following their child’s injury. The *PCL* consists of 17 items that assess symptoms of Posttraumatic Stress Disorder as described by the DSM-IV. For each item, participants rated on a scale of 1 to 5 how much they have been bothered by a particular problem in the last month. Consistent with the DSM-IV criteria for Posttraumatic Stress Disorder, the measure consists of three subscales: reexperiencing, avoidance, and hyperarousal, as well as a total score. High internal consistency has been demonstrated for all subscales with Cronbach’s alpha coefficients of .94 for total score, .85 for the reexperiencing subscale, .85 for the avoidance subscale, and .87 for the hyperarousal subscale (Ruggiero, Del Ben,
Scotti, & Rabalais, 2003). In the current study sample, Cronbach’s alpha was .94 for total score, .86 for the reexperiencing subscale, .88 for the avoidance subscale, and .84 for the hyperarousal subscale. Convergent validity was demonstrated for the PCL through high correlations between the PCL and the Impact of Event Scale (Horowitz, Wilner, & Alvarex, 1979) & the Mississippi Scale for PTSD, Civilian version (Vreven, Gudanowski, King, & King, 1995), as well as a significant correlation between PCL score and number of traumatic events experienced by participants. Test-retest reliabilities were calculated for 1 hour, 1 week, and 2 weeks, and coefficients were .92, .88, and .68, respectively (Ruggiero, et al., 2003). This measure has been used previously to assess PTSS in parents of children experiencing a burn (Hall et al., 2006). Items on this measure are presented in Appendix C.

**Child Stress Disorders Checklist (CSDC; Saxe et al., 2003).**

The CSDC was completed by parents to assess posttraumatic stress and acute stress symptoms in their child experiencing the burn. The checklist consists of 36 items regarding child behavior that the parents rated as either: 0= Not True, 1= Somewhat or Sometimes True, or 2= Very True or Often True. The items of the CSDC create scores for immediate response, reexperiencing, avoidance, numbing and dissociation, increased arousal, impairment in functioning, and a total posttraumatic symptom score. Cronbach’s alpha for the internal consistency of the symptom scales was .84 (Saxe et al. 2003). Cronbach’s alphas were also computed for the current study sample for total score and the subscales of immediate response, reexperiencing, avoidance, numbing and
dissociation, increased arousal, and impairment in functioning. Alphas were .86, .84, .81, .69, .71, .77, and .58, respectively. Test-retest reliability for the total scale was .84 and individual subscale test-retest reliabilities ranged from .63 to .89 (Saxe et al., 2003). Convergent validity was demonstrated through a .85 correlation between the CSDC and the Mississippi Scale (Weathers et al., 1993). This measure has been used previously to assess PTSS in young children experiencing a burn (Stoddard, et al., 2009). Items on this measure are presented in Appendix D.

**Situational Optimism Measure (Developed for this study; See Appendix A)**

This measure includes 5 items assessing parental optimism regarding their child’s ability to recover following burn injury, and it was created for use in this study. Parents rated the degree to which they agree with statements such as “My child will be able to grow up just like other kids, even with their burn injury.” Parents responded to each item with either: 0= Strongly disagree; 1= Disagree; 2= Neutral; 3= Agree; 4 Strongly agree. Cronbach’s alphas were computed as a measure of internal consistency based on participant responses in the current study. Internal consistency for this measure was relatively poor. Cronbach’s alpha was .36 for the total measure, .64 for positively worded items, and .37 for negatively phrased items.

**Demographics Form (Developed for this study; See Appendix E).**

Parents completed demographic questions regarding things such as socioeconomic status, gender, race, age, family medical and mental health history, and burn injury factors (e.g. location where burn occurred, who was present with child at time
of burn). This information was used to describe the sample and in data analysis to predict parent and child outcomes. Information regarding family mental health history was used to compute a composite family mental health variable used in data analysis. The number of different mental health diagnoses in a child’s family history were summed to create this variable. The frequency of these diagnoses or severity were not accounted in the variable.

**Burn Injury Information Form (Developed for this study; See Appendix F).**

This form was used by researchers to obtain information from patients’ medical charts following parental consent. Information regarding burn variables such as the size, severity, time since injury, and location of the burn were obtained from the medical charts in order to ensure the reliability of this information.

**Procedures**

Prior to initiation of this study, the study protocol was approved both by the Research Review and Ethics Committee in the Department of Psychology at the University of Dayton and the Institutional Review Board at Nationwide Children’s Hospital. During study recruitment, parents of patients meeting eligibility criteria were approached in the burn clinic waiting room while waiting for their child’s appointment. After obtaining informed consent, participants completed all study measures. Data was collected for this project in collaboration with another research project and master’s thesis, and data collection took place between August 2009 and March 2010. Overall,
parents were administered the *Life Orientation Test, Revised (LOT-R: Scheier et. al., 1994)*, the parent rating scale of the *Behavior Assessment System for Children second edition (BASC-2: Reynolds & Kamphaus, 2004)*, the *Brief COPE (Carver, 1997)*, the *Post-traumatic Stress Disorder Checklist (Ruggiero et al., 2003)*, the *Child Stress Disorders Checklist (Saxe et. al., 2003)*, a Psychosocial Adjustment to Burn Questionnaire, a Situational Optimism Measure, and a demographics form. As the *BASC-2* is only normed for children between the ages of 2 and 6, parents of children under the age of 2 were not asked to complete this measure.

The data regarding parental dispositional and situational optimism, parental coping styles, symptoms of posttraumatic distress for both parent and child, demographic information, and medical variable information were used for analysis in this study. Completion of the parent measures took about 60 minutes. Parents were encouraged to complete measures at the clinic while the child was waiting for their services, although parents who did not complete them during this time were given self-addressed envelopes to return remaining measures. Parents were given $10 to compensate for their time when completed study measures were returned. Following parental consent, study investigators collected information regarding burn related variables from the child’s medical records.
Results

Prior to data analyses, data were evaluated to determine whether assumptions of the multiple regression test were met. First, the relationships between the predictors of situational and dispositional optimism and the outcome variables of parental and child PTSS were graphed to determine whether the relationships were linear. All relationships were linear and not better represented by a quadratic line. For example for the relationship between dispositional optimism and total parental PTSS, a quadratic prediction line did not explain a significantly greater portion of the dependent variable ($R^2 = .030$) than a linear prediction line ($R^2 = .028$). Next, it was investigated whether the regression standardized residuals were normally distributed. The majority of regression residuals clearly represented a normal distribution. Although the residuals of some regressions of child PTSS on dispositional optimism were somewhat skewed, the skewness was not considered severe enough to impact data analyses, as regressions are generally robust to small violations (Keith, 2006).

Data was collected from parents of both burn and abrasion patients, as both injuries are treated in the same outpatient burn clinic, a frequent practice in pediatric care. Forty-two (84%) of the participants had children experiencing a burn, and 8 (16%) participants had a child with an abrasion. Prior to analysis, t-tests were performed to identify whether any group differences between the burn and abrasion subsamples were
present. For all t-tests, Levene’s Test for Equality of Variances was used to test the assumption that groups had homogeneous variances. For several variables this assumption was violated, and in these instances a variation of the t-test which does not assume equal variances was used.

Group differences were not found for the number of days spent inpatient ($t = -1.184, p = .242$). However, the two groups did differ on TBSA ($t = -3.684, p = .001$) and the child’s age at the time of injury ($t = 3.028, p = .004$), with burn patients experiencing larger injuries at younger ages. The parents of the two groups also did not differ on optimism as measured by a total LOT-R score ($t = .757, p = .453$), optimism measured as single construct score ($t = 1.014, p = .316$), pessimism ($t = -.501, p = .618$), or situational optimism ($t = .419, p = .677$). Means for each group on these continuous variables are presented in Table 3. For non-continuous variables (i.e. income, parental education, and ethnicity), one-way ANOVAs were conducted to determine if the abrasion and burn groups differed. The frequency distributions for these variables are provided in Table 4. The abrasion and burn groups did not differ on child ethnicity, $F (1, 48) = .909, p = .345$, parent ethnicity, $F (1, 47) = 1.255, p = .268$, or family income, $F (1, 35) = 1.147, p = .291$. However, the two groups did differ on parental level of education, $F (1, 47) = 8.460, p = .006$. 
Table 3

*Group Means for Abrasion and Burn Groups*

<table>
<thead>
<tr>
<th></th>
<th>Abrasions</th>
<th></th>
<th>Burns</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td><strong>Demographics and Medical Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days Inpatient X</td>
<td>1.00</td>
<td>1.69</td>
<td>7.21</td>
<td>14.70</td>
</tr>
<tr>
<td>TBSA</td>
<td>1.00***</td>
<td>0.00</td>
<td>5.52***</td>
<td>7.77</td>
</tr>
<tr>
<td>Child Age (months)</td>
<td>31.22**</td>
<td>14.33</td>
<td>18.72**</td>
<td>9.80</td>
</tr>
<tr>
<td><strong>Parent Symptoms, Optimism, and Pessimism</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reexperiencing</td>
<td>5.25***</td>
<td>0.71</td>
<td>7.58***</td>
<td>3.47</td>
</tr>
<tr>
<td>Avoidance</td>
<td>7.25</td>
<td>0.46</td>
<td>8.74</td>
<td>3.53</td>
</tr>
<tr>
<td>Hyperarousal</td>
<td>6.75</td>
<td>3.15</td>
<td>8.50</td>
<td>4.42</td>
</tr>
<tr>
<td>Total PTS</td>
<td>19.25</td>
<td>3.77</td>
<td>25.00</td>
<td>10.80</td>
</tr>
<tr>
<td>Dispositional Optimism (Total LOT-R)</td>
<td>16.63</td>
<td>3.58</td>
<td>15.39</td>
<td>4.28</td>
</tr>
<tr>
<td>Dispositional Optimism (single construct score)</td>
<td>8.88</td>
<td>1.55</td>
<td>8.03</td>
<td>2.25</td>
</tr>
<tr>
<td>Pessimism</td>
<td>4.25</td>
<td>2.12</td>
<td>4.74</td>
<td>2.59</td>
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<tr>
<td>Situational Optimism</td>
<td>16.63</td>
<td>2.56</td>
<td>16.10</td>
<td>3.36</td>
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<td><strong>Child Symptoms</strong></td>
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<tr>
<td>Immediate Response</td>
<td>0.50***</td>
<td>1.07</td>
<td>3.01***</td>
<td>3.10</td>
</tr>
<tr>
<td>Reexperiencing</td>
<td>1.38</td>
<td>2.50</td>
<td>0.72</td>
<td>1.88</td>
</tr>
<tr>
<td>Avoidance</td>
<td>0.75</td>
<td>0.89</td>
<td>0.88</td>
<td>1.45</td>
</tr>
<tr>
<td>Numbing and Dissociation</td>
<td>0.38</td>
<td>1.06</td>
<td>0.45</td>
<td>0.92</td>
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<tr>
<td>Increased Arousal</td>
<td>1.25</td>
<td>1.58</td>
<td>1.78</td>
<td>2.28</td>
</tr>
<tr>
<td>Impairment in Functioning</td>
<td>0.38</td>
<td>1.06</td>
<td>0.45</td>
<td>0.92</td>
</tr>
<tr>
<td>Total PTS</td>
<td>4.13</td>
<td>6.03</td>
<td>4.16</td>
<td>4.53</td>
</tr>
</tbody>
</table>

*Note.* *p < .05  **p < .01  ***p < .001
Table 4

Frequencies for Abrasion and Burn Groups on Family Demographic Variables

<table>
<thead>
<tr>
<th>Family Income</th>
<th>Abrasions</th>
<th></th>
<th>Burns</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>$0-$15,000</td>
<td>1</td>
<td>12.5</td>
<td>8</td>
<td>19.0</td>
</tr>
<tr>
<td>$15,000-$30,000</td>
<td>2</td>
<td>25.0</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>$30,000-$45,000</td>
<td>0</td>
<td>0.0</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>$45,000-$60,000</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>7.1</td>
</tr>
<tr>
<td>$60,000-$75,000</td>
<td>0</td>
<td>0.0</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>$75,000-$90,000</td>
<td>2</td>
<td>25.0</td>
<td>2</td>
<td>4.8</td>
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<tr>
<td>$90,000-$105,000</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>Over $120,000</td>
<td>2</td>
<td>25.0</td>
<td>3</td>
<td>7.1</td>
</tr>
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In terms of parental PTSS, the two groups differed in the number of reexperiencing symptoms \((t = -3.782, p < .001)\), with parents of burn patients experiencing more symptoms. However, groups did not differ on avoidance \((t = -1.178, p = .248)\), hyperarousal \((t = -1.060, p = .295)\), or total PTS symptoms \((t = -1.475, p = .147)\).

Next, t-tests were conducted to compare child PTSS in the two groups. The two groups differed on child immediate response symptoms \((t = -4.087, p < .001)\). However, the groups did not differ on child symptoms of reexperiencing \((t = .852, p = .399)\), avoidance \((t = -.240, p = .812)\), numbing and dissociation \((t = -.691, p = .493)\), increased arousal \((t = -.628, p = .533)\), impairment in functioning \((t = -.209, p = .835)\), and total child PTSS \((t = -.018, p = .986)\).

Given the fact that parents of children with burn and abrasion injuries did not differ on optimism and that both groups experienced similar symptoms on the majority of PTSS subscales, the decision was made to combine both groups as a single study sample. Therefore, in data analysis, no distinction was made between patients experiencing burns and those experiencing abrasions.

**Stress Symptoms**

Due to variation in the number of days post-burn at which participants completed study measures, for some participants acute stress symptoms were assessed, while for others posttraumatic stress symptoms were assessed (See Introduction for full discussion on difference between terminology). The size of the current sample \((n \text{ ASD} = 27, n\)
PTSD = 23) prevented separate analysis for each group. However, group mean comparisons were conducted between those participants less than 31 days post-burn (experiencing ASD symptoms) and those equal to or greater than 31 days post-burn (experiencing PTSD symptoms). No differences were found between the groups on amount of parental posttraumatic stress symptoms (PTSS) experienced, as measured by both the total symptom score and symptom subscale scores. For child symptoms, the groups differed on only one subscale of stress symptoms. Child avoidance symptoms were found to differ between the groups (t = 2.170, p = .036). However, no differences were found between the groups on child total symptoms, immediate response symptoms, reexperiencing symptoms, numbing and dissociation, increased arousal, or impairment in functioning. Correlations between number of days post-burn and child and parent symptoms were also conducted, and no significant correlations were found between number of days post-burn and any total or subscale scores of symptoms. Therefore for simplicity of reporting results, all stress reactions will be referred to as “posttraumatic stress symptoms.”

Mean parental rating of PTSS on the PCL-S was 23.977 (SD=10.128), with scores ranging between 17 and 60. In the current study, the cutoff score of 50 was employed to identify clinically significant PTSS, as this score has been used previously in assessing PTSS among parents of children with health concerns (e.g. Manne, Du Hamel, Gallelli, Sorgen, and Redd, 1998). Two of the 45 participants with complete PCL-S scores (4.444%) met the cutoff score for experiencing clinically significant PTSS. Such a
percentage is less than the estimated lifetime prevalence of PTSD (8%) in community samples (American Psychiatric Association, 2000) and prevalence estimates of acute stress disorder (14% to 33%) in populations exposed to trauma (American Psychiatric Association, 2000).

**Relationships Between Demographics, Optimism, and PTS**

Bivariate correlations between family demographic variables, levels of optimism, and parent and child PTSS were computed. The variable of family mental health represented the number of different mental illnesses diagnosed in members of the child’s family. Table 5 displays all correlations between these variables. Parental PTSS were significantly related to child age at time of injury \( (r = -.356, p = .021) \), family history of mental illness \( (r = .550, p < .001) \), and child PTSS \( (r = .554, p < .001) \). Child PTSS were also significantly associated with family history of mental illness \( (r = .596, p < .001) \).

Relationships were found between parental dispositional optimism and family income \( (r = .419, p = .011) \), parental level of education \( (r = .360, p = .015) \), and family history of mental illness \( (r = -.338, p = .022) \). No significant relationship was found between parent’s situational optimism towards the burn event and any of the other variables, including parent PTSS \( (r = -.025, p = .869) \) or child PTSS \( (r = .136, p = .367) \). Parent dispositional optimism was also not found to be correlated with parent PTSS \( (r = -.166, p = .293) \) or child PTSS \( (r = -.213, p = .169) \). Medical variables such as TBSA or number of days in patient were also not found to be related to parental or child PTSS.
Table 5

**Correlations Between Demographics, Optimism, and Posttraumatic Stress**

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*Note.* *p < .05, **p < .01, ***p < .001
Several significant relationships were found between demographic or medical variables. Number of days spent inpatient was significantly related to TBSA ($r = .859$, $p < .001$). Parent age was also related to family income ($r = .645$, $p < .001$) and parent education ($r = .528$, $p < .001$). Parent education was also found to be significantly correlated with family income ($r = .565$, $p < .001$).

**Parent Posttraumatic Stress Symptoms**

It was hypothesized that greater dispositional and situational optimism would be predictive of fewer PTSS in parents of pediatric burn patients. Simultaneous multiple regressions were used to determine whether parental optimism (dispositional and situational) served as a predictor of parental posttraumatic stress symptoms (PTSS). For these analyses, optimism was computed through use of the total LOT-R measure score. This score includes the sum of both responses to optimism questions and the inverse of responses to pessimism questions and is based on the assumption that optimism and pessimism are both polar opposites of one continuum (Scheier et al., 1994). Correlations between the predictors and outcome variables and demographic variables and findings from previous research were used to identify other variables controlled for in the regression. Child age in months when burned, family mental health history, education level of the parent completing study measures, and TBSA were all entered as covariates. Although TBSA was not correlated with optimism or PTSS in this study, past research (e.g. Bakker et al., 2010; Rizzone et al., 1994) has supported the influence of burn size on
parental adjustment and PTSS. Therefore, it was also included in the regression. Family mental health history, TBSA, child age at burn, and optimism were all entered as an initial block, with dummy coded vectors representing parent education entered in a second block. This was done so that information about the impact of parent education as a single variable could be obtained. One set of simultaneous multiple regressions was performed to assess the significance of dispositional optimism as a predictor and another set was done to investigate the impact of situational optimism on PTSS.

Therefore for the first set of regressions, child age, family mental health history, parental education level, TBSA, and dispositional optimism total score were entered. Although the model was a significant predictor of total parental PTSS (PTS-T), $F(5, 32) = 3.656$, $R^2 = .540$, $p = .004$, dispositional optimism was not found to be a unique predictor of PTS-T ($\beta = -.117$, $p = .471$). See Table 6 for complete regression model and statistics for control variables. Dispositional optimism was also not a unique predictor of the PTS subscales for reexperiencing (PTS-R), $\beta = -.037$, $p = .818$, avoidance (PTS-A), $\beta = -.175$, $p = .334$, and hyperarousal (PTS-H), $\beta = -.112$, $p = .496$, specifically. Next, the regressions were performed entering situational optimism rather than dispositional optimism. Situational optimism also did not have a significant unique impact on PTS-T ($\beta = .048$, $p = .742$), PTS-R ($\beta = .098$, $p = .476$), PTS-A ($\beta = .101$, $p = .539$), and PTS-H ($\beta = -.039$, $p = .789$).
Table 6

**Summary of Simultaneous Regression Model for Total Parent PTSS**

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Child Posttraumatic Stress Symptoms

Study hypotheses were that parental dispositional and situational optimism would predict fewer PTSS in the burn patients themselves. Simultaneous multiple regressions were also used to investigate the impact of parental optimism as a predictor of child PTSS. As with the regressions predicting parental PTSS, parental optimism was measured through use of a single score from the LOT-R. Family mental health history, parent education level, and parental total PTSS were controlled for in the regression based on their bivariate correlations with either parental optimism or child PTSS. As was the case with parent PTSS, TBSA was not correlated with child PTSS. However, the research has been inconclusive on the influence of burn variables on child adjustment post-burn (e.g., Blakeney, Meyer, Moore, & Broemeling, et al., 1993; Noronha & Faust, 2007; Tyack & Ziviani, 2003), and so therefore TBSA was controlled for as well. The first set of regressions was performed with dispositional optimism as a predictor and the second set with situational optimism as a predictor.

Family mental health history, total parent PTSS, TBSA, and dispositional optimism were entered in step one, with dummy coded vectors representing parent education entered in step two. The model significantly predicted total child PTSS (CSDC-T), $F(5, 32) = 2.771, R^2 = .471; p = .019$. See Table 7 for details about the regression model and role of control variables as predictors of CSDC-T. Dispositional optimism, however, was not a unique predictor of CSDC-T, $\beta = .070, p = .690$. Dispositional optimism was also not a unique predictor of the specific subscales of
immediate response symptoms (CSDC-IR), $\beta = .105$, $p = .560$, impairment in functioning (CSDC-IF), $\beta = -.081$, $p = .676$, numbing and dissociation (CSDC-ND), $\beta = .174$, $p = .336$, reexperiencing (CSDC-R), $\beta = .059$, $p = .789$, or increased arousal (CSDC-IA), $\beta = .038$, $p = .811$. However, dispositional optimism was a unique predictor of the avoidance symptoms subscale (CSDC-A), $\beta = .611$, $p = .003$. Given the previous finding that participants over 1 month post-burn significantly differed from participants less than 1 month post-burn on child avoidance symptoms, separate regressions were conducted for each group to see if dispositional optimism influenced both ASD and PTSD symptoms. Dispositional optimism was found to be a unique predictor only for PTSD symptoms ($\beta = 1.119$, $p = .001$), and only approached significance as a predictor for ASD symptoms ($\beta = .610$, $p = .071$)

Once this set of regressions was completed, the variables family mental health history, parent education, TBSA, parent total PTSS, and parental situational optimism were entered to predict child PTSS. Parental situational optimism was not a unique predictor of CSDC-T ($\beta = .133$, $p = .357$), CSDC-IR ($\beta = .165$, $p = .322$), CSDC-IF ($\beta = .139$, $p = .396$), CSDC-ND ($\beta = .252$, $p = .092$), CSDC-R ($\beta = .071$, $p = .694$), CSDC-IA ($\beta = .074$, $p = .579$), or CSDC-A ($\beta = .182$, $p = .312$).
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</table>
**Parent Coping Styles**

It was hypothesized that particular coping styles, such as acceptance, positive reframing, and active coping, would be associated with greater levels of dispositional and situational optimism. Further, it was hypothesized that particular coping styles, such as active coping, would be related to lower PTSS in parents and their children. As mentioned, the Brief COPE was used to measure parental coping styles. Both individual scores on two item subscales and second order factors obtained through the factor analysis were used in data analysis. Factor scores used for analysis were obtained through the least squares regression approach.

The relationships between parental level of dispositional and situational optimism and use of particular coping styles were investigated. This relationship was investigated for both the individual subscale measures of coping and the second order factors obtained through factor analysis. For the individual subscales, higher levels of parental dispositional optimism were associated with less use of self distraction ($r = -.411, p = .007$) and behavioral disengagement ($r = -.375, p = .013$) in coping with the child’s burn injury. Parental situational optimism was found to be positively correlated with use of positive reframing ($r = .303, p = .041$). When relationships between the second order coping factors and dispositional and situational optimism were investigated, dispositional optimism was found to be negatively correlated with use of avoidance techniques ($r = -.501, p = .001$). All other relationships were non-significant.
Correlations were also computed between the various coping two item subscales on the Brief COPE and parental PTSS of reexperiencing (PTS-R), avoidance, (PTS-A), hyperarousal (PTS-H), and total PTSS (PTS-T). Given the large number of correlations computed in this analysis, an alpha of .001 was used for determining the significance of correlations. Therefore, the family-wise error rate for making a Type 1 error was .064. More frequent use of 8 of the 14 coping styles was associated with greater parental PTSS. See Table 8 for a complete correlation matrix between coping styles and PTSS. All correlations listed below are significant. Greater use of active coping was found to be associated with greater PTS-R \((r = .603)\), PTS-A \((r = .492)\), PTS-H \((r = .549)\), and PTS-T \((r = .589)\). Use of planning and use of acceptance to cope with the burn event were both positively correlated with the PTS-R \((r = .480 \text{ and } r = .495, \text{ respectively})\). Positive correlations were also found between use of self-distraction and PTS-R \((r = .488)\), PTS-A \((r = .482)\), PTS-H \((r = .574)\), and PTS-T \((r = .562)\). More frequent use of denial as a coping strategy was associated with greater PTS-R \((r = .482)\), PTS-A \((r = .488)\), and PTS-T \((r = .501)\). Such associations were also found between use of venting and PTS-R \((r = .679)\), PTS-A \((r = .696)\), and PTS-H \((r = .622)\). Venting was also associated with greater PTS-T \((r = .715)\). Positive correlations were obtained between behavior disengagement and PTS-R \((r = .578)\), PTS-A \((r = .597)\), PTS-H \((r = .590)\), and PTS-T \((r = .630)\). Lastly, greater use of self blame was found to be associated with greater PTS-R \((r = .660)\), PTS-A \((r = .540)\), PTS-H \((r = .646)\), and PTS-T \((r = .661)\).
Table 8

*Correlations Between Individual Subscale Coping Styles and Parent Posttraumatic Stress*

<table>
<thead>
<tr>
<th></th>
<th>PTS-R</th>
<th>PTS-A</th>
<th>PTS-H</th>
<th>PTS-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Coping</td>
<td>.603***</td>
<td>.492***</td>
<td>.549***</td>
<td>.589***</td>
</tr>
<tr>
<td>Planning</td>
<td>.480***</td>
<td>.268</td>
<td>.448</td>
<td>.432</td>
</tr>
<tr>
<td>Positive Reframing</td>
<td>.322</td>
<td>.190</td>
<td>.298</td>
<td>.288</td>
</tr>
<tr>
<td>Acceptance</td>
<td>.495***</td>
<td>.230</td>
<td>.433</td>
<td>.421</td>
</tr>
<tr>
<td>Humor</td>
<td>.106</td>
<td>-.123</td>
<td>-.052</td>
<td>-.033</td>
</tr>
<tr>
<td>Religion</td>
<td>.269</td>
<td>.042</td>
<td>.165</td>
<td>.167</td>
</tr>
<tr>
<td>Emotional Support</td>
<td>.215</td>
<td>.085</td>
<td>.008</td>
<td>.110</td>
</tr>
<tr>
<td>Instrumental Support</td>
<td>.322</td>
<td>.234</td>
<td>.193</td>
<td>.260</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.488***</td>
<td>.482***</td>
<td>.574***</td>
<td>.562***</td>
</tr>
<tr>
<td>Denial</td>
<td>.482***</td>
<td>.488***</td>
<td>.445</td>
<td>.501***</td>
</tr>
<tr>
<td>Venting</td>
<td>.679***</td>
<td>.696***</td>
<td>.622***</td>
<td>.715***</td>
</tr>
<tr>
<td>Substance Use</td>
<td>.320</td>
<td>-.009</td>
<td>.261</td>
<td>.230</td>
</tr>
<tr>
<td>Behavioral Disengagement</td>
<td>.578***</td>
<td>.597***</td>
<td>.590***</td>
<td>.630***</td>
</tr>
<tr>
<td>Self-blame</td>
<td>.660***</td>
<td>.540***</td>
<td>.646***</td>
<td>.661***</td>
</tr>
</tbody>
</table>

Note  *** p < .001

PTS-R= reexperiencing; PTS-A= avoidance; PTS-H= hyperarousal; PTS-T= total symptoms
Next, the relationship between parental coping style and child PTSS was explored by computing bivariate correlations between the subscales of the Brief COPE and the CSDC scales: immediate response (CSDC-IR), impairment in functioning (CSDC-IF), numbing and dissociation (CSDC-ND), reexperiencing (CSDC-R), avoidance (CSDC-A), increased arousal (CSDC-IA), and total PTSS (CSDC-T). The complete correlation matrix is presented in Table 9. An alpha of .001 was also used for this analysis, producing a family-wise error rate of .098. A positive correlation was found between parental use of acceptance as a coping style and CSDC-T ($r = .533$). Greater parental use of humor was also associated with greater CSDC-R ($r = .479$), and use of instrumental support was positively correlated with CSDC-IR ($r = .502$), and CSDC-ND ($r = .462$). Relationships were also found between parental use of self-distraction and CSDC-IA ($r = .622$) and between venting and CSDC-ND ($r = .465$) and CSDC-IA ($r = .541$). Parental behavior disengagement was found to be associated with greater CSDC-IA ($r = .474$), and CSDC-T ($r = .505$). Lastly, a relationship was found between parental use of self-blame and CSDC-T ($r = .498$).
Table 9

Correlations Between Individual Subscale Coping Styles and Child Posttraumatic Stress

<table>
<thead>
<tr>
<th></th>
<th>CSDC-IR</th>
<th>CSDC-R</th>
<th>CSDC-A</th>
<th>CSDC-ND</th>
<th>CSDC-IA</th>
<th>CSDC-IF</th>
<th>CSDC-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Coping</td>
<td>.328</td>
<td>.105</td>
<td>.230</td>
<td>.308</td>
<td>.402</td>
<td>.018</td>
<td>.337</td>
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<tr>
<td>Planning</td>
<td>.389</td>
<td>.103</td>
<td>.235</td>
<td>.403</td>
<td>.284</td>
<td>.100</td>
<td>.314</td>
</tr>
<tr>
<td>Positive Reframing</td>
<td>.362</td>
<td>.142</td>
<td>.239</td>
<td>.195</td>
<td>.315</td>
<td>.081</td>
<td>.303</td>
</tr>
<tr>
<td>Acceptance</td>
<td>.394</td>
<td>.332</td>
<td>.316</td>
<td>.314</td>
<td>.433</td>
<td>.197</td>
<td>.533***</td>
</tr>
<tr>
<td>Humor</td>
<td>.191</td>
<td>.479***</td>
<td>-.098</td>
<td>-.184</td>
<td>.060</td>
<td>.142</td>
<td>.205</td>
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<tr>
<td>Religion</td>
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<td>.207</td>
<td>.210</td>
<td>.264</td>
<td>.186</td>
<td>.320</td>
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<tr>
<td>Emotional Support</td>
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<td>.070</td>
<td>.047</td>
<td>.399</td>
<td>.174</td>
<td>.256</td>
<td>.164</td>
</tr>
<tr>
<td>Instrumental Support</td>
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<td>.097</td>
<td>.462***</td>
<td>.200</td>
<td>.348</td>
<td>.234</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.383</td>
<td>.148</td>
<td>.065</td>
<td>.435</td>
<td>.622***</td>
<td>.398</td>
<td>.441</td>
</tr>
<tr>
<td>Denial</td>
<td>.047</td>
<td>.049</td>
<td>.003</td>
<td>.141</td>
<td>.298</td>
<td>-.070</td>
<td>.234</td>
</tr>
<tr>
<td>Venting</td>
<td>.403</td>
<td>.038</td>
<td>.028</td>
<td>.465***</td>
<td>.541***</td>
<td>.186</td>
<td>.379</td>
</tr>
<tr>
<td>Substance Use</td>
<td>.181</td>
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<td>.149</td>
<td>.214</td>
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<td>.163</td>
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<tr>
<td>Behavioral Disengagement</td>
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<td>.358</td>
<td>-.052</td>
<td>.170</td>
<td>.474***</td>
<td>.247</td>
<td>.505***</td>
</tr>
<tr>
<td>Self-blame</td>
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<td>.236</td>
<td>.166</td>
<td>.273</td>
<td>.332</td>
<td>.212</td>
<td>.498***</td>
</tr>
</tbody>
</table>

Note  *** p < .001

CSDC-IR = immediate response; CSDC-R = reexperiencing; CSDC-A = avoidance; CSDC-ND = numbing and dissociation; CSDC-IA = increased arousal; CSDC-IF = impairment in functioning; CSDC-T = total symptoms.
Lastly, correlations between the second order factors of coping and parent and child PTSS were examined. This was only performed for the three factors containing items from multiple original subscales, as computing them for the factors identical to the two item subscales would have been redundant. Given the smaller number of correlations computed in this analysis in comparison to that using the individual coping style subscales, an alpha of .01 was used rather than the more conservative .001, leading to a familywise error rate of .12. More frequent use of cognitive techniques for coping was associated with greater PTS-R \( (r = .414, p = .005) \) and PTS-H \( (r = .395, p = .008) \). Use of avoidance strategies was also found to be related to greater PTS-R \( (r = .413, p = .005) \), PTS-A \( (r = .434, p = .003) \), PTS-H \( (r = .418, p = .005) \), and PTS-T \( (r = .448, p = .003) \). Lastly, greater use of comfort seeking was associated with lower PTS-H and PTS-T \( (r = -.399, p = .007; r = -.394, p = .009, \text{respectively}) \). See Table 10 for all correlations.

Table 10

<table>
<thead>
<tr>
<th></th>
<th>PTS-R</th>
<th>PTS-A</th>
<th>PTS-H</th>
<th>PTS-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Techniques</td>
<td>.414**</td>
<td>.160</td>
<td>.395**</td>
<td>.353</td>
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<tr>
<td>Avoidance</td>
<td>.413**</td>
<td>.434**</td>
<td>.418**</td>
<td>.448**</td>
</tr>
<tr>
<td>Comfort Seeking</td>
<td>-.371</td>
<td>-.342</td>
<td>-.399**</td>
<td>-.394**</td>
</tr>
</tbody>
</table>

Note: **p < .01

For child PTSS, parental use of cognitive techniques for coping was associated with greater CSDC-T \( (r = .409, p = .007) \). Parental use of comfort seeking was found to
be related to lower CSDC-IR ($r = -0.431$, $p = 0.003$) and lower CSDC-IA ($r = -0.391$, $p = 0.008$). See Table 11 for complete correlation matrix.

Table 11

<table>
<thead>
<tr>
<th></th>
<th>CSDC-IR</th>
<th>CSDC-R</th>
<th>CSDC-A</th>
<th>CSDC-ND</th>
<th>CSDC-IA</th>
<th>CSDC-IF</th>
<th>CSDC-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Techniques</td>
<td>.308</td>
<td>.241</td>
<td>.364</td>
<td>.253</td>
<td>.338</td>
<td>.080</td>
<td>.409**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>.014</td>
<td>.221</td>
<td>-.111</td>
<td>-.016</td>
<td>.346</td>
<td>.087</td>
<td>.385</td>
</tr>
<tr>
<td>Comfort Seeking</td>
<td>-.431**</td>
<td>-.121</td>
<td>-.251</td>
<td>-.345</td>
<td>-.391**</td>
<td>-.297</td>
<td>-.323</td>
</tr>
</tbody>
</table>

*Note* ** $p < .01$; *** $p < .001$

CSDC-IR= immediate response; CSDC-R= reexperiencing; CSDC-A= avoidance; CSDC-ND= numbing and dissociation; CSDC-IA= increased arousal; CSDC-IF= impairment in functioning; CSDC-T= total symptoms.

**Exploratory Analyses**

For initial analyses, optimism was measured through use of a total score on the LOT-R. Such a method is consistent with the original suggested use of the measure. However, the measure authors (e.g. Scheier et al., 1994) have suggested pessimism and optimism may not necessarily be polar opposites of one dimension. Rather, it has been suggested that optimism and pessimism may in fact be separate constructs, and that different items on the LOT-R may assess each of these constructs. Therefore following initial analyses, responses on the LOT-R were used to create separate optimism and pessimism scores to be used in an exploratory analyses. Positively worded items on the
LOT-R are believed to assess optimism, while negatively worded items are believed to measure the domain of pessimism (Kubzansky et al., 2004).

Correlations were computed between the independent constructs of optimism and pessimism and demographic variables, total PTSS scores, and situational optimism. The correlation matrix is presented in Table 12. As would be expected, the independent optimism and pessimism scores were negatively correlated \((r = -.566, p < .001)\). Parent optimism was found to be correlated with parent age at the time of the child’s burn \((r = .342, p = .023)\), family income \((r = .377, p = .024)\), and parent education \((r = .464, p < .001)\). Parent pessimism was associated with family income \((r = -.397, p = .015)\) and family mental health history \((r = .378, p = .007)\).

Simultaneous multiple regressions predicting parent and child PTSS were recomputed with the insertion of either pessimism or optimism in the regression model in place of a total LOT-R optimism score. All other variables in the regression remained the same as in the primary regression analysis. Exploratory analyses found that dispositional optimism as a singular, independent construct was not a unique predictor of parent PTSS while controlling for family mental health history, parent education, TBSA, and child age at time of burn. It was not found to be a predictor of PTS-T \((\beta = -.053, p = .745)\), PTS-H \((\beta = -.036, p = .834)\), PTS-R \((\beta = -.021, p = .901)\), or PTS-A \((\beta = -.065, p = .713)\). The same was found for the independent construct of pessimism. Dispositional pessimism was also not found to be a unique predictor of PTS-T \((\beta = .151, p = .345)\), PTS-H \((\beta = .137, p = .383)\), PTS-R \((\beta = .049, p = .742)\), or PTS-A \((\beta = .243, p = .175)\).
Table 12

<table>
<thead>
<tr>
<th></th>
<th>Optimism</th>
<th>Pessimism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age</td>
<td>.011</td>
<td>.049</td>
</tr>
<tr>
<td>Days Since Burn</td>
<td>.038</td>
<td>.001</td>
</tr>
<tr>
<td>Days Inpatient</td>
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<td>.003</td>
</tr>
<tr>
<td>TBSA</td>
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<td>.075</td>
</tr>
<tr>
<td>Parent Age</td>
<td>.342*</td>
<td>-.163</td>
</tr>
<tr>
<td>Family Income</td>
<td>.377*</td>
<td>-.397*</td>
</tr>
<tr>
<td>Parent Education</td>
<td>.464***</td>
<td>-.229</td>
</tr>
<tr>
<td>Family Mental Health History</td>
<td>-.166</td>
<td>.378**</td>
</tr>
<tr>
<td>Parent PTS</td>
<td>-.041</td>
<td>.240</td>
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<tr>
<td>Child PTS</td>
<td>-.118</td>
<td>.212</td>
</tr>
<tr>
<td>Situational Optimism</td>
<td>-.147</td>
<td>-.047</td>
</tr>
<tr>
<td>Dispositional Optimism (total LOT-R score)</td>
<td>.864***</td>
<td>-.904***</td>
</tr>
</tbody>
</table>

Note  * p < .05  ** p < .01  *** p < .001

Regressions predicting child PTSS were also recomputed substituting a singular, independent optimism score in place of the total LOT-R optimism score and a pessimism score in place of the optimism score. Results were consistent with those found when using only the total optimism score in the primary analysis. Both the single construct optimism score and the pessimism score were predictive of CSDC-A (β = .619, p = .002 and β = -.486, p = .010, respectively). However, the single optimism score was not predictive of CSDC-T (β = .062, p = .727), CSDC-IR (β = -.008, p = .964), CSDC-IF (β
The relationships between the separate constructs of optimism and pessimism and the various coping styles assessed by the *Brief COPE* were also explored. Interestingly, the single construct optimism score was not associated with use of any of the particular two item subscale coping styles. This was in contrast to when self-distraction and behavioral disengagement were each found to be used less frequently in individuals with a high total optimism score. Correlations between pessimism and the various coping styles found that pessimism was positively correlated with use of self-distraction (*r* = .433, *p* = .003) and behavior disengagement (*r* = .463, *p* = .001).
Discussion

**Relationships Between Demographics, Optimism, and PTS**

The present study provided support for the association between parent and child PTSS. These findings are consistent with previous literature (e.g. Saxe et al., 2005; Stoddard et al., 2006) and support the idea that family factors may have the greatest influence on adjustment of children following a burn (LeDoux, Meyer, Blakeney, & Herndon, 1998). While this relationship has been previously demonstrated in samples with predominantly moderate to large burns (e.g. Fukunishi, 1998; Hall et al., 2006), the current study extends these findings by providing support for this relationship in a sample with a relatively small mean TBSA. Although the correlation found between parent and child PTSS was strong, the current study design did not allow identification of the causal direction of this relationship. Past studies have suggested both that parent symptoms of ASD serve as a pathway for the development of child ASD symptoms (Stoddard et al., 2006) and that child PTSD symptoms serve as a pathway for adult symptoms (Hall et al., 2006). Further investigation of these complex interactions is necessary and would be helpful in the development of interventions to treat PTSS from a family systems perspective.
Age of child at burn and parental stress symptoms were also found to be related. Specifically, greater parental PTSS were associated with younger age of child at time of burn. One explanation for this relationship is that younger children require greater supervision, and therefore parents may feel greater responsibility for injury to very young children. Epidemiological research has identified actions of caregivers as primarily responsible for injuries in infancy (Pickett, Streight, Simpson, & Brison, 2003) but as children age they begin to participate in more self-initiated activity and play a greater role in their risk for injury (Flavin, Dostaler, Simpson, Brison, & Pickett, 2006). In young children, adult supervision plays a critical role in injury prevention (Morrongiello, Ondejko, & Littlejohn, 2004). Likewise, young children may be more likely to experience a burn due to parental behavior (e.g. mother leaving hot stove on) in comparison to their own behavior (e.g. child turns on stove). As a result, parents may feel greater guilt or responsibility for injury in infant or toddler children. Prior research suggests that parental guilt does play a role in the development of PTSS following a child’s burn injury (Bakker et al., 2010), and it may be by this mechanism that younger child age at burn is associated with greater parent PTSS.

A relationship was also found between the family demographic variable of mental health history and parent and child PTSS. Both parent and child PTSS were found to be strongly and positive correlated with a composite family history of mental illness variable, assessing history of a variety of mental illnesses. This variable was the sum of different mental diagnoses experienced by members of the child’s family. For example, if
a child had a family member with bipolar disorder, a family member with an anxiety disorder, and a family member with depression, the child’s family mental health history value would be 3. Frequency of each diagnosis, level of impairment, or confirmation of diagnosis were not included in the computation of this variable. This is a limitation in that children with similar mental health history composite scores may have significant variation in their family mental health history, and such an approach to computing a family mental health variable has not been used or supported in prior research. The relationship between PTSS and family history of mental illness suggests a predisposition or risk for the development of poor mental health functioning may play a role in the development of PTSS post-burn.

Family history of mental illness was also found to be correlated with parental level of dispositional optimism. Specifically, lower levels of optimism were associated with greater numbers of mental diagnoses in family history. However, a limitation of the demographics form used in data collection makes this relationship difficult to interpret. Participants were asked about the child’s family mental health broadly, meaning parents did not report on their own mental health history, specifically. For example, a participant would select borderline personality disorder if anyone in the child’s family had the disorder but no information was asked about the parent’s own mental health. Therefore, it is uncertain whether it was the parent’s own mental health history that was associated with their levels of optimism, or whether genetic predispositions or modeling of patterns displayed in other family members led to this correlation. Optimism has been
demonstrated to be a resiliency factor for psychological health (Scheier et al., 2001), and therefore this association may be the result of the fact that individuals high in optimism may be less likely to suffer a mental illness. However, it is not clear whether individual parental mental health history explains a large variation in the family mental health history variable.

Dispositional optimism was found to be positively correlated with family income and parental level of education. This finding is consistent with prior research. A strong connection between optimism and socioeconomic status has been supported in previous studies (e.g. Heinonen et al., 2006). Both optimism and pessimism have been found to be associated with current socio-economic status (SES) variables, such as income and education, as well as past SES as a child (Heinonen et al., 2006).

No relationships were present between situational optimism and demographic variables or parent or child PTSS. While research studies investigating the relationships between dispositional optimism and psychological adjustment abound, fewer studies have examined the influence of situational optimism on mental health, and in particular PTSS. As with situational optimism, dispositional optimism was also not correlated with child or parent PTSS. Speculation and consideration of these findings will be discussed later in this paper in the context of the multiple regressions performed to predict parent and child PTSS.

Several associations that should be expected between demographic and medical variables were also found. For example, number of days spent inpatient was significantly
related to the child’s TBSA. Further, older parental age was associated with higher income and greater educational obtainment, and parent education and family income were positively correlated. However, medical variables, such as number of days inpatient or TBSA, were not found to have an impact on parent or child PTSS. Previous investigations of parent PTSS have shown size of burn to be the greatest predictor of symptoms (e.g. Rizzone et al., 1994), yet the current study contradicts these findings. The relatively small burns seen at the outpatient clinic where data collection occurred may have been responsible for this variation in findings. The average TBSA for the study sample was 4.77%, with 50% of the sample experiencing burns equal to or less than 1% TBSA. Although size of burn and PTSS may be related in some samples, this relationship may only exist once burns have reached a medium to moderate size. Regarding adjustment of children post-burn, previous findings on the influence of medical variables have been mixed and inconclusive (e.g. Noronha & Faust, 2007; Tyack & Ziviani, 2003). The current study supports the idea that medical variables do not influence PTSS post-burn, at least in samples with relatively small burns.

A comparison between the burn and abrasion subgroups of the sample was also conducted, with several significant differences apparent between groups. These findings are particularly interesting given the fact that both populations are typically treated in the same clinic. Therefore, it is important that professionals working in these clinics are aware of the similarities and differences in working with each of these populations. Between group differences were found for TBSA, child age at burn, and parent level of
education. Future studies should investigate how parent education may impact a child’s risk of experiencing a burn or abrasion injury. The burn and abrasion subgroups were also compared on PTSS. Parents of children experiencing burns exhibited greater symptoms of reexperiencing than parents of children with abrasions. However, other parental PTSS were similar across groups. Children experiencing burns were more likely than those with abrasions to experience immediate response symptoms but were similar on all other PTSS. These findings suggest that on most facets, children experiencing abrasions are at risk for PTSS at rates comparable to burn patients.

**Parent and Child Posttraumatic Stress Symptoms**

It was hypothesized that parental dispositional and situational optimism would serve as predictors of parent and child PTSS. When investigating optimism as a predictor of parent symptoms, the child’s family history of mental illness, parent level of education, TBSA, and the child’s age when the burn occurred were controlled. Study analyses using optimism as a predictor of child symptoms controlled for family history of mental illness, parent education, TBSA, and PTSS experienced by the parent. Contrary to hypotheses, dispositional optimism was only found to be a significant predictor of child avoidance symptoms. It was not a predictor of any parent symptoms or of child symptoms of immediate response, reexperiencing, numbing and dissociation, increased arousal, impairment in functioning, or total symptoms. Situational optimism was also not found to be a predictor of any parent or child PTSS.
The function of optimism as a resiliency factor has been well validated in the literature, including with parents of children experiencing a medical event (e.g. Fotiadou et al., 2007; McIntosh et al., 2004). Prior studies have also suggested parental optimism and positive views towards child illness or injury can impact adjustment of the child as well (Bryne et al., 1986; Sanger et al., 1991). This leaves question as to why optimism did not predict less parent and child symptoms in the current study sample. One potential explanation is that injury-specific variables may influence optimism’s ability to serve as a resiliency factor. While an optimistic attitude may be advantageous for some pediatric medical populations, it may not be beneficial for all. Much of the research on optimism and parent or child adjustment following a medical event has been conducted on the cancer population (e.g. Fotiadou et al., 2007; Sanger et al., 1991), and such findings have not been investigated in a burn population, specifically. Perhaps, findings with families experiencing cancer are not generalizable to children experiencing burns. The idea that adjustment to a medical event may be injury specific has been demonstrated by Wade and colleagues (2001). Their research found that the effectiveness of coping strategies used by parents was dependent on the type of injury experienced by their child. In a similar vein, strategies that aid appropriate adjustment following certain types of childhood injuries may not be effective for coping with a burn injury.

One difference with parents adjusting to their child experiencing a burn injury in comparison to other medical conditions is that parent’s may be able to identify a direct responsibility for the event and may feel guilt for their child’s injury. Although feelings
of guilt and responsibility are also seen in parents of children with many chronic illnesses, such a direct link between one particular event and the medical outcome is more characteristic of injuries than chronic illness. Guilt has been demonstrated to be a factor in the development of PTSS in parents of pediatric burn patients (Bakker et al., 2010), and an investigation of the potential interplay or interaction between guilt and optimism in adjustment post-burn should be a goal for further study. Interestingly although optimism did not appear to be a resiliency factor for pediatric burn patients or their parents in the current study, the impact of optimism on adjustment of adult burn survivors has been demonstrated (Fauerbach et al., 1999). Further investigation regarding why optimism may lead to better adjustment in adults experiencing the burn themselves but not for parents of pediatric burn patients is necessary.

Another potential explanation for the unexpected finding that optimism was not a predictor of PTSS is that the sample experienced relatively low levels of PTSS. If many of the parents and children in the sample did not experience initial distress or were not at risk for the development of PTSS, there may have been little opportunity for optimism to serve as a resiliency factor. This idea is supported by the fact that the majority of parents and children in the study, both those optimistic and pessimistic, showed little maladjustment. Therefore, no effect for optimism may have been found because even pessimistic parents and children were able to adjust quite well.

As size of burn has been suggested to play a role in PTSS in both parents and children post-burn (Baker et. al, 1996; Rizzone et al., 1994), the relatively small burn size
of the current study sample may have been responsible for the generally good adjustment of the sample, with less than 5% of the adult sample meeting cutoff scores for PTSS. Source of burn may also be influential on symptoms. Some sources of burn, such as flame, may be interpreted by parents or children as more life-threatening or threatening to well-being, making individuals more susceptible to PTSS. For example, burns resulting from house fires or automobile accidents may be more likely to be perceived as an immediate threat and may lead to greater feelings of arousal. The majority of children in the current study experienced either scald or contact burns, and therefore parents and children may have been less likely to experience PTSS. Investigation regarding the influence of the source of burn on PTSS is warranted.

In addition, some children in this study (36%) were not hospitalized for their burn injury, and therefore may have had less traumatic experiences. Further, newer burn-care techniques and treatments, such as use of silver-impregnated antimicrobial dressings or absorbent dressings, were used with some participants. Some of these treatments, such as AQUACEL®, are reportedly less traumatic or painful, which may have also impacted development of PTSS (e.g. Caruso et al., 2006; Kogan, Moldavsky, Szvalb, & Govrin-Yehudain, 2004). Such topical treatments may also make the experience less traumatic because they shorten the length of hospitalization required for pediatric burn patients (Paddock, Fabia, Giles, Hayes, Lowell, & Besner, 2007) and often require the patient to endure fewer debridement treatments. Lastly as mentioned previously, younger children tend to experience better psychological outcomes post-burn (Tyack & Ziviani, 2003).
Given the current study population was less than 6 years of age, they may have been more resilient to the development of PTSS.

Regarding situational optimism, optimism may not have been found to predict distress symptoms due to inadequacy of the measure assessing situational optimism. This measure was created solely for the current study and had not been validated. Although the format of questions was modeled after the well validated LOT-R measurement of dispositional optimism (Scheier et al., 1994), content and phrasing of the items was based solely on theoretical knowledge. Concerns regarding the validity of this measure stem from the weak correlations found between situational optimism and dispositional optimism \((r = -0.051, p = 0.737)\). Previous work with situational and dispositional optimism has shown the two constructs are only moderately correlated but this correlation tends to be greater than that found in the current study (e.g. Segerstrom, Taylor, Kemeny, & Fahey, 1998; Taylor et al., 1992). Further, the internal consistency of this measure was very poor, leading to further question about the validity of this measure. Perhaps the situational optimism measure did not significantly predict PTSS because it was not truly assessing the construct of situational optimism.

Lastly, regarding the influence of parental optimism on child symptoms, although prior research has validated a connection between optimism and one’s own adjustment, optimism by proxy (i.e. the influence of parental optimism on child functioning) has not been well validated. Although there is some support for optimism by proxy as a resiliency factor (e.g. Sanger et al., 1991), this connection has not been investigated to an
extent that suggests our findings are necessarily contradictory. Perhaps, additional factors about both parents and children (e.g. interaction style), as well as the situation (e.g. control over outcomes), may play a role in the influence of optimism by proxy, and a connection between parental optimism and child symptoms may not be present in a burn population.

Although situational and dispositional optimism were not predictors of most parent and child PTSS, parental dispositional optimism was found to be a predictor of child avoidance symptoms. Due to the eligibility requirements of the study, some participants reported acute stress symptoms, while others reported posttraumatic stress symptoms. When each of these groups was examined separately, parent level of optimism was found to be a significant predictor only for the group at least 31 days post-burn and experiencing posttraumatic symptoms. Although the relationship approached significance for the acute stress group, it did not reach significance as a predictor. Interestingly contrary to hypotheses, greater optimism was associated with greater symptoms of avoidance. Although a small amount of research has suggested in certain situations optimism may lead to more negative outcomes, this has typically been around the idea that expecting positive outcomes may lead people to overestimate their abilities or ignore potential threats (Scheier et al., 2001). However, the majority of research does not support these conclusions (Scheier et al., 2001). Further, there is no theoretical basis for why overestimating one’s abilities may lead to greater avoidance symptoms in this context.
The young age of the children in this study may play a role in the association between optimism and greater avoidance. Due to their stage of cognitive development, many of the young children in the study do not have the ability to understand the context of their burn injury and that outcomes in similar situations may vary. Without this understanding, avoiding settings and people associated with the burn event may actually be an adaptive response by very young children. However, prior use of the *Child Stress Disorders Checklist* to assess symptoms in young pediatric burn patients has not displayed a pattern of greater avoidance symptoms (Stoddard et al., 2009). Another potential explanation for this finding is bias in reporting of optimistic parents. Perhaps in attempts to positively reframe the situation and provide meaning to the injury, optimistic parents may view their children as having learned from the injury event, and specifically learned to avoid potentially dangerous situations similar to where the burn occurred. Optimistic parents may therefore perceive their child as avoiding stimuli associated with the burn event. Given the uncertainty of this finding and its contradiction with study hypotheses, replication of the association between parental optimism and greater child avoidance symptoms is necessary in future research.

**Parent Coping Styles**

As hypothesized, relationships were found between several coping styles and dispositional and situational optimism. Greater parental dispositional optimism was associated with less use of self-distraction and behavioral disengagement for coping with
the burn injury. Dispositional optimism was also found to be inversely related to use of avoidance techniques. Further, greater parental situational optimism was associated with more frequent use of positive reframing. These findings are consistent with previous findings that optimism is associated with less use of avoidant coping strategies (e.g. Aspinwall et al., 2001) and greater use of positive reframing (e.g. Scheier et al., 2001).

Unexpected results were found when examining correlations between parental use of the different coping styles and parent and child PTSS. Rather than some coping styles appearing to be adaptive and others maladaptive, only positive correlations were found between use of coping styles and PTSS, with the exception of one second order coping style factor. This suggests that the use of more coping strategies in general, regardless of the particular strategy, was associated with poorer adjustment, both for the parent and child. More frequent use of 8 of the 14 individual coping styles assessed were found be positively correlated with parent PTSS. Greater use of active coping, planning, acceptance, self-distraction, denial, venting, behavior disengagement, and self blame were all associated with either greater total PTSS or greater PTSS on at least one of the symptoms subscales. The coping style factors of using cognitive techniques and using avoidance strategies were also associated with greater PTSS. Similarly, more frequent parental use of 7 of the 14 individual coping strategies was associated with greater child PTSS. Greater parental use of acceptance, humor, instrumental support, self-distraction, venting, behavior disengagement, and self-blame as measured by the individual coping strategy subscales were associated with greater PTSS in their children. Greater use of
cognitive techniques for coping by parents was also associated with greater child symptoms. These findings are contrary to expectations that some coping strategies would be adaptive. For example, it had not been believed that planning and positive reframing would be associated with greater PTSS.

Prior research has found that various coping strategies are associated with varied adjustment post-burn in samples of adult burn patients (e.g. Fauerbach, Lawrence, Bryant, & Smith, 2002). For example, use of the combination of venting emotions and mental disengagement was found to be associated with greater body dissatisfaction (Fauerbach, Heinberg, Lawrence, Bryant, Richter, & Spence, 2002), greater symptoms of depression and lower quality of life (Fauerbach, Lawrence et al., 2002), and greater PTSS (Fauerbach, Richter, & Lawrence, 2002). Emotion focused coping, avoidance coping strategies, and helplessness have also been linked to greater PTSS (Kildal, 2003; Tedstone, Tarrier, & Faragher, 1998). However, use of other coping styles, such as acceptance, has been associated with better adjustment post-burn. Acceptance as a coping strategy has been linked to lower levels of anxiety and PTSD (Tedstone et al., 1998) and use of emotional support has been associated with better adjustment (Kildal, 2003).

However, the current study findings were contradictory to this notion that some coping strategies are adaptive and lead to better outcomes, while others are maladaptive. The large magnitude of the correlations between the Brief COPE and PTSS (as high as .715 between venting as a coping strategy and total parent PTSS) and the fact that high scores on most subscales were associated with greater PTSS may lead to initial doubt
whether the Brief COPE is a valid measure of coping. However given the strong amount of validation and frequent use of the Brief COPE in prior research, speculation about the validity of the measure seems unwarranted. Past studies have used the Brief COPE when investigating the influence of coping strategies on symptoms of PTS, and these study findings have not brought to question the validity of the use of the Brief COPE for these purposes (e.g. Greening & Stoppelbein, 2007; Ribi, Vollrath, Sennhauser, Gnehm, & Landolt, 2007).

A potential explanation for the contradictory finding that more frequent use of any coping strategy was associated with greater PTSS is that participants experiencing more distress attempted more efforts at coping to meet the increased demands imposed by their distress symptoms. Participants who did not view the event as highly traumatic or did not experience distress post-burn may have only needed to make minimal attempts at coping. Therefore even frequent use of the more adaptive coping methods (e.g. acceptance) may have only been required in instances where the parent was experiencing greater PTSS.

Coping responses result from a person’s perception or appraisal of the situation, and coping efforts are only used in response to situations evaluated as stressful (Brown, Shiang, & Bongar, 2003). Therefore, even individuals experiencing similar situations may exhibit differences in coping patterns based on their perception of the situation. Consistent with this definition, parents that did not view the burn as distressing and who did not experience stress post-burn would not have responded with a coping strategy. Given the strong positive correlation between parent and child PTSS, those parents
needing to use more coping strategies were also more likely to have children experiencing numerous PTSS, possibly leading to the connection between greater parent use of coping strategies and greater child PTSS.

The one exception to the finding that greater use of the majority of coping styles was related to greater PTSS was the second order factor of comfort seeking. Greater use of comfort seeking strategies was associated with lower parent hyperarousal symptoms, lower total parent PTSS, lower child increased arousal, and lower child immediate response symptoms. This coping style factor consisted of the items: “I’ve been looking for something good in what is happening,” “I’ve been trying to get advice or help from other people about what to do,” and “I’ve been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.” Interestingly, this factor contained items from the positive reframing, instrumental support, and self-distraction subscales, which were each found to be positively correlated with at least one facet of parent or child PTSS. Therefore, future studies should further investigate the connection between coping styles and PTSS in this population through use of other measures of coping and with greater attention to the influence of individual actions and tactics.

Limitations and Future Directions

There were several limitations to the current study. Although one unique benefit of this study was that it assessed PTSS in young children under 6, who represent the
largest group of pediatric burn patients (Centers for Disease Control and Prevention, 2008), this also presented a situation where information about child adjustment could not be obtained through self-report. For this study, both parent and child PTSS were assessed by report from one parent. Parents own adjustment post-burn, PTSS, or levels of optimism and pessimism may have impacted their report and perception of their child’s adjustment. Therefore, the correlations found between parent and child PTSS may have been inflated by parent reporting or perception biases. Future studies investigating the relationship between parent and child adjustment should look for alternatives to parent report for assessing adjustment in children too young to provide information themselves. For example, direct assessment of childhood behavior by trained researchers may provide a more objective measurement of child symptoms and functioning. The involvement of medical personnel, such as occupational therapists or pediatric nurses, in future research may also provide the opportunity to assess functioning of preverbal children independent of parent report.

The use of a non-validated measure of situational optimism was also a major limitation of the study and potentially renders analyses regarding situational optimism invalid and their interpretation should be taken with caution. Perhaps inadequacies of this measure were responsible for the unexpected finding that situational optimism did not predict PTSS. Concerns regarding the validity of this measure stem from a poor internal consistency of the measure, as well as unexpectedly low correlations between dispositional and situational optimism.
Other study limitations involve the sample used for this study. Although the sample size of this research project is adequate, given the population and high response rate (88% of parents approached completed study measures), the sample size was not large enough to provide the statistical power necessary to investigate more potential predictors of PTSS in both parents and their children. Therefore, the number of variables that could be entered or controlled for in the multiple regressions performed was limited. However, given the small portion of variance in outcome measures explained by the predictors of dispositional and situational optimism, it is unlikely statistical significance would have been obtained even with a larger study sample. For example, as a predictor of total parental PTSS, $R^2$ for dispositional optimism was only .009.

Also regarding the study sample, although participants were ethnically diverse, several families ($n = 7$) who presented at clinic but were not eligible for study participation because they were not fluent in English, and therefore could not complete study measures, even though they met all other study criteria. Although initial barriers are present for including such families in research studies (e.g. requirement of interpreters, creating multiple language versions of forms), it is important that future studies investigate the adjustment and needs of these families. Language barriers may create unique needs for these families that may impact adjustment or development of PTSS. Further, cultural differences, such as differences in expressing feelings of stress or differences in feelings of guilt, may also impact the development of PTSS. Therefore, future studies should seek to eliminate language barriers to study participation.
Another limitation of the sample is the limited number of father participants \( (n = 10) \). The lack of father involvement in pediatric research has been identified as problematic in the field (Phares, Lopez, Fields, Kamboukos & Duhig, 2005). In the current study, children were more frequently accompanied to their burn clinic appointments by their mothers, and therefore a smaller number of fathers were available for recruitment. Due to the small number of fathers in the sample, differences in paternal and maternal PTSS or specific paternal or maternal effects could not be assessed. This limitation is of concern because research has suggested fathers of pediatric burn patients may experience less PTSS and that maternal and paternal symptoms may be influenced by different factors (Boot, 2009).

Lastly, as previously mentioned, a limitation was present in the collection of information about family mental health history. Information was collected about composite mental health for all of the child’s family members. Parents did not report on their own mental health history, specifically. Family mental health was shown to be highly correlated with several outcome measures and used as a control variable in data analyses. Given parents served as reporters in the current study and information about their PTSS was analyzed, knowledge of their own mental health history would have been valuable and allowed investigation of the potential relationship between parent’s own mental health history and their development of PTSS. Further, given the correlation between parent and child PTSS and the known influence of family functioning on child adjustment post-burn (Kaslow et al., 1994), it is hypothesized that parental mental health
history, specifically, would be influential on the development of child PTSS. Similarly, information regarding whether parents or children had received mental health services to address adjustment following the burn was not obtained. Receiving such services may have influenced the ways in which parents coped or minimized trauma symptoms.

In addition to the recommendations previously mentioned, it is suggested that future research investigate optimism as a predictor of adjustment in children experiencing larger burns and their parents. The sample in the current study experienced relatively small burns in comparison to those samples used in other research on pediatric burn survivors. This is a limitation in generalizing information from the current study to other burn populations. Further, it may be due to this limitation that expected findings regarding optimism were not obtained and that relationships between outcomes and burn size were not found. However, some research has suggested burn variables (e.g. size of burn) do not predict outcomes (Tyack & Ziviani, 2003). Current study findings should be replicated or examined in populations with a greater TBSA. Such studies could shed light on whether factors specific to burn injuries caused optimism to not be a predictor of better functioning or whether this relationship in the current study resulted due to the low rates of PTSS in the sample. Further, studies should also look at how situational factors related to the burn experience itself (e.g. source, caregiver presence) may relate to parental optimism and the development of PTSS.

Despite these limitations, current study findings contribute to the field by providing information regarding children experiencing relatively small burns, as well as
their parents. The average TBSA of the sample was 4.77% and 50% of the sample experienced burns equal to or less than 1% TBSA. Prior research on this population has been lacking, as the majority of research on pediatric burn patients has involved children with moderate to large burns. Findings regarding parental coping style suggest that parents employ numerous coping styles even in response to small burns, despite that these coping responses may not necessarily be effective. This suggests clinically that parents may benefit from information regarding effective and adaptive coping. Further, the relationship demonstrated between parent and child PTSS and the influence of parental coping on child adjustment provides support for the use of a family systems approach to interventions promoting recovery following a pediatric burn.
References


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with severe burn injuries. *Psychological Reports, 83*, 331-335.


life is impaired in pediatric burn survivors with posttraumatic stress disorder. 

*Journal of Pediatric Psychology, 34, 14-21.*


Appendix A

Life Orientation Test- Revised and Situational Optimism Measure
LOT-R/Situational Optimism Measure

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

0 = Strongly disagree
1= Disagree
2= Neutral
3= Agree
4= Strongly agree

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax.
3. If something can go wrong for me, it will.
4. I'm always optimistic about my future.
5. I enjoy my friends a lot.
6. It's important for me to keep busy.
7. I hardly ever expect things to go my way.
8. I don't get upset too easily.
9. I rarely count on good things happening to me.
10. Overall, I expect more good things to happen to me than bad.

Now, thinking about your child’s burn injury, answer the following 5 questions.

0 = Strongly disagree
1= Disagree
2= Neutral
3= Agree
4= Strongly agree

1. My child will be able to grow up just like other kids, enough with their burn injury.
2. My family will be able to be just like other families, enough with my child’s burn injury.
3. Even after treatment, my child will not be able to do the same physical activities most children can do.
4. After treatment, my child will not experience any emotional or behavioral problems because of their burn injury.
5. Because of my child’s injury, my child will not be treated the same as other kids by his or her friends.
Appendix B

Brief COPE
Brief COPE

These items deal with ways you've been coping with the stress in your life since your child’s burn injury. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real.".
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.
25. I've been thinking hard about what steps to take.
26. I’ve been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.
Appendix C

PTSD Checklist Stressor Specific Version
PTSD Checklist Stressor Specific Version (PCL-S)

Name: ________________________________________________

The event you experienced was: ______________________on:___________

Instruction to patient: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, put an “X” in the box to indicate how much you have been bothered by that problem in the last month.

<table>
<thead>
<tr>
<th>No.</th>
<th>Response:</th>
<th>Not at all (1)</th>
<th>A little bit (2)</th>
<th>Moderately (3)</th>
<th>Quite a bit (4)</th>
<th>Extremely (5)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Repeated, disturbing memories, thoughts, or images of the stressful experience from the past?</td>
<td></td>
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<td>2.</td>
<td>Repeated, disturbing dreams of the stressful experience?</td>
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<td>3.</td>
<td>Suddenly acting or feeling as if the stressful experience were happening again (as if you were reliving it)?</td>
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<td>4.</td>
<td>Feeling very upset when something reminded you of the stressful experience from the past?</td>
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<td>5.</td>
<td>Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of the stressful experience from the past?</td>
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<td>6.</td>
<td>Avoid thinking about or talking about the stressful experience from the past or avoid having feelings related to it?</td>
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<td>7.</td>
<td>Avoid activities or situations because they remind you of the stressful experience from the past?</td>
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<tr>
<td>No.</td>
<td>Response:</td>
<td>Not at all (1)</td>
<td>A little bit (2)</td>
<td>Moderately (3)</td>
<td>Quite a bit (4)</td>
<td>Extremely (5)</td>
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<td>8.</td>
<td>Trouble remembering important parts of the stressful experience from the past?</td>
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<td>9.</td>
<td>Loss of interest in things that you used to enjoy?</td>
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<td>10.</td>
<td>Feeling distant or cut off from other people?</td>
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<td>11.</td>
<td>Feeling emotionally numb or being unable to have loving feelings for those close to you?</td>
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<td>12.</td>
<td>Feeling as if your future will somehow be cut short?</td>
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<td>13.</td>
<td>Trouble falling or staying asleep?</td>
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<td>14.</td>
<td>Feeling irritable or having angry outbursts?</td>
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<td>15.</td>
<td>Having difficulty concentrating?</td>
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<td>16.</td>
<td>Being “super alert” or watchful on guard?</td>
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<td>17.</td>
<td>Feeling jumpy or easily startled?</td>
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Appendix D

Child Stress Disorder Checklist
Directions: Below is a list of feelings or behaviors that children sometimes have immediately after a frightening event (or after he or she regained consciousness from such an event). For each item that describes your child immediately after the event, please circle 2 if the item is VERY TRUE of your child. Circle 1 if the item is SOMEWHAT TRUE of your child. If the item is NOT TRUE of your child, circle 0. Please answer all items as well as you can even if some do not seem to apply to your child. For children who have experienced more than one event, choose the event that was most distressing to him or her.

0 = Not True (as far as you know) 1 = Somewhat True 2 = Very True

0 1 2 1) Child felt terrified (extreme anxiety or fear).
0 1 2 2) Child felt horrified (extreme feelings of revulsion, disgust, or shame).
0 1 2 3) Child felt helpless.
0 1 2 4) Child’s behavior became agitated. For example, his or her behavior became hyperactive, impulsive, or difficult to control.
0 1 2 5) Child’s behavior became disorganized. For example, his or her behavior became very different than is usual, his or her behavior did not make sense.
Directions: Below is a list of behaviors that describe children. For each item that describes your child NOW or WITHIN THE PAST MONTH, please circle 2 if the item is VERY TRUE or OFTEN TRUE of your child. Circle 1 if the item is SOMETHING or SOMETIMES TRUE of your child. If the item is NOT TRUE of your child, circle 0. Please answer all items as well as you can even if some do not seem to apply to your child. The term “event” refers to the most stressful experience that you have described above.

0 = Not True (as far as you know) 1 = Somewhat or Sometimes True 2 = Very True or Often True

0 1 2 1) Child reports uncomfortable memories of the event.
0 1 2 2) Child startles easily. For example, he or she jumps when hears sudden or loud noises.
0 1 2 3) Child gets very upset if reminded of the event.
0 1 2 4) Child seems numb or distant from his or her feelings.
0 1 2 5) Child avoids doing things that remind him or her of the event.
0 1 2 6) Child seems irritable or angry.
0 1 2 7) Child has difficulty remembering details about the event.
0 1 2 8) Child has difficulty falling asleep or staying asleep.
0 1 2 9) Child seems detached or distant from other people.
0 1 2 10) Child has difficulty getting along with friends, schoolmates or teachers.
0 1 2 11) Child does things that he or she outgrew. For example, thumb sucking, bedwetting, nail biting, or requests to sleep with parents.
0 1 2 12) Child reports feeling as if the event were happening again.
0 1 2 13) Child is restless and doesn’t sit still.
0 1 2 14) Child avoids places that remind him or her of the event.
0 1 2 15) Child has difficulty getting along with family members.
0 1 2 16) Child appears confused about things that he or she should know.
0 1 2 17) Child seems “on edge” or nervous.
0 1 2 18) Child seems “spaced out” or in a daze.
0 1 2 19) Child acts as if the event were happening again.
0 1 2 20) Child has trouble keeping track of time. He or she may become confused about the time of day, the day of the week, or when something really happened.
0 1 2 21) Child avoids talking about the event.
0 1 2 22) Child reports bad dreams.
0 1 2 23) Child reports more physical complaints when reminded of the event. For example, headaches, stomach aches, nausea, difficulty breathing.
0 1 2 24) Child has difficulty performing activities such as schoolwork or chores.
0 1 2 25) Child plays about the event (child expresses what happened to him or her with toys, games, drawings, or other fantasy-play).
0 1 2 26) Child appears slowed down. It takes him or her a long time to respond to things.
0 1 2 27) Child reports that his or her environment seems different than it used to. For example, he or she may report that things look or sound different.
0 1 2 28) Child avoids people who remind him or her of the event.
0 1 2 29) Child has trouble concentrating
0 1 2 30) Child reports that he or she does not want to think about the event.
Appendix E

Demographics Form
Demographic Form
Child Information- Please complete this information about your child who has suffered a burn:

My child is a:
- [ ] Female
- [ ] Male

Child’s Birthday (month/day/year) __________

Ethnicity
- [ ] Caucasian
- [ ] African-American
- [ ] Asian
- [ ] Hispanic
- [ ] American Indian
- [ ] Other ____________

Does your child experience another physical health concern?:
- [ ] Yes
- [ ] No

If Yes, what condition:
- [ ] Asthma
- [ ] Diabetes
- [ ] Arthritis
- [ ] Seizure Disorder
- [ ] Cancer
- [ ] Other ____________

Does your child experience a mental health or behavior-related concern?:
- [ ] ADHD
- [ ] Depression
- [ ] Anxiety
- [ ] PTSD
- [ ] Aspergers
- [ ] Mental Retardation
- [ ] Other ________________________________________

Injury-related Information

Date of child’s burn injury (month/day/year) _______________________

Where did injury occur:
- [ ] Home
- [ ] Car
- [ ] Childcare
- [ ] Home of Family or Friends
- [ ] Other _________________________

Was anyone else injured at the time of the accident?
- [ ] Yes
- [ ] No

If yes, what relationship do they have to child? ____________________________

Who was with the child at the time of injury?
- [ ] Child’s Friends
- [ ] Family Members
- [ ] Other ____________

Please list those present at the time of injury (e.g. child’s mother, child’s friend, etc.)
________________________________________________________________________

Was your child hospitalized for their burn injury?
- [ ] Yes
- [ ] No

If yes, how long was your child hospitalized? ____________________________

During this time, how many times per day (on average) did your child receive burn dressing changes? _____ (Mark 0 if no dressing changes).

At home, did your child require burn dressing changes?
- [ ] Yes
- [ ] No

If yes, how many? _______
Parent and Family Information

Your gender
  □ Female           □ Male

Your date of birth (month/day/year) ______________________

Your Ethnicity:
  □ Caucasian        □ African-American   □ Asian
  □ Hispanic         □ American Indian    □ Other ____________

Your relationship to the child:
  □ Mother           □ Father            □ Step-parent
  □ Grandparent      □ Aunt/Uncle        □ Other ____________

Your Marital Status:
  □ Single           □ Married           □ Separated/Divorced
  □ Widowed

Do you or anyone in your family experience a mental health or behavior-related concern?:
  □ Depression       □ Anxiety            □ PTSD
  □ Mental Handicap  □ Bipolar            □ Borderline Personality Disorder
  □ Other ________________

Annual Family Income (include all financial resources: work income, child support, government assistance) ____________

How far (in miles) is your home from Nationwide Children’s Hospital? ____________

Who lives at home with the child?

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<tr>
<th>Relationship</th>
<th>Gender</th>
<th>Age</th>
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Mom’s Highest Level of Education:
  □ Some High School □ Some College □ Graduate School
  □ High School Degree □ College Degree □ Other ____________

Dad’s Highest Level of Education:
  □ Some High School □ Some College □ Graduate School
  □ High School Degree □ College Degree □ Other ____________
Appendix F

Burn Injury Information Form
Burn Injury Information Form

Medical Records Chart Information

Subject ID: _______________    Date of collection: _______________

Date of injury: _____________

Date of discharge: ___________

Is this an abrasion injury?    YES     NO

Source of burn: _______________

Location of burn:
   Face    YES    NO
   Hands   YES    NO
   Joints  YES    NO

Inhalation injury:   YES     NO

Total body surface area: _______

Total number of surgeries: _____________
   Debridement _____________
   Contractures _____________
   Grafting _____________

Type of treatment (Circle one)
   Silvadine  Aquacel  Bacitran  Glucan  Other _______________