Coping and Post-Traumatic Stress in Male Firefighters

Crystal A. Martin

B.Sc., University of Northern British Columbia, 2005

Thesis Submitted in Partial Fulfillment of

The Requirements for the Degree of

Master of Arts

in

Disability Management

The University of Northern British Columbia

April 2009

Canada

Abstract

The purpose of this study was to determine whether emotional intelligence and proactive coping had an effect on firefighters' susceptibility to developing post-traumatic stress. This study compared data from an existing sample of 94 firefighters. Data was split by subscale for the *Impact of Events Scale - Revised* questionnaire, and was analyzed using regression. The results indicated that firefighters higher in emotional intelligence experienced greater symptoms of avoidance than firefighters lower in emotional intelligence. Additionally, the data supported the hypothesis that firefighters who were higher in proactive coping would experience less anxiety. However, results of the study indicated that emotional intelligence did not influence symptoms of hyperarousal, intrusions, or anxiety, and proactive coping does not predict avoidance, hyperarousal, or intrusions.

TABLE OF CONTENTS

List of Appendixes

List of Tables

Coping and Post-Traumatic Stress in Firefighters

Introduction

There is a vast amount of literature investigating how Post-Traumatic Stress Disorder

(PTSD) affects firefighters and other emergency service personnel, and whether or not

intervention strategies such as Critical Incident Stress Debriefing (CISD) are effective in

preventing the onset of PTSD symptoms (e.g., Hokanson & Wirth, 2000; Miller, 1999;

Mitchell & Everly, 1995). However, little research has been conducted over the last 35 years

(Nurmi, 1999) that investigates the role that cumulative stress (Moran & Colless, 1995) plays

in the development of PTSD. Even less research has been conducted on coping factors such

as emotional intelligence, proactive coping, and their relationship to PTSD. Consequently,

this study will investigate the various aspects of coping, such as emotional intelligence and

proactive coping, which may affect a firefighter's level of susceptibility to developing PTSD.

In addition, this paper will provide a review of the current literature describing stress, coping,

and the nature, causes, risk factors, and effect of PTSD on firefighters, and the types of

treatment available.

Post-Traumatic Stress Disorder

It is only within the last 10 years that researchers have started investigating the

possibility of industrial accidents and other work-related incidents as a cause of PTSD

(MacDonald, Colotla, Flamer, & Karlinsky, 2003). The majority of past research has been

narrowly focused on individuals who have experienced specific types of trauma such as

violent sexual assaults, military combat, and catastrophic natural disasters; whereas current

research investigating PTSD has focused on how emergency service personnel such as

1

firefighters, police officers and paramedics react to specific types of traumatic events, and the clinical manifestations of PTSD symptoms (MacDonald et al., 2003).

A traumatic event is an event in which a person has "experienced, witnessed, or was confronted with an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (DSM-IV-TR, 2000, p. 467) which was vastly outside the normal realm of human experience (Dougall, Hyman, Hayward, McFeeley, & Baum, 2001). It is important to note that this definition does not include experiences such as severe humiliation or disappointment (Brunello et al., 2004).

In current literature, traumatic events are also known as critical incidents (Nurmi, 1999). Unfortunately, there is some confusion as to the exact meaning of *critical incident*. According to Everly (1999) "the term critical incident is often confused with the word *crisis*" (p. 77) leading some individuals to believe that the critical incident is the crisis response. However, Everly (1999) suggests that the critical incident is best described as "the stimulus that sets the stage for the crisis response" (p. 77) rather than the crisis response itself.

Researchers vary in their opinion of when a stressor is severe enough to be an adequate cause of PTSD by itself, as some researchers believe that vulnerability also plays a factor in the development of this disorder (Weisæth, 1989). According to Weisæth (1989), this disagreement among researchers is fuelled by methodological limitations in past studies such as the use of retrospective designs, non-representative samples, and a lack of control groups.

One reason why emergency service workers may be more likely to develop PTSD than individuals in other professions is because their job is more likely to place them in situations where they are faced with distressing sounds, smells, or sights (Back, 1992). For

example, the occupational duties of firefighters will often require them to enter buildings with temperatures that exceed 1000°F, little oxygen, limited visibility, and a very real risk that dangerous gases may combust (Fannin & Dabbs, 2003).

Additionally, there are certain types of incidents that emergency service personnel find more distressing than others. The events most commonly described by firefighters as highly distressing include line-of-duty deaths, an accident with multiple casualties, a seriously injured member of the rescue team, an emergency worker's suicide, incidents involving the traumatic death or injury of a child, and a victim who is known to the firefighter (Mitchell & Everly, 1996). As well, media presentations can increase the negative effect that an incident has on emergency service personnel because they are brief, highly edited, and only the most violent and graphic aspects of an incident and the reactions it causes are broadcast to the public (Moran, 1998). Moran and Colless (1995) found that factors such as bells, shift work, and dealing with other organizations were often cited by firefighters as causes of stress; however, these factors were seldom considered by firefighters to be major sources of stress. Instead, like Mitchell and Everly (1996), Moran and Colless (1995) found that motor vehicle accidents, deaths, fires, incidents involving children, and burns were considered to be the most stressful aspects of firefighting. Additional stressful incidents often include factors such as inadequate police protection, attacks by crowds while providing medical care, an increased number of dispatches, an overwhelming number of injuries and fatalities (Wee, Mills, & Koehler, 1999), distraught relatives or bystanders, physically demanding or prolonged incidents, severe injuries such as deformations, and belief of failed responsibility (Boudreaux & McCabe, 2000). Finally, situations in which the emergency worker has had to fear for her or his personal safety (Clifford, 1992), witness

3

parental grief, or is blamed for the death or injury of a victim can also contribute to the development of PTSD (Back, 1992).

In order to be diagnosed with PTSD, the symptoms associated with this disorder must be present for a minimum of one month. The symptoms include recurring nightmares, intrusive images, physiological reactivity (i.e., uncontrollable shaking), and heart palpitations that can be triggered by events, smells, sights, and people that remind the affected individual of the traumatic event. Individuals suffering from PTSD often report feeling numb, and will attempt to avoid places, people, thoughts, and other activities that may trigger memories of the event. Other common symptoms include withdrawal from family members and friends, and a loss of interest in activities that he or she previously enjoyed. Moreover, these individuals may become irritable, experience difficulties concentrating, have trouble sleeping, and be easily startled (DSM-IV-TR, 2000).

The symptoms of PTSD can have a profound effect on one's ability to function efficiently, not only in her or his personal life, but also at work. However, despite years of research, it is still unclear exactly how PTSD symptoms and work outcomes are related (Smith, Schnurr, & Rosenheck, 2005). Past research suggests that the level of impairment that occurs within the workplace is dependent on the type of traumatic event that was experienced and whether the event is related to the workplace. If an event occurs within the work environment or is associated with one's work duties, then it is likely that the presentation of symptoms at work will be more severe (Bolton et al., 2004). However, regardless of whether or not a traumatic event occurs at the workplace, the affected individual's performance at work is likely to be severely diminished. Affected employees may appear to zone out, forget where they are, lose track of time, and appear unreliable, lazy,

unmotivated, and irresponsible (Bolton et al., 2004). Diminished work performance among firefighters is especially concerning since the profession of firefighting puts firefighters in a position where their actions can affect not only the lives of the people they are saving, but also the lives of their coworkers. Firefighting is undoubtedly a dangerous profession, and a reckless decision, lengthy bout of hesitation, or an ill-timed rescue attempt could place the lives of those around the affected firefighter in immediate and potentially life-threatening danger.

Interestingly, despite the dangers firefighters face while on duty, they still tend to underestimate their chances of being negatively affected (Moran & Colless, 1995). At the same time, current research suggests that individuals who are under a greater amount of stress and pressure at work are at a higher risk of developing PTSD, perhaps because these individuals are more likely to use maladaptive coping methods such as behavioral and mental disengagement, black humor, and venting of emotions. These maladaptive coping strategies may increase the individual's stress levels because they do little to actually reduce stress. A study by Haisch and Meyers (2004) which assessed the relationship between risk for PTSD, coping, job stress, and work assignment in a law enforcement sample, found that participants at a higher risk of developing PTSD were more likely to use drugs, alcohol, and denial to cope with stressful situations.

As well, individuals who have certain personality characteristics may be more vulnerable to developing PTSD. Haisch and Meyers (2004) found that firefighters who are introverted, disagreeable, irresponsible, and more neurotic are more likely to develop PTSD. Moreover, those individuals in Regehr et al.'s (2002) study who were suspicious, hostile, demanding, controlling, and manipulative were more likely to have taken a mental health

stress leave after being exposed to a traumatic event. In contrast, other researchers such as Moran and Britton (1994) have found that personality variables are not related to the likelihood of developing PTSD after experiencing a traumatic event. However, Moran and Britton (1994) suggest that the results of studies investigating the link between personality and PTSD could be influenced by various methodological factors, especially since the relationship between personality and PTSD is not straightforward. Obviously more research is needed regarding the extent to which personality characteristics contribute to one's susceptibility to developing PTSD (Regehr et al., 2002).

One factor that is thought to increase resilience to PTSD is social support (Haslam & Mallon, 2003). Corneil et al. (1999) found that those Canadian and American firefighters who had higher levels of social support from families and coworkers, and lower levels of work stress were less likely to develop PTSD. Additionally, the social support system between firefighters is unique because firefighters live with their supervisors and co-workers for considerable periods of time while on duty, and they can only leave the confines of the fire station when responding to a call. Therefore, as a result of the vast amount of time that firefighters spend together, their social network could be compared to a *family system*. As a result, work-related social support has been seen as such a strong protective measure against PTSD that it is considered to be equivalent to the protective measures of family support (Corneil et al., 1999). Furthermore, firefighters who have stronger support systems tend to cope with critical incidents better than those firefighters without strong support systems. For example, firefighters with adequate support networks tend to dream or fantasize less as a coping mechanism after experiencing a traumatic event, release less epinephrine, experience lower stress overall, and experience fewer long-term intrusions (Dougall et al., 2001), while

stressors from home or work (i.e., marital discord; new baby; increased workload; company downsizing; etc.) that reduce the individual's support system have been found to increase the severity of PTSD symptoms (Bolton et al, 2004).

Symptoms of PTSD can be difficult to manage; therefore, a number of different types of intervention and treatment programs have been developed. The most commonly used form of intervention is critical incident stress debriefing (CISD). Based on crisis intervention theory, CISD is a seven stage debriefing process in which either a series of traumatic events or a singular traumatic event is discussed in a group setting (Mitchell & Everly, 1995). CISD is meant to be used as a form of early intervention which must be implemented within three days of the traumatic event. It is suggested that one of the major benefits of CISD is that it allows individuals to release emotions in a supportive and structured setting (Mitchell & Everly, 1995). Mitchell and Everly (1995) believe that the purpose of CISD is to facilitate the recovery of the affected individual by preventing the development of post-traumatic symptoms. Mitchell and Everly (1995) suggest that post-traumatic symptoms can be prevented by alleviating the psychological impact of the critical incident, promoting the return of homeostatic mechanisms to their previous level of optimal functioning, and by acting as an early screening tool for individuals who may be in need of help after experiencing a traumatic event.

Interestingly, CISD is an extremely popular form of intervention among firefighters and other emergency service personnel despite the controversy surrounding its effectiveness. Some studies have shown that CISD does not significantly reduce traumatic stress reactions to traumatic events, nor does it improve one's ability to cope with these events (Harris, Baloğlu, & Stacks, 2001). Unfortunately, it is not easy to assess the effectiveness of CISD

due to the amount of variability in its aims (Moran, 1998). For example, if one believes that the goal of CISD is to provide social support and a safe place to vent feelings, CISD appears to work. However, the results are not as clear cut when the goal is to reduce the symptoms of PTSD, and therefore the effectiveness of CISD in this light is debatable (Moran, 1998). Neely and Spitzer (1997) suggest that CISD is not the most effective means of intervention as it focuses on a single event rather than focusing on the cumulative stress that emergency workers face. Understandably, due to the contradictory results that researchers have found regarding the effectiveness of CISD, the efficacy of this program remains under debate (Wee et al., 1999).

A common form of treatment of PTSD is the prescription of anxiolytic/hypnotic-sedative medication, antidepressants, and antipsychotics (MacDonald et al., 2003). These medications are typically believed to be very beneficial in treating PTSD because they reduce symptoms such as re-experiencing, hyperarousal, avoidance, depression, and sleep disturbances (Bolton et al., 2004). However, despite the ability of these medications to reduce the symptoms of PTSD, these drugs can also have unpleasant side effects that can negatively impact one's ability to function both at work and at home. For example, these drugs can affect the patient's ability to safely operate machinery or drive vehicles (MacDonald et al., 2004). Non-compliance is often high in individuals who are taking these medications due to their unpleasant side effects. Additionally, these medications do not provide solutions to the many occupational, social, intrapersonal, and health problems that often accompany PTSD (Bolton et al., 2004). In order to address the occupational, social, intrapersonal, and health issues associated with PTSD, a number of psychotherapeutic treatments such as eye movement desensitization and reprocessing (EMDR), exposure

therapy, cognitive therapy, anxiety management, and psychodynamic therapy, have been developed. These psychotherapeutic treatments focus on reducing fear, modifying negative thought patterns, and increasing anxiety-related coping skills (Bolton et al., 2004).

In EMDR, patients are asked to follow the therapist's finger with their eyes as it is moved rapidly from side to side in order to elicit rhythmic, bilateral saccadic eye movements, while simultaneously visualizing the traumatic event (Shapiro, 1989). Preliminary testing of EMDR by Shapiro (1989) suggested that traumatic memories could be desensitized within a short period of time with minimal distress to the patient, however, this form of treatment is considered controversial my many researchers as a number of design flaws such as poor sample definition, unreliable measures, and non-blinded evaluations, have been noted in past EMDR studies (Boudewyns & Hyer, 1996). Additionally, it is possible that the positive effects of EMDR are due to "imaginal exposure during sessions, which in turn may facilitate naturally occurring in vivo exposure" (Taylor, Thordarson, Maxfield, Fedoroff, Lovell & Ogrodniczuk, 2003, p. 337).

Exposure therapy repeatedly exposes an individual to anxiety provoking stimuli in an attempt to diminish her or his anxiety about the stimuli (Bolton et al., 2004). According to Bolton et al. (2004), exposure therapy has been successful in reducing PTSD symptoms such as nightmares, intrusive visions, and hyperarousal. Unfortunately, exposure therapy appears to be less successful in reducing symptoms in individuals who are experiencing guilt or anger as the primary emotion in response to a traumatic event (Bolton et al., 2004). As a result, this form of treatment may not be the most beneficial for emergency service personnel who are experiencing high levels of distress due to circumstances that were beyond their control. For example, emergency service personnel often report feeling the most distressed when an

9

accident involves children (Haslam & Mallon, 2003). In an event in which a child is severely injured or killed, it is highly likely that emergency personnel may feel that they should have tried harder to save the child from harm. As a result, the individual may harbor a high level of guilt which can hinder his or her ability to cope with the event (Haslam & Mallon, 2003).

A more effective treatment for emergency service personnel may be cognitive therapy (Bolton et al., 2004). The goal of cognitive therapy is to change the patient's maladaptive patterns of thinking. Some researchers believe that negative thought patterns create feelings of guilt, anger, anxiety, depression, and/or shame (Bolton et al., 2004). Cognitive therapy, when treating individuals with PTSD, typically focuses on one's beliefs about safety and trust. While research suggests that cognitive therapy is not a successful treatment for PTSD on its own, research does show that cognitive therapy may be a more effective treatment when combined with exposure therapy (Bolton et al., 2004).

Finally, the last form of psychotherapy that is often used to treat PTSD is anxiety management (Bolton et al., 2004). Anxiety management theory suggests that avoidance behaviors can be reduced by providing firefighters with the skills to manage their anxiety. Anxiety management treatments include stress inoculation training, biofeedback and relaxation training, and assertiveness training. Unfortunately, empirical data supporting the effectiveness of anxiety management treatments is limited, therefore Bolton et al. (2004) suggest that these methods should not be the only approach used to treat PTSD.

Despite the number of treatments available, research suggests that treatment for PTSD is still inadequate. One reason why treatments may appear to be ineffective is because the duration of treatment studies is too short (Brunello et al., 2001). It is possible that the effects of certain treatments are delayed and therefore will not appear until after the studies

have been finished (Brunello et al., 2001). Additionally, MacDonald et al., (2003) suggest that in some cases psychological treatments may be discontinued prematurely because current compensation programs encourage the short-term treatment of specific physical injuries rather than the long-term treatment of complicated psychological ailments such as PTSD. Brunello et al. (2001) suggest that many PTSD treatments are inadequate because they often only partially relieve symptoms. Furthermore, although research has not discovered any long-term side effects of psychotherapy, it is common for patients to experience an increase in the severity of their symptoms in the initial stages of treatment. However, an increase in distress is normal during the course of psychotherapy as one of the core symptoms of PTSD is avoidance of reminders of the traumatic event, and psychotherapy inevitably requires some discussion of the incident (Bolton et al., 2004). Unfortunately, PTSD treatment is a "forward cycle of gaining ground and losing ground" as the patient must learn to cope with her or his symptoms (Fogarty & Beck, 1995, p. 76).

Despite the vast amount of literature detailing the symptoms and treatment of PTSD, there is still a need for more research. PTSD is a complex disorder that requires more research in order to effectively treat existing cases and prevent new cases from developing. Two areas of research that could help clarify how PTSD develops are in the areas of emotional intelligence and proactive coping strategies. Surprisingly, there is little empirical research regarding the types of coping strategies used by firefighters and other emergency service providers (Jenkins, 1997), and how use of these coping strategies may help protect emergency service providers against developing PTSD.

11

Stress

The term *stress* has been used since the early 14th century (Lazarus & Folkman, 1984); however, there is a significant amount of disagreement in the literature on how to accurately define stress, perhaps because researchers often use a definition of stress that fits their particular research interests (Breznitz & Goldberger, 1993). Selye (1993) defined stress as the "*nonspecific* (that is common) *result of any demand upon the body,* be the effect mental or somatic" (p. 7). According to Selye (1993), there are a variety of situations that can cause stress in an individual such as emotional arousal, fatigue, concentration, pain, humiliation, loss of blood, fear, and sudden success, making it impossible to pinpoint a single factor as the cause of a stress reaction. McEwen and Mendelson (1993) on the other hand, define stress as a

> term used for certain types of experiences, as well as the body's response to such experiences. The term generally refers to challenges, real or implied, to the homeostatic regulatory processes of the organism. Thus, heat and cold, as well as physical trauma, are direct assaults on homeostasis, whereas fear, joy, surprise, and other emotions represent internal states that threaten the internal stability of the body. (p. 101)

According to Lazarus (1999), a key reason for the current popularity of stress research and theory is the abundant evidence that understanding stress is important for our social, physiological, and psychological health. One area of stress research that is often misunderstood concerns the difference between the stressor and the stress response (McEwen & Mendleson, 1993). It is commonly thought that the word *stressor* means an environmental event which may lead to an undesirable outcome such as an illness (McEwen & Mendleson,

1993). McEwen and Mendelson (1993) suggest that a more appropriate view of the concept of a stressor is to think of it as "an event that challenges homeostasis, with a disease outcome being looked upon as a failure of the normal process of adaptation to the stressor" (p. 101). The stress response, on the other hand, is responsible for triggering neural and hormonal events which affect both the brain and the body. The effects that these events have on an individual's brain and body can be either short-lived or chronic (McEwen & Mendelson, 1993).

According to Cassidy (1999), theories of stress typically fall under one of three common models: a) the stimulus model; b) the response model and; c) the transactional model. The *stress as a stimulus* model assumes that stress occurs in one's environment and makes demands on that individual (Cassidy, 1999). In other words, stress is imposed upon an individual when aspects of his or her environment overwhelm the individual through increased demands. For example, one's work environment can place a high level of stress on an individual by interfering with her or his time with family. The focus of the stimulus model is on the causes of stress, commonly known as *stressors* (Cassidy, 1999).

Some stimulus-based theorists have split stressors into different categories based on their capacity to create stress (Derogatis & Coons, 1993). These categories consist of a) *acute, time-limited stressors* (i.e, crossing paths with an aggressive dog); b) *stressor sequences* (i.e., unemployment, death of a family member); c) *chronic intermittent stressors,* (i.e, learning to drive a car; final exams for students) and; d) *chronic stressors* (i.e., financial strains, an intimidating manager at work). Simply put, events that lead to psychological suffering, a change in behavior, or a decrease in performance are classified as stressors (Derogatis & Coons, 1993).

The *stress as a response* model looks at the consequences of dealing or attempting to deal with the demands of a stressor. In this approach, stress is an abstract experience identified by common observable symptoms such as lack of energy, headaches, irritability, sleeplessness, digestive trouble, etc. (Cassidy, 1999). In other words, the stress response model focuses on the individual's experience of the stress reaction rather than the stressor itself (Cassidy, 1999). One of the most influential stress response models is Hans Selye's (1950, 1970) *General Adaptation Syndrome* (GAS) (Derogatis & Coons, 1993; Lazarus, 1999).

In his GAS, Selye (e.g., 1950, 1956) suggested that physical and psychological stressors can lead to "diseases of adaptation" via a series of "nonspecific" biological responses, called the *General Adaptation Syndrome* (Monat & Lazarus, 1977). The "GAS is the defensive physiological reaction of the organism which is set in motion by any noxious stimulus" (Monat & Lazarus, 1977, p. 6).

Selye (1993) divided stress into three phases called a) the *alarm reaction;* b) the *stage of resistance* and; c) the *stage of exhaustion.* The first stage, *alarm reaction,* is one's initial response to a stressor and represents the activation of the body's defense system. During this stage, "the cells of the adrenal cortex discharge their secretory granules into the bloodstream and thus become depleted of corticoid-containing lipid storage material" (Selye, 1993, p. 10).

Continuous exposure to the alarm reaction results in a stage of adaptation called the *resistance* stage. The resistance stage occurs because the stage of alarm cannot be maintained over long periods of time without negative consequences (Selye, 1993). This stage is the body's way of defending itself against stress (Lazarus, 1999). In order to contain damage done to the body by the stressor, the injured tissues are isolated from the rest of the body via

14

inflammation. By isolating the injured tissues in this manner the body is able to repair them without further damage being caused to the body. Anti-inflammatory adrenocortical hormones are then used by the body to facilitate healing by relieving the swelling. An important fact about this stage is that it "is catabolic in action—that is, it draws on and uses up bodily resources rather than building or restoring them anabolically" (Lazarus, 1999, p. 44). As a result, continued exposure to the stressor causes bodily resources to become exhausted and the individual to lose the adaptation that he or she gained during the resistance stage, therefore entering into the *exhaustion stage* (Selye, 1993).

In the exhaustion stage the body wears down due to the "constant wear and tear" (p. 10) of being in a highly aroused state for a significant period of time (Selye, 1993). Selye (1993) states that the body can recover with adequate sleep and rest, however, it is unlikely that full recovery is possible as stress leaves chemical scars that build up over time and begin to appear as signs of aging. While the GAS helps us survive stressful situations and environments, the physiological cost of GAS to one's bodily resources can be lethal (Lazarus, 1999). Continued exposure to the alarm stage can result in death within several days (Selye, 1993) because bodily resources are severely reduced and the individual is no longer able to sustain itself (Lazarus, 1993).

Finally, the *stress as a transaction* model combines aspects of both the stimulus and response models (Cassidy, 1999). Also known as the *process model*, the stress as a transaction model focuses on the individual's interaction with his or her environment. This model attempts to use a more holistic approach to understanding stress, and is a much more complex model than the stimulus and response models. As a result of the complexity of the transaction model, it tends to reflect a more realistic picture of stress (Cassidy, 1999).

The transaction model considers any potential threat in the environment to be a stressor (Singer & Davidson, 1986). According to Singer and Davidson (1986), the focus of this model is the word *potential* since the transactional model assumes that a stimulus by itself cannot be a stressor. A stimulus becomes a stressor when it is appraised as being harmful or threatening. In other words, it is one's interpretation of a physical or physiological stressor as threatening that produces a stress response (Singer & Davidson, 1986). For example, imagine two individuals are walking through the park and see a dog on the path ahead of them. Perhaps one individual was attacked by a vicious dog as a child, and as a result, has a fear of dogs. To this individual, the dog may be interpreted as aggressive and dangerous, and therefore its sudden appearance will elicit a stress reaction. If the other person has never been attacked by a dog and has no reason to be afraid, he or she may interpret the dog differently. Perhaps this individual will perceive the dog as playful rather than aggressive. The stimulus is the same for both individuals, but it is defined differently and therefore causes a different reaction in each person.

Appraisal of a stimulus, therefore, is the key issue in the transactional model. It can occur repeatedly after introduction to a stressor (Singer & Davidson, 1986). The stressor is evaluated in terms of its ability to do harm, its novelty, certainty, and predictability. Additionally, the individual will assess his or her own ability to cope effectively with the stressor (Singer & Davidson, 1986). According to Singer and Davidson (1986), the transactional stress model is very important to researchers because it brings together a wide array of cognitive activities that humans engage in, and allows researchers to comprehend and easily explain phenomena that may be more difficult to understand with other models.

Despite the benefits of the transactional model, there are some problems that are inherent to the model (Singer & Davidson, 1986). Singer and Davidson (1986) feel that one issue associated with this model is the fact that individual differences in the frequency, level, and patterning of stress exposure need to be considered, whereas these measures may not be necessary in other models (Singer & Davidson, 1986). Additionally, whether a stressor is perceived to be a threat or a challenge depends on how it is interpreted, and people differ significantly in their appraisals of stressful circumstances. People also differ in their appraisal of their own resources and capabilities to deal with a stressor, and unfortunately the transactional model cannot explain whether these differences are due to experience, practice, knowledge, or individual differences in self-esteem and self-competence (Singer & Davidson, 1986).

Effects of Stress

Reactions to stressful situations vary in intensity from individual to individual, and no two people react to the same environmental event (i.e., oppressive leadership, combat, internment, threat to livelihood, or threat to life) in an identical manner (Appley & Trumbull, 1977). In fact, Appley and Trumbull (1977) suggest that stress reactions differ because each person is vulnerable to a particular kind of stressor that must reach a set level of intensity before it leads to stress. However, one common reaction to continued stress is the development of a somatic illness.

According to Monat and Lazarus (1977), exposure to continued stress can lead to somatic illness in three ways, all consequences of the body's natural coping strategies. First, neurohormonal influences can cause the disruption of tissue functioning when the body is under stress. Stress causes the body to release powerful hormones into the bloodstream,

drastically altering bodily processes which can be experienced as a pounding heart, fatigue, trembling, and sweating. Stress can also lead to somatic illness when the individual adopts coping strategies that are dangerous to his or her health. Several examples of maladaptive coping strategies given by Monat and Lazarus (1977) include employing a pressured lifestyle in order to advance either socially or occupationally, getting insufficient rest, following a poor diet, or excessive use of alcohol and/or tobacco. Fundamentally harmful lifestyles can damage body tissue, increasing one's susceptibility to disease. Finally, stress may cause disease through psychological and/or sociological factors which cause a person to ignore, misinterpret, or downplay the importance of various symptoms. That is, the person may not seek medical help for life-threatening symptoms because she or he interprets these symptoms as being inconsequential (Monat & Lazarus, 1977).

Another important aspect of how stress can affect one's functioning is its ability to influence one's capacity to make decisions (Janis, 1993). High levels of stress reduce an individual's ability to effectively problem-solve, especially when decisions are complicated by "numerous competing values" (p. 57), which can further reduce the individual's problem-solving capabilities (Janis, 1993). Stress can impair an individual's attention and perception, consequently causing the individual to display various forms of inflexible thinking. As a result of these cognitive deficiencies, the individual may demonstrate an inability to think of alternative solutions to a problem, an inability to perceive potential long-term consequences, an inefficient method of information gathering, inaccurate assessment of expected outcomes, and use of "oversimplified decision rules that may fail to take into account the full range of values implicated" (p. 57) by their decision (Janis, 1993). Furthermore, stress has been shown to impair decision-making most profoundly when the decision involves "imminent

threats of physical suffering, bodily injury, or death" (Janis, 1993, p. 57). The negative

effects stress can have on an individual are especially troubling when one considers the

danger that firefighters are in when fighting fires or rescuing victims. A firefighter who is

under an inordinate amount of stress and is demonstrating impaired decision making skills is

liable to endanger not only him or herself and their teammates, but also the victims they are

trying to save.

While stress can have many negative effects on an individual, it is important to note

that stress is a normal part of life (Brown et al., 2003) and will not necessarily lead to

personal deterioration (Haan, 1993). Haan (1993) suggests that society's general perception

of stress is that it is beneficial because it makes people more humble, considerate, resilient,

and that stress may also make people behave more kindly to others. However, if anxiety and

stress overwhelm the individual's coping skills, then stress may lead to personal crisis

(Brown, Shiang, & Bongar, 2003), such as the development of PTSD.

One area of stress research that has been gaining attention over the last 15 years is the

field of occupational stress (Holt, 1993). Workplace stress is a relatively new area in stress

research, but it is a difficult field to study as it is complicated by social controversy, labor

management difficulties, and politics. Researchers may begin their research merely looking

for the facts; however, it is possible that they may soon face pressure from the organization

under study to produce results that support the organization's stance on concerns such as job

hazards (Holt, 1993). As a result of organizational pressure, research investigating

occupational stressors tends to fall under suspicion when it is funded by either the

management or union of an organization (Holt, 1993).

The cost of occupational stress is tremendous (Dyck, 2004). For example, employees who work in occupations with high effort/low reward and high pressure/low control are two to three times more susceptible to contracting an infection than other employees (Siegrist, 1996). The mental consequences of workplace stress include depression, nervousness, recklessness, inability to concentrate, impaired decision making abilities, and being easily distracted. Physically, occupational stress can result in employees who eat poorly, do not exercise, overuse drugs and alcohol, get inadequate sleep, are more susceptible to infections, are more likely to be injured on the job, and have a higher incidence of cardiovascular disease, headaches, anxiety, ulcers, hostility, and hypertension (Siegrist, 1996). Despite the cost to one's health, few people are willing to admit to having a mental health issue such as anxiety because they are afraid of being labeled as a "mental patient" and would rather assume the medical patient role which, presumably, is a more socially accepted role (Holt, 1993).

Examples of occupational stressors include too many responsibilities, time pressure, little or no influence over day-to-day work, insufficient training, job ambiguity, lack of rewards such as appreciation, harassment, discrimination, poor communication, and safety concerns (Siegrist, 1996). Occupational stress can also include exposure to physical stressors such as high levels of noise potentially causing damage to a worker's middle and inner ear. Even lower levels of noise which may not be capable of causing physical damage to an employee's hearing are still considered by researchers to be psychologically distressing (Holt, 1993). Additional sources of occupational stress can include level of dangerousness (i.e., jobs in which loss of either life or limb is possible), and shift work which can disturb one's

circadian rhythms leading to digestive ailments, poor sleep, and bad moods. Shift work can also disrupt social aspects such as family living and social roles (Holt, 1993).

Stress and Emotion

It is important for researchers to consider the influence that stress has on one's emotions, and the influence that one's emotions have on her or his stress levels (Lazarus, 1999). Lazarus (1999) argued that the concept of stress by itself is too limited to accurately portray an individual's struggle to adapt to stressful situations. In order to fully understand the relationship between stress and how it affects an individual, researchers need more information. Therefore, Lazarus (1999) suggested that emotion can be used to enrich current knowledge of humankind's struggle to cope with stress. There are 15 emotions that Lazarus (1999) believed can reflect how an individual perceives what is occurring during a stressful situation, and how she or he is coping with it. These 15 emotions include anger, anxiety, compassion, envy, fright, jealousy, gratitude, guilt, happiness, hope, love, pride, relief, sadness, and shame. Each emotion provides a different perspective about one's continuing relationship with his or her environment (Lazarus, 1993; Lazarus, 1999). If researchers observe an individual frequently expressing one emotion, one can assume that "this person often is placed in situations that provoke the emotion or that personality factors, such as goals or beliefs, make that person vulnerable to the particular recurrent emotion" (Lazarus, 1993, p. 23).

Initially, past literature tended to overlook the idea that stress had the ability to influence one's emotions, and that emotion could also influence one's stress levels (Lazarus, 1999). As a result, Lazarus (1999) argued that stress and emotions were interdependent, and that researchers were doing a great disservice to the study of stress and emotion by treating

them as separate fields. In fact, Lazurus (1999) suggested that there are more similarities between stress and emotion, such as how these states are "aroused, coped with, and how they affect psychological well-being, functioning, and somatic health" (p. 36), than there are differences.

Lazarus (1999) proposed that certain emotions—such as anger, anxiety, envy, fright, jealousy, shame, guilt, and sadness—arise from stressful circumstances (i.e., harmful, threatening, or challenging situations) and therefore can be referred to as *stress emotions*. Even emotions that are commonly considered to arise from positive circumstances, such as the realization of important goals, can be linked to threat or harm (Lazarus, 1999). For example, "relief results from a harmful or threatening situation that has abated or disappeared; hope, more often than not, stems from a situation in which we must prepare for the worst while hoping for the better" (Lazarus, 1999, p. 36). Even love, which is typically considered to be a "highly desirable emotional state, can be exceedingly stressful when it is unrequited, or if we think our lover is losing interest. When gratitude is grudging, or violates one's values, the social necessity of showing it may be stressful" (Lazarus, 1999, p. 37).

While researchers are starting to notice the links between stress and emotion, emotion theorists often overlook another important part of emotion (Lazarus, 1999). Lazarus (1999) proposed that this overlooked aspect of emotion theory is the concept of coping. In fact, according to Lazarus (1999), it is more common for coping to be associated with stress than it is for coping to be linked to emotions. Lazarus (1999) suggested that theories of emotion either ignore coping or treat it as "separate from the emotion process" (p. 37). Lazarus (1999) believed that coping is incorrectly thought, by many emotion theorists, "to come into focus after an emotion has been aroused to regulate it or deal with the conditions provoking it" (p.

37). This mistaken belief is unfortunate "because coping is an integral part of the process of emotional arousal. Judging the significance of what is happening always entails evaluating what might be done about it, which determines" (p. 37) how one responds emotionally (Lazarus, 1999).

Coping

Lazarus and Folkman (1984) define coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). One benefit of Lazarus and Folkman's (1984) definition of coping is that it includes "anything the person does or thinks, regardless of how well or badly it works" (p. 142), which prevents confusion between the concepts of *coping* and *outcome* (Lazarus & Folkman, 1984). Measuring coping separately from its outcomes allows researchers to properly evaluate the effectiveness of each coping strategy (Lazarus, 1999). The outcome of a situation is often considered to be an indication of whether or not one has coped with a noxious situation. For example, when coping is confounded with outcome, successfully overcoming a stressful situation is considered to be indicative of one's ability to cope successfully. On the other hand, if the outcome of a situation is poor, the individual is considered to have coped badly. However, one must keep in mind that coping does not equal mastery over stress or the environment. Effective coping is "what allows the person to tolerate, minimize, accept, or ignore what cannot be mastered" (Lazarus & Folkman, 1984, p. 140).

Lazarus (1975) (as cited in Monet & Lazarus, 1977) emphasized two major categories of coping, direct actions and palliative modes. *Direct actions* are specific behaviors that are intended to alter one's troubled relationship with her or his physical or social environment.

An example of a direct action is the *fight or flight* response (Monet & Lazarus, 1977) which prepares an individual to either face a threat (fight) or flee from it (flight) by increasing blood flow, speeding up the heart, and increasing the availability of glucose to the body (Frankenhaeuser, 1986).

Palliative modes of coping are actions or thoughts that are intended to alleviate the emotional impact of stress (Monat & Lazarus, 1977). Palliative methods of coping do not change the threatening or noxious events, however, these methods of coping do make the individual feel better. Some examples of palliative modes of coping include denial (a defense mechanism), or avoiding thinking about a stressful situation (such as an important exam) by thinking about something less stressful (like a pleasant childhood memory). Other forms of palliative coping include somatically oriented forms such as biofeedback, relaxation techniques, or the use of tranquilizers (Monat & Lazarus, 1977).

In the past, palliative modes of coping such as denial have been viewed as negative and maladaptive, however, at times palliative methods of coping can be positive (Monat & Lazarus, 1977). For example, denial can initially provide a buffer to prevent an individual from feeling overwhelmed by a situation in which they have little control such as being diagnosed with a life threatening disease (i.e., cancer) (Monat & Lazarus, 1977). Palliative modes of coping can be destructive if they are used when direct action is needed, but it is important to remember that they may be beneficial in cases where palliative modes of coping help an individual maintain a sense of hope or wellbeing in situations typically expected to cause negative psychological outcomes (i.e., depression) (Monat & Lazarus, 1977).

According to Monat and Lazarus (1977), the classification of coping types into either direct action or palliative modes does not mean that an individual uses one method

exclusively. Rather, combinations of the two modes of coping are used based upon one's

personality, the conditions being faced, and the options available to the individual (Monat &

Lazarus, 1977).

Emotional Intelligence

While coping has been well researched in current literature, one notable gap in coping

research is whether emotional intelligence can predict susceptibility to developing PTSD.

Goleman (1998) suggests that it is emotional intelligence that determines one's level of self-

awareness, motivation, self-regulation of emotions, empathy, and proficiency in relationships.

Emotional intelligence is the ability to "motivate oneself and persist in the face of

frustrations; to control impulse and delay gratification; to regulate one's moods and keep

distress from swamping the ability to think; to emphasize and to hope" (p. 34). In addition,

emotional intelligence is the ability to accurately appraise and express the emotions of others

and oneself, and the capability to enhance one's life by the effective regulation of emotion

(Mayer, DiPaolo and Salovey, 1990). There are three dimensions of emotional intelligence

that are thought to moderate one's emotional experience: *clarity, attention,* and *intensity*

(Gohm, 2003).

Gohm (2003) describes *emotional clarity* as an ability to accurately label one's

feelings more specifically than either "good" or "bad". The ability to accurately label

emotion reflects a deeper understanding of the emotion itself and therefore increases the

chances that an individual will react to the emotion in a proactive manner. Individuals who

do not have a good understanding of their emotions or have low emotional clarity may be

more likely to react to emotional situations in an unpredictable and maladaptive manner

(Gohm, 2003).

Research suggests that those individuals who are able to correctly identify their physiological reactions are not as severely affected by those reactions as participants who can not accurately identify their physiological reactions (Gohm, Baumann, & Sniezek, 2001). As a result, Gohm et al. (2001) predict that those individuals who are able to appropriately identify an *emotional* reaction (i.e., have a higher level of emotional intelligence) will be less negatively affected by exposure to a critical incident. Accordingly, those individuals able to identify their emotional reactions may spend less time focusing on their emotional reactions (i.e., are less distracted by his or her emotions) during a stressful event, and therefore may be better able to focus their attention on problem solving and dealing with the task at hand (Gohm et al., 2001).

Attention to emotion refers to the ability of an individual to determine the value of an emotion and to pay attention to its importance (Gohm, 2003). There are two extremes to this dimension of emotional intelligence. First, those individuals who pay little attention to the value of emotions and the role that they play in social interactions are likely to be unable to regulate their mood. At the same time, individuals who pay too much attention to the value of emotions are also unlikely to be able to effectively regulate their mood because they attach too much significance to the role that emotions play. A balance between the two extremes is needed in order for an individual to be able to regulate his or her emotions effectively (Gohm, 2003).

The third aspect of emotional intelligence is called *emotional intensity*, which describes the strength of the emotions felt by a particular individual. Gohm (2003) predicted that individuals who experience intense emotions are more likely to be aware of the effect that emotions can have and therefore may attempt to dampen the magnitude of their

emotional experience. One reason that firefighters might be susceptible to developing PTSD is because they often need to ignore their emotions during a critical incident in order for them to be able to get the job done. As a result, the firefighter may not immediately recognize how strong an impact an event has had on them until after the event is over (D'Andrea & Waters, 2000). At the same time, it is also possible that individuals who feel emotions strongly have more trouble regulating their moods due to the intense nature of their emotions (Gohm, 2003). According to Goleman (1995),

> "when emotions are too muted they create dullness and distance; when out of control, too extreme and persistent, they become pathological, as in immobilizing depression, overwhelming anxiety, raging anger, manic agitation. Indeed, keeping our distressing emotions in check is the key to emotional well-being; extremes—emotions that wax too intensely or for too long—undermine our stability." (pg 56)

However, just because a person feels emotions intensely does not mean that her or his reactions to an emotional stimulus can be easily predicted. One's reactivity is also influenced by his or her level of emotional clarity and attention to emotion (Gohm, 2003). Additionally, it is important to remember that just because an individual knows how to regulate their emotions, it does not mean that they actually *will* choose to regulate them (Gohm, 2004).

Emotional intelligence is often considered to be a strong predictor of one's ability to succeed in his or her professional and personal life (Mayer et al., 2004). Mayer et al. (2004) have argued against the idea that the higher in emotional intelligence an individual is, the more successful they are likely to become; however, there is evidence that emotional intelligence can predict some aspects of success such as one's level of academic performance. Additionally, people high in emotional intelligence are often described more favorably by

their peers (Mayer et al., 2004). For example, people rated as high in emotional intelligence are considered to be better at understanding emotions, require less effort to solve problems, have higher levels of intelligence in verbal and social abilities, and are drawn to social occupations like teaching and counseling. Individuals with high levels of emotional intelligence are also less likely to engage in socially unacceptable behaviors such as drinking excessively, abusing drugs, or engaging in violent or other "problem" behaviors (Mayer et al., 2004).

A downside to being higher in emotional intelligence appears to be that individuals who are more in tune with their emotions and the emotions of others tend to experience a greater adverse effect from stress (Ciarrochi, Deane, & Anderson, 2002). This finding may be due to the fact that individuals who are high in emotional perception are more likely to feel depressed or hopeless when under stress, compared to individuals who are lower in emotional intelligence (Ciarrochi et al., 2002).

Measuring Emotional Intelligence

The three most recognized measures of emotional intelligence are the Mayer-Salovey-Caruso Emotional Intelligence test (MSCIET) (Mayer, Salovey, & Caruso, 2002), the Emotional Quotient Inventory (EQ-i) (Bar-On, 1997), and the self-report emotional intelligence test (SREIT) (Brackett & Mayer, 2003; Schutte et al.,1998).

The MSCIET was designed to measure emotional intelligence by assessing it like one would assess a mental ability. The MSCIET tests one's ability to perceive emotion by asking people to rate the amount of emotion being expressed in pictures of faces, landscapes, and designs. The MSCIET also measures emotional facilitation of thought by asking people to, for example, judge how different emotions can influence thoughts. Other aspects of

emotional intelligence assessed by the MSCIET include understanding of emotions and emotional management (Bracket & Mayer, 2003).

Unlike the MSCIET, the EQ-i is a self-report test of emotional intelligence. The EQ-i (Bar-On, 1997) was originally composed of five scales such as a) intrapersonal emotional quotient, b) interpersonal emotional quotient, c) stress management, d) adaptability, and e) general mood. Bar-On (2000) revised the EQ-i in 2000, removing the general mood scale and computing the total EQ-i score by summing the remaining four scales. However, research is still needed to assess the comparability of the scoring methods between the two versions of the EQ-i (Brackett & Mayer, 2003).

Like the EQ-i, the SREIT is also a self-report measure of emotional intelligence. The SREIT started out as a 62 item scale based on the early model of emotional intelligence proposed by Salovey and Mayer (1990), but a factor analysis of the original scale items suggested a "one factor solution of 33 items" (Schutte et al., 1998, p. 175) . This scale has been criticized for being multidimensional (Petrides & Furnham, 2000), and for overlapping with existing personality measures (Brackett & Mayer, 2003) and personality traits such as openness to experience (Schutte et al., 1998). However, Schutte et al., (1998) argue that the SREIT's overlap with openness to experience does not make the scale redundant, nor is the SREIT significantly related to any of the remaining big five personality dimensions (Shutte et al., 1998).

Unfortunately, research has suggested that the content measured by emotional intelligence assessments varies widely from test to test. Moreover, there is some debate among researchers as to whether emotional intelligence measures are actually assessing

29

emotional intelligence, or whether they are simply measuring constructs already measured by more well-known constructs such as the Big Five personality dimensions (Conte, 2005).

According to Livingstone and Day (2005), the psychometric properties of emotional intelligence measures still need to be clarified through research. Additionally, since ability tests such as the MSCIET are weakly related to self-report tests such as the SREIT and the EQ-i (Brackett & Mayer, 2003), researchers are still debating which scale is a better measure of emotional intelligence (Livingstone & Day, 2005).

Proactive Coping

Another area of coping that has been largely ignored in traumatic stress research is the concept of proactive coping. Proactive coping can be defined as "efforts undertaken in advance of a potentially stressful event to prevent it or to modify it before it occurs" (Aspinwall & Taylor, 1997, p. 417). Proactive coping is different from *coping* in three ways. First, proactive coping requires an individual to acquire skills and resources that are intended to ensure that he or she is prepared to deal with potential stressors before they occur. Individuals who are high in proactive coping skills recognize that stress is a part of life and that it is necessary to be prepared to handle it. Proactive coping does not prepare one for a specific type of stressor, but rather prepares the individual for stress in general. Second, proactive coping does not help one cope with existing stressors, and therefore requires different skills. An example of one of these skills is the ability to predict or recognize situations that may cause stress in the future (Aspinwall & Taylor, 1997) (i.e., being injured on the job, which could result in financial difficulties).

Proactive coping helps an individual reduce the impact of a stressful event, and in some cases, the impact of the stressful event may not even be noticed by the individual

(Aspinwall & Taylor, 1997). Additionally, when a stressor is dealt with in its early stages, the individual's coping skills and resources are likely to be adequate to deal with the event. Obviously, as a stressor increases in magnitude, there are fewer options available to manage it. Finally, since proactive copers likely have the ability to prevent stressful events before they occur, it is possible that the amount of chronic stress experienced by these individuals is relatively low (Aspinwall & Taylor, 1997).

Unfortunately, there has been little focus on proactive coping in empirical research. Aspinwall and Taylor (1997) suggest several reasons why proactive coping is under-represented in current research. First, most studies investigating coping look at an individual's ability to solve or react to a looming crisis such as an illness or a form of financial or interpersonal failure, and fail to take into consideration any activities that occurred prior to the start of the stressful event. Additionally, individuals who use proactive coping efficiently may be eliminated from studies looking at stress and coping entirely because they have been able to prevent the stressful event from occurring, or at least reduced the impact of the event. Also, if a proactive coper is included in a study on stress and coping it is likely that the results will show that the individual is well-adjusted and successful, however, it is doubtful that researchers will attribute these good outcomes to the individual's proactive efforts that were made before the crisis occurred (Aspinwall & Taylor, 1997).

Of course, there are also cons to proactive coping (Aspinwall & Taylor, 1997). For example, one's initial coping mechanisms can be ineffective because the cause of his or her stress may be ambiguous. When a stressor is ambiguous, the individual may invest valuable time and energy into developing a coping strategy for an event that either may never happen or differs from the predicted event. Consequently, there is a chance that the individual's

31

coping mechanisms may be exhausted before the stressful event occurs (Aspinwall & Taylor, 1997).

Hypotheses

The purpose of this study is to address the current gaps in stress and coping literature by determining how firefighters' susceptibility to developing post-traumatic stress is affected by emotional intelligence and proactive coping. For the purposes of this study, post-traumatic stress was broken down into four constructs: a) avoidance, b) hyperarousal, c) intrusions, and d) anxiety. Based on current gaps in the literature, the following hypotheses were developed:

Emotional Intelligence

The first hypothesis holds that firefighters higher in emotional intelligence are less likely to experience symptoms of avoidance. There is some evidence to support the idea that emotional intelligence helps people feel capable of dealing with difficult events (Gohm et al., 2005). In support of Gohm et al.'s (2005) theory, Mayer et al. (2004) suggest that solving emotional problems is easier for individuals who are higher in emotional intelligence, therefore it is possible that these individuals are more likely to deal with a problem "head-on" rather than by avoiding it. Additionally, individuals who are high in emotional intelligence are likely to have strong social supports (Mayer et al., 2004), and consequently are more likely to have friends and family that can be confided in.

Hypothesis two proposes that firefighters higher in emotional intelligence are less likely to experience hyperarousal than those firefighters who are lower in emotional intelligence. In other words, firefighters higher in emotional intelligence may experience less hyperarousal if they are able to correctly identify and regulate their emotions, therefore reducing physiological responses to their emotional reaction. For example, once an

individual realizes that they are feeling anxious, he or she can take steps to reduce their anxiety by going for a walk, employing deep breathing techniques, or listening to relaxing music. On the other hand, if the individual is unable to identify that they are feeling anxious, the anxiety may increase over time resulting in observable symptoms such as an exaggerated startle response. This hypothesis is based on past research that suggests that individuals who are able to correctly identify their *physiological* reactions are less severely affected by them (Gohm et al., 2001), therefore it follows that individuals who are able to correctly identify their emotional reactions may experience fewer physiological reactions such as hyperarousal, in response their emotions.

The third hypothesis suggests that firefighters higher in emotional intelligence are less likely to experience intrusions. This hypothesis is based on Gohm's (2003) theory of emotional clarity. Specifically, firefighters who are able to accurately label their feelings and understand their causes will be more likely to deal effectively with the distressing emotions caused by exposure to a critical incident. When emotions can only be labeled as "good" or "bad", rather than as "happy" or "sad", it may be more difficult for the individual experiencing them to find proactive ways to deal with the emotion. Additionally, those firefighters who are able to accurately label their emotions are less likely to be distracted by their emotional reactions (Gohm, 2001), and therefore better able to cope with critical incident stress through proactive coping methods.

The fourth hypothesis holds that firefighters higher in emotional intelligence will experience less anxiety than firefighters who are lower in emotional intelligence. This hypothesis is also based on the concept of identification and regulation of one's emotions. The ability to accurately label one's feelings increases the chance that he or she will respond

33

to them in a proactive manner (Gohm, 2003), such as reaching out to family and friends, and thereby reducing anxiety levels. Individuals higher in emotional intelligence have been shown to be more willing to seek help for emotional problems (Ciarrochi & Deane, 2001), and being willing to accept help from outside sources rather than attempting to deal with the issue alone is likely to reduce stress levels.

Proactive Coping

Hypothesis five proposes that firefighters higher in proactive coping will experience fewer symptoms of avoidance. This hypothesis is developed from Aspinwall and Taylor's (1997) suggestion that proactive copers understand that stress is a part of life, and are therefore more likely to be prepared to deal with potential stressors before they occur. Firefighting is a very stressful and dangerous job and it follows that firefighters high in proactive coping will have invested some energy in determining possible "worst-case" scenarios (i.e., being seriously injured on the job), and therefore, working to develop strategies to effectively cope with these potential stressors.

The sixth hypothesis holds that firefighters higher in proactive coping will experience less hyperarousal than firefighters lower in proactive coping skills. According to Aspinwall and Taylor (1997), proactive coping can help an individual reduce the impact that a stressful event can have. For example, a firefighter who sets aside a little bit of money from each paycheque in case of an emergency, will be under much less stress if he is injured on the job and cannot work for six weeks. While it is likely that he is still worried about his financial state and he may need to adjust his spending habits slightly, he will still be able to pay his bills with the money he has set aside. An individual who has not set aside any money in case of an emergency, on the other hand, would likely be experiencing a far higher level of

anxiety regarding his financial situation, and would therefore be more likely to be experiencing a heightened state of arousal as a result.

The seventh hypothesis suggests that firefighters higher in proactive coping skills will be less likely to experience intrusions as they are more likely to have coping skills that are adequate to deal with the stress of experiencing a critical event (Aspinwall & Taylor, 1997). For example, proactive copers may ensure that they attend debriefings after a critical incident callout, or have the telephone numbers to local health professionals on hand in case they need to debrief. As a result of these simple preparations, the individual is likely to feel more in control of her or his reactions to a stressful event and therefore will be less likely to experience intrusions.

Hypothesis eight proposes that firefighters who use proactive coping strategies more frequently in their day to day life will experience less anxiety than those firefighters who use less adaptive methods of coping with stress. Aspinwall and Taylor (1997) state that proactive coping has several important benefits which can help minimize stress, such as lessening the impact a stressful event may have on an individual and making it easier to deal with the stressor in its earlier stages (before the stressor gets out of hand). Additionally, when a stressful event is dealt with in its early stages, it is likely there are more options available to manage it.

Method

Participants

The data for this study was obtained from a current data set consisting of 94 full-time, professional, male firefighters. The firefighters were recruited through the local fire department by a Disability Management graduate student. The firefighters were aged 25

through 58 years. All participants were male, primarily Caucasian, and resided in Prince

George, B.C. Table 1 (on page 67) contains the descriptive frequencies of the demographic

information for the firefighters.

Procedure

Data was obtained from a pre-existing data set consisting of 94 full-time career

firefighters.

Measures

Demographic measure.

1. The demographic questionnaire (Appendix C) contained items measuring the

   participant's age, occupation, length of employment, highest level of education

   completed, martial status, number of children and their ages, current health status, and

   ethnicity.

Measures of Mental Health.

1. The *Impact of Event Scale-Revised* (Appendix E; Horowitz, Wilner, & Alvarez, 1979)

   is a 22-item scale that assesses symptoms of PTSD such as avoidance, hyperarousal,

   and intrusion. Items are scored on a 5-point scale that ranges from 1 (*not at all*) to 5

   (*extremely*). The IES-R has a split half reliability of r = 0.86, and the internal

   consistency of the avoidance and intrusion subscales, calculated using Cronbach's

   alpha, is high (avoidance = .82, intrusion = .78) (Horowitz, Field, & Classen, 1993).

2. The *Symptom Checklist-90-Revised* © (Appendix F; Derogatis, 1994) is a 90 item

   scale that evaluates levels of reported symptoms on nine different scales

   (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety,

hostility, phobic anxiety, paranoid ideation, and psychoticism). Only the results of the anxiety scale were used in this study.

Measures of Coping.

1. The *Proactive Coping Scale* (Appendix G; Greenglass, Schwarzer, & Taubert, 1999) is a 14-item scale that assesses whether or not one uses proactive coping methods. Items are scored on a 4-point scale that ranges from 0 (*not at all true*) to 3 (*completely true*).

2. The *Emotional Intelligence* scale (Appendix H; Schutte et al., 1998; $\alpha = .90$ and test-retest reliability $= .78$) is a 33-item scale that assesses whether the participant has a high or low level of emotional intelligence. Items are scored on a 5-point scale that ranges from 1 (*strongly disagree*) to 5 (*strongly agree*).

Treatment of Data

In the analyses for this study, a series of regressions was used to investigate each of the hypotheses listed above. An alpha level of .05 was used in each case.

Results

Regression Analyses

Regressions were computed to determine whether linear relationships existed between emotional intelligence and symptoms of post-traumatic stress, and for proactive coping and symptoms of post-traumatic stress. Regressions computed for the firefighters ($N= 94$), were found to be significant for the relationship between emotional intelligence and avoidance, $t (90) = -2.31, p = .023$. However, the results indicated that emotional intelligence did not predict hyperarousal ($t (91) = -1.56, p = .123$), intrusions ($t = -1.63, p = .118$), or anxiety ($t (91) = -1.58, p = .629$). The results of this study also indicated that proactive

coping did predict anxiety, *t* (92) = -2.65, *p* <.01. However, proactive coping did not predict

hyperarousal (*t* (92) = -1.15, *p* = .253), intrusions (*t* (92) = -.94, *p* = .350), or avoidance

(*t* (91) = -1.71, *p* = .090).

Discussion

Current literature indicates that firefighters and other emergency service personnel are

more susceptible to developing PTSD because their jobs not only place them in situations

that are potentially life threatening, but also expose them to distressing events such as burn

victims, line of duty deaths, and multiple casualties (Mitchell & Everly, 1995). However,

little research has been conducted investigating how coping factors such as emotional

intelligence and proactive coping may affect the development of PTSD. The purpose of this

study was to determine if emotional intelligence and proactive coping were related to

symptoms of post-traumatic stress such as avoidance, hyperarousal, and intrusions, as well as

general symptoms of anxiety.

Emotional Intelligence

The first hypothesis predicted that symptoms of avoidance were influenced by

emotional intelligence. This hypothesis was supported by the data, however, the results were

significant (*p* = .023) in a direction opposite to that predicted (*r* = .237). Firefighters with

higher emotional intelligence experienced greater symptoms of avoidance than firefighters

with lower levels of emotional intelligence. A potential explanation for this result may be

related to the idea of emotional clarity. Individuals higher in emotional intelligence are also

higher in emotional clarity, which helps them accurately identify and label their emotions and

the most likely cause of the emotion in question (Gohm, 2003). Consequently, knowing that

certain thoughts or places related to a traumatic event will trigger feelings of anxiety, the

emotionally intelligent individual may attempt to avoid reminders of the event in order to reduce the amount of anxiety they are feeling.

The second hypothesis was not supported in that emotional intelligence did not influence the level of hyperarousal experienced by firefighters. In other words, firefighters who scored higher in emotional intelligence did not experience fewer symptoms of hyperarousal than firefighters with lower scores of emotional intelligence. One potential reason for this finding is that perhaps emotional intelligence does not influence one's ability to determine the cause of physical symptoms of anxiety such as fatigue, trembling or sweating (Monat & Lazarus, 1977) in the same manner that it helps identify the cause of an emotion. For example, a firefighter may notice that she or he is feeling unusually keyed up and restless after responding to a serious car accident. However, if the individual is unaware that these symptoms can be caused by feelings of anxiety, they may attribute these symptoms to an incorrect stimulus such as a sudden "intolerance" for caffeine. As a result, despite having a higher level of emotional intelligence, the individual is no better at regulating symptoms of hyperarousal than individuals lower in emotional intelligence, because they are not associating the symptoms (hyperarousal) with an underlying emotion (anxiety).

Hypothesis three predicted that firefighters higher in emotional intelligence would experience fewer intrusions; however, this hypothesis was not supported by the data. The results of this study demonstrated that emotional intelligence did not predict intrusions. One potential explanation for this finding is because intrusions are unintentional recollections of an event, the sudden, intense memories associated with intrusions may render the skills associated with higher levels of emotional intelligence, such as mood regulation and the ability to keep distress from encumbering the ability to think, useless. Whereas one may be

able to modify a depressed mood by thinking of positive memories or reframing negative thoughts in *normal* circumstances, it's much more difficult to actively reframe or ignore a vivid memory that is repeatedly "experienced as if the events are occurring again in the present" (Holmes & Bourne, 2008, p. 555). Furthermore, past research has suggested that caution needs to be exercised when attempting to regulate the occurrence of intrusions, as there is some evidence to suggest that thought suppression and distress related to the initial intrusion may play a role in the *continuation* of intrusive thoughts (Nixon, Nehmy, & Seymour, 2007). As a result, it is possible that emotionally intelligent individuals are choosing strategies such as thought suppression or avoidance to cope with intrusions because they appear to be logical solutions. Unfortunately, these logical "solutions" may actually be contributing to the problem, rather than improving it.

The fourth hypothesis, which proposed that firefighters who were higher in emotional intelligence would experience less anxiety than firefighters with lower levels of emotional intelligence, was not supported by the data. In other words, emotional intelligence did not predict anxiety levels in firefighters. These results are consistent with Gohm et al.'s (2005) study in which emotional intelligence was not related to stress. One aspect that was not looked at in this study was how personality traits might affect one's use of the skills and abilities that are typically associated with emotional intelligence. According to Gohm et al. (2005), emotional intelligence has the *potential* to help individuals reduce stress; however, it is unknown which individuals would benefit the most from it. For example, would an emotionally intelligent individual who is also an extravert be more successful in reducing his or her anxiety levels than an emotionally intelligent introvert? It is recommended that future

research in this area investigate whether personality traits affect the relationship between emotional intelligence and anxiety.

Overall, the results of this study suggest that emotional intelligence, as measured by the SREIT (Schutte et al., 1998), does not influence symptoms of post-traumatic stress, except in the case of symptoms of avoidance. One possible reason for the lack of support for the prediction that emotional intelligence plays a role in the development of symptoms of PTSD, may be related to the scale used to measure emotional intelligence in this study. Due to the research questions being investigated, and the population that this study is based on, a one factor scale such as the SREIT, may have overlooked important aspects of emotional intelligence that might have been detected had a different measure been used. For example, the EQ-I (Bar-On, 2000) uses four scales (intrapersonal emotional quotient, interpersonal emotional quotient, stress management, and adaptability) to measure emotional intelligence.

As stated previously in this paper, there is considerable debate among researchers regarding whether emotional intelligence scales actually measure emotional intelligence, or whether they are simply measuring constructs already encapsulated by more well-known measures such as the Big Five personality dimensions (Conte, 2005). Researchers have not determined which scale is a better measure of emotional intelligence (Livingstone & Day, 2005), and perhaps the SREIT did not accurately capture the construct of emotional intelligence in the firefighter population. Additional research investigating measurement of emotional intelligence is needed in order to ensure that the current emotional intelligence scales are, in fact, measuring emotional intelligence, and to help clarify which scale is the best measure of emotional intelligence.

Proactive Coping

Hypothesis five proposed that firefighters higher in proactive coping would be less likely to experience symptoms of avoidance. The test of this hypothesis was not significant ($p = 0.09$), therefore suggesting that proficiency in proactive coping does not affect symptoms of avoidance. The benefit of proactive coping is that it helps an individual minimize the effects of stress *before* a stressful event occurs. In other words, having resources available ahead of time will help keep stress under control (Aspinwall & Taylor, 1997). However, it is possible that by the time the firefighter starts to experience symptoms of avoidance, his or her proactive coping skills and resources have already been exhausted. While there may be less need to avoid reminders of the critical incident when the individual has constructive ways to help them cope with critical incident stress already in place, once these resources are depleted symptoms such as avoidance may become more prevalent. Additionally, it is possible that the support systems and resources in place *before* a critical event has been experienced are easily overwhelmed by the individual's reaction to a critical event, therefore providing less of a protective buffer than originally intended, and leading to increased stress reactions such as avoidance.

The sixth hypothesis, which predicted that firefighters higher in proactive coping would experience less hyperarousal than firefighters lower in proactive coping skills, was not supported by the results of this study. Proactive coping did not predict hyperarousal. One reason for this outcome may be because it is difficult to prepare for a potential stressor when one cannot reliably predict how they will react to a particular situation. Proactive coping is often an educated guess about a possible stressor and the coping strategies that will counteract it (Aspinwall & Taylor, 1997), and unfortunately, not all traumatic events are

created equally. Car accidents are not the same with every crash. There are always variables that can change—the force of the impact, the number of victims involved, the type of injuries, the cause of the crash, etc. There are numerous factors that can affect how traumatic an event can be; therefore, one must constantly be thinking of potential stressors that may occur, and updating their coping "toolbox". However while the coping toolbox used by firefighters may be being constantly updated with tools for dealing with the psychological aspects of critical incident stress, ways of coping with the physiological signs of stress may be getting accidentally overlooked.

The seventh hypothesis predicted that firefighters higher in proactive coping skills would experience fewer symptoms of intrusions, however, this hypothesis was not supported by the data. While proactive coping can help diminish the negative effects of stress, proactive coping becomes difficult, if not impossible, in chronically stressful environments (Aspinwall & Taylor, 1997). As a result, continually being exposed to high-stress environments can have a negative effect not only on one's ability to engage in proactive coping, but it can also reduce perceptions of control (Aspinwall & Taylor, 1997). As one's ability to successfully look to the future and anticipate potential stressors is reduced, it becomes more difficult to effectively keep stress and its symptoms at a manageable level. Furthermore, as one's coping abilities wane and symptoms of stress increase, he or she may begin to question personal competence and ability to successfully deal with future critical incidents. Bryant and Guthrie (2005) found that a major predictor of post-traumatic stress symptoms in firefighters is the amount of catastrophic thinking, specifically maladaptive self-appraisals, engaged in by the firefighters prior to exposure to a critical incident. Furthermore, Nixon et al. (2007) suggest that interfering with the encoding process of a traumatic event (i.e., processing the event in a

logical manner so that it is no longer seen as a current threat) can increase the development of intrusions. Therefore, if firefighters are engaging in an increasing number of maladaptive self-appraisals as coping resources are depleted, these thoughts may subsequently interfere with their ability to effectively process and make sense of a traumatic event. As a result, despite whether an individual is a strong proactive coper or not, continued exposure to the stress associated with witnessing critical incidents may diminish the firefighter's coping abilities and increase their vulnerability to negative self appraisals, faulty encoding of traumatic events, and intrusions. Further research is needed in this area in order to compare proactive coping and maladaptive appraisals, and their relationship with the encoding of critical incidents, as this information may help clarify the reasons why proactive coping is not significantly related to symptoms of intrusion.

Finally, the eighth hypothesis proposed that firefighters who were higher in proactive coping would experience less anxiety. This hypothesis was supported by the data. Proactive coping involves the "accumulation of resources and the acquisition of skills" (Aspinwall & Taylor, 1997, p. 417) to help one prepare, in general, for potential stressors. Though it is difficult for one to predict how he or she might react to witnessing certain types of trauma, the data supports the hypothesis that firefighters who demonstrate higher levels of proactive coping may experience less anxiety as a result of the steps they have taken to help reduce the strain of traumatic incidents prior to being exposed to them. Furthermore, maintaining an awareness of the types of traumas that could potentially be seen in the course of duty may help firefighters mentally prepare themselves for coping with the trauma that is unequivocally part of their jobs. One example of proactive coping that firefighters may use might include talking to other firefighters who have experienced critical events in the past;

such an encounter would give the individual insight into how others have reacted to past events and the differences in intensity of the reactions, thus helping her or him to determine what kinds of resources might be needed to help cope successfully if exposed to a similar event. Additionally, a willingness to attend debriefings, and making sure that contact numbers for counselors and other health professionals are easily accessible are also examples of proactive coping strategies that can be performed ahead of time to help reduce the impact of a critical incident. These simple preparatory steps may give the individual a sense of control when in the midst of trauma, and while that feeling of control may not reduce the intensity of their reaction to a critical event, it can help reduce the burden felt by the individual (Gohm et al., 2005), therefore reducing feelings of anxiety.

Taken as a whole, the results of this study indicate that perhaps proactive coping is more effective in reducing anxiety, in general, rather than reducing specific physical symptoms of stress such as avoidance, hyperarousal, and intrusions. Since proactive coping does not prepare an individual for a specific type of stressor (Aspinwall & Taylor, 1997), it would seem reasonable to suggest that proactive coping would, therefore, fail to prepare an individual for specific *symptoms* of stress as well. Perhaps proactive coping influences symptoms of stress as a whole, rather than individually. In other words, while proactive coping may not influence intrusions when looked at separate from hyperarousal and avoidance, future researchers may find that proactive coping reduces intrusions when looked at in conjunction with the other symptoms associated with post-traumatic stress.

Limitations

There are several limitations to this study that should be noted. First, this study used self-reports as a method to gather information about emotional intelligence and proactive coping skills. Despite the fact that that past research has indicated that self report questionnaires are a reliable form of data collection (Lunsford & Lunsford, 1995), it is still possible that some participants may have answered questions in a manner intended to make themselves look more favorable in terms of their social abilities and coping practices. Additionally, as suggested by Mayer et al. (2004), the participant's perception of his or her own emotional intelligence or coping skills may be considerably different from their actual abilities. For example, an individual may think that he or she is able to effectively control their anger, however, friends, family, or coworkers may describe the individual as hot tempered.

Second, the generalizability of this study is limited for several reasons. Since the participants in this study were paid career firefighters, it may not be appropriate to generalize this study to volunteer firefighters. There are two major differences between career firefighters and volunteer firefighters that may affect the generalizability of this study. First, career firefighters experience more callouts than volunteer firefighters, and therefore are exposed to a higher number of traumatic events in a shorter period of time than volunteer firefighters. Second, it is likely that there are some differences in the types of callouts career and volunteer fire departments respond to, especially since the environments in which these departments are associated with differ (eg., urban verses rural areas).

Additionally, the firefighters involved in this study consisted of only male participants, as the local fire department did not employ any female firefighters at the time

this study was conducted. As a result, this study should not be generalized to female firefighter populations.

Future Research

In conclusion, the results of this study contribute to the literature on firefighters and post-traumatic stress by investigating how emotional intelligence and proactive coping may influence anxiety levels, and affect one's susceptibility to developing symptoms of post-traumatic stress. Specifically, this study found that firefighters higher in emotional intelligence experienced higher levels of avoidance symptoms, and that higher levels of proactive coping were related to lower symptoms of anxiety.

Research in the area of coping and post-traumatic stress is important, not only to the firefighters who are exposed on a daily basis to potentially life-threatening or traumatic incidents, but to their families and loved ones, and to the victims whose lives depend on the mental health and quick thinking of those firefighters. In order to continue to benefit the lives of everyone who is affected by PTSD, research into this complex disorder must continue. Knowledge gained in this area of research will not only help identify factors, such as coping strategies and personality characteristics, which may contribute to the development of PTSD, but it may also help reduce the prevalence of PTSD in emergency service providers, and expand current treatment options for individuals with PTSD.

PTSD is a complex disorder, and there are many aspects of PTSD and its development that still need to be investigated. Specifically, it would be valuable for researchers to examine how personality characteristics and other factors may affect whether firefighters choose to utilize skills such as mood regulation or to initiate proactive coping strategies to reduce stress. Additionally, it would be interesting to examine how proactive

coping strategies change for firefighters the longer they are on active duty, and if the use of proactive coping strategies varies within a firefighter across different types of traumatic incidents. Furthermore, it is important to consider the factors that may cause a person to forgo proactive coping even though they have the ability to initiate it, so that interventions aimed at increasing proactive coping skills can be implemented prior to exposure to a critical incident (i.e., during training). Aspinwall (2005) suggests that perhaps proactive coping is not initiated when it appears too costly in time, resources, or energy in comparison to the potential benefits. However, more research is needed to support this theory.

In addition, this study did not evaluate the specific coping strategies used by the firefighters. Thus, it is important that future research investigates the effect that certain coping practises can have on the development of PTSD and its symptoms. The results of this study did indicate that proactive coping plays a role in the reduction of anxiety levels, in general; however, more information is needed in order to understand whether there are aspects of proactive coping that can be used to aid in the reduction of specific symptoms of post-traumatic stress.

Bibliography

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed., text revision). Washington DC: Author.

Appley, M.H., & Trumbull, R. (1977). On the concept of psychological stress. In A. Monat & R. S. Lazarus (Eds.), *Stress and Coping: An Anthology,(pp.* 58-66), New York, NY: Columbia University.

Aspinwall, L.G., & Taylor, S.E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin, 121*(3), 417-436.

Back, K.J. (1992). Critical incident stress management for care providers in the pediatric emergency department. *Critical Care Nurse, 12*(1), 78-83.

Bar-On, R. (1997). *Emotional Quotient Inventory: Technical manual.* Toronto, Canada: Multi-Health Systems.

Bar-On, R. (2000). Emotional and social intelligence: Insights from the Emotional Quotient Inventory. In R. Bar-On & J. Parker (Eds.), *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace* (pp. 363-388). San Francisco, CA, US: Jossey-Bass.

Bolton, E., Holohan, D.R., King, L.A., & King, D.W. (2004). Acute and post-traumatic stress disorder. In J.C. Thomas & M. Hersen (Eds.), *Psychopathology in the Workplace: Recognition and Adaptation,* (pp.119-131). New York: Brunner-Routledge.

Boudreaux, E.D., & McCabe, B. (2000). Critical incident stress management: I. Interventions and effectiveness. *Psychiatric Services, 51*(9), 1095-1097.

Brackett, M.A., & Mayer, J.D. (2003). Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. *Personality and Social Psychology Bulletin, 29*(9), 1147-1158.

Breznitz, S., & Goldberger, L. (1993). Stress research at a crossroads. In L. Goldberger & S. Breznitz (Eds.). *Handbook of Stress: Theoretical and Clinical Aspects* (2nd ed.) (pp.3-6). Toronto: The Free Press.

Boudewyns, P.A., & Hyer, L.A. (1996). Eye movement desensitization and reprocessing (EMDR) as treatment for post-traumatic stress disorder (PTSD). *Clinical Psychology and Psychotherapy, 3*(3), 185-195.

Brown, L.M., Shiang, J., & Bongar, B. (2003). Crisis intervention. In G. Stricker, T.A. Widiger, & I.B. Weiner (eds.). *Handbook of Psychology: Vol. 8. Clinical Psychology* (pp.431-451). Hoboken, NJ: John Wily & Sons.

Brunello, N., Davidson, J.R.T., Deahl, M., Kessler, R.C., Mendlewicz, J., Racagni, G., Shalec, A.Y., & Zohar, J. (2001). Post-traumatic stress disorder: Diagnosis and epidemiology, comorbidity, and social consequences, biology and treatment. *Neuropsychobiology, 43,* 150-162.

Bryant, R.A., & Guthrie, R.M. (2005). Maladaptive appraisals as a risk factor for post-traumatic stress: A study of trainee firefighters. *Psychological Science, 16*(10), 749-752.

Cassidy, T. (1999). Stress, cognition and health. New York: Routledge

Ciarrochi, J.V., & Deane, F.P. (2001). Emotional competence and willingness to seek help from professional and nonprofessional sources. *British Journal of Guidance & Counselling, 29*(2), 233-246.

Ciarrochi, J., Deane, F.P., & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences, 32,* 197-209.

Clifford, B. (1999). The New South Wales Fire Brigades' critical incident stress management response to the Thredbo landslide. *International Journal of Emergency Mental Health, 2,* 127-133.

Conte, J. M. (2005). A review and critique of emotional intelligence measures. *Journal of Organizational Behavior, 26,* 443-440.

Corneil, W., Beaton, R., Murphy, S., Johnson, C., & Pike, K. (1999). Exposure to traumatic incidents and prevalence of post-traumatic stress symptomology in urban firefighters in two countries. *Journal of Occupational Health Psychology, 4*(2), 131-141.

D'Andrea, L.M., & Waters, C. (2000). Predicting post-incident stress in emergency personnel: A guide for mental health professionals on critical incident stress management teams. *International Journal of Emergency Mental Health, 2*(1), 33-41.

Derogatis, L.R. (1994) *Symptom checklist-90-R (SCL-90-R): Administration, scoring and procedures manual* (3rd ed.). Minneapolis, MN: National Computer Systems.

Derogatis, L.R., & Coons, H.L. (1993). Self-report measures of stress. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: theoretical and clinical aspects* (2nd ed.) (pp. 200-233). Toronto: The Free Press.

Dougall, A.L., Hyman, K.B., Hayward, M.C., McFeeley, S., & Baum, A. (2001). Optimism and traumatic stress: The importance of social support and coping. *Journal of Applied Social Psychology, 31*(2), 223-245.

Dyck, D. E. G. (2004). *Disability management: Theory, strategy and industry practice* (2nd Ed.). Markham, Ontario: Butterworths.

Everly, G.S. Jr. (1999). A primer on critical incident stress management: What's really in a name? *International Journal of Emergency Mental Health, 1*(2), 77-79.

Fannin, N., & Dabbs, J.M. Jr. (2003). Testosterone and the work of firefighters: Fighting fires and delivering medical care. *Journal of Research in Psychology, 37,* 107-115.

Fogarty, C.A., & Beck, R.J. (1995). Work adjustment for individuals with PTSD. *Vocational Evaluation & Work Adjustment Bulletin, 28*(3), 76-80.

Frankenhaeuser, M. (1986). A psychobiological framework for research on human stress and coping. In M.H. Appley & R. Trumbull (Eds.). *Dynamics of Stress: Physiological, Psychological, and Social Perspectives.* (pp. 101-116). New York: Plenum Press.

Gohm, C.L. (2003). Mood regulation and emotional intelligence: Individual differences. *Journal of Personality and Social Psychology, 84*(3), 594-607.

Gohm, C.L. (2004). Moving forward with emotional intelligence. *Psychological Inquiry, 15*(3), 222-227.

Gohm, C.L., Baumann, M.R., & Sniezek, J.A. (2001). Personality in extreme situations: Thinking (or not) under acute stress. *Journal of Research in Personality, 35,* 388 399.

Gohm, C.L., Corser, G.C., & Dalsky, D.J. (2005). Emotional intelligence under stress: Useful, unnecessary, or irrelevant? *Personality and Individual Differences, 39,* 1017-1028.

Goleman, D. (1995). *Emotional intelligence.* Toronto: Bantam Books.

Goleman, D. (1998). *Working with emotional intelligence.* Toronto: Bantam Books.

Haan, Norma. (1993). The assessment of coping, defense, and stress. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: Theoretical and clinical aspects* (2nd ed.) (pp. 258-273). Toronto: The Free Press.

Harris, M.B., Baloğlu, M., & Stacks, J.R. (2002). Mental health of trauma-exposed firefighters and critical incident stress debriefing. *Journal of Loss and Trauma, 7,* 223-238.

Haslam, C., & Mallon, K. (2003). A preliminary investigation of post-traumatic stress symptoms among firefighters. *Work & Stress, 17*(3), 277-285.

Hokanson, M., & Wirth, B. (2000). The critical incident stress debriefing process for the Los Angeles County Fire Department: Automatic and effective. *International Journal of Emergency Mental Health, 2*(4), 249-257.

Holmes, E.A., & Bourne, C. (2008). Inducing and modulating intrusive emotional memories: A review of the trauma film paradigm. *Acta Psychologica, 127,* 553-566.

Holt, R.R. (1993). Occupational stress. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: Theoretical and clinical aspects* (2nd ed.) (pp.342-367). Toronto: The Free Press.

Horowitz, M.J., Wilner, N., & Alvarez, W. (1979). The impact of event scale: A measure of subjective stress. *Psychosomatic Medicine, 41*(3), 209-218.

Horowitz, M.J., Field, N.P., & Classen, C.C. (1993). Stress response syndromes and their treatment. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: Theoretical and clinical aspects* (2nd ed.) (pp.757-773). Toronto: The Free Press.

Janis, I.L. (1993). Decisionmaking under stress. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: Theoretical and clinical aspects* (2nd ed.) (pp. 56-74). Toronto: The Free Press.

Jenkins, S.R. (1997). Coping, routine activities, and recovery from acute distress among emergency medical personnel after a mass shooting incident. *Current Psychology: Developmental·Learning·Personality·Social, 16*(1), 3-19.

Lazarus, R.S. (1993). Why we should think of stress as a subset of emotion. In L. Goldberger & S. Breznitz (Eds.). *Handbook of Stress: Theoretical and Clinical Aspects* (2nd ed.) (pp. 21-39). Toronto: The Free Press.

Lazarus, R.S. (1999). *Stress and emotion: A new synthesis.* New York, NY: Springer Publishing.

Lazarus, R.S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York, NY: Springer Publishing.

Livingstone, H. A., & Day, A. L. (2005). Comparing the construct and criterion-related validity of ability-based and mixed-model measures of emotional intelligence. *Educational and Psychological Measurement, 65*(5), 757-779.

Lunsford, B. R., & Lunsford, T. R. (1995). Research Forum – the research sample part II: Sample size. *Journal of Medicine, 7,* 137-141.

MacDonald, H.A., Colotla, V., Flamer, S., & Karlinsky, H. (2003). Post-traumatic stress disorder (PSTD) in the workplace: A descriptive study of workers experiencing PSTD resulting from work injury. *Journal of Occupational Rehabilitation, 13*(2), 63-77.

Mayer, J.D., DiPaolo, M., & Salovey, P. (1990). Perceiving affective content in ambiguous visual stimuli: A component of emotional intelligence. *Journal of Personality Assessment, 54*(3&4), 772-781.

Mayer, J.D., Salovey, P., & Caruso, D.R. (2004). Emotional intelligence: Theory, findings and implications. *Psychological Inquiry, 15*(3), 197-215.

McEwen, B.S., & Mendelson, S. (1993). Effects of stress on the neurochemistry and morphology of the brain: Counterregulation versus damage. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: Theoretical and clinical aspects* (2nd ed.) (pp.101-126). Toronto: The Free Press.

Miller, L. (1999). Critical incident stress debriefing: Clinical applications and new directions. *International Journal of Emergency Mental Health, 1*(4), 253-265.

Mitchell, J.T., & Everly, G.S. Jr. (1995). Critical incident stress debriefing (CISD) and the prevention of work-related stress among high risk occupational groups. In J.T. Mitchell & Everly G.S. (Eds.), *Psychotramatology,* (pp. 267-280). New York, NY: Plenum.

Monat, A., & Lazarus, R. (Eds.). (1977). *Stress and coping: An anthology.* New York: Columbia University Press.

Moran, C.C. (1998). Individual differences and debriefing effectiveness. *The Australasian Journal of Disaster and Trauma Studies, 1998*(1), no pagination specified.

Moran, C., & Britton, N.R. (1994). Emergency work experience and reactions to traumatic incidents. *Journal of Traumatic Stress, 7*(4), 575-585.

Moran, C.C., & Colless, E. (1995). Perceptions of work stress in Australian firefighters. *Work & Stress, 9*(4), 405-415.

Neely, K.W. & Spitzer, W.J. (1997). A model for a statewide critical incident stress (CIS) debriefing program for emergency services personnel. *Prehospital and Disaster Medicine, 12*(2), 43-48.

Nixon, R.D.V., Nehmy, T., & Seymour, M. (2007). The effect of cognitive load and hyperarousal on negative intrusive memories. *Behavior Research and Therapy, 45,* 2652-2663.

Nurmi, L.A. (1999). The sinking of the Estonia: The effects of critical incident stress debriefing (CISD) on rescuers. *International Journal of Emergency Mental Health, 1,* 23-31.

Petrides, K.V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences, 29,* 313-320.

Regehr, C., Goldberg, G., Glancy, G.D., & Knott, T. (2002). Post-traumatic symptoms and disability in paramedics. *Canadian Journal of Psychiatry, 47(10),* 953-958.

Robinson, R.C. & Mitchell, J.T. (1993). Evaluation of Psychological Debriefings. *Journal of Traumatic Stress, 6*(3), 367-382.

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition and Personality, 9,* 185-211.

Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., et al. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences, 25,*167-177.

Selye, Hans. (1993). History of the concept of stress. In L. Goldberger & S. Breznitz (Eds.). *Handbook of stress: Theoretical and clinical aspects* (2nd ed.) (pp.7-17). Toronto: The Free Press.

Shapiro, F. (1989). Efficacy of the eye movement desensitization procedure in the treatment of traumatic memories. *Journal of Traumatic Stress, 2,* 199-223.

Siegrist, J. (1996). Adverse health effects of high-effort/low reward conditions. *Journal of Occupational Health Psychology, 1*(1), 27-41.

Singer, J.R., & Davidson, L.M. (1986). Specificity and stress research. In M.H. Appley & R. Trumbull (Eds.). *Dynamics of stress: Physiological, psychological, and social perspectives* (pp.47-59). Toronto: The Free Press.

Smith, M.W., Schnurr, P.P., & Rosenheck, R.A. (2005). Employment outcomes and PTSD symptom severity. *Mental Health Services Research, 7*(2), 89-101.

Taylor, S., Thordarson, D.S., Maxfield, L., Fedoroff, I.C., Lovell, K., & Ogrodniczuk, J. (2003). Comparative efficacy, speed, and adverse effects of three PTSD treatments: Exposure therapy, EMDR, and relaxation training. *Journal of Consulting and Clinical Psychology, 71*(2), 330-338.

Wee, D.F., Mills, D.M., & Koehler, G. (1999). The effects of critical incident stress debriefing (CISD) on emergency medical services personnel following the Los Angeles civil disturbance. *International Journal of Emergency Mental Health, 1,* 33-37.

Weisæth, L. (1989). The stressors and the post-traumatic stress syndrome after an industrial disaster. *Acta Psychiatrica Sandinavioca, 80,* 25-37.

Appendix A

Introductory Letter:

Dear Sir or Madam:

I am writing to tell you about a research project entitled "An investigation of the rescue personality" that you may be interested in and to ask if you would consider participating. The intent of this project is to attempt to describe emergency service workers regarding various types of personal characteristics. Consequently, your participation may have been requested as either an emergency service worker or trainee, or alternately as a control participant from another profession.

Your participation in this phase of this project will involve one 60 minute time period during which we will ask you to complete several surveys that ask questions about yourself and your reactions to stress, etc. These questionnaires should not be viewed as a "test". I am simply interested in overall perceptions or views. All information that you provide is held in strict confidence. Only the researchers who are involved in this project will ever have access to your completed surveys, which will be kept in a locked and secure place at the university for a period of seven years after which time they will be shredded. Your names will be removed from all questionnaires and replaced with code numbers. Also, please be assured that once you volunteer to participate, you can still withdraw from the study at any time with no consequence and any information collected from you will be withdrawn and shredded.

At another time, I may contact you again to participate in the second phase of the project that will evaluate further aspects of the emergency service experience. I will provide you with full details about this phase of the study at a later time.

If you would like to participate in this project, please complete and return the attached informed consent sheet and feel free to keep this information letter for further reference. In exchange for your participation, I will provide a five dollar donation to the BC Burn Fund or other charity of your choice. A copy of the final results can be attained, upon completion of the project, by contacting me directly.

Thank you very much for your time and consideration. I look forward to hearing from you; if you have any further questions please contact me at wagners@unbc.ca or 250 960-6320. If at any time, you have concerns about the research project or the researchers, you may contact the UNBC Office of Research at 250-960-5820.
Sincerely,

Dr. Shannon Wagner
Assistant Professor,
Disability Management Program
250-960-6320

Appendix B

Informed Consent:

<u>**Researcher Copy**</u>

I have read the letter concerning the research project entitled "An investigation of the rescue personality" being conducted by Dr. Shannon Wagner of the University of Northern British Columbia. I understand that all information gathered for this project is to be used for research purposes only and will be considered confidential. I also understand that permission to participate may be withdrawn at any time.

I will participate: _____ Yes _____ No

Signature: _____

Name: _____

Address:

_____

Telephone number: _____ Best times to call:

_____

Charity to which I would like to donate:

                                      BC Burn Fund   _____

                                        Other (please specify)

_____

_____

If you would like more information about this project, please provide your phone number and I will contact you as soon as possible.

Name: _____ Phone number: _____

Best Times to call: _____

57

Informed Consent:

Participant Copy

I have read the letter concerning the research project entitled "An investigation of the rescue personality" being conducted by Dr. Shannon Wagner of the University of Northern British Columbia. I understand that all information gathered for this project is to be used for research purposes only and will be considered confidential. I also understand that permission to participate may be withdrawn at any time.

I will participate: _____ Yes _____ No

Signature: _____

Name: _____

Address:

_____

Telephone number: _____ Best times to call:

_____

Charity to which I would like to donate:

BC Burn Fund   _____

Other (please specify)

_____

_____

—

If you would like more information about this project, please provide your phone number and I will contact you as soon as possible.

Name: _____ Phone number: _____

Best Times to call: _____

Demographic Information:

Please complete the following demographic information to the best of your knowledge:

Name: _____

Age: _____

Gender: □ M   □ F

Occupation: _____

Number of Years in Occupation: _____

Highest Level of Education:
        □ Elementary School
        □ High School
        □ Some College/University
        □ Graduated College
        □ Graduated University
        □ Post-graduate (e.g., Master's or PhD)

Marital Status:
        □ Married or common-law
        □ Separated
        □ Divorced
        □ Widowed

Number and Age of Children:_____

Current Health Status:
        □ Very good
        □ Above average
        □ Average
        □ Below Average
        □ Poor

Ethnicity:
        □ Caucasian
        □ First Nations
        □ African-Canadian
        □ Indo-Canadian
        □ Asian
        □ Other _____ (please specify)

Appendix D

Prince George Wellness Resources

Resource	Contact Number
Fire Department Resources (First Choice for Assistance with Referral)	
Prince George Fire Department Employee Assistance Program	564-9101
Shannon Wagner (CIRT MHP)	961-5989
Prince George Regional Hospital (Quick Response Social Worker)	565-2281
Public Resources	
Alcohol and Drug Referral	1-800-663-1441
Anxiety Disorders Group www.bcss.org	561-8033
Community Response Unit – PGRH	565-2668
Canadian Mental Health Association	564-8644
Depression Support Group	564-8644 (ext 26)
Mental Health Information Line – B.C. www.cmha-bc.org	1-800-661-2121
Psychological Association Referral Service – B.C. www.psychologists.bc.ca	1-800-730-0522
Private Resources	
Brazzoni & Associates www.brazzoni.com	614-2261
Walmsley & Associates Professional Counseling www.walmsley.ca	564-1000
Worth Counseling and Assessment	563-7331

IMPACT OF EVENTS SCALE

Directions: The following is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you during the past 7 days with respect to the event (even if the event happened long ago). How much were you distressed or bothered by these difficulties.

1 = not at all
2 = a little bit
3 = moderately
4 = quite a bit
5 = extremely

1. Any reminder brought back feelings about it.

2. I had trouble staying asleep.

3. Other things kept making me think about it

4. I felt irritable and angry.

5. I avoided letting myself get upset when I thought about it or was reminded of it.

6. I thought about it when I didn't mean to.

7. I felt as if it hadn't happened or wasn't real.

8. I stayed away from reminders about it.

9. Pictures about it popped into my mind.

10. I was jumpy and easily startled.

11. I tried not to think about it.

12. I was aware that I still had a lot of feelings about it, but didn't deal with them.

13. My feelings about it were kind of numb.

14. I found myself acting or feeling like I was back at that time.

15. I had trouble falling asleep.

16. I had waves of strong feelings about it.

17. I tried to remove it from my memory

18. I had trouble concentrating.

19. Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.

20. I had dreams about it.

21. I felt watchful and on guard.

22. I tried not to talk about it.

Appendix F

Symptom Checklist-90-Revised ©

Appendix G

PROACTIVE COPING SCALE

Directions: The following statements deal with reactions you may have to various situations. Indicate how true each of these statements is depending on how you feel about the situation. Do this by circling the most appropriate number.

0 = not at all true
1 = moderately disagree
2 = slightly disagree
3 = slightly agree
4 = moderately agree
5 = strongly agree

1. I am a take-charge person.

2. I try to let things work out on their own.*

3. After attaining a goal, I look for another more challenging one.

4. I like challenges and beating the odds.

5. I visualize my dreams and try to achieve them.

6. Despite numerous setbacks, I usually succeed in getting what I want.

7. I try to pinpoint what I need to succeed.

8. I always try to find a way to work around obstacles; nothing really stops me.

9. I often see myself failing so I don't get my hopes up too high.*

10. When I apply for a position, I imagine myself filling it.

11. I turn obstacles into positive experiences.

12. If someone tells me I can't do something you can be sure I will do it.

13. When I experience a problem, I take the initiative in resolving it.

14. When I have a problem, I usually see myself in a no-win situation.*

* reverse score

EMOTIONAL INTELLIGENCE SCALE

Directions: Each of the following items asks you about your emotions or reactions connected to emotions. After deciding whether the statement is generally true for you, use the 5-point scale to respond to the statement. Please circle the **1** if you strongly disagree that this is like you, the **2** if you somewhat disagree that this is like you, the **3** if you neither agree or disagree that this is like you, the **4** if you somewhat agree that this is like you, and the **5** if you strongly agree that this is like you. There are no right or wrong answers. Please give the response that best describes you.

1. I know when to speak about my personal problems to others.

2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.

3. I expect that I will do well at most things I try.

4. Other people find it easy to confide in me.

5. I find it hard to understand the non-verbal messages of other people.*

6. Some of the major events of my life have led me to re-evaluate what is important.

7. When my mood changes, I see new possibilities.

8. Emotions are one of the things that make my life worth living.

9. I am aware of my emotions as I experience them.

10. I expect good things to happen.

11. I like to share my emotions with others.

12. When I experience a positive emotion, I know to make it last.

13. I arrange events that others enjoy.

14. I seek out activities that make me happy.

15. I am aware of the non-verbal messages that I send to others.

16. I present myself in a way that makes a good impression on others.

17. When I am in a positive mood, solving problems is easy for me.

18. By looking at their facial expressions, I recognize the emotions people are experiencing.

19. I know why my emotions change.

20. When I am in a positive mood, I am able to come up with new ideas.

21. I have control over my emotions.

22. I easily recognize my emotions as I experience them.

23. I motivate myself by imagining a good outcome to tasks I take on.

24. I compliment others when they have done something well.

25. I am aware of the non-verbal messages that other people send.

26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself

27. When I feel a change in emotions, I tend to come up with new ideas.

28. When I am faced with a challenge, I give up because I believe that I will fail.*

29. I know what other people are feeling just by looking at them.

30. I help other people feel better when they are down.

31. I use good moods to help myself keep trying in the face of obstacles.

32. I can tell how people are feeling by listening to the tone of their voice.

33. It is difficult for me to understand why people feel the way they do.*

* reverse score

Table I

Descriptive Frequencies for the Demographics of the Firefighters

	Percent Firefighters
Level of Education	
High School	21.3
Some College/University	58.5
Graduated College	12.8
Graduated University	7.4
Post Graduate	0.0
Marital Status	
Married or Common Law	86.2
Separated	1.1
Divorced	10.6
Single, Never Married	1.1
Widowed	0.0
Number of Children	
Zero	10.6
One	12.8
Two	42.6
Three	24.5
Four	8.5
Five or More	1.1
Current Health Status	
Poor	43.6
Below Average	33.0
Average	21.3
Above Average	2.1
Ethnicity	
Caucasian	97.9
First Nations	1.1
Asian	0.0
Other	1.1