

PERSONAL AND ENVIRONMENTAL PREDICTORS OF
POSTTRAUMATIC STRESS IN EMERGENCY MANAGEMENT
PROFESSIONALS

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PERSONAL AND ENVIRONMENTAL PREDICTORS OF POSTTRAUMATIC
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Dedication

To the victims and survivors of the terrorist attacks of September 11, 2001—the horrible event that affected so many people, an event that also led me to disaster mental health and doctoral study, inspired me to learn and research, and above all to *help* after traumatic events.

Acknowledgments

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Abstract of Dissertation

Personal and Environmental Predictors of Posttraumatic Stress in Emergency Management Professionals

This cross-sectional survey research examined levels of trauma exposure frequency, burnout, compassion fatigue, compassion satisfaction, and posttraumatic stress disorder (PTSD) symptoms in a non-random sample of emergency management professionals. Three models exploring how personality factors (neuroticism, extraversion), ethnic identity strength, trauma exposure frequency, burnout, and compassion satisfaction predict posttraumatic stress symptoms were tested. Professionals were recruited for an online survey from four emergency management associations via an email announcement sent to member list-servs and attendees at one emergency management event. The data from 197 participants were analyzed with hierarchical regression analysis.

The results supported the hypothesis that a model containing neuroticism and extraversion, trauma exposure frequency, burnout, and compassion satisfaction would account for the most variance in predicting PTSD symptoms as compared to individual predictors, namely, personality, frequency of trauma exposure, and repeated exposure symptomology. Neuroticism, burnout, and compassion satisfaction were found to be significant, individual positive predictors in the context of the full model. There was no support for the hypothesis that the predictor variables moderate the relationship between trauma exposure frequency and PTSD symptoms. Ethnic identity strength did not significantly contribute to variance in the model or serve as a moderator with trauma

exposure. Future areas of research suggested include replication with a random more diverse sample, consideration of alternate trauma exposure measurement methods, and examination of additional pathways in which the study's variables may influence PTSD symptoms.

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Chapter 1: Introduction

Emergency management can be defined in the simplest terms as “the discipline of dealing with risk and risk avoidance” (Haddow & Bullock, 2006, p.1). This discipline of examining risk and coping with the aftermath has existed for as long as there have been disasters; however, organization of the emergency management field did not begin until contemporary times (Haddow & Bullock). The field developed and became more organized following an increase in disasters and more recently terrorism, influencing the evolution of the various roles of an emergency management professional to include mitigation, response, recovery, preparedness, and communications before, after, and during a crisis (Haddow & Bullock).

With the diversification of responsibilities, emergency management has also become a growing sought-after profession in our post-September 11th society with its new focus on terrorism and security (Haddow & Bullock, 2006). The increasing number of related associations, such as the National Emergency Management Association (NEMA), the International Emergency Management Society (TIEMS), and the Emergency Management Professional Organization for Women’s Enrichment (EMPOWER), demonstrate evidence of the progressing organization of the field.

Members of these organizations come from a variety of backgrounds. They may work in the public (e.g. state emergency management agencies, homeland security) or private (e.g. consulting firms) sector and respond to local, national, or international incidents that are man-made or natural disasters. Job responsibilities include preparing for

emergencies, conducting training exercises, developing response plans, consulting with individuals and organizations outside of their primary place of employment, providing public or media information, and assisting with response and recovery from critical incidents (EMPOWER strategic plan, 2007). Emergency management professionals are trained in discipline areas such as law enforcement, medical services, first responder occupations, communications, interdisciplinary degree programs, and other aspects of disaster recovery (EMPOWER strategic plan; McEntire, 2006). Despite these differences, all emergency management personnel likely have frequent exposure to all or some of the various aspects and phases of crises, including preparation for, response to, and recovery from traumatic events.

Given their contact with aspects of disasters or crises, potentially high exposure to trauma, and public scrutiny, emergency management professionals may experience a higher level of stress response than the general population or a similar level of stress response to other professionals that work with crises such as mental health professionals, emergency services workers (e.g. paramedics, hospital personnel), or first responders (e.g. firefighters, police). Many variables have been explored in research with emergency workers, including individual factors (e.g. personality, past experience), job and organization characteristics (e.g. relationship with supervisors and coworkers, length of service), event characteristics (e.g. intensity of exposure, work conditions), and mediating and moderating factors (e.g. coping, support) and their influence on the development of stress/distress symptoms, posttraumatic stress disorder, and positive adjustment (McCammon, 1996). However, researchers have frequently explored factors related to posttraumatic stress disorder symptoms using samples of first responders, while researchers

investigating specific symptoms of repeated trauma exposure, such as compassion fatigue and compassion satisfaction, have focused more on samples of helping professionals. The researcher found no previous work using either type of variable that examined emergency management professionals' psychological responses or personal reactions to their work. Emergency management professionals may be additional victims of traumatic stress given their roles in relation to critical incidents or crises, similar to human service and first responder professionals, and this unstudied area warranted attention.

Theoretical Foundation

Since emergency management professionals perform a combination of duties that may include crisis response work and preparation or rebuilding activities, they can be considered a profession with roles comparable to first responders and helping professionals. The theoretical base for this study of emergency management professionals is extrapolated from the literature on posttraumatic stress, burnout, secondary traumatic stress/compassion fatigue, and compassion satisfaction in these related occupational categories. The role of personality, which has been identified as an important protective or pre-disposing factor related to the development of posttraumatic stress disorder symptoms for both victims and responders following a traumatic event (e.g. Haisch & Meyers, 2004; Holeva & Tarrier, 2001), will be further defined. Finally, since results of the research concerning the relationship between ethnicity (as a demographic variable) and PTSD have been mixed (Andrés-Hyman, Cott, & Gold, 2004; Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002; Stamm & Friedman, 2002), literature providing evidence to support an investigation of ethnic identity will also be delineated to help explain the inconsistencies.

Posttraumatic Stress Disorder (PTSD)

Given emergency management professionals' potential for frequent exposure to traumatic events, they may be at risk for developing posttraumatic stress disorder (PTSD) symptoms. A history of the disorder, prevalence information, risk factors, and theoretical models of posttraumatic stress will be discussed in this section.

Posttraumatic stress is considered a unique type of stress reaction. The field of traumatic stress developed as a separate field from stress and coping research due to the specific nature of the trauma response which involves hyperarousal, learned conditioning, social avoidance, and changed meanings that are most likely explained by changes in neurobiological processes, a conditioned fear response to trauma-related stimuli, and alterations in cognitive schema (Shalev, 1996). However, this field did not get much attention until the formalization of the posttraumatic stress disorder (PTSD) diagnosis.

The diagnosis of PTSD was introduced into the *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III)* in 1980 after it became clear that those who had trauma reactions following the Vietnam War were experiencing similar symptoms to those of rape survivors (Flouri, 2005; McNally, 2003; Ozer, Best, Lipsey, & Weiss, 2003). Since this inclusion, the criteria have changed twice, but the basic criteria have remained the same (Ozer et al.). When the *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition revised (DSM-III-R)* was introduced in 1987 the criteria noted that children's reactions may differ from adults, expanded the number of symptoms, and included a one-month criterion section (Flouri, 2005; Wilson, 1994). Following this, in the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)* the criteria for the traumatic event changed from an event that was "outside range of normal experience" (as in *DSM-*

III/DSM-III-R) to an event in which the response caused fear, helplessness, or horror (Ozer et al., p. 54). The modification in the *DSM-IV* focuses on the emphasis of the *subjective* experience of the person exposed to trauma, broadening the criteria for a traumatic event (Breslau, 2002).

With the *DSM-IV* criteria, the prevalence of exposure to trauma is noted as approximately 50-60% lifetime with the rates of PTSD being approximately 7% lifetime (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kessler, Berglund, Demler, Jin, & Walters, 2005; Ozer et al., 2003). However, since there have been differences in how researchers measure exposure to trauma (e.g. one question versus many), prevalence rates vary, though studies often report a higher prevalence of PTSD in women (Breslau, 2002).

Due to this variance, researchers have also looked at risk factors in terms of development of PTSD or exposure to traumatic events. Risk factors for PTSD have been divided into personal characteristics and aspects of the traumatic event. Individual risk factors include lower social support, lower intelligence or education level, a pre-existing or family history of a mood or anxiety disorder, prior psychological difficulties, past abuse or prior trauma, peritraumatic dissociation, perception that one's life is in danger, more intense negative emotional or biological (e.g. elevated norepinephrine levels) response during or immediately following the traumatic event, and compromised neurocognitive functioning (Halligan & Yehuda, 2000; Kessler et al., 1999; Ozer et al., 2003; Shalev, 1996). Incident risk factors include human cause to the disaster, large amount of property damage, financial problems for the community, and many injuries and/or deaths (Norris, Friedman, & Watson, 2002). Furthermore, risk factors for exposure have included female

gender, minority group status, neuroticism, early conduct problems, and family history of mental health problems (Breslau, 2002).

Along with risk factors, theoretical models that attempt to explain the presence or absence of PTSD have also been described. Biomedical models use a stress-diathesis conceptualization in which a predisposition to PTSD and exposure to severe stress cause development of the disorder, while other models suggest that parts of the brain are changed or damaged following exposure to trauma (Flouri, 2005). Some biological studies have supported this concept in that researchers have found that changes in regions of the brain and neurochemical responses influence the development of PTSD (Yehuda, 2004). Alternatively, multiple pathways are involved, meaning that an individual's biology, psychology, social context, prior trauma(s), development history, event factors, and subjective interpretation of the traumatic event all interact to protect or put an individual at risk for development of PTSD (Flouri; Yehuda). Due to the complexity of the disorder it is likely that research of any model examining PTSD symptoms must take into account many different variables. This chapter will introduce variables from the repeated exposure, personal, and environmental categories.

Repeated Exposure to Trauma: Burnout, Compassion Fatigue/Secondary Traumatic Stress, and Compassion Satisfaction

Besides posttraumatic stress, other types of work-related reactions might occur from frequently working with crises or trauma that have the potential to influence the development of PTSD symptoms. As Stamm (1997) notes in *Work-Related Secondary Traumatic Stress*, there is no one term used to describe a helper's repeated exposure and

subsequent response to trauma. The terms used most frequently are compassion fatigue, secondary traumatic stress, vicarious trauma, and countertransference. The term burnout is also utilized, and although this concept is not specific to trauma/disaster work, it may contribute to a negative response to trauma. This section will present burnout and secondary traumatic stress/compassion fatigue. These concepts are appropriate to examine for emergency management professionals since burnout is applied to general emotional overload or disengagement in work life while secondary traumatic stress/compassion fatigue is a response often observed in those who work with individuals exposed to trauma. Compassion satisfaction, a potential positive outcome of working with trauma material, will also be discussed.

Burnout, a term originally defined by Freudenberger in 1975 and further conceptualized by Maslach in 1976, is a phenomenon that has been greatly researched (Maslach & Schaufeli, 1993). There have been many definitions of the concept, but the common components are that burnout occurs on the level of the individual and is an internal negative psychological experience, frequently accompanied by exhaustion (Maslach, 1982b). Burnout research can be categorized into two specific phases (Maslach & Schaufeli). In the pioneering phase researchers examined clinical experiences of burnout, and in the empirical phase researchers examined the experience and determined how to measure it (Maslach & Schaufeli).

The first articles on burnout appeared in the mid-1970s after Freudenberger, a psychiatrist who had observed that healthcare volunteers experienced a loss in motivation, commitment, and emotional expression, defined the concept (Maslach & Schaufeli, 1993). At the time Freudenberger was noticing this phenomenon, Maslach, a social psychology

researcher, was studying how people cope with emotional arousal, detached concern, and dehumanization in their work life (Maslach & Schaeufeli). When Maslach discussed her observations with a poverty lawyer, he called the experience “burnout,” which she then used in her work (Maslach & Schaeufeli). Burnout was identified as a common experience and was written about in a descriptive manner as society became more individualized and human service work more professionalized and isolated from the community (Maslach & Schaeufeli).

Research on burnout, the professions experiencing it, and the development of models and measures such as the Maslach Burnout Inventory (MBI) increased with the awareness of the widespread presence of the phenomenon in the 1980s (Maslach & Schaeufeli, 1993). Countries outside of the United States began researching burnout, and other occupations apart from human services, such as police and business professionals, began to be studied. The 1980s work on burnout concluded that it is often a stable factor, it can lead to physical symptoms and turnover, and role conflict and lack of social support are often predictors (Maslach & Schaeufeli).

Finally, in the 1990s, theoretical models became more commonplace in the literature and burnout was considered an experience that developed over time in multiple domains that varied by researcher focus (Maslach & Schaeufeli, 1993). These domains included emotional exhaustion, depersonalization, cynicism, personal accomplishment, and broader physical, emotional, behavioral, work-related, and interpersonal categories (Figley, 1995; Maslach, 1982; Maslach, Schaeufeli, & Leiter, 2001).

Besides varying researcher domain focuses, different models of burnout have also been defined including existential, social comparison, individual, and environmental

perspectives. Pines (1993) considered burnout in an existential manner—the result of a process of disillusionment from one’s work when it is not providing meaning in one’s life. Buunk and Schaufeli (1993) presented an alternative view—that burnout developed from social comparison under conditions of stress; symptoms develop when individuals think that their peers are experiencing burnout. Individual theories of burnout considered resources and the environment. For example, burnout may result from a lack of support and autonomy (Burisch, 1993) or failure to meet goals (Hallsten, 1993). Similarly, Hopfoll’s conservation of resources theory (Hopfoll & Freedy, 1993) states that individuals’ inability to keep resources when needed causes stress, which over time leads to burnout.

Though the relationship can be complicated due to interactions between person and environment, personality on its own or in combination with the environment is also described as a contributing factor to burnout (Schaufeli & Enzmann, 1998). Personality factors that may lead to burnout include submissiveness, conformism, dependency, anxiety, easily angered, low self-concept, need for approval or achievement, low autonomy, neuroticism, low extraversion, cautiousness, and high level of reactivity (Bakker, Van Der Zee, Lewig, & Dollard, 2006; Buunk & Schaufeli, 1993; Carroll & White, 1982; Maslach, 1982; Noworol, Zarczynski, Fafrwicz, & Marek, 1993). Stressful work environments, physically or emotionally demanding tasks, lack of control or social support, and organizational culture (e.g. lack of structure) may also contribute to the experience of burnout (Carroll & White, 1982; Maslach, 1976, 1982; Winnubst, 1993).

Additionally some demographic factors have been identified as associated with burnout. Being younger, single, and childless are often correlated with the experience of

burnout while lack of strong associations with gender and education level are noted in the literature (Maslach, 1982; Maslach et al., 2001).

Despite the varying conceptualization of the construct, research on burnout has indicated that it is present in individuals from human service and first responder populations. Exposure to work or personal trauma has shown relationships to negative reactions such as burnout (Whealin, Ratzer, Detwiler, Schnurr, & Friedman, 2007), but the level of burnout for specific responder populations has varied. In a study of police officers the researchers noted the officers experienced less burnout than human services workers (Kop, Euwenma, & Schaufeli, 1999), while researchers studying paramedics and ambulance technicians found at least a medium level of burnout symptoms in one-third of the sample (Alexander & Klein, 2001). The level of burnout in emergency management professionals and how it may affect development of posttraumatic stress had not been assessed prior to this study.

Burnout is often looked at in conjunction with secondary traumatic stress or compassion fatigue. Compassion fatigue, a term originally used by Joinson, 1992, who explored the effects of trauma work in nurses, and secondary traumatic stress (STS), a term developed by Figley, 1995, are often used interchangeably (Figley, 1995, 1999). Figley (1995, 1995b) considers STS or compassion fatigue symptoms similar to the symptoms of PTSD with a quicker onset and recovery period than burnout. He notes risk factors for compassion fatigue/STS as use of empathy to assist individuals who are traumatized and reactivation of personal trauma experiences (Figley, 1995b). Empathy, according to Wilson and Thomas (2004), is the basis for understanding stress symptoms of individuals who work with trauma. They conceptualize compassion fatigue and secondary traumatic

stress slightly differently in that empathic identification or countertransference reactions towards those who have experienced a trauma may cause empathic strain and dysregulation of affect in trauma/emergency workers, which may lead to “traumatoid states” (Wilson & Thomas, p. 175) that include compassion fatigue, secondary traumatic stress, and vicarious trauma (changes in beliefs, worldview). Wilson and Thomas define compassion fatigue as behavioral symptoms of physical and mental fatigue following work with trauma survivors, and STS as “PTSD-like” reactions (p. 204), while also noting there is no evidence showing that STS is the same as PTSD in etiology, psychobiology, brain functioning, or course of disorder. Nevertheless, theorists agree that the exposure to a traumatic event through contact with another individual places professionals at risk for a secondary traumatic stress response despite the variation in descriptions. The amount of exposure may vary per profession, but the risk of secondary exposure is added to the potential of personal exposure to life-threatening events and incident sites for crisis and emergency workers (Beaton & Murphy, 1995).

In addition to the risk for burnout or STS, individuals may also have benefits from working with traumatized individuals, namely they may experience compassion satisfaction. The compassion satisfaction term originated with Stamm (2002) and is defined as the positive fulfillment gained from the process of assisting others (DePanfilis, 2006) and feeling that one is making a difference through their work (Larsen & Stamm, 2008). Work that involves helping after traumatic or critical events creates the possibility for compassion satisfaction development. Though this has also not yet been explored prior to this study, it was expected that emergency management professionals might have this potential due to their helping response or mitigation roles.

Most of the research on compassion fatigue/secondary traumatic stress and compassion satisfaction has been conducted using samples of mental health professionals and is often cross-sectional and descriptive. The main finding is that compassion satisfaction has a negative relationship to burnout and compassion fatigue, suggesting that it may play a protective role (Conrad & Kellar-Guenther, 2006; Simon, Pryce, Roff, & Klemmack, 2005). More research is needed concerning these constructs with individuals from other disciplines assisting post-crises, in conjunction with consideration of other risk and protective factors.

Personality

One of these personal pre-trauma risk or protective variables, personality, will be introduced in this segment. The construct of personality has been found to be invariable over time in self-report and spousal ratings after age 30 (Costa & McCrae, 1988). There are several theories of personality described in the literature (McCrae & Costa, 2003). All of them try to provide a psychological description of the person and include some aspect of human nature, information about traits, and motivational differences (McCrae & Costa). For example, behavioral theories enforce situational determinants and reinforcement, while humanistic theories emphasize individuals' abilities to think, grow, and love.

Many trait systems that are compatible with the different theoretical approaches also developed (McCrae & Costa, 2003). Within the trait systems are three overarching models used to describe and measure personality: multidimensional models, the Big Three model, and the Big Five model (Watson, Clark, & Harkness, 1994). The multidimensional models conceptualize personality as a large number of traits and assess personality by

extensive inventories such as the California Psychological Inventory; the Big Three model developed out of the work of Eysenck and identified three main personality factors, extraversion, neuroticism, and psychoticism; and the Big Five model was originally developed by Allport and Odbert and further defined by Costa and McCrae in the Five Factor Model (FFM) of neuroticism, extraversion, conscientiousness, agreeableness, and openness to experiences (McCrae & Costa, 2003; Watson et al., 1994).

Although there are different ways to conceptualize personality, theoretical models attempt to explain the relationship between personality and mood and anxiety disorders. Vulnerability models state that personality has a causal role in the development of disorders; pathoplasty models assert that aspects of personality influence the course of the disorder and shape the environment to help maintain the disorder; complication/scar theories describe how the disorder changes an individual's personality (such as losing the ability to trust, decreasing level of self-esteem); and spectrum/continuity models discuss the underlying shared aspects of personality and the disorder, considering the disorder a result of the personality and personality an expression of the disorder (Clark, Watson, & Mineka, 1994; van der Kolk, 1996).

Nevertheless, since mood and anxiety disorders affect affective, cognitive, biological, and behavioral aspects of an individual, relationships with personality seem likely and are found in the literature (Clark et al., 1994). A large amount of research showing the relationship between personality and general psychopathology as well as research showing the relationship between personality and PTSD has been conducted. The most consistent findings are reported with the variables of neuroticism, extraversion, and hardiness. A hardy personality is associated with less burnout (Alexander & Klein, 2001),

less posttraumatic stress symptoms (Bartone, 1999; Schnurr & Vielhauser, 1999), and less overall psychological distress (Waysman, Schwartzwald, & Soloman, 2001; Zakin, Soloman, & Neria, 2003). Extraversion is associated with more positive outcomes (Campbell-Sills, Cohen, & Stein, 2006; Fauerbach, Lawrence, Schmidt, Munster, & Costa, 2000; Paton & Auld, 2006), while neuroticism has a strong positive relationship to posttraumatic stress symptoms (Hall & Wilson, 2005; Paris, 2000). Research concerning neuroticism, extraversion, and burnout has also found similar relationships (Bakker, Van Der Zee, Lewig, & Dollard, 2006; Schaufeli & Enzmann, 1998).

Culture and Ethnic Identity

Besides personal factors, other factors in the environment, such as culture, may affect individuals' responses following trauma exposure. There is less research concerning the influence of culture on trauma symptoms compared to other risk and protective factors. Some of the research describes culture as a demographic variable such as race or ethnicity (e.g. Adams & Boscarino, 2005; Pole, Best, Metzler, & Marmar, 2005), while other research is beginning to examine culture in terms of identity (e.g. racial, ethnic) (e.g. Khaylis, Waelde, & Bruce, 2007). The need to explore culture in terms of response and recovery from trauma is written about conceptually in many forms.

Although culture is frequently used as a demographic variable, it is better described as how one makes meaning of one's belonging to various groups (e.g. ethnic, socioeconomic). Most simply, culture is a lens through which individuals interpret the world. Pederson (2006) summed it up best in his statement, "Skin color at birth is an individual difference, but what skin color has come to mean since birth is cultural" (p. 583).

Despite culture's importance to individuals and society, there is limited research on the trans-cultural aspects of traumatic stress (Stamm & Friedman, 2000). There is some evidence suggesting that how distress is expressed or experienced may be related to culture since individuals from non-Western cultures have often been found to express difficulties through somatization and dissociation following trauma (Stamm & Friedman). Moreover, intrusion and arousal symptoms of PTSD are often present in most trauma survivors, while expression of avoidance or numbing symptoms seems to be more related to culture (Stamm & Friedman). The reasons for this are not clear, but may include a combination of learned behavior, the environment, and cultural identity.

One form of cultural identity is ethnic identity. The definitions of ethnic identity vary but usually include self-identification to a group, belonging and commitment feelings, attitudes towards a group, cultural behaviors, and values (Phinney, 1990). Ethnic identity is conceptualized as a group-specific culture factor, cultural adaptation (e.g. level of adherence to one's culture), and/or ethnic group affiliation (e.g. group label, ethnic preferences and behaviors) (Helms, 1996) while also being considered as a social construct created through family and community interactions (Chávez & Guido-DiBrito, 1999). Ethnic identity is also suggested as important to self-concept and psychological functioning (Phinney, 1990).

Given ethnic identity's potential significance, further delineation of the concept and initial research will be depicted. In Phinney's (1990) review of 70 ethnic identity articles published in peer-reviewed journals from 1972 to 1990, she described three conceptual frameworks as well as components and empirical research findings concerning the construct. The first framework, social identity theory, came from social psychology and

states that being a member of a group provides a sense of belonging that leads to positive self-concept. Acculturation and culture conflict theories from social psychology, sociology, and anthropology see ethnic identity as a part of acculturation in that how individuals relate to their own group changes as they come into contact with other cultures. Finally, ethnic identity formation from developmental and counseling psychology view it as a process that occurs over time as individuals explore their ethnic identity and make decisions about the role they want it to play in their lives (Phinney, 1990, 1996).

Components of ethnic identity noted by Phinney (1990) include self-identification, sense of belonging, attitudes towards one's ethnic group, level of ethnic involvement, and ethnic identity formation. More recent work describes ethnic identity as dependent on relational and contextual factors, which suggests both environmental and individual influences (Coleman, Norton, Miranda, & McCubbin, 2003; Yeh & Hwang, 2000).

When examining early ethnic identity research, it is difficult to come to conclusions about its relationship to other psychological variables since there are different conceptualizations of the term and various measures used. Research has found mixed results in terms of how ethnic identity is related to self-esteem, self-concept, and psychological adjustment (Phinney, 1990). Specifically Phinney discusses 11 studies exploring this relationship and notes three found positive effects of ethnic identity as conceptualized as acceptance of identity, ethnic esteem, and higher ethnic identification, four found no relationship, and four found positive relationships between ethnic identity stage and self-concept or self-esteem.

Research examining ethnic identity in relation to trauma, stress, and other psychological symptoms has only recently begun. In research with adolescents and

emerging adults, stronger identity status (for ethnicity or race) has been shown to be both a protective (Bruce, 2005; Lee, 2005) and risk (Khaylis, Waelde, & Bruce, 2007) factor in terms of negative outcomes. In adult populations there also have been studies relating ethnic identity strength to negative symptoms (Midlarsky & Midlarsky, 2004) or finding no relationship (Ozegovic, 2002).

Theory Overview

The foundation for this project comes from a variety of aforementioned theories concerning the constructs under study. The multiple pathway model (Flouri, 2005; Yehuda, 2004) concerning the development of PTSD serves as the basis for exploration of multiple factors, specifically personality variables (neuroticism and extraversion), ethnic identity, trauma exposure, and work-related risk (burnout) and potential protective (compassion satisfaction) factors as predictor variables. The ideas that burnout, compassion fatigue/secondary traumatic stress, and compassion satisfaction are all potential outcomes for those who work with trauma (Figley, 1995, 1995b), and that trauma exposure is present for emergency management professionals, are also paramount to the current work. Burnout is considered using an individual global perspective as general negative work-related emotional and physical symptoms that have developed over time (Figley, 1995). The vulnerability model of personality is utilized, meaning that personality will be viewed as related to the development of PTSD (Clark, Watson, & Mineka, 1994) and the measurement of personality is assessed through the traits of neuroticism, extraversion, conscientiousness, agreeableness, and openness to experience (McCrae & Costa, 2003) with a specific focus on two of the factors, neuroticism and extraversion, in the hypotheses.

Lastly, the construct of ethnic identity is conceptualized using the development framework originally outlined by Phinney (1990), which currently defines ethnic identity through a level of personal exploration and commitment (Phinney & Ong, 2007) to an ethnic group following social experience with that group.

Problem Statement

It is evident that learning about a traumatic event carries the potential for an individual trauma or stress response (Figley, 1995b). Working with crises as part of one's professional role on a daily basis likely either heightens this potential or causes individuals to habituate to crises and their aftermath. The occupational hazard of crisis work is verified in research concerning the effects of trauma in terms of burnout, compassion fatigue/secondary traumatic stress, and posttraumatic stress disorder in helping and first responder professionals where the risk for negative outcomes is confirmed. However, repeated exposure research has focused more on the helping professionals, while research that explores PTSD is more common in first responders. To date the vulnerability of crisis work has not been previously investigated in emergency management professionals, a group that frequently works with preparation for and response to many different types of critical incidents. The amount and intensity of this exposure had not been defined and probably varies per individual due to both personal and work-related factors.

Regardless of the potential for negative outcomes following exposure to or working with a crisis, all people who experience or respond to a traumatic event do not develop psychopathology, and some develop positive outcomes such as compassion satisfaction. The reasons for this are likely a combination of genetic, personal, and environmental

factors. Beaton and Murphy (1995) suggest that pre-existing factors are one source of variance in outcomes following exposure to trauma. One such stable pre-existing factor is individual personality. Since personality factors such as extraversion and hardiness have been found to protect individuals from having increased distress or long-term difficulties (Haisch & Meyers, 2004; Wilson & Agaibi, 2005), personality is an important factor to utilize in trauma research. Furthermore, the role of culture has been suggested as an important variable to consider in counseling practice and research. Specifically, practitioners have discussed the importance of cultural identity in both response to and recovery from trauma (Bryant-Davis, 2005; Scurfield & Mackey, 2001) and although initial research findings on the role of one specific cultural variable, ethnic identity, are mixed, there is evidence that it may affect psychological outcomes (Bruce, 2005; Byers, 2006; Midlarksy & Midlarksy, 2004; Vollebergh & Huiberts, 1997).

Despite the aforementioned research, the variables in this project have never been considered together in terms of their predictive utility of PTSD symptoms. Therefore, the problem this project aimed to address was the examination of levels of trauma exposure, burnout, compassion fatigue, compassion satisfaction, and PTSD, and the investigation of models exploring neuroticism, extraversion, ethnic identity, trauma exposure, burnout, and compassion satisfaction as predictors of posttraumatic stress symptoms in a sample of emergency management professionals.

Significance

The current research project was conceptualized due to the paucity of research concerning traumatic stress and repeated exposures in emergency management

professionals. Since emergency management professionals are frequently involved in tasks before, during, and after a critical incident, they may have similarities to human services professionals in regards to their work with individuals and groups in preparation for and recovery following trauma, and similarities to first responders in terms of their work in the area of communications, mitigation, or on-site event response. Traumatic stress and the effects of repeated exposures have been studied in these aforementioned professional populations in many forms. The populations studied have included groups such as mental health professionals (Betts Adams, Matto, & Harrington, 2001; Creamer & Liddle, 2005; Jacobson, 2006), firefighters (Bryant & Harvey, 1996), paramedics (Lowry & Stokes, 2005), emergency medical technicians (Beaton, Murphy, Johnson, Pike, & Corneil, 1999), police officers (Hodgins, Creamer, & Bell, 2001), disaster volunteers (Fullerton, Ursano, & Leming Wang, 2004; Simons, Gahler, Meyer, & Johnson-Jimenez, 2005; Zimering, Bulliver, Knight, Monroe, & Keane, 2006), and medical military professionals (Akbayrak, Oflaz, Asian, Ozcan, Tastan, & Çiçek, 2005; Epstein, Fullerton, & Ursano, 1998). Variables measured in these studies have included posttraumatic stress/posttraumatic stress disorder, burnout, and compassion fatigue/secondary traumatic stress. Examining posttraumatic stress in emergency management professionals, a population that works daily with aspects of crises and is frequently scrutinized by the public or media, to determine how similar or different they might be from those already studied, was clearly needed.

Along with examining levels of traumatic exposure and stress and the roles of burnout and compassion satisfaction in a new population, this study also investigated whether neuroticism and extraversion served the same risk and protective roles in the

population of emergency management professionals as they do in first responders and other trauma survivors, and extended the data on the role of ethnic identity. This extension is significant since the role of ethnic identity appeared to be a potential explanatory factor of why research has found varying results concerning the relationship between cultural demographics and PTSD symptoms (Hembree & Foa, 2003; Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002; Perilla, Norris, & Lavizzo, 2002; Rabalais & Scotti, 2002).

Need for the Study

The study examined posttraumatic stress disorder symptoms in emergency management professionals, an unstudied population. A portion of this population includes workers employed by the Federal Emergency Management Agency (FEMA). FEMA consists of approximately 2,600 full-time employees and 4,000 individuals on standby for disaster response duties (FEMA, 2007). Given that government, private, and volunteer agencies locally, nationally, and internationally utilize individuals for emergency management roles, the population of individuals in this profession is substantial.

This population is exposed to aspects of disasters or critical incidents as part of their normal work routine, which likely amounts to extensive experience with potentially traumatic material. For instance, the number of federally declared disasters in 2008, 2007, and 2006 was reported by FEMA (2009) as 75, 63, and 52. However, the number of incidents that could be considered as exposure events for emergency management professionals is much higher, since roughly only 10% of all disasters receive this designation (Reyes & Elhai, 2004). These additional incidents, such as disaster events

managed with local resources, are estimated to be about 4,000 each year (Reyes & Elhai) and are increasing in number, intensity, and variety (McEntire, 2006, 2007).

Aside from the fact that this research was conducted using an understudied exposed group, the study was needed to provide new insight into a combination of potential person and environmental factors associated with PTSD symptoms, as both types of variables have been shown to be important (e.g. Lowry & Stokes, 2005; Marmar, Weiss, Metzler, Delucci, Best, & Wentworth, 1999). The inclusion of a cultural construct, ethnic identity, following traumatic exposure in an adult population aimed to fill another gap in the literature as well. Since PTSD is a complex disorder that may have persistent and incapacitating effects, researching multifaceted models is essential in order to gain further understanding of influencing factors and improve both individual and work functioning of those with symptomology.

Research Questions and Hypotheses

Given the paucity of research in emergency management personnel, the purpose of this study was to determine levels of trauma exposure, burnout, compassion fatigue (secondary traumatic stress), compassion satisfaction, and posttraumatic stress disorder symptoms in a sample of emergency management professionals. Models examining how personality (neuroticism, extraversion), ethnic identity strength, trauma exposure frequency, burnout, and compassion satisfaction predict posttraumatic stress symptoms in a cross-sectional design were also explored. More specifically, the study examined the following research questions and tested the corresponding hypotheses.

Research Question 1

To what extent do neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction explain and predict PTSD symptoms in a sample of emergency management professionals?

Hypothesis 1

A model containing personality factors (neuroticism, extraversion), trauma exposure, and the repeated exposure variables of burnout and compassion satisfaction will account for the most variance in comparison to the individual predictors, namely, personality (neuroticism, extraversion), trauma exposure, and repeated exposure symptomology (burnout, compassion satisfaction) in predicting PTSD symptoms.

This model includes: neuroticism and extraversion as measured by the NEO-FFI (Costa & McCrae, 1992) neuroticism (N) and extraversion (E) subscales, trauma exposure as measured by the frequency of events endorsed on the Trauma History Questionnaire (Green, 1996), and burnout and compassion satisfaction as measured by the Professional Quality of Life (Stamm, 2005) burnout and compassion satisfactions subscales. PTSD symptoms were measured by the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993; Weathers, Litz, Huska, & Keane, 1994).

Studies have shown that personal and environmental factors influence PTSD symptom development (e.g. Lowry & Stokes, 2005; Marmar et al., 1999) and inclusion of both may help further explain symptom level following exposure to traumatic or crisis events. The variables in this model (personality, trauma exposure, burnout, compassion satisfaction) have individually shown significant relationships, predictive value, or

potential theoretical explanation for PTSD symptomology; this will be further described below. No research has looked at the interplay of these variables in terms of PTSD symptom development.

Sub-Hypotheses

It was also hypothesized that the individual predictors of neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction would demonstrate predictive utility in explaining PTSD symptoms in the following ways:

a. *Neuroticism*: Neuroticism as measured by the N subscale of the NEO-FFI (Costa & McCrae, 1992) will positively predict posttraumatic stress symptoms as measured by the PTSD Checklist (Weathers et al., 1993, 1994) in a model containing extraversion (measured by the E subscale of the NEO-FFI; Costa & McCrae, 1992), trauma exposure (measured by the THQ; Green, 1996), burnout and compassion satisfaction (measured by the burnout and compassion satisfaction subscales of the ProQoL; Stamm, 2005).

There is a multitude of research studies supporting the positive relationship between neuroticism and negative outcomes such as PTSD (e.g. Hall & Wilson, 2005; Hyer, Braswell, Albrecht, Boyd, Boudewyns, & Talbert, 2003; Schnurr & Vielhauser, 1999). The utility of neuroticism to positively predict PTSD symptoms is demonstrated in research with different populations such as firefighters (McFarlane, 1989) and medical patients (Chung, Berger, Jones, & Rudd, 2006). It was expected that this relationship would also be present in a sample of emergency management professionals.

b. *Extraversion*: Extraversion as measured by the E subscale of the NEO-FFI (Costa & McCrae, 1992) will negatively predict posttraumatic stress symptoms as

measured by the PTSD Checklist (Weathers et al., 1993, 1994) in a model containing neuroticism (measured by the N subscale of the NEO-FFI; Costa & McCrae, 1992), trauma exposure (measured by the THQ; Green, 1996), burnout and compassion satisfaction (measured by the burnout and compassion satisfaction subscales of the ProQoL; Stamm, 2005).

A reasonable amount of research has found support for the inverse relationship between extraversion and negative outcomes such as PTSD. Less extraverted police officers were found to be more at risk for PTSD (Haisch & Meyers, 2004) and higher extraversion protected against development of PTSD in longitudinal research utilizing a sample of burn victims (Fauerbach et al., 2000). It was also anticipated that a similar relationship would be found in the current study.

c. Trauma Exposure: Trauma exposure as measured by the frequency of events endorsed on the THQ (Green, 1996) will positively predict posttraumatic stress symptoms as measured by the PTSD Checklist (Weathers et al., 1993, 1994) in a model containing neuroticism and extraversion (measured by the N and E subscales of the NEO-FFI; Costa & McCrae, 1992), and burnout and compassion satisfaction (measured by the burnout and compassion satisfaction subscales of the ProQoL; Stamm, 2005).

Trauma exposure is an orthogonal condition necessary for PTSD symptom development. Research has found that greater exposure frequency (Bryant & Harvey, 1996; Eriksson, Vande Kemp, Gorsuch, Hoke, & Foy, 2001) or prior history of trauma (Ozer et al., 2003) is related to increased PTSD symptoms. It was expected that the more personal and work-related trauma experiences endorsed by participants in the study, the more PTSD symptoms they would report.

d. *Burnout*: Burnout as measured by the burnout subscale of the Professional Quality of Life Scale (Stamm, 2005) will be an individual positive predictor of posttraumatic stress symptoms as measured by the PTSD Checklist (Weathers et al., 1993, 1994) in a model with neuroticism and extraversion (measured by the N and E subscales of the NEO-FFI; Costa & McCrae, 1992), trauma exposure (measured by the THQ; Green, 1996), and compassion satisfaction (measured by the compassion subscale of the ProQoL; Stamm, 2005).

Symptoms of burnout have been found to be associated with both somatic symptoms and intrusiveness of client material in research with social workers (Betts Adams, Matto, & Harrington, 2001), while positive relationships between burnout and compassion fatigue or secondary stress (which have symptoms similar to PTSD) have been noted in past research (Collins & Long, 2003; Corey-Souza, 2007; Simon et al., 2005). Research with police officers (Carrier, Lamberts, & Gersons, 1997) and firefighters, paramedics, and emergency medical technicians (Sirratt, 2001) also found that emotional exhaustion, a component of burnout, was predictive of PTSD symptoms. It may be that an individual who experiences burnout is less able to access their own psychological or physical resources putting them more at risk for the development of PTSD symptoms when exposed to a traumatic event.

e. *Compassion Satisfaction*: Given that no one has explored the relationship between compassion satisfaction and PTSD, this hypothesis was exploratory. Extrapolating from the secondary traumatic stress literature, this sub-hypothesis stated: Compassion satisfaction as measured by the compassion satisfaction subscale of the Professional Quality of Life Scale (Stamm, 2005) will serve as a negative predictor of posttraumatic

stress symptoms as measured by the PTSD Checklist (Weathers et al., 1993, 1994) in a model with neuroticism and extraversion (measured by the N and E subscales of the NEO-FFI; Costa & McCrae, 1992), trauma exposure (measured by the THQ; Green, 1996), and burnout (measured by the burnout subscale of the ProQoL; Stamm, 2005).

Research has found that high levels of compassion satisfaction are related to low levels of compassion fatigue or secondary traumatic stress (Collins & Long, 2003; Conrad & Kellar-Guenther, 2006). Since compassion fatigue symptoms are similar to PTSD with the exception that the exposure is through another individual, the negative relationship between compassion satisfaction and PTSD may be similar. The positive experience of compassion satisfaction may serve as a protective factor or resource and lessen development of PTSD symptoms.

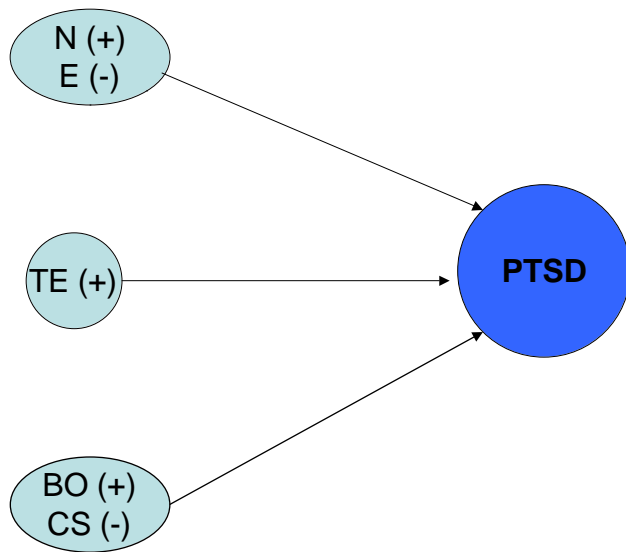


Figure 1. Hypothesized theory explaining PTSD symptoms.

N= Neuroticism, E= Extraversion, TE= Trauma Exposure, BO= Burnout, CS= Compassion Satisfaction

Research Question 2

To what extent do neuroticism, extraversion, burnout, and compassion satisfaction moderate the relationship between trauma exposure frequency and PTSD symptoms in a sample of emergency management professionals?

Hypothesis 2

Neuroticism, extraversion, burnout, and compassion satisfaction will moderate the relationship between trauma exposure frequency and PTSD symptoms in the following

ways: For participants high in neuroticism, the association between trauma exposure frequency and PTSD symptoms will be strong and positive, for participants low in neuroticism, this association will be weakly positive or nonexistent; For participants low in extraversion, the association between trauma exposure frequency and PTSD symptoms will be strong and positive, for participants high in extraversion, this association will be weakly positive or nonexistent; For participants high in burnout the association between trauma exposure frequency and PTSD symptoms will be strong and positive, for participants low in burnout, this association will be weakly positive or nonexistent; For participants low in compassion satisfaction, the association between trauma exposure frequency and PTSD will be strong and positive, for participants high in compassion satisfaction, this association will be weakly positive or nonexistent.

This model included trauma exposure frequency as measured by the Trauma History Questionnaire (Green, 1996), neuroticism and extraversion measured by the NEO-FFI (Costa & McCrae, 1992) neuroticism (N) and extraversion (E) subscales, and burnout and compassion satisfaction as measured by the Professional Quality of Life Scale (Stamm, 2005) burnout and compassion satisfaction subscales. PTSD symptoms were measured by the PTSD Checklist (Weathers et al., 1993, 1994).

Since greater trauma exposure frequency has been associated with or predictive of PTSD symptoms (e.g. Bryant & Harvey 1996), it was expected that as trauma exposure increases, risk factors would exacerbate and protective factors would decrease the level of PTSD symptoms observed in the sample. Research finds support that neuroticism (Hall & Wilson, 2005) and burnout (Sirratt, 2001) place individuals at risk for PTSD symptoms while extraversion (Fauerbach et al., 2000) may protect individuals from PTSD following

trauma exposure. Support for the idea that compassion satisfaction may also decrease the risk for PTSD was extrapolated from the secondary traumatic stress literature (e.g. Conrad & Kellar-Guenther, 2006) as well.

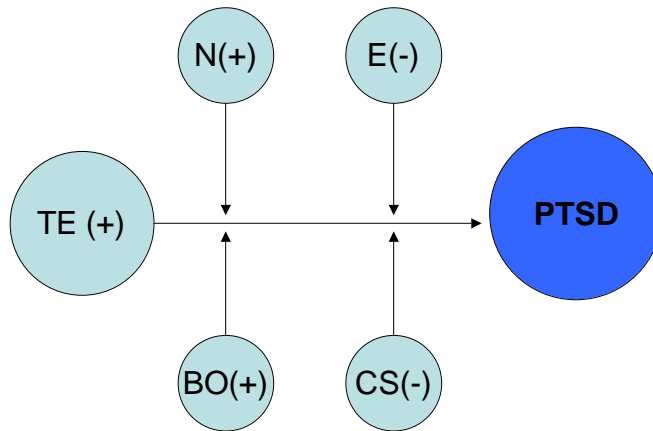


Figure 2. Hypothesized theory of moderating relationships explaining PTSD symptoms.

N= Neuroticism, E= Extraversion, TE= Trauma Exposure, BO= Burnout, CS= Compassion Satisfaction

Exploratory Research Question

3. Does ethnic identity moderate the relationship between trauma exposure frequency and PTSD symptoms in a model containing neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction?

This model included: neuroticism and extraversion as measured by the NEO-FFI (Costa & McCrae, 1992) neuroticism (N) and extraversion (E) subscales, ethnic identity as

measured by the Multigroup Ethnic Identity Measure-Revised (Phinney & Ong, 2007), trauma exposure as measured by the frequency of events endorsed on the Trauma History Questionnaire (Green, 1996), and burnout and compassion satisfaction as measured by the Professional Quality of Life (Stamm, 2005) burnout and compassion satisfaction subscales. PTSD symptoms were measured by the PTSD Checklist (Weathers et al., 1993, 1994).

There were no directional hypotheses concerning this question since the construct of ethnic identity has been defined and measured in various ways (Phinney, 1990), and to the researcher's knowledge has never been explored in the population under study, first responders, or helping professionals following trauma exposure. Studies concerning this variable have also shown mixed results concerning psychological outcomes varying by population and type of stress or trauma experience (e.g. Byers, 2006; Midlarsky & Midlarsky, 2004; Ozegovic, 2002). Research has been found to support ethnic identity strength being positively related to well-being (Martinez & Dukes, 1997) as well as serving as a predictor of distress (Byers, 2006), but not enough evidence was available to hypothesize about what the specific role of ethnic identity in predicting PTSD symptoms would be in the population under study.

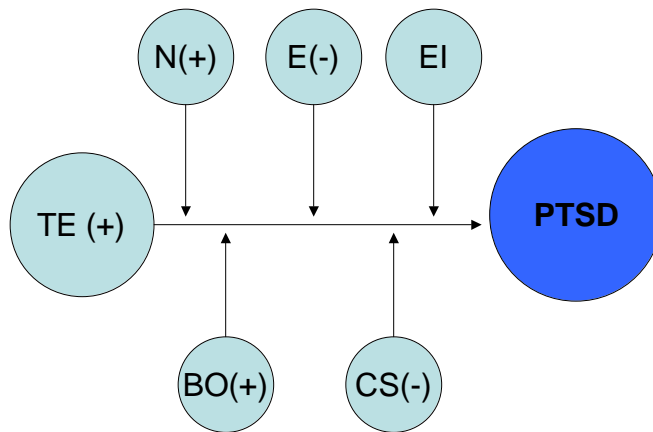


Figure 3. Exploratory theory of moderating relationships explaining PTSD symptoms.

N= Neuroticism, E= Extraversion, EI= Ethnic Identity, TE= Trauma Exposure
 BO= Burnout, CS= Compassion Satisfaction

Summary of the Methodology

The research project employed a cross-sectional survey design using valid and reliable instruments in a sample of emergency management professionals. The sample of participants for the study were recruited from international and national emergency management groups via an email announcement and invitation of the research study sent to the member list-servs of the groups that have agreed to participate in the research and attendees at one emergency management association event. The following instruments

were presented to those individuals who agreed to participate via the PsychData Internet web survey tool along with an information sheet which served as the informed consent document: NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrae, 1992), Multigroup Ethnic Identity Measure-Revised (Phinney & Ong, 2007), Trauma History Questionnaire (THQ) (Green, 1996), Profession Quality of Life Scale (ProQol) (Stamm, 2005), PTSD Checklist-Civilian version (PCL-C) (Weathers et al., 1993, 1994), and a demographics questionnaire. The data were analyzed with descriptive and correlation statistics and hierarchical regression analysis to test models explaining the variance in PTSD symptoms using predictors of neuroticism, extraversion, ethnic identity, trauma exposure, burnout, and compassion satisfaction.

Delimitations

There are theoretical and sampling delimitations of this study that deserve mention. The predictor construct delimitations were as follows: Neuroticism and extraversion are the factors of personality that were chosen to be included in the hypotheses. Consideration of models utilizing other elements of personality such as conscientiousness and hardiness or using alternative methods to identify a larger number of traits (e.g. California Psychological Inventory, Minnesota Multiphasic Personality Inventory) could capture other aspects of personality's relationship to traumatic stress. Ethnic identity strength was chosen as a variable to examine in terms of culture. Ethnic identity is only one aspect of cultural identity and may not be the most salient aspect of culture for each participant in the sample. The choice to use this variable was based on previous research, but other aspects of culture such as gender or religious identity may also be important. Trauma exposure

was also limited in its conceptualization as the number of traumatic, crisis, or emergency events experienced in either a work or personal context, regardless of perception of severity; this variable may be affected by job assignment or function and individual experiences.

Additionally, the selection of the sample of participants was limited to emergency management professionals that belong to an emergency management organization that agreed to participate in the research or those who attended an emergency management conference. Those individuals who are not members of an organization or meeting attendees could not be part of the sample; therefore the results may not generalize to these individuals. The sample was further limited by the need to have at least a sixth-grade English reading level to be able to understand and complete the assessments, and to not be diagnosed with a psychotic disorder. Moreover, those who responded to the request to participate in the research, given the self-selected nature of the sampling process, may be different than those who did not respond. For example, those with the most responsibilities and perhaps the most exposure to various aspects of emergencies may not have chosen to complete the survey due to time constraints.

Limitations

There are many limitations to this cross-sectional retrospective survey design research study. First and foremost, many factors affect an individual's response to trauma and it would be impossible to collect data on all the potential factors. Since this is a non-random sample, there is no assurance that the sample obtained is representative of the population of emergency management professionals, making generalizeability and external

validity less strong. There was limited information on the ethnic/racial demographics of emergency management professionals available to compare the sample obtained to the population. One study reported the majority (87%) of its International Association of Emergency Management participants to be Caucasian (Cwiak, Cline, & Karlgaard, 2004). The current sample was similarly homogenous (83% White participants). Furthermore, Weisaeth (1989) found that individuals who have more symptoms following exposure to trauma are less likely to respond to surveys, so those with the most severe posttraumatic stress symptoms may be missing from the sample. This may have also limited the range of responses on the criterion variable. Additionally, due to the cross-sectional correlational nature of the design, implications about causation cannot be made.

Other limits involve aspects of the instrumentation. Since all measures used are self-report and retrospective, social desirability and memory effects may have influenced the responses. Individuals may have wanted to make themselves look healthier than they are or may not have remembered the extent of their symptoms especially if they recovered in a brief amount of time, yet research has found that overall, disaster victims remember experiences accurately over time (Norris & Kaniasty, 1992). The sample of emergency management professionals may not all be victims of a disaster, but the majority has been exposed to crises and trauma. Also, a potential problem in using the same type of assessment tool for all constructs is the shared variance that using the same method employs. However, since this project was exploratory and intended to reach a large number of respondents, self-report measures were the easiest way to access the participants in the population in a timely manner. There is also measure order bias present since counterbalancing of measures was not possible due to financial limitations. Finally, to the

researchers' knowledge, this is the first time that most of the measurement tools such as the PTSD Checklist and Multigroup Ethnic Identity Measure-Revised were used on a sample of emergency management professionals. In spite of these limitations, since this population had not been studied gathering data on the effects of cumulative exposure to various aspects of crises events that emergency management professionals experience was important.

Assumptions

Assumptions in terms of the population, constructs under study, and measures were made during the conceptualization of this research. In terms of the population in which the sample was obtained, one assumption was that emergency management professionals consist of a distinct unified population despite their training in different areas (e.g. response, communications) and potential for different roles before, during, and after a disaster (e.g. preparation, mitigation). Additionally, it was assumed that emergency management professionals are at risk for traumatic stress due to their probable trauma exposure and have the potential for compassion satisfaction due to their work in assisting other individuals or the community before, during, or after a crisis. Another assumption is that personality as a construct is stable over time and does not change much following exposure to trauma, and that ethnic identity would be a salient construct to examine for the emergency management professionals participating in the research. Finally, it was assumed that the instruments chosen for the research would be valid and reliable in a new population of crisis workers, emergency management professionals, due to their commonalities with first responder and helping professionals.

Definition of Key Terms

Emergency Management Professional

An individual whose job involves one or more of the following aspects before, after, or during a disaster or critical event: mitigation (attempt to decrease risk), response, recovery, preparedness, and/or communications (Haddow & Bullock, 2006). In this project emergency management professionals are individuals who belong to a professional emergency management organization or attend a local emergency management conference.

Trauma Exposure

The experience or witnessing of an event that involves potential physical and/or psychological harm to self, others, and/or property. Exposure to trauma is measured by frequency of endorsed items on the Trauma History Questionnaire (Green, 1996).

Posttraumatic Stress Disorder (PTSD)

Personal experience of a traumatic event accompanied by symptoms in three categories: 1) *Re-experiencing the event*: recurrent recollections or dreams related to the event, feeling as if the event was reoccurring, distress when exposed to cues from the event, reactivity to cues; 2) *Avoidance of event or stimuli associated with the event or Numbing*: avoidance of thoughts, feelings, or places related to the event, inability in recollection of aspect(s) of the event, decreased interest in activities, feelings of detachment, restricted range of affect, sense of foreshortened future; and 3) *Increased arousal*: sleep or concentration difficulties, irritability or anger, hypervigilance, increased startle response. Symptoms last for more than one month and significantly interfere with daily functioning (American Psychiatric

Association, 1994, 2000). PTSD symptoms are measured as a continuous variable by endorsement of items on the PTSD Checklist-Civilian version (Weathers et al., 1993, 1994).

Burnout

Burnout is a general syndrome of physical and mental exhaustion that builds up over time through working in a draining work environment (Collins & Long, 2003b); it often results in hopelessness and difficulties in job performance (Stamm, 2005). This variable is defined through the burnout subscale of the Professional Quality of Life Scale (Stamm).

Compassion Fatigue/Secondary Traumatic Stress (STS)

Compassion fatigue and Secondary Traumatic Stress (STS) will be used interchangeably. Secondary Traumatic Stress is “the natural, consequent behaviors and emotions resulting from *knowledge* about a traumatizing event experienced by a significant other. It is the stress resulting from *helping or wanting to help* a traumatized or suffering person” (Figley, 1995b, p.10). Compassion fatigue/STS usually has a quick onset, and includes psychological distress, cognitive changes, behavioral and physical symptoms, and relational difficulties (Collins & Long, 2003b; Figley, 1999). This construct is measured through the compassion fatigue subscale of the Professional Quality of Life Scale (Stamm, 2005).

Compassion Satisfaction

Compassion satisfaction is the fulfillment or pleasure gained from assisting other individuals and the feeling of having done your job well (DePanfilis, 2006; Stamm, 2002, 2005). The compassion satisfaction subscale of the Professional Quality of Life Scale (Stamm, 2005) is used to capture this variable.

Personality: Neuroticism and Extraversion

Personality is internal, organized, individual traits that are considered stable over time and situations (Watson, Clark, & Harkness, 1994). The specific personality traits of neuroticism and extraversion will be utilized in this study's hypotheses. Neuroticism is the tendency to experience negative affect (Costa & McCrae, 1992), while extraversion is described as a willingness to actively engage with people and the environment (Costa & McCrae, 1992; Watson et al., 1994). Neuroticism is measured by the neuroticism (N) subscale and Extraversion by the extraversion (E) subscale of the NEO Five-Factor Inventory (Costa & McCrae, 1992).

Ethnic Identity

Ethnic identity is an individual's level of exploration and commitment "to both endorsing and practicing a set of values, beliefs, and behaviors associated with a particular ethnocultural tradition" (Marsella, Chemtob, & Hamada, 1990, p. 4) following social experience with an ethnic group or tradition. The Multigroup Ethnic Identity Measure-

Revised (Phinney & Ong, 2007) total score measures the strength of ethnic identity for participants in the research study.

Chapter 2: Literature Review

This study examined models explaining posttraumatic stress disorder symptoms in a sample of emergency management professionals considering the framework that repeated exposure to crises may place individuals at risk for traumatic stress symptoms. In examining personal and environmental influences to this risk, the literature concerning PTSD, compassion fatigue/secondary traumatic stress, burnout, compassion satisfaction, neuroticism, extraversion, ethnicity, and ethnic identity will be discussed in this chapter. Trauma exposure, including both a personal history of trauma and experience of work-related traumatic events, is discussed within these literature bases, as it is a necessary context of posttraumatic stress symptom development.

Since emergency management is a new population focus in traumatic stress research, this review will cover both the first responder and helping professional research to get a comprehensive idea of the state of the field. Research has found that although both occupational categories are at risk, human services professionals have a higher rate of traumatic stress symptoms than the first responder population (Kop, Euwenna, & Schaufeli, 1999; Paton & Smith, 1996). Prior to this study, there was no data identifying if emergency management professionals were more like first responders (such as firefighters), due to their role in response or individuals in the helping professions (such as counselors and psychologists), due to their continual role with individuals and groups on many levels such as preparation and rebuilding.

Both personal and environmental factors will be considered in presenting this research. Emergency management professionals are often exposed to many different types of environments and cultures, and since all individuals bring pre-existing traits to their work, both types of factors are important to consider. Specifically, the researcher explored personality as a personal variable, and ethnic identity as an environmentally influenced variable in reviewing the literature and developing models to test in this study.

This review will give an overview of PTSD research and discuss further research comparing PTSD in related professional groups. The review will then examine the influences of personality and ethnicity, as several studies identify personality as a predisposing factor in the development of traumatic stress or psychological symptoms (e.g. Bartone, 1999; Hall & Wilson, 2005), while research of ethnicity as a demographic variable shows mixed results in relation to PTSD symptoms (Hembree & Foa, 2003; Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002; Perilla, Norris, & Lavizzo, 2002; Rabalais & Scotti, 2002). A description of research exploring symptoms of repeated exposures such as burnout, compassion fatigue/secondary traumatic stress, and compassion satisfaction follows. Finally, the researcher will discuss the role of cultural and ethnic identity from both theoretical and empirical contexts, since culture/ethnicity considered in this matter may assist to explain inconsistencies in the research. Overall, this review aims to provide evidence of how neuroticism, extraversion, ethnic identity, and repeated exposures are related to posttraumatic stress disorder symptoms in occupations exposed to trauma, and to demonstrate why there was a need to examine these variables in the emergency management field.

Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) symptoms may occur after “ordinary” and “extraordinary” incidents (Shalev, 1996, p. 79). What makes PTSD different from a normal stress reaction following the experience of a traumatic event is its “unique combination of hyperarousal, learned conditioning, shattered meaning propositions, and social avoidance” (Shalev, p. 94). Some level of transient stress reaction, such as changes in behavior, cognitions, or affect following exposure to a traumatic event is expected, but it is the symptoms of re-experiencing, arousal, numbing, and avoidance that continue to affect one’s daily functioning and relationships that are characteristic of PTSD.

Since the formalization of PTSD as a diagnosis, many different types of studies have been conducted investigating the prevalence of PTSD, vulnerability factors, longitudinal course, disorders of co-morbidity, and biological aspects (Yehuda & McFarlane, 1999). Regarding prevalence, researchers have provided evidence that PTSD is not the norm following exposure to trauma, with a lifetime prevalence recently noted as 8-12% (Norris & Slone, 2007). Since prevalence rates of PTSD have varied, vulnerability studies examined which individuals may or may not develop PTSD. These studies have explored genetic factors, family and personal history of psychological problems, personality, life events, social support, exposure, and other individual variables (Yehuda & McFarlane). Longitudinal studies have attempted to find more evidence for an individual’s vulnerability for and subsequent course of PTSD. Early studies examining the disorder over time explored symptoms as a continuation of a normal stress response or failure to recover from exposure (Yehuda & McFarlane). More recent evidence finds that immediate response to exposure is most likely different in those who develop PTSD

compared to those who do not and is also affected by other variables, such as prior trauma history (Yehuda & McFarlane). Furthermore, co-morbidity studies have reported that 50-90% of those with chronic PTSD meet criteria for another mental health or substance use disorder, which brings up questions concerning overlap of symptoms and proper differentiation between disorders (Yehuda & McFarlane). Finally, neurobiological studies have found that biological changes are present in the trauma response of an individual with PTSD (Yehuda & McFarlane). This response is different than the response of those who do not develop PTSD; some of these changes include a more sensitive hypothalamic-pituitary-adrenal (HPA) axis, decreased cortisol levels, and increased negative regulation and response to stimuli (Yehuda & McFarlane).

In the next three subsections, the reader will find an overview of the posttraumatic stress literature in emergency management, helping, and first responder groups in order to highlight the constructs that have been researched most frequently, define what is known, and identify current gaps in the literature. Prior to describing this literature base, it is important to note that studies examining the traumatic stress reactions of individuals who work in disaster response are somewhat recent, in part due to the relative newness of the PTSD diagnosis. Acknowledgement of the emotional consequences of ongoing trauma work began in the 1980s with the development of strategies for addressing posttraumatic stress reactions and research exploring trauma effects following shortly after in the mid-late 1980s and early 1990s (McCammon & Allison, 1995; van der Kolk, 2007).

Posttraumatic Stress Disorder and Emergency Management Professionals

In reviewing the literature, the researcher did not find any research involving emergency management professionals' responses to traumatic stress. There has been work examining stressors or stress responses of American Red Cross or Federal Emergency Management Agency staff following their disaster response duties (Myers & Wee, 2005), but no research has been conducted within the broader profession of emergency management. However, some authors have conceptually discussed the hazards of the type of work emergency management professionals perform. An article in the *Journal of Emergency Management* noted the need for qualitative research to determine how trauma and stress affect emergency responders and terrorism investigators due to three stress areas that these professionals work under: dangerous working environments, post-event reminders of the crises, and politically motivated demands/frequency of high-profile events (Friedman, 2006). Emergency management professionals as a larger group are also frequently under the same stressors, although the environment may not always be a source of immediate risk. Similarly, Kowlaski and Vaught (2001) noted that both the emergency manager and worker may be exposed to injury, loss of life, fatigue, work overload, unrealistic expectations, limited resources, and a need for high performance; these are elements that may increase risk for emergency management professionals. These authors also emphasize that while there is a great deal of research on emergency workers responding to one specific incident, research on the cumulative effects of working with multiple disasters is lacking. Since there is no research exploring posttraumatic stress symptoms within emergency management professionals, a field that has existed formally

only since the 1970s (Haddow & Bullock, 2006), it is helpful to compare them to helping professionals and first responders.

Emergency management professionals perform roles that have similarities to both the helping and first responder populations, but there are also ways in which the profession is different. The similarities include comparable roles in terms of preparation for and response to emergency events, potential for cumulative exposure to different types of trauma (e.g. natural disaster, terrorism), varying amounts of exposure within the profession as a whole, interaction with the public on individual, group, or organizational levels, and receipt of specialized training. The differences include that emergency management professionals may have to play many roles throughout a crisis, have varying levels and types of education and occupational training, have frequent travel or displacement from their primary place of employment (EMPOWER strategic plan, 2007), and are often under intense public scrutiny, especially within government organizations.

Regardless of the similarities and differences, when trying to form conclusions from studies concerning professionals responding to emergencies and trauma, it becomes evident that research concerning “emergency” personnel is difficult to generalize since the term is used in various ways in the literature. Some researchers use the term “emergency” worker to describe the more typical first responder population such as firefighters, police, emergency medical technicians, and highway department rescue workers (Marmar et al., 1999; Weiss, Marmar, Metzler, & Ronfeldt, 1995), while others also add groups such as nurses and doctors to the definition of an “emergency” worker (McCammon, Durham, Allison, & Williamson, 1988). Furthermore, some of the literature groups all types of emergency workers in a single study (e.g. Marmar et al.); whereas other work has been

conducted on more defined individual groups (e.g. North et al., 2002). The review of PTSD (and repeated exposures) research will include emergency personnel in two general categories, helping professionals and first responders, and note when these categories appear to overlap.

Despite difficulties in distinguishing between groups, one of the most consistent findings in traumatic stress research with both helping professionals and first responders is that event and personal factors affect symptom development (e.g. Chrestman, 1995; Marmar et al., 1999). Many studies have explored event factors such as exposure to disaster (e.g. Fullerton, Ursano, & Leming Wang, 2004) and individual factors, such as emotional reactions (e.g. Lowry & Stokes, 2005) and demographic factors (e.g. Creamer & Liddle, 2005). The results will be summarized in the next section according to occupational category, following a study that utilized a sample that appears quite similar to emergency management professionals.

Moran and Britton (1994) conducted a study with participants performing a variety of roles typical of emergency management professionals. This sample could be categorized as either a helping or first responder group. The research employed 210 volunteers from two emergency services organizations in Australia who were responsible for preparation/planning, response, and prevention of disasters. The participants who self-reported a higher level of symptoms were more likely to have past history of trauma, a more intense reaction, and score higher on a “less mature” defense style (Moran & Britton, p. 582). Personality variables did not contribute to severity or length of reaction to the incident. Since generalizing results of this study’s sample to the current project is limited due to the fact that the sample was composed of volunteers and only 9.5% female, the

researcher will describe additional studies' findings concerning other workers who focus on the response role in the following two segments.

Posttraumatic Stress Disorder and Helping Professionals

When reviewing the research on helping professionals working after a traumatic event, it is often challenging to classify whether their roles are more similar to first responders or to the roles of helpers. This is due to the fact that volunteers, crisis workers, and mental health and medical professionals often take on a response role in their helping work when providing psychological first aid or assisting with primary needs (e.g. safety, shelter) (Reyes & Elhai, 2004). This section will focus on helping professionals working during and immediately following traumatic events.

The types of helping occupations that have been researched include mental health professionals (Chrestman, 1995), medical professionals (Epstein, Fullerton, & Ursano, 1998; Lubin, Sids, Vishne, Shochat, Ostfield, & Shmushkevitz, 2007), and disaster workers or volunteers (Grieger, Stabb, Cardena, McCarroll, Brandt, Fullerton, & Ursano, 2000; Simons, Gahler, Meyer, & Johnson-Jimenez, 2005). Researchers have often focused on disaster workers from within the Red Cross (e.g. Long, Meyer, & Jacobs, 2007) and other organizations due to the many stressors of crisis response. These stressors, which may be similar to those experienced by emergency management professionals, include changes in procedures during response to a crisis, ambiguous roles and command structures, varying cultures and needs of victims, difficult working environments, lengthy work assignments, and political factors (DeWolfe, 2000; Eby, 1984; Reyes & Elhai, 2004).

The general body of helping professionals research has examined exposure rates (Grieger et al., 2000), development of PTSD and other disorders (Fullerton, Ursano, & Leming Wang, 2004; Grieger et al., 2000; Simons et al., 2005; Zimering, Bulliver, Knight, Munore, & Keane, 2006), and the effect of demographic and individual factors such as age and years of experience (Fullerton et al.; Grieger et al.; Simons et al.). The research has found that greater exposure frequency (Eriksson et al., 2001) and previous exposure to trauma or disasters (Akbarak et al., 2005; Fullerton et al.) is associated with increased symptoms or risk for PTSD. Research on the relationship between demographic variables and symptomology is more varied. Some researchers have found that those younger (Epstein et al., 1998), single (Akbarak et al.), and without a college education (Epstein et al.) are more at risk for difficulties or posttraumatic stress symptoms, while others found no association among demographic variables, exposure, and development of symptoms (Grieger et al.). There also is support for the relationship between negative affect and post-disaster difficulties (Epstein et al.). The researcher will discuss selected studies highlighting what has been explored the most—namely, trauma exposure, symptom level, and other individual (e.g. personal history of trauma, reactions), and event/work factors next.

Recent research has looked at the specific impact of 9/11 on disaster workers. One study (Long, Meyer, & Jacobs, 2007) examined how Red Cross paid and volunteer staff's function and disaster exposure one year following September 11th affected distress levels. The study used a large sample (N=3,055) and found only small differences in distress levels (PTSD and other psychological symptoms) across indirectly and directly exposed workers, which is in contrast to the majority of the research that notes exposure level as

positively related to traumatic stress (e.g. Eriksson et al., 2001; Fullerton et al., 2004). The researchers interpreted that this finding could be due to the ongoing perceived threat (e.g. fear of potential future attacks, continuing media focus on events) that was associated with this event.

Trauma exposure and PTSD symptoms have also been studied in a sample of international relief and development personnel (Eriksson et al., 2001). This study, using self-report measures, in a majority Caucasian sample, noted 10% of the participants met the criteria for PTSD (as assessed by the Los Angeles Symptom Checklist). Significant variance in PTSD symptoms was explained by frequency of exposure to life-threatening events and frequency of vicarious exposure, witnessing or knowing someone, who experienced life-threatening events. After the variance in these events was accounted for, additional exposure events did not contribute to the variance in PTSD symptoms.

Besides disaster workers, health professionals (medical and mental health) are another group of helpers that regularly has some exposure to traumatic stressors. The amount of exposure may vary by professional role and work setting, but is nevertheless present. Researchers have studied exposure, prior trauma history, and symptomology in military medical professionals who respond to injuries of others caused by a traumatic incident and who are directly exposed to crises themselves. Akbayrak and colleagues (2005) explored self-reported symptoms in a diverse group of medical military professionals in Turkey that included physicians, nurses, lab technicians, social workers, psychologists, pharmacists, and dentists. They reported symptoms of PTSD were higher in participants who had prior exposure to trauma or experience with loss, but noted no differences with anxiety symptoms. In addition, working with burn or child victims,

exposure to bodies, and feeling anxious or numb after the disaster were factors that increased likelihood of PTSD in a sample of military medical workers responding to a midair airplane collision disaster (Epstein et al., 1998).

Another way to consider exposure of helpers is in terms of level of identification with disaster victims. In a study comparing volunteer rescue workers and a control group of soldiers three months after an earthquake in Turkey, the rescue group had higher levels of intrusion, avoidance, and arousal symptoms as well as greater levels of identification with the victims (via self, friend, or family) (Cetlin, Kose, Ebrinc, Yigit, Elhai, & Basoglu, 2005). The identification variables were also significantly positively correlated with intrusion, avoidance, and arousal symptoms, and with the total score on the Impact of Event Scale (measure of PTSD).

Although exposure to trauma and identification with victims may put medical and mental health professionals at risk for PTSD, the majority will not develop the disorder. This may be due to training, preparation, or adjustment to frequent traumatic exposure. For instance, in a study using a sample of 141 medics and medical doctors providing emergency treatment in Judea and Samaria, the researchers identified only one case of PTSD and 13 cases of Acute Stress Disorder (Lubin et al., 2007). In another study using a convenient sample of 109 relief workers following September 11th, 4.6% of the participants met criteria for PTSD from indirect exposure (helping others) while 6.4% of the participants met criteria through direct personal exposure 6-8 months post-disaster (Zimering et al., 2006).

In addition to research exploring rates of PTSD following immediate exposure to crises, studies has also explored PTSD symptoms in helping professionals with more

ongoing exposure to trauma in less volatile settings. These studies have included samples of individuals who specialize in trauma treatment (Chrestman, 1995) or work as child protective/welfare workers (Regehr et al., 2004). This population may be similar to emergency management professionals in that most aspects of their job deal with crises or trauma. In survey research with therapists, Chrestman found a positive relationship between exposure to clients' traumatic material and symptoms of intrusion, avoidance, dissociation, and sleep disturbance. Mediators between exposure and symptoms included experience and income; those with more professional experience and income reported less symptoms, but those who had a higher percentage of clients who had experienced trauma in their caseload or spent more time doing clinical work than other activities had more symptoms.

Besides income and professional experience level, the influence of other environmental work factors has also been explored. In a purposive sample of child welfare workers in Toronto, workload, difficult clients, organizational change, and public scrutiny influenced posttraumatic stress response (Regehr et al., 2004). Distress (PTSD symptoms of intrusion and avoidance and depression) increased with higher levels of union support, number of work-related traumatic events experienced in the past year (e.g. death of child, threat against self), and recency of traumatic event(s). Although some works such as the ones described here have explored PTSD symptoms in mental health professionals with ongoing trauma exposure, the majority of research with mental health professionals frequently examines secondary traumatic stress (STS) or compassion fatigue instead of PTSD based on their recurrent exposure through other individuals. The researcher will further describe STS/compassion fatigue research in a later section.

When considering the results, the one aspect that stands out is that exposure, personal, and environment factors are often associated with PTSD development. It is important to recognize that emergency management professionals may have comparable risks due to their assistance work with individuals and groups. However, emergency management professionals may also resemble first responder occupations due to additional similarities, such as organizational response duties. This research will be delineated next.

Posttraumatic Stress Disorder and First Responders

Researchers examining PTSD in first responder populations conducted studies within various occupations such as firefighters (e.g. Bryant & Harvey, 1996; Haslom & Mallon, 2003; North et al., 2002), paramedics (e.g. Alexander & Klein, 2001; Lowry & Stokes, 2005), and police (e.g. Hodgins, Creamer, & Bell, 2001; Hyman, 2004; Robbers & Jenkins, 2001). Individuals studying first responder professions as a unified group over many occupations (e.g. firefighters, police) examined variables similar to helping professionals such as psychopathology (Marmar et al., 1999; Weiss et al., 1995), exposure (Marmar et al.; Weiss et al.), and individual factors (Marmar et al.; Weiss et al.), while also exploring social support or coping (McCammon et al., 1988). Researchers have found that a greater degree of exposure to a critical incident (e.g. type and severity of work activity) is related to an increased posttraumatic stress response following response to a disaster (Weiss et al.) and years later (Marmar et al.) in groups of emergency personnel defined as police, firefighters, paramedics, emergency medical technicians, and highway/road workers. Additionally, one's amount of professional experience, locus of control, and support have been found to be related to distress symptoms (Marmar et al.; Weiss et al.).

Dissociation has been identified as a powerful predictor of stress reaction severity following a disaster and long-term (Marmar et al.; Weiss et al.) as well.

Firefighters are one individual group of first responders who are exposed to trauma regularly and who are at risk for stress reactions and psychopathology. A study conducted after the Oklahoma City bombing confirmed this risk following exposure (North et al., 2002). This research, which included a volunteer sample of 181 firefighters responding to the bombing, found that 15% qualified for a PTSD diagnosis, and most acknowledged their own functional impairment using self-report measures. In another study, the researchers noted that, in their post-hoc comparisons, New South Wales volunteer firefighters who had greater exposure, namely the number of events experienced, had an overall higher total score on the Impact of Event Scale (measure of PTSD symptoms) and intrusion subscale score than those exposed to less traumatic incidents when the participants were asked to focus on the experience of one work-related emergency (Bryant & Harvey, 1996).

Researchers found contrasting results in a longitudinal study of firefighter/emergency medical technicians and firefighter/paramedics in that years of service and frequency of exposure in the last six months were not related to participants' Impact of Event Scale scores, when controlling for baseline levels (Beaton, Murphy, Johnson, Pike, & Corneil, 1999). However, the study used the Impact of Event Scale to assess for symptoms following *multiple* exposures when it is intended for assessment following a *single* exposure incident. This usage of the scale is commonly found throughout the literature, though scale instructions usually direct participants to consider multiple exposure incidents when responding to the instrument (e.g. Alexander & Klein, 2001; Bryant & Harvey, 1996; Hyman, 2004). Other limitations of note in this study are

that the non-participants were found to be younger, have fewer years of service, and sought less counseling than the participants.

A group of professionals similar to firefighters are paramedics or emergency medical technicians. The roles of these two professions sometimes overlap, as in the study of Beaton and colleagues (1999) and may include emergency management functions. Research on this population, where workers are dealing with the effects of cumulative exposure, also has explored symptomology. In one study focusing solely on paramedics, Lowry and Stokes (2005) retrospectively found an additive path model that included frequency of exposure to high stress situations (e.g. accidents), dysfunctional peer support, and negative attitude towards emotional expression to be predictive of PTSD in a study of 42 student paramedics, with 16.5% having a moderate level of symptoms and 5% meeting criteria for diagnosis. In another study, Tracy's (2007) dissertation investigating the experiences of 16 Emergency Medical Technician-Paramedics deployed by the Federal Emergency Management Agency six weeks following Hurricane Katrina, the main themes identified in this qualitative inquiry included: disruptions in the Critical Incident Stress Management (CISM) process, distress from relating to administrative and political systems, PTSD symptoms, relationship problems, decreased job satisfaction, and existential dilemmas.

Police officers are another group of professionals that regularly deal with crises and are at risk for traumatic stress responses. Research in this population explored severity of exposure, trauma history, and level of symptoms. Findings from a study of junior police officers including multiple variables (e.g. personality, exposure) concluded that the severity (the amount of direct exposure to the event(s)), not the number of incidents experienced,

was a better predictor of posttraumatic stress symptoms (Hodgins, Creamer, & Bell, 2001). In another study of 90 Israeli police forensic technicians with a low-to-medium level of symptoms, the researchers found that intrusion symptoms were correlated with participants' perceived severity of both their own personal trauma experiences and their forensic work (Hyman, 2004). Besides severity, other researchers have examined length of exposure to a specific traumatic incident in conjunction with demographic factors. Using a small non-probability sample of police responding to the September 11th attack on the Pentagon within 90 minutes of the plane crash, the researchers found that time spent at the Pentagon and level of education predicted 45% of the variance in PTSD symptoms (Robbers & Jenkins, 2001). Thirty-six percent of these officers qualified for a PTSD diagnosis. Those who spent more time working at the Pentagon and those with less education reported more PTSD symptoms. From these studies it appears that length of exposure, severity (level of direct exposure or subjective appraisal of the event), experiences of past personal traumas, and educational history may affect symptoms in police professionals.

Individual reactions following traumatic exposure may also influence PTSD symptom development. The immediate and short-term responses of individuals and how they contribute to PTSD have been studied in first responder occupations. In samples of police (Carlier, Lambert, & Gersons, 1997; Hodgins, Creamer, & Bell, 2001), student paramedics (Lowry & Stokes, 2005), and firefighters (Bryant & Harvey, 1996) individual predictors of posttraumatic stress reactions have included emotional exhaustion (a component of burnout), dissociation, negative attitudes towards emotional expression, and helplessness. These studies' implications concerning negative reactions are important

given the current study's hypothesis that burnout, a negative work-related response, would be predictive of PTSD symptoms.

Despite the findings confirming the presence of posttraumatic stress symptoms in individuals with first responder occupations, researchers have also confirmed the uncommonness of a full PTSD diagnosis. In one study that examined the experiences of 51 body handlers working after the Oklahoma City bombing, the researchers noted a low level of PTSD symptoms at the time of body handling as well as one year later (Tucker, Pfefferbaum, Doughty, Jones, Jordan, & Nixon, 2002). Likewise, researchers using a sample of 31 UK firefighters found that 22 participants reported one or more symptoms of PTSD, but only one met the criteria for a full PTSD diagnosis (Haslam & Mallon, 2003). Nevertheless, it is important for the reader to recognize that researchers have found varying levels of PTSD, ranging up to one-third of a sample (e.g. Robbers & Jenkins, 2001). Symptom level is likely dependent on population, type of incident(s), and other personal and environmental factors.

Even though a full diagnosis of PTSD might be uncommon or vary per study, researchers studying first responders have attempted to define the relationships between demographic variables and posttraumatic stress symptomology. Tucker and colleagues (2002) found no relationship between gender, age, and posttraumatic stress in their retrospective study of body handlers after the Oklahoma City bombing. Similarly, two studies found no gender differences in PTSD symptoms when using samples of police professionals (Carrier, Lamberts, & Berthold, 1997; Pole, Best, Weiss, Metzler, Liberman, Fagan, & Marmar, 2001). However, it is important to note that the majority of the samples in emergency first responder professions have not had equal representation of men and

women, so the relationships between gender and posttraumatic stress are hard to test. This could be because gender is a proxy variable for other factors that put women at risk for PTSD (Vogt, King, & King 2007). It may also be because confounding factors, such as why individuals decide to seek out a particular profession, are present.

Additional recent research compared first responders and helping professional occupations. Perrin and colleagues (2007) examined the prevalence of PTSD two to three years following September 11th using a World Trade Center Health Registry sample of 28,692 first responders and helpers from the following occupations: police, firefighters, emergency medical service/medical disaster personnel, construction/engineering workers, sanitation workers, volunteer organizations, unaffiliated volunteers (e.g. clergy), and other government agencies. The overall prevalence of PTSD was 12.4%, with police officers showing the lowest rates (6.2%) and unaffiliated volunteers showing the highest (21.2%). Being injured, performing tasks outside of the usual job role, working longer, and starting work on 9/11 (as opposed to a week or more later) all increased the risk for PTSD. Personal individual (e.g. job roles, trauma history) and environment differences (e.g. event exposure) may account for the varying PTSD levels noted in this study.

Regardless of the findings that individual, work, and exposure factors affect development of PTSD symptoms among helping and first responder professionals, there are many limitations in the PTSD research. The main one is that the studies exploring PTSD are usually cross-sectional and retrospective (Epstein et al., 1998). These types of studies lack examination of risk factors pre-exposure (Brewin, Andrews, & Valentine, 2000), making causal conclusions unfeasible. Since the types of studies vary in many ways, forming generalizations across studies is difficult as well. For instance, these studies

have examined individuals exposed to one or multiple incidents, compared psychopathology risk factors, and described rates of PTSD. PTSD has been assessed through different measures as both a discrete or continuous variable as well (Brewin et al.). The types of professionals exposed to cumulative trauma have also varied. Therefore, risk factors that have been identified by researchers using different designs and populations are not necessarily comparable (Brewin et al.). This means that finding one model to explain PTSD development should not be the goal (Brewin et al.). Alternatively, researchers ought to explore predictive models of the disorder within a specific setting and population. To meet this objective, models that take personal, environmental, and cultural variables into account are needed.

Personality and PTSD

Since personal constructs are one class of variables essential to consider in development of posttraumatic stress symptoms, this section will examine personological variables in PTSD research, with a focus on the traits identified in the literature. Research suggests that stressors or exposure are important, but personality factors may increase the risk of developing problems following trauma (Clark, Watson, & Minke, 1994) or serve as protective factors (Wilson & Agaibi, 2005). The research examining posttraumatic stress symptoms and personality has been overwhelmingly cross-sectional, and overall finds that two traits, neuroticism and low hardiness, are positively related to PTSD diagnosis or posttraumatic stress symptomology, while also finding evidence of the negative relationship between extraversion and PTSD (Schnurr & Vielhauer, 1999). Since this study focuses on exploring a positive predictive relationship utilizing neuroticism, and a

negative predictive relationship utilizing extraversion, these two traits will be the focus of this section's review. The literature will be presented as a whole, since the populations under study have varied and have not focused specifically on first responders or helpers.

Many studies have explored the relationship between neuroticism, extraversion, and posttraumatic stress symptoms. In a comprehensive review of 21 studies from 1985-2004 that examined the relationship of personality and PTSD using various personality assessment tools (e.g. Eysenck Personality Inventory, NEO-Personality Inventory), Hall and Wilson (2005) discovered that almost all studies found neuroticism was positively related to PTSD or other negative behavioral symptoms. Furthermore, in a descriptive review of the relationship between personality, as conceptualized by the Five Factor Model, and outcomes following trauma, Moran and Shakespeare-Finch (2003) noted that all five personality factors predict variance in negative and positive outcomes following exposure to trauma. Neuroticism and extraversion were found to be responsible for the most variance.

Individual studies within various professions and individual groups have found support for the relationship between neuroticism, extraversion, and PTSD. Some researchers have explored these constructs in first responder occupations. In a longitudinal study of Australian firefighters exposed to a bushfire disaster, McFarlane (1989) found that neuroticism and past history of treatment for a psychological disorder were better predictors of PTSD than degree of exposure or loss. Other researchers (Haisch & Meyers, 2004) also explored PTSD development risk using the variables of personality and PTSD along with stress and coping. They found that participants in a voluntary sample of 254 police officers who were less agreeable, less extraverted, less conscientious, and more

neurotic were more at risk for developing PTSD. Slightly different results were found in longitudinal research with junior police officers (Hodgins, Creamer, & Bell, 2001). The researchers found that neuroticism was a significant predictor of posttraumatic stress symptoms in their initial model, but it did not remain a significant predictor in a subsequent model that included initial symptoms (at assessment time one) and number of traumatic exposure incidents experienced.

War veterans have also been participants in PTSD and personality studies with similar results. In a study of a convenient sample of Vietnam veterans who were chronic PTSD sufferers, Hyer and colleagues (2003) found that neuroticism was related to PTSD, while a high level of agreeableness was related to avoidance symptoms. Another study within this population, conducted by Talbert and colleagues (1993) identified a NEO-Personality Inventory (NEO-PI) profile that included high neuroticism and low to low-average extraversion. Also, Davidson, Kudler, and Smith (1987) found that World War II, Korean, and Vietnam veterans with PTSD were more neurotic and introverted than veterans in an age-matched control group.

Personality's relationship to PTSD has been researched in medical patients as well. Chung, Berger, Jones, and Rudd (2006) investigated how the five personality factors were related to PTSD symptoms and health problems in post-myocardial infarction patients and a control group of patients from two medical practices in the United Kingdom. They found that 30% of the treatment group met the full criteria for PTSD, with neuroticism predicting PTSD symptoms and general health problems. However, in this research extraversion did not have a relationship with PTSD or health problems. Limitations of this study include that the majority of the participants in both groups were White and the control group (that

was only assessed on general health problems) had experienced more past trauma in certain areas (accidents, assaults, torture, bereavement). In another study, a one-year longitudinal investigation of burn victims, the researchers found that neuroticism placed individuals at greater risk for development of PTSD, while extraversion served a protective function (Fauerbach et al., 2000).

Researchers have also explored similar personality-PTSD relationships in survivors of other traumatic events. Using a sample of residents of the United Kingdom living close to an airline crash, Chung and colleagues (1999) found that neuroticism was a predictor of intrusive imagery and avoidance symptoms, although extraversion predicted intrusive symptoms. Moreover, Holeva and TARRIER (2001) found neuroticism and psychoticism were associated with the development of PTSD 4-6 months following participants' experience of a road traffic accident. Limitations of their research were that participants had to opt into the study in the hospital and the study had a low response and high dropout rate.

The results of these studies provide evidence that personality plays a role in the development of PTSD symptoms in first responders and other exposed groups. Support for relationships between neuroticism, extraversion, and PTSD have been found, but it is also clear that other factors such as exposure, immediate reactions to traumatic incidents, or history of psychological difficulties are involved.

Ethnicity and PTSD

Another factor that has been explored in relation to its association with PTSD is ethnicity. The PTSD research that uses ethnicity as a variable of interest has focused on

samples of individuals that have experienced trauma, such as disaster victims (e.g. Perilla, Norris, & Lavizzo, 2002), abuse survivors (e.g. Clear, Vincent, & Harris, 2006), first responders (e.g. Pole, Best, Metzler, & Marmar, 2005), and war veterans (e.g. Stuker, Davis, Uddo, & Ditta, 1995). These works will also be represented in a unified section due to lack of specific research focus on first responder or helping professionals.

When viewed collectively, these studies have shown mixed results (Hembree & Foa, 2003; Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002; Perilla et al., 2002; Rabalais & Scotti, 2002). Some research, including the National Co-morbidity Study, did not find ethnic/racial differences in rates of PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris & Slone, 2007), but in a research review of 11 studies, individuals from ethnic minority groups more often had a poorer outcome following exposure to disaster (Norris et al., 2002). However, in a study of 257 women with a history of child sexual abuse seeking outpatient psychotherapy, the researchers found that Hispanics scored lower than non-Hispanics on the intrusion subscale of the Impact of Event Scale (IES) (Andrés-Hyman, Cott, & Gold, 2004). The results of this research found that belonging to a Hispanic culture had a protective effect from some PTSD symptoms, but this is an ambiguous conclusion to make considering that Hispanics are not a uniform culture. The researchers suggested looking at ethnic identity in future studies. Limitations of this research include the sample being inclusive of only individuals receiving treatment and using the IES in the context of childhood sexual abuse, which is usually a repeated trauma, when the IES is meant for measurement of a response to a single event. Additional researchers (Clear, Vincent, & Harris, 2006) examined similar post-trauma symptoms in 50 girls who had experienced sexual abuse. The results included the finding that African

Americans had more avoidance symptoms, but no other differences were noted between Caucasians, African Americans, and Hispanics on IES scores. However, this study used racial/ethnic terms together, had limited power due to the size of its volunteer sample, and also used the IES for potentially multiple exposures.

Different results were found by Perilla et al.'s (2002) research using a purposive sample of 128 individuals affected by Hurricane Andrew. The results from retrospective self-reports indicated that Blacks and Hispanics were more distressed than Whites, with Spanish language-preferring Hispanics more distressed than English language-preferring Hispanics. The rates of PTSD were highest in Spanish language-preferring Hispanics, followed by Blacks, English language-preferring Hispanics, and Whites. There were also differences between minority groups and Whites on all PTSD criteria except arousal, while the group of symptoms expressed varied depending on trauma exposure. The researchers further explored exposure (personal history of trauma and exposure to neighborhood trauma) as well as cultural beliefs (fatalism, acculturative stress, familism) as mediators. The greater expression of PTSD by minority groups was related to high exposure levels, but for intrusion symptoms, the effects of exposure and cultural beliefs were equal, and for avoidance and arousal symptoms the effects of trauma exposure were greater than cultural beliefs. Exposure levels and past history of trauma explained a large amount of the increased symptomology in minority groups, but cultural beliefs also explained some of the increased symptoms. How differential exposure and cultural beliefs may work together to influence vulnerability is not explained by this study.

Researchers have also investigated the general population's reactions to the September 11th terrorist attacks in terms of ethnicity. Adams and Boscarino (2005)

examined a random sample of 2,180 English- or Spanish-speaking adults (Whites, African Americans, Dominicans, Puerto Ricans, Other Hispanics) one year following 9/11 with an over-sampling of those who were seeking mental health treatment. They found that racial/ethnic minority participants did not have a greater likelihood of PTSD. However in a longitudinal study of 1,559 individuals conducted via the web, the researchers found that Hispanics reported more posttraumatic stress symptoms than Whites one to two years after September 11th (Chu, Seery, Ence, Holman, & Silver, 2006).

Additional researchers have examined ethnicity following cumulative trauma exposure in the police profession. In research with a group of 655 police officers from New York City, Oakland, and San Jose that included European Americans, African Americans, and Hispanic Americans, Pole and colleagues (2001) found that Hispanic American officers reported significantly more PTSD symptoms than European Americans and more peritraumatic dissociation than both European Americans and African Americans. Ethnicity was also a weak, yet significant predictor of PTSD. The data was reanalyzed in another study (Pole et al., 2005) to gain further understanding of the results. In the second study, the researchers reported that Hispanic Americans had significantly greater PTSD symptoms in all three individual criteria areas than European Americans. The significant difference between Hispanic Americans and African Americans did not become significant until all PTSD symptoms were examined together. Several variables were also examined in terms of their correlation to PTSD severity. For instance, greater perceptions of work-related racism, increased wishful thinking, and self-blame were associated with PTSD. These variables could potentially be related to level of ethnic or cultural identity.

Race, ethnicity, and PTSD have also been explored in studies of Iraq, Afghanistan, Persian Gulf, and Vietnam War veterans. The only ethnic difference in PTSD symptoms reported in a study of army soldiers returning from Iraq and Afghanistan was that soldiers who were deployed to Iraq and identified as Pacific Islanders reported less PTSD symptoms (Lapierre, Schwegler, & LaBauve, 2007). On the contrary, in a study of 912 military personnel serving in the Persian Gulf War including individuals deployed as well as those serving in the United States, male minority (African American, Hispanic, Asian American, Native American) participants reported more PTSD symptoms (Sutker et al., 1995). Similarly, in the National Vietnam Veterans Readjustment Study, among those exposed to combat, the prevalence of PTSD was reported as 20.6%, 27.9%, and 13.7% for Black, Hispanic, and White veterans respectively (Ruef, Litz, & Schlenger, 2000). When predisposing factors (e.g. socioeconomic status, pre-existing problems) and exposure rates were controlled for, there were no differences between Black and White veterans, but Hispanic veterans continued to have the highest prevalence rate. Race/ethnicity was not a significant predictor of a PTSD diagnosis in another study of American Vietnam veterans, but the risk for exposure to trauma was found to be higher in racial/ethnic minorities (Stamm & Friedman, 2002). When taking exposure into account, other researchers also found no difference between Whites, Black, and Hispanic Vietnam veterans in terms of PTSD when exposed to no or low levels of combat, but conversely found that Black veterans had higher levels of PTSD when exposed to heavy combat levels (Penk et al., 1989).

Due to these inconsistent findings and frequent increased risk levels of non-majority individuals, researchers have descriptively tried to explain differences for

traumatic stress reactions. These explanations have included racism (Marsella, Chemtob, & Hamada, 1990; Matsouka, Hamada, Kiluano, & Coalson, 1992; Pole et al., 2005; Ruef, Litz, & Schlenger, 2000), cultural beliefs and differences (e.g. idealization of masculine role) (Marsella et al.; Ruef et al.), language differences (Marsella et al.), symptom reporting styles and symptom expression (e.g. non-disclosure, somatization) (Marsella et al.; Pole et al.; Ruef et al.), coping mechanisms (Pole et al.), postwar adjustment (Matsouka et al.), additional life stressors of non-majority individuals (e.g. increased exposure to violence, poverty) (Matsouka et al.; Ruef et al.), and utilization of mental health services (Ruef et al.).

In summary, the research finds varying results when exploring ethnicity's relationship to PTSD symptoms, while noting that other mechanisms (e.g. identity, cultural beliefs) may be involved. Given the contrasting results concerning ethnicity and posttraumatic stress, cultural, personal, or social factors appear to be more important than ethnicity as a demographic variable. This will be further described through the construct of ethnic identity in a later section.

Repeated Exposure to Trauma: Burnout, Compassion Fatigue, and Compassion Satisfaction

Besides development of PTSD symptoms through direct exposure, repeated exposure to trauma by working with individuals or groups that have experienced traumatic event(s) may cause negative (e.g. burnout, compassion fatigue) or positive (e.g. compassion satisfaction) reactions. There is a multitude of research exploring burnout,

compassion fatigue/secondary traumatic stress, and compassion satisfaction in helping professionals, but less research with these constructs in samples from other exposed occupations, such as first responders. Disaster mental health workers (Creamer & Liddle, 2005), trauma therapists (Deighton, Gurriss, & Traue, 2007), child protective services workers (Conrad & Kellar-Guenther, 2006), clergy (Roberts, Flannelly, & Figley, 2003), and employee assistance professionals (Jacobson, 2006) have been studied due to their exposure, which involves listening to their clients' stories and, for some, on-site crisis work. This research explores the presence of repeated exposure constructs and considers the roles of pre-existing variables and work environment factors. Since mental health work may occur on a disaster site during the response and recovery phases and also includes tasks involving indirect exposure, aspects of the environment may be similar to those encountered by emergency management professionals. Therefore, research from this field may be applicable to emergency management professionals. Literature investigating repeated exposures in helping professionals, along with the limited studies of first responders, who also share similarities with emergency management professionals, is reviewed in these sections.

Repeated Exposures and Helping Professionals

Research concerning repeated exposures constructs in helping professions such as counselors, psychologists, social workers, and other human services professionals will be discussed in this segment. Many researchers have examined levels of and relationships between burnout, compassion fatigue/secondary traumatic stress, and compassion satisfaction in the mental health occupations. In one study using a random sample of 325

employee assistance professionals who had offered crisis intervention services, Jacobson (2006) found participants to be at low to moderate risk for compassion fatigue and burnout, and moderate to high potential for compassion satisfaction based on the cut-off scale levels described in the Professional Quality of Life Scale manual. In another study that explored compassion fatigue in a sample of 363 child protection workers and supervisors attending a secondary trauma seminar in a mid-western state, Conrad and Kellar-Guenther (2006) noted that compassion fatigue and compassion satisfaction were both high, while burnout was low, according to scoring level groups delineated in the Compassion Satisfaction/Fatigue Self-Test. Those with high levels of compassion satisfaction also had lower levels of compassion fatigue and burnout. Compassion satisfaction appeared to play a protective role in compassion fatigue and burnout symptom development in both of these studies; the different levels may be related to the sampling procedures (random versus convenient). Research with Florida crisis team members assisting victims of disasters (Corey-Souza, 2007), health care workers responding to a car bomb explosion in North Ireland (Collins & Long, 2003), and social workers working in oncology (Simon et al., 2005) has similarly supported the inverse relationship between compassion satisfaction and both burnout and compassion fatigue. Sprang, Clark, and Whitt-Woosley (2007) also explored these concepts using a sample of 1,121 licensed mental health professionals in a rural Southern state. Using the Professional Quality of Life Scale, they found that their sample had lower compassion fatigue, lower burnout, and higher compassion satisfaction than national norms. Different results were found in self-report data of a sample of clergy and religious leaders involved in response following September 11th in that the researchers noted that the mean risk for compassion fatigue and burnout was higher than the norms,

and the mean level of compassion satisfaction was lower (Roberts, Flannelly, & Figley, 2003). Trauma exposure levels or specific training may explain the varying levels found in these two studies.

Other researchers have examined risk levels in less clinically experienced populations, such as students and employees trained in counseling skills. In a study using a random sample of students of human services professions in a Christian seminary and graduate school, Montgomery and colleagues (2005) found that they were at a high risk for burnout. Specifically 50% were at high risk for emotional exhaustion, 46% were at high risk for cynicism, and 34% were at high risk for not being effective, according to scores on the Maslach Burnout Inventory. In a sample of bank workers trained to assist coworkers following bank robberies in South Africa, the researchers found the sample to be at low risk for burnout and compassion fatigue, and had high or good potential for compassion satisfaction according to the Compassion Satisfaction/Fatigue Test (Ortlepp & Friedman, 2002). Since the two populations in which these samples were drawn likely vary in many ways, the different levels of risk are not surprising.

Researchers have also looked further at burnout and secondary traumatic stress/compassion fatigue in relation to other demographic and work variables in helping professionals. In a study with a randomly selected group of 236 social workers in New York City after September 11th, the researchers found that 9/11 recovery involvement (e.g. supporting rescue efforts, providing shelter, assisting in lowering rescue workers' stress) was a positive predictor of secondary traumatic stress symptoms, while a supportive work environment was a negative predictor (Boscarino, Figley, & Adams, 2004).

Another study examined secondary traumatic stress reactions of mental health professionals who responded to the September 11, 2001 terrorist attacks in conjunction with both personal and work variables (Creamer & Liddle, 2005). The researchers found that pre-existing therapist variables accounted for 20% of the variance in secondary traumatic stress symptoms, and work assignment (e.g. population, length) accounted for an additional 12% of variance. They found no relationship between personal trauma history and STS symptoms. This finding was supported in research of bank workers with counseling skills training in that no relationship between previous experience of non-work trauma and secondary traumatic stress symptoms was found (Ortlepp & Friedman, 2002). In these two studies, the finding that prior trauma history is not related to STS symptoms differs from the majority of the PTSD research. However, in a study synthesizing STS research by an epidemiological level of evidence approach method, reasonable findings included that having a personal history of trauma was both associated and not associated with STS (Baird & Kracen, 2006). It is evident from these contradictions that the relationship between personal trauma history and secondary traumatic stress symptoms is complicated, and likely involves consideration of additional personal and environmental factors.

These additional factors may include seeking therapy or other individual and client variables. In the aforementioned study of professionals assisting after 9/11, a history of using therapy predicted STS, while seeing trauma clients throughout one's career was related to higher levels of STS (Creamer & Liddle, 2005). Work assignment, such as treating firefighters and children, longer length of assignment, and individual variables, such as younger age and less experience, also correlated with STS. A similar finding in

terms of age and burnout was found in research with religious leaders post-9/11 (Roberts, Flannelly, & Figley, 2003). Somewhat contrasting findings in terms of severity of work exposure were noted in the bank workers study, in that no STS differences were found between those who responded to an incident involving death or injury and those who responded to an incident without these factors (Ortlepp & Friedman, 2002).

Additional researchers focusing on licensed mental health professionals investigated relationships between gender, work-related variables, and symptoms of repeated exposure. Sprang and colleagues (2007) found females were at a greater risk for compassion fatigue and burnout, having training in trauma increased compassion satisfaction and reduced levels of compassion fatigue and burnout, and the percentage of clients with a PTSD diagnosis in one's caseload predicted levels of compassion fatigue and burnout. However, this research had a very low response rate, did not include data on personal history of trauma experiences, and sampled only licensed professionals.

In another study of a randomly selected group of social workers, Betts Adams et al. (2001) examined the relationship between personal and work variables, burnout (conceptualized as emotional exhaustion, depersonalization, low personal accomplishment), vicarious trauma, and social support. Lower personal accomplishment was related to having a lower salary, being younger, having less experience, belonging to a minority racial group, perceiving less social support, and having more somatic symptoms. Higher depersonalization was related to younger age, having more somatic symptoms, lower perceived social support, increased number of hours worked, and level of intrusiveness of client material. Higher emotional exhaustion was related to somatic symptoms, level of intrusiveness of client material, and lower perceived social support.

Consequently, all components of burnout had relationships with demographic variables, work factors, and affective or somatic symptoms.

Another individual variable, personality, also has demonstrated relationships to one specific repeated exposure construct, burnout, in research utilizing samples of helping professionals. The results have been most consistent concerning a positive relationship between neuroticism and burnout, and also provide some evidence for a negative relationship between extraversion and burnout (Bakker, Van Der Zee, Lewig, & Dollard, 2006; Schaufeli & Enzmann, 1998). Details of the research in this area with helping professionals will be delineated further.

Bakker and colleagues (2006) examined how the Big Five personality factors predicted burnout in 80 Dutch volunteers working with terminally ill patients. Neuroticism was the only factor that was related to all three burnout dimensions, with extraversion being negatively related to depersonalization and positively related to personal accomplishment. In the regression models, neuroticism positively predicted emotional exhaustion; neuroticism (+), extraversion (-), and autonomy (-) predicted depersonalization; and extraversion and low neuroticism positively predicted personal accomplishment. The relationship between neuroticism and burnout was present for volunteers who endorsed negative experiences with patients, but not for volunteers who felt like they had more positive than negative experiences.

More evidence for the contributions of both neuroticism and extraversion in predicting burnout was found in research with nurses. In one study utilizing a random sample of nurses in a German hospital, Bühler and Land (2003) found that neuroticism and extraversion were significant variables in all the regression models utilizing emotional

exhaustion, depersonalization, and personal accomplishment as the criterion variables. An unexpected result in this study that contradicts most literature was that there was a positive relationship between extraversion and emotional exhaustion, as well as depersonalization. Different results were found by researchers using a small sample of Australian nurses in that neuroticism was not found to be a predictor of burnout symptoms, although neuroticism had significant correlations with each of the burnout constructs (Allen & Mellor, 2002).

Work constructs have also been explored along with personality and burnout. A longitudinal study of occupational therapists in Washington, DC examined personality in relationship to emotional exhaustion, depersonalization, and personal accomplishment and added work environment variables in the second stage of the research (Piedmont, 1993). The researcher found that neuroticism was positively related to emotional exhaustion and depersonalization, with 50% of the variance in both of the subscales accounted for by this personality factor. In the follow-up, personality factors remained significant predictors following the addition of work environment variables (e.g. pressure), but work environment variables did not predict burnout on their own.

To review, the influence of both individual and work variables in helping professionals' reactions to repeated exposure is supported in the literature. Relationships between burnout, secondary traumatic stress, and compassion satisfaction, and associations between personality factors and burnout are found. The ways in which burnout and compassion satisfaction may conjunctively predict PTSD or contribute over and above personality variables had not been fully explored prior to the current study.

Repeated Exposures and First Responders

Outside of the mental health professions there has been limited research examining the constructs of compassion satisfaction and compassion fatigue, but some researchers have explored burnout. Specifically, there are no published studies investigating repeated exposure symptoms in emergency management professionals, but burnout research has been conducted with samples of first responders (e.g. Alexander & Klein, 2001; Beaton et al., 1999; Kop, Euwenma, & Schaufeli, 1999).

Researchers studying paramedics, ambulance workers, and firefighters have explored levels of burnout, exposure, and personality correlates. Beaton and colleagues (1999) examined burnout symptoms in a paramedic sample and found 26% reported depersonalization, 20% emotional exhaustion, and 36% low personal accomplishment. Those with a hardy personality had fewer symptoms of burnout. Job satisfaction was negatively associated with emotional exhaustion and depersonalization and positively associated with personal accomplishment. Alexander and Klein (2001) also explored the relationship between repeated exposures and well-being (general health, PTSD, burnout) in ambulance personnel. The number of critical incidents experienced had a low, yet significant, correlation with burnout. Furthermore, in Bissett's (2002) study of 240 firefighter paramedics, burnout positively correlated with compassion fatigue and PTSD symptoms while also predicting traumatic stress symptoms, as measured by the Los Angeles Symptom Checklist (LASC).

Stressful experiences such as burnout and positive aspects of police work were identified in the work of Kop, Euwenma, and Schaufeli (1999) using a sample of Dutch police officers. Difficult facets of work described included poor management, emotionally

demanding situations, and reorganization, while positive facets included contact with civilians, variation of work, and assisting society. Aspects of burnout were compared to a reference group of 4,000 human service workers. The researchers found that the police sample had a lower level of emotional exhaustion, higher level of personal accomplishment, and a similar level of depersonalization. Additionally, being inexperienced, cynical, or male was associated with use of violence. From this research it appears that both work environment and personal variables are related to police professionals' response to traumatic events.

Both negative and positive aspects of exposure have also been examined among individuals trained in Critical Incident Stress Management (CISM). In a group of CISM professionals that combined both first responder (firefighters, law enforcement) and helping professionals (nurses, mental health professionals) involved in a crisis response role, 57.7% of the 71 participants in a convenient sample stated they had a psychological reaction following response to a traumatic incident (Wee & Myers, 2003). But as a whole, the group had a good potential for compassion satisfaction, low risk for compassion fatigue, and extremely low risk for burnout, as assessed by the Compassion Satisfaction and Fatigue Test. Older age served as protective factor for burnout and increased the potential for compassion satisfaction. Years providing services, amount of services provided, and education level had no relationship to repeated exposure variables.

Additional researchers have focused on personality's relationship to burnout in first responder occupations, specifically police professionals. The main effect of neuroticism in predicting burnout and physical symptoms was verified in a study using police personnel (Hills & Norvell, 1991). In another study, demographic variables, job factors, and

personality were explored together. This work, which involved a sample of 1,794 police professionals, found that job stress, low emotional stability (e.g. neuroticism), and low conscientiousness were significant predictors of two factors of burnout: exhaustion and cynicism (Mostert & Rothmann, 2006).

Given these studies, the following conclusions can be made from the research regarding repeated exposure to traumatic material in the helping and first responder occupational populations. First, there is the potential for burnout, compassion fatigue/secondary traumatic stress, and compassion satisfaction from trauma or emergency work, but the levels of emergency management professionals' compassion satisfaction, compassion fatigue/secondary traumatic stress, and burnout have not been previously studied. Second, burnout and compassion fatigue/secondary traumatic stress have been found to be positively related to each other while compassion fatigue/secondary traumatic stress and burnout are both negatively related to compassion satisfaction. There is also evidence suggesting that younger age and less experience are positively related to compassion fatigue/secondary traumatic stress and burnout; however, there are mixed results concerning personal trauma history and level of exposure. Furthermore, the results of these studies provide some evidence that neuroticism and extraversion are positively and negatively related, respectively, to burnout symptoms. Past models have considered work variables with personality factors in predicting burnout, but repeated exposure variables such as burnout and compassion satisfaction have not been used to predict or moderate posttraumatic stress in conjunction with personality and trauma exposure frequency prior to the current project.

Nevertheless, in spite of personality's relationship to burnout or posttraumatic stress and the need for further research, it is frequently assumed that a specific type of person may be drawn to trauma or disaster work. Emergency and disaster workers are often categorized as macho, tough (Moran, 1998), or risk-takers. Humor and denial of feelings are frequently mentioned ways of coping with the daily exposure to trauma (Moran). However, in an article reviewing the literature, Wagner (2005) found little empirical support for a personality type that applies to all emergency response professions. Some evidence was found for the qualities of openness to experience, aggressiveness, and tough-mindedness, but the research suggested that this likely varies according to culture. If variation exists within professions, it is an important factor to consider in terms of psychological outcomes. Despite these variations, since individuals do not operate out of an environmental context, the influence of culture remains important to consider; this influence will be described next.

Culture: Ethnic Identity

Given individual differences and the varying results concerning the relationship between ethnicity and posttraumatic stress disorder described previously, it seems likely that the extent to which an individual values and adheres to their own ethnic group may affect the extent to which culture has an effect on individuals' reactions to crises.

This adherence often involves family, community, relational, and other outside forces (Jourdan, 2006; Root, 1998; Yeh & Hwang, 2000). Since development of ethnic identity to a specific group cannot occur without having social experience with that group, it may be viewed as an environmental influence to psychological outcomes. This section

will describe the literature concerning theoretical ways of exploring cultural identity in terms of trauma response and present empirical work involving the construct of ethnic and racial identity. The literature is not grouped according to occupational type since this construct has not been extensively studied in either population.

Theoretical writings and the literature of practice have described ways in which “culture” may affect ways of coping, interpretation of events, expression of reactions, use of social supports, one’s sense of identity, and the social or political climate following a trauma. At the same time, the need for future research in trying to understand the relationship between these variables is frequently stated. The way that an individual’s traumatic stress reaction is culturally conditioned, and what trauma means in a family’s culture, may affect the type and severity of trauma reaction (Webb, 2004). Differences within a culture are also affected by acculturation, nationalization, regionalization, peer influence, and personal and family history (Nader, 2004). These processes may interact, causing aspects of an individual’s culture to act in a manner of putting one at higher risk or protecting one from difficulties. For example, an individual’s culture may influence his or her worldview to focus on positive things that may come out of a traumatic event, such as a greater sense of community, or the culture may cause the individual to ruminate on negative aspects or difficulties of the past. Culture may also help identify support systems, provide direction on ways to respond to the exposure of traumatic material, or influence disclosure of traumatic stress symptoms (Kirmayer, 1997; Rablais & Scotti, 2002). Moreover, the experience of prejudice, discrimination, or racism of those belonging to a non-majority group of any kind may put an individual at risk for an increased level of baseline or acculturation stress (Rablais & Scotti, 2002) or decreased access to resources

(Ford, 2008), making the individual more likely to experience heightened traumatic stress reactions following a disaster.

Besides reactions, the way culture affects long-term recovery from trauma has been described. This deserves mention since PTSD symptoms are more representative of those who have not recovered from their exposure, while acute traumatic stress reactions may be considered more “normal.” Complex emotions are often difficult to translate cross-culturally and cultural factors may affect emotions, symptoms, and how behavior and experience interact (Kirmayer, 1997). A trauma therapist, Bryant-Davis, devoted a text, *Thriving in the Wake of Trauma* (2005), to exploring this complexity, specifically how themes of safety, self-care, trust, shame, self-blame, memories, mourning losses, anger, body image, sexuality, coping, and thriving relate to one’s culture in the process of recovery from interpersonal trauma. She believes that “erasure and denial of a person’s heritage and their experience in the world as an ethnic being is as harmful as denial and erasure of a person’s trauma history” (Bryant-Davis, 2005, p. 7-8). Through her work with survivors of trauma, she describes the power of culture in how individuals understand interpersonal trauma, and make meaning in their recovery. The power of cultural identities may also be salient in recovery from other types of traumatic events apart from interpersonal trauma since the meaning of trauma varies according to individuals’ cultural groups and strength of identity in relation to those groups. Additional individuals have also suggested that clinicians should assess developmental aspects of racial or ethnic identity for their clients, as identity status may be a source of strength or cause additional stress (Scurfield & Mackey, 2001).

Others have also noted how culture may influence individuals' identities, which in turn affects recovery from exposure to trauma. Silberbauer (2003) emphasizes the importance of culture in informing individuals as to who they are and how to behave. During disasters, this flow of information may be disjointed, potentially causing difficulties. Throughout recovery, individuals need to make sense of the new post-trauma reality, and a strong sense of identity may help in this manner. Young and Erickson (1988) described something slightly different in their writing on how cultural transitions in society may prevent recovery following trauma. They suggested at the time of their writing that the focus on individualism and frequent familial relocations in society made it harder for individuals to maintain identity continuity and connection with others following traumatic events, therefore making it more difficult to have a positive resolution following trauma. Since these two aspects are still present in today's society and work travel and/or contact with diverse groups may be frequently necessary in the emergency management profession, Young and Erickson's claims may still have relevance.

Despite the conceptualizations of culture as a factor in the trauma response, not much has been shown empirically. As the interactions between individual biology, psychological influences, and cultural influences are delineated, ethnocultural identity has been examined in cross-cultural research (Marsella, Friedman, & Spain, 1996). Consequently, there has been a call for the same type of examination in traumatic stress research in terms of determining whether cultural factors, such as ethnic and racial identity, are involved in the response to traumatic events (Rabalais & Scotti, 2002). While research in this area is in its early stages, several ethnic/racial identity studies deserve further mention.

The role of ethnic and racial identity in relation to psychological outcomes in adolescents has been examined in research over the past decade. For instance, Martinez and Dukes (1997) explored the effects of ethnic identity on the relationship between ethnicity, gender, and well-being in a large sample (12,386) of junior high and high school students living in Colorado. Ethnicity had a strong effect on ethnic identity, with the effects being strongest for Black and Hispanic students. In terms of well-being, the highest self-esteem scores were found for identity-achieved respondents, White respondents, and male respondents; the highest purpose in life scores were found for identity-achieved and White participants; and the highest self-confidence scores were for identity-achieved, White, and Asian participants. The findings suggest that racial/ethnic identity status is related to well-being for adolescents. In another study, Arroyo and Zigler (1995) examined racelessness or racial disidentification and found correlations between the African American adolescent participants' racelessness scores and anxiety and depression. High-achieving European Americans *and* African Americans both had higher racelessness scores, although racelessness was significantly (positively) related to introjective (related to self concept) depression in African Americans, but not European Americans. Similar results were found in a cross-sectional study of 159 European and African American successful and at-risk middle school students (Yasui, Dorham, & Dishion, 2004) in that lower ethnic identity (as assessed by the Multigroup Ethnic Identity Measure) was associated with being at-risk for African American participants, although total ethnic identity score was a significant negative predictor of all psychological variables (depression, internalizing and externalizing behaviors) for both European and African American students.

Additional ethnic identity research has been conducted using adult participants with varied results. Marginalized ethnic identity and traumatic distress were predictors of depression in a study utilizing an American Indian sample (Byers, 2006). In a study of 72 European-born non-Jews who lived through World War II and immigrated to the United States or Canada, Midlarsky and Midlarsky (2004) found that residents of Canada had more psychological symptoms related to war activity compared to residents of the United States, suggesting that stronger ethnic identity may be a risk factor. Ethnic identity was not measured per se, but the researchers implied that those living in Canada had stronger ethnic identities than those living in the United States since 89% of Canadian participants indicated their country of birth compared to 83% of United States participants who indicated they were American. Contrary to these studies, in research involving individuals living outside of Yugoslavia during the North Atlantic Treaty Organization (NATO) bombing of 1999, Ozegovic (2002) found that ethnic identity (assessed by the MEIM) did not have a relationship to distress or trauma symptoms.

More recent research begins to consider ethnic identity as a moderating variable in the development of psychological symptoms in adolescent and college-age populations. In a study of juvenile delinquent adolescents, ethnic identity moderated the relationship between PTSD symptoms and delinquent behavior with higher ethnic identity serving as a protective factor for delinquency (Bruce, 2005). But, in studies with college-age students, researchers have found stronger ethnic identity associated with increased PTSD symptoms in the context of higher levels of race-related stress within a mixed sample (Khaylis, Waelde, & Bruce, 2007) and ethnic identity pride associated with lower depression in the context of perceived low discrimination in a Korean American sample (Lee, 2005). The

research suggests ethnic identity may have a role in the development of psychological symptoms, but the results vary.

Nonetheless, from the existing research and theoretical writing, it is evident that more research is needed on ethnic and racial identity, especially in more diverse samples (e.g. age, ethnic groups) and in relation to the experience of trauma. Ethnicity has often been oversimplified as a demographic variable, while the majority of research participants have been Caucasian/White (Rabalais & Scotti, 2002) until recently. Varying, yet significant, results have been found in terms of ethnic identity as a predictor and moderator variable using adolescent and adult populations. The current literature implies that ethnic or cultural identity may be an important predictor of the way an individual may respond to a situation or treatment (Stamm & Friedman, 2000). If this suggestion is valid, cultural identity, specifically ethnic identity, has the potential to serve as a crucial variable in explaining variance in posttraumatic stress symptoms. Since this concept has not been researched in first responders or helpers following emergency events and researchers have described varying results, the hypothesis concerning this variable was exploratory.

Summary

The current review brings together the following main points. First, it is evident that research has not been conducted on the distinct population of emergency management professionals. Secondly, a key finding in research concerning related professional groups is that those who directly or indirectly work with crises are at risk for psychological reactions, such as posttraumatic stress disorder and repeated exposure (burnout, secondary

traumatic stress/compassion fatigue) symptoms. The main conclusions obtained from the repeated exposure research are that there is usually an inverse relationship between compassion satisfaction and both burnout and STS/compassion fatigue, and a positive relationship between burnout and STS/compassion fatigue, while all are potential outcomes for individuals who work with individuals exposed to trauma. Additionally, whereas compassion satisfaction, burnout, and secondary traumatic stress symptoms are common reactions, a full PTSD diagnosis is uncommon in both helping and first responder occupations.

In terms of the development of PTSD symptoms, there is strong evidence that individual factors, trauma exposure, and environmental variables are important predictors, while more mixed results have been noted in terms of the relationship between demographic variables (e.g. ethnicity) and PTSD. One of the individual factors that may influence the development of PTSD symptoms following regular trauma exposure is personality. This branch of research identified neuroticism and extraversion as factors that have shown a relationship to burnout and respectively increase and decrease the risk for development of posttraumatic stress symptoms.

Finally, a newer area of traumatic stress research is examining the effect of culture and ethnic identity, which may be considered an environmental factor, on trauma and/or psychological symptoms. Theorists have described how cultural factors may influence the expression of symptoms following trauma and serve as a factor in preventing or accelerating recovery. How ethnicity and ethnic identity have been defined and measured varies tremendously in the research, but evidence suggests that ethnic identity may have the potential to explain variance in symptoms. This deserved further investigation.

Despite the aforementioned findings, there is a lack of research that includes non-demographic cultural variables within multifaceted models to try to explain and predict PTSD symptoms following trauma exposure. The evidence shows that repeated exposure, personal, and environmental variables are important in terms of psychological outcomes of professionals who deal with crises on a regular basis. Therefore, this current project defined negative and positive outcomes of exposure and explored predictive models of PTSD symptoms utilizing a set of variables that had not been explored together—neuroticism, extraversion, ethnic identity, trauma exposure frequency, burnout, and compassion satisfaction—in an understudied population, emergency management professionals.

Chapter 3: Methodology

This chapter presents an overview of the methodology utilized in the study. It includes a description of the research design, questions, and hypotheses, sampling and data collection procedures, description and psychometric properties of the instruments, data analysis procedure, limitations of the study, and ethical concerns. A copy of each instrument, the demographics questionnaire, Multigroup Ethnic Identity Measure-Revised (Phinney & Ong, 2007), Trauma History Questionnaire (Green, 1996), Professional Quality of Life Scale (Stamm, 2005), and PTSD Checklist-Civilian Version (Weathers et al., 1993, 1994), is included in the Appendix. Sample items from the NEO Five-Factor Inventory (Costa & McCrae, 1992) are also included per the permission of the publisher.

Research Design

The current project used a cross-sectional survey design to answer the following research questions in a sample of emergency management professionals:

1. To what extent do neuroticism, extraversion, trauma exposure frequency, burnout, and compassion satisfaction predict PTSD symptoms?
2. To what extent do neuroticism, extraversion, burnout, and compassion satisfaction moderate the relationship between trauma exposure frequency and PTSD symptoms?

3. Does ethnic identity moderate the relationship between trauma exposure frequency and PTSD symptoms in a model containing neuroticism, extraversion, trauma exposure frequency, burnout, and compassion satisfaction?

These research questions were tested using hierarchical regression models. The predictor variables were neuroticism, extraversion, ethnic identity, trauma exposure frequency, burnout, and compassion satisfaction. The criterion variable was total number of PTSD symptoms reported in the past month.

Review of Research Hypotheses

The research hypotheses that were tested in a sample of emergency management professionals are restated below.

Hypotheses

1. A model containing the personality factors of neuroticism and extraversion, trauma exposure frequency, and the repeated exposure variables of burnout and compassion satisfaction will account for the most variance in predicting PTSD symptoms as compared to individual predictors, namely, personality, frequency of trauma exposure, and repeated exposure symptomology.

The hypothesized roles of the individual predictors were as follows:

- a. Neuroticism will positively predict PTSD symptoms (Chung et al., 2006; McFarlane, 1989) in a model with extraversion, trauma exposure frequency, burnout, and compassion satisfaction.

- b. Extraversion will negatively predict PTSD symptoms (Fauerbach et al., 2000) in a model with neuroticism, trauma exposure frequency, burnout, and compassion satisfaction.
- c. Trauma exposure frequency will be a positive predictor of PTSD symptoms (Bryant & Harvey, 1996) in a model including neuroticism, extraversion, burnout, and compassion satisfaction.
- d. Burnout will be a positive predictor of PTSD symptoms (Bissett, 2002; Serratt, 2001) in a model including neuroticism, extraversion, trauma exposure frequency, and compassion satisfaction.
- e. The hypothesis concerning compassion satisfaction's individual predictive utility of PTSD symptoms was exploratory since no one has examined the relationship between compassion satisfaction and PTSD. Considering that research from secondary traumatic stress/compassion fatigue literature provides support for an inverse relationship between compassion satisfaction and secondary traumatic stress/compassion fatigue (e.g. Conrad & Kellar-Guenther, 2006; Simon et al., 2005), the researcher hypothesized: Compassion satisfaction will be a negative predictor of PTSD symptoms in a model including neuroticism, extraversion, trauma exposure frequency, and burnout.

2. Neuroticism, extraversion, burnout, and compassion satisfaction will moderate the relationship between trauma exposure frequency and PTSD symptoms as follows: For participants high in neuroticism, the association between trauma exposure frequency and PTSD symptoms will be strong and positive (Hall & Wilson, 2005), for participants low in neuroticism, this association will be weakly positive or nonexistent; For participants low in extraversion, the association between trauma exposure frequency and PTSD symptoms will

be strong and positive (Fauerbach et al., 2000), for participants high in extraversion, this association will be weakly positive or nonexistent; For participants high in burnout the association between trauma exposure frequency and PTSD symptoms will be strong and positive (Bissett, 2002; Surratt, 2001), for participants low in burnout, this association will be weakly positive or nonexistent; For participants low in compassion satisfaction, the association between trauma exposure frequency and PTSD will be strong and positive (Conrad & Kellar-Guenther, 2006), for participants high in compassion satisfaction, this association will be weakly positive or nonexistent.

3. There was no directional hypothesis concerning ethnic identity as a predictor or moderator of PTSD symptoms in a model with neuroticism, extraversion, trauma exposure frequency, burnout, and compassion satisfaction. This hypothesis was exploratory since the research concerning this variable is mixed (e.g. Byers, 2006; Midlarsky & Midlarsky, 2004; Ozegovic, 2002) and first responder and helping professionals have not been studied.

Population and Sample

The population utilized in this study is emergency management professionals. An emergency management professional is defined as an individual whose job involves one or more of the following aspects before, after, or during a crisis event: mitigation, response, recovery, preparedness, and communications (Haddow & Bullock, 2006). The population of emergency management professionals was somewhat difficult to define due to the various roles, job titles, and associations that encompass this growing field. However, with the assistance of a consultant with emergency management expertise, the researcher

identified seven groups that would be appropriate sources to obtain a convenient sample of emergency management professionals. The organizations that were contacted to request participation are: Emergency Management Professional Organization for Women's Enrichment (EMPOWER), International Association of Emergency Managers (IAEM), National Emergency Management Association (NEMA), Association of Contingency Planners (ACP), Ontario Association of Emergency Managers (OAEM), The International Emergency Management Society (TIEMS), and the Federal Emergency Management Agency (FEMA). IAEM's executive director, EMPOWER's president, OAEM's president, and ACP-DC's Mid-Atlantic Chapter President gave the researcher permission to request participation from members of their respective groups. Current approximate membership levels of these organizations are: IAEM, 4,000 (E.B. Armstrong, personal communication, February 22, 2008), EMPOWER, 500 (K.F. Discount, personal communication, March 12, 2008), OAEM, 400 (J. Kilgour, personal communication, February 22, 2008), and ACP-DC, 200 (M. Barber, personal communication, April 7, 2008) members. The researcher obtained the sample of emergency management professional participants for the study from these emergency management organizations via an email announcement of the research study sent to the member list-servs in each organization and recruitment at one local emergency management meeting. Further description of the sample that participated in the research is described in chapter four.

Data Collection Procedure

Initially, the researcher contacted emergency management organizations (e.g. president, supervisor, or board of directors) requesting permission to access their membership/employee base. Four organizations, IAEM, OAEM, EMPOWER, and ACP-DC, agreed to participate.

Approval for the study was received from The George Washington University's Office of Human Research Institutional Review Board (IRB) on May 9, 2008 and from the Graduate School of Education and Human Development Associate Dean of Academic Affairs on May 14, 2008. The IRB approval was for 122 participants. This number was the minimum sample size needed for a power of .80 to yield a medium effect size (.15) (Cohen, 1992) for an alpha level of .05 with 11 variables (predictors and interaction terms) as determined by a priori sample size calculator (Soper, 2008). A modification to increase the sample to a maximum of 1,500 participants was granted by the IRB following the researcher's request on May 21, 2008 after it was apparent that more than 122 participants would respond to the recruitment emails.

On May 16, 2008, the researcher sent the email script for request for participation and the information sheet to the four participating emergency management organizations: IAEM, EMPOWER, OAEM, and ACP-DC. The researcher used the email to request study participation and provide the research study information sheet along with a password and link to access a secure online survey tool, PsychData (www.PsychData.com). The information sheet served as informed consent without signature due to the survey nature of the research and included the following elements: purpose of the study; risk and benefits; statements concerning anonymity of the responses, voluntary participation, opportunity to

withdraw at any time; contact information of the investigators and Office of Human Research; and information on how to access a mental health referral if needed. A web-based survey was chosen since it is an easy and cost-efficient way to access numerous organizations based locally, nationally, and internationally. PsychData was used to collect survey data at one point in time using six instruments: Demographics Questionnaire, Multigroup Ethnic Identity Measure-Revised (MEIM-R) (Phinney & Ong, 2007), Trauma History Questionnaire (THQ) (Green, 1996), NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrae, 1992), Professional Quality of Life Scale (ProQol) (Stamm, 2005), and the PTSD Checklist (PCL-C) (Weathers et al., 1993, 1994).

A contact person (e.g. membership director) from each association sent out the requests for participation on their individual organizational timelines. The researcher remained in contact with each organization to assist in this process and remind the contact person to send out reminders four weeks after the original request for participation (if they had not done so) and six weeks prior to the data collection end date, October 31, 2008. Table 1 details the dates the recruitment emails were distributed by each organization. OAEM also posted the study information on their website May 22-June 30, 2008, July 7-July 31, 2008, and October 2-31, 2008.

In-person recruitment took place at EMPOWER's bi-annual event, "EMPOWERing Preparedness: An in-depth discussion of the state of preparedness and what the future may hold," on September 24, 2008 in Washington, DC. There were approximately 70 participants including emergency management professionals, their partners, and volunteers who attended this event. Prior to and immediately following the main event, the researcher was stationed at a table outside of the room where the speakers

presented. EMPOWER’s president encouraged survey participation in her upcoming program remarks as well. The researcher had available a computer for online participation, in-person paper and pencil version of the battery of surveys, and the email recruitment script/information sheet for individuals to take home to complete the survey at their leisure. Eighteen email recruitment script/information sheets were distributed. No surveys were completed at the event, likely due to time constraints. Furthermore, numerous individuals attending the event indicated that they already had completed the survey.

Table 1

Request for Participation Dates by Organization

| <u>Organization</u> | <u>First Request</u> | <u>Second Request</u> | <u>Final Request</u> |
|---------------------|----------------------|---|----------------------|
| IAEM | 5/19/08 | 5/28/08 | 10/01/08 |
| OAEM | 5/22/08 | Posted on website 7/9/08 through 7/31/08 | 9/30/08 |
| EMPOWER | 6/16/08 | 8/19/08 | 10/13/08 |
| ACP-DC | 6/19/08 | 7/17/08 | 10/03/08 |

Instrumentation

NEO Five-Factor Inventory (NEO-FFI)

There was a need to administer a measure of personality to determine an estimate of pre-exposure psychological functioning of the participants and to examine personality’s

relationship to PTSD symptoms. Therefore, the NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrae, 1992), one of the most popular and widely used personality assessment tools (Scandell, 2000), was used to measure participants' personality traits. The NEO Personality inventories are appropriate for use in counseling research since they emphasize individual qualities and strengths (Silvestri & Richardson, 2001). In this study participants completed the entire NEO-FFI; however, only the neuroticism and extraversion scales were used in analysis of the hypotheses since research finds the most support for relationships between these two factors and PTSD symptoms. Not utilizing the scales with less proven utility also assisted in conserving degrees of freedom and improving power (Piedmont, 1993).

The NEO-FFI is a 60-item scale that assesses the degree of five personality traits: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Costa & McCrae, 1992). The scale is an abbreviated version of the NEO-Personality Inventory (NEO-PI) constructed by selection of the 60 items that most represented the five factors when analyzed using item and factor analyses (Tokar, Fischer, Snell, & Harik-Williams, 1999). The instrument is appropriate for use in individuals aged 17 and older and takes 10 to 15 minutes to administer (Costa & McCrae). Items on the NEO-FFI are phrased in the first person and utilize a 5-point Likert scale ranging from strongly disagree (0) to strongly agree (4) (Costa & McCrae, 1992; McCrae & Costa, 2003). The N scale consists of items 1, 6, 11, 16, 21, 26, 31, 36, 41, 46, 51, and 56, while the E scale consists of items 2, 7, 12, 17, 22, 27, 32, 37, 42, 47, 52, and 57; items 1, 16, 31, 46, 12, 27, 42, and 57 are reverse-scored (Costa & McCrae). The range of each of the subscales is 0-48.

Research with the scale has also shown support for its reliability and validity. The NEO-FFI manual notes Cronbach's alphas for each of the factors as neuroticism (.86), extraversion (.77), openness to experience (.73), agreeableness (.68), and conscientiousness (.81) (Costa & McCrae, 1992). Rush et al. (2000) reported internal consistency coefficients ranged from .68 to .86 and short-term test-retest reliability ranged from .75 to .83. Additionally, in an Australian community sample, the internal reliability estimates ranged from .77 to .87, and test-retest reliability estimates were noted as between .80 and .87 for a 6-month time period and .73 to .86 for a 30-month time period (Murray, Rawlings, Allen, & Trinder, 2003), while in a sample of Canadian college women, reliability estimates for the subscales ranged from .73 to .87 (Holden & Fekken, 1994). Researchers found support for the appropriateness of the five-factor model through factor analyses (Mooradian & Nezlek, 1996; Murray et al., 2003); although, despite this, some researchers identified six factors in the scale (Tokar et al., 1999).

In the current study, the Cronbach's alpha for the neuroticism scale was .89 and extraversion scale was .81. These reliabilities were slightly higher than the manual's reliabilities of .86 (neuroticism) and .77 (extraversion) (Costa & McCrae, 1992).

Multigroup Ethnic Identity Measure (MEIM)/

Multigroup Ethnic Identity Measure-Revised (MEIM-R)

The Multigroup Ethnic Identity Measure-Revised (MEIM-R) (Phinney & Ong, 2007) was used to determine the strength of participants' ethnic identity in the research project. This measure was chosen since it is one of the only measures that assesses ethnic identity for any ethnic group, as opposed to a specific group, and is appropriate for use in

early adolescents through adults. A description of the original measure and its development follows given the limited research on the newest version.

The original Multigroup Ethnic Identity Measure (MEIM) was developed by Jean Phinney in 1992 and tested in samples of high school and college students, with wording appropriate for a minimum of a sixth-to-seventh-grade reading level (Phinney, 1992; Ponterotto, Gretchen, Utsey, Stracuzzi, & Saya, 2003). Phinney composed the original instrument using self (by an open-ended label question and forced choices) and parental ethnic identification (by forced choices) and the following components: ethnic behavior and practices, affirmation and belonging, ethnic identity achievement, and assessment or attitudes towards interactions with ethnic groups other than one's own. These components comprised 20 items and three subscales, affirmation/belonging, ethnic achievement, and ethnic behaviors, and were assessed on a 4-point Likert scale ranging from strongly agree to strongly disagree with a total score range of 1-4, as the mean of items was used (Phinney).

Research by Phinney (1992) and others (e.g. Ponterotto et al., 2003) investigated the psychometric properties of the original instrument. Reliability estimates for Phinney's (1992) sample of high school and college students was reported through Cronbach's alphas of .81 and .90, respectively, with an independent two-factor solution of ethnic identity (EI) and other group orientation (OGO). Ponterotto and colleagues (2003) also noted that the subscale alphas for ethnic identity ranged from .81 to .92, and other group orientation from .35 to .69. Support for the two-factor solution of the 1992 version of the scale was found in another study (Worrell, 2000) as well as in a review article of 12 studies utilizing this instrument (Ponterotto et al.).

Roberts, Phinney, and colleagues (1999) conducted further research and revision of the measure using a heterogeneous sample of 5,423 sixth, seventh and eighth grade students. The research resulted in a 12-item, 4-point Likert scale of exploration and commitment items with possible total scores of 1-4, since the mean of the item scores is the preferred scoring method; additional items concerning self (open-ended label question and forced choices) and parental ethnic self-identification (forced choices) were included as well. In Roberts et al. study, the researchers also hypothesized that the two factors identified would correspond to two theoretical approaches of identity, namely social identity (sense of belonging to a group) and development (exploration process). Exploratory and confirmatory factor analysis confirmed this theory in a two-factor solution of belonging and exploration, with European Americans scoring lower than other groups on the MEIM (Roberts et al.). The researchers also conceptualized commitment as a component of both of these factors reflected in positive feelings about one's group and commitment to one's ethnic identity. This two-factor solution was supported in research by Pegg and Plybon (2005) using a sample of early adolescent African American females, but not supported in research by Spencer and colleagues (2000) with a group of ethnically heterogeneous adolescents since a slightly different solution of identification and exploration factors was identified. In another study, the researchers also found that this version of the instrument was a satisfactory and equivalent assessment tool across adults of diverse ethnicities and ages (Avery, Tonidandel, Thomas, Johnson, & Mack, 2007).

However, discrepancies in factor solutions in additional research and the emphasis placed on exploratory factor analysis led Phinney and Ong (2007) to revise Roberts and colleagues' (1999) MEIM to its newest shortened version, the Multigroup Ethnic Identity

Measure-Revised (MEIM-R). Despite differences in factor solutions, the exploration and commitment factors appeared important facets to maintain in the instrument. The preliminary modifications included deletion of two items and alterations in the wording and subscales. Following these initial changes, research using factor and item analysis suggested removal of the items with low loadings, leading to the current 6-item MEIM-R (Phinney & Ong, 2007).

The MEIM-R is a 5-point Likert (strongly disagree-1 to strongly agree-5) 6-item scale that measures ethnic identity across two factors, exploration (items 1,4,5) and commitment (items 2,3,6), while also using an open-ended format to determine ethnic self-label (Phinney & Ong, 2007). Phinney and Ong also maintain that the scale should conclude with a list of “appropriate” ethnic groups that respondents can check for themselves and both their parents (p. 276). The raw score range is 6-30 and the raw subscales range is 3-15. The total score of the instrument ranges from 1-5 since the score is calculated by the means of each subscale or scale as a whole. The mean of the total scale was used as a measure of ethnic identity strength in this study, with higher scores indicating a stronger ethnic identity.

The MEIM-R has shown good fit with a two-factor model and the Cronbach’s alphas are reported as .76 for exploration, .78 for commitment, and .81 for total scale (Phinney & Ong, 2007). The correlation between the subscales was found to be .74, which makes theoretical sense in that a certain level of commitment to one’s ethnic identity would be related to exploration (Phinney & Ong). The internal consistency of the MEIM-R for the current sample was .90, which was higher than Phinney and Ong’s reported reliability.

The exploration subscale reliability was .91 and commitment subscale reliability was .87, also higher than previous research (Phinney & Ong).

Trauma History Questionnaire (THQ)

The Trauma History Questionnaire (THQ) (Green, 1996), an instrument created from the *DSM-IV* Field Trial *Potential Stressful Events Interview* (Resnick, Falsetti, Kilpatrick, & Freedy, 1996), was used to assess the frequency of lifetime trauma exposure in the sample. The instrument was developed for use in all populations and meant to determine respondents' exposure to events that would meet criterion A, part one (stressor/traumatic event) for *DSM-III-R* and *DSM-IV* PTSD diagnoses (Green, 1996; Green, Krupnick, Rowland, Epstein, & Stockton, n.d.). The THQ is a 24-item self-report measure that asks about respondents' experiences with different types of traumatic events in three main areas (crime-related events, general disaster and trauma, unwanted physical and sexual experiences) using a dichotomous (yes/no) format while also assessing the frequency of events that have been experienced and age when respondent experienced each event endorsed (Freedman, Gluck, Tuval-Mashlach, Brandes, Peri, & Shalev, 2002; Green; Green et al.; Norris & Hamblen, 2004). Administration time is between 10 and 15 minutes (Green).

The scoring method for the questionnaire is not standardized and can be altered to meet needs of research (Green et al., n.d.). Ways of scoring the instrument include adding up types of events experienced and/or number of exposure events (Green et al.). In the current study, the type and total number of exposure events was determined and the number

of events experienced by participants was entered as a continuous variable in the analyses of the study's hypotheses.

In a summary research review, the authors reported that the test-retest correlations of the measure ranged from .54 (bereavement) to .92 (total crime) (Norris & Hamblen, 2004), while in a study of individuals with severe mental disorders, the researchers found test-retest correlations that ranged from .36 (life-threatening illness) to .89 (natural or human-made disaster) (Mueser, Salyers, Rosenburg, Ford, Fox, & Carty, 2001).

Cronbach's alphas for the THQ in the current study were not calculated since the items on the THQ are not expected to be related. Total lifetime trauma exposure reported by the participants on the THQ had a low insignificant correlation (.17) with trauma exposure frequency on the job reported on the demographic questionnaire. However, many ($N= 85$) participants who endorsed having experienced a trauma on the job left the specific number blank; the total frequency for these participants was counted as one. The mean number of total trauma events endorsed on the THQ by 197 participants was 51.25 with a standard deviation of 84.63. The total range was 0-452. One hundred thirty of the participants (66%) endorsed experiencing a crime-related traumatic event with a mean frequency of 2.49, standard deviation of 7.60, and range of 0-103 while 196 (99.5%) endorsed experiencing general disaster and trauma events with a mean frequency of 47.57, standard deviation of 83.19 and frequency range of 0-452.

Sexual and physical abuse and other events questions were counted as 1 or 0 as the exact frequency of the events was difficult to determine given the varied responses by participants (e.g. weekly, unknown). Physical and sexual traumatic experiences were endorsed by 95 (48.2%) of the participants on the THQ. The frequency ranged from 0-5

(potential range 0-6) with a mean of .93. The percentage of repeated exposure of sexual traumatic events ranged from 3.6-6.1% while the percentage of repeated exposure to physical traumatic events ranged from 6.6-14.2%.

The “other” traumatic events described by 67 (34.0%) participants in the last question of the THQ included: family changes such as divorce, deaths, care-giving of parents, general workplace stress and bullying, and responding to specific disasters (e.g. Hurricane Katrina, September 11th terrorist attacks). The other events were repeated events 17.3% of the time.

Professional Quality of Life Scale (ProQol)

The Professional Quality of Life Scale (ProQoL) (Stamm, 2005) was used to measure burnout and compassion satisfaction in the study. Additionally, for descriptive purposes only, the researcher assessed compassion fatigue levels in the sample, as measured by this instrument. Compassion fatigue was not be used in the study’s hypotheses due to its symptom similarities to PTSD.

The Professional Quality of Life Scale R-IV (ProQol) is the newest revision of the Compassion Fatigue Self-Test as originally developed by Figley (Stamm, 2005, 2008). The compassion satisfaction subscale was added in the second revision of the instrument when it was obvious that individuals taking the assessment felt it implied there needed to be negative aspects of their work with trauma while there were also positive aspects apparent (Stamm, 2002). The current revised version was constructed through many methods such as examination of reliability, item-to-scale, and factor analysis data of previous scale versions (Stamm, 2005). Use of the instrument has varied in terms of analysis and

population. Health workers, child and family workers, and school personnel are populations in which the instrument has been used.

The scale consists of 30 items; 10 items measure each of the three constructs. (Stamm, 2005, 2008). Participants are instructed to rate each of the items for frequency of experience in the last 30 days using a 6-point scale ranging from 0 (never) to 5 (very often). Items 3, 6, 12, 16, 18, 20, 22, 24, 27, and 30 measure compassion satisfaction; items 1, 4, 8, 10, 15, 17, 19, 21, 26, and 29 measure burnout; and items 2, 5, 7, 9, 11, 13, 14, 23, 25, and 28 measure compassion fatigue, with items 1,4,15,17 and 29 reverse-scored. The three scales are interpreted individually and not meant to be combined into a composite score. The subscale scores are intended for use as individual continuous variables, but have also been utilized using cut-off scores to determine level of risk or protection. The range of each subscale is 0-50, with means of each subscale as follows: compassion satisfaction= 37, burnout= 23, and compassion fatigue= 13 (Stamm, 2008). In the current study each subscale score was used to assess burnout, compassion fatigue, and compassion satisfaction levels in the sample, while the burnout and compassion satisfaction scores were utilized in testing the hypotheses.

The ProQol has good psychometric properties as indicated from research with 1,180 individuals that included clinicians, child and family workers, administrators, and school personnel (Stamm, 2008). The manual reports the reliability estimates for the subscales as .88 (compassion satisfaction), .75 (burnout), and .83 (compassion fatigue) (Stamm). In a dissertation study of 96 crisis team members, the researcher also reported the internal consistencies of the instrument subscales as .93 (compassion satisfaction), .79 (burnout), and .83 (compassion fatigue) (Corey-Souza, 2007). The Cronbach's alpha

coefficients for the subscales in this research were as follows: .91 for compassion satisfaction, .73 for burnout, and .79 for compassion fatigue. These internal consistency levels were similar to levels listed in the ProQoL manual (Stamm, 2008).

The manual also notes that construct validity of the test is demonstrated through more than 200 articles and that the multi-trait multi-method validation method found evidence for discriminant validity with the shared variance between the scales reported as 2% (compassion fatigue and compassion satisfaction), 5% (burnout and compassion satisfaction), and 34% (compassion fatigue and burnout) (Stamm, 2005, 2008). Factor analysis techniques have also found evidence for a three-factor solution (Stamm, 2008). Small standard errors have been reported in the manual's aforementioned sample as well.

PTSD Checklist-Civilian version (PCL-C)

The PTSD Checklist-Civilian version (PCL-C) (Weathers et al., 1993, 1993b, 1994) was used to assess the presence and severity of Posttraumatic Stress Disorder (PTSD) symptoms in the sample. Frank Weathers and colleagues at the National Center for PTSD developed the PCL-C (Norris & Hamblen, 2004). This self-report instrument consists of 17 items that correspond to the 17 symptoms of PTSD as described by criterion B (re-experiencing symptoms, 5 items, questions 1-5), C (avoidance and numbing symptoms, 7 items, questions 6-12), and D (arousal symptoms, 5 items, questions 13-17) of the *DSM-IV* (Ruggerio, Del Ben, Scotti, & Rabalais, 2003; Smith, Redd, DuHamel, Vickberg, & Ricketts, 1999). The administration time for completion of the instrument is five to seven minutes (Weathers & Ford, 1996). The items are measured on a 5-point Likert scale (ranging from "not at all" (1) to "extremely" (5)) assessing how much the respondent is

“bothered by that problem in the past month” (Weathers et al., 1993b, Paragraph 1). The PCL-C version is not specific to one traumatic event but inquires about overall problems following any traumatic events experienced.

The scoring for the instrument ranges from 17-85 and can be done in two ways, using cut-off scores for establishing a clinical diagnosis (44 or higher for PTSD diagnosis in nonmilitary samples; 50 or higher for military samples) or following the *DSM-IV* criteria (moderately bothered, score of 3 or higher, on at least one re-experiencing symptom, three avoidance/numbing symptoms, and two arousal symptoms) (Orsillo, 2001; Smith et al., 1999). In the current study, PTSD symptoms were assessed as a continuous variable, using a cut-off score of 44 for diagnosis, as this is suggested and supported as a method of meeting accurate diagnostic criteria in non-clinical populations (Ruggiero et al., 2003; Ventureya, Yao, Cottraux, Note, & De Mey-Guillard, 2002).

Researchers in the United States and other countries have found that the instrument has excellent psychometric properties. In a summary description of research using the PCL, the average stability coefficient was found to be .96, and the consistency coefficient as .97 (Norris & Hamblen, 2004). Additionally, in a psychometric review study of the PCL-C using 392 college students ages 18-44, the researchers found the following: Cronbach’s alpha coefficients for re-experiencing score (.94), avoidance score (.85), hyperarousal score (.85), total score (.85); test-retest correlations for total scores, immediate time period (.92), one week retest (.88), and two week retest (.68); evidence for convergent validity by correlations between PCL scores and the Impact of Event Scale and Mississippi Scale for PTSD; and evidence for discriminant validity by lower correlations between the PCL and Symptom Check List 90-Revised than the other aforementioned measures

(Ruggiero et al., 2003). Researchers using a sample of individuals who received a bone marrow transplant also reported sufficient internal consistency coefficients for the PCL-C as .89 for total scale, .74 (re-experiencing scale), .76 (avoidance/numbing scale), and .78 (arousal scale) with good convergent and discriminant validity when compared to other measures (Smith et al., 1999). Furthermore, research by Blanchard and colleagues (1996) reported a Cronbach's alpha level of .94 with subscale alphas as .94 (criterion B), .82 (criterion C), and .84 (criterion D), as well as a correlation between the PCL and Clinician-Administered PTSD scale (CAPS) to be .93, while Ventureya and colleagues (2002) found internal consistency for the French version of the scale to be .86 and test-retest reliability to be .80.

The internal consistency of the full instrument for this study's sample was .94. The Cronbach's alpha for the re-experiencing scale was .88, avoidance/numbing scale was .87, and hyperarousal scale was .87. All of these reliabilities were within range of previous research with the PCL-C (e.g. Blanchard et al., 1996; Norris & Hamblen, 2004).

Demographics Questionnaire

A brief demographics questionnaire, created by the researcher, was administered to obtain information to define the sample. The questionnaire included questions about age, gender, race, marital/partner status, years of education and emergency management experience, frequency of job-related trauma exposure (general disaster and trauma, crime-related), job title, job role, association and organizational membership, and employment type (part-time, full-time) and sector (e.g. private, government). An inclusion criterion question was included to inquire if the participant has been involved in at least one work-

related disaster or emergency. An exclusion criterion question asked if the participant had been diagnosed with a psychological condition currently or in the past. Having a history of psychosis precluded individuals from participating in the study since there was the potential for inaccuracies in reporting due to reality-based impairments.

Data Analysis Procedure

Analysis of the data proceeded in the following manner. The data were imported from PsychData to the Statistical Package for the Social Sciences (SPSS) version 16.0 computer software for analysis. The responses were initially examined for missing data. Missing data on the THQ were considered a no response while missing data on the NEO-FFI, MEIM-R, ProQoL, and PCL-C were imputed with the EM (expectation-maximization) algorithm, a maximum likelihood estimator method (Howell, 2007; McLachlan, & Thriyambakam, 1997), using EQS software. Descriptive statistics were used to describe the demographics of the participants, neuroticism, extraversion, ethnic identity, trauma exposure frequency, levels of burnout, compassion fatigue, compassion satisfaction, and PTSD symptoms in the sample. Cronbach's alphas were utilized to describe the internal consistency of the instruments.

Hierarchical multiple regression analysis was used to answer the research questions. The assumptions of regression, linearity between predictor and criterion variables, and assumptions of the prediction errors: normality, homoscedasticity (constant variances across scores), and independence were tested first to ensure variability in the sample (Cohen, Cohen, West, & Aiken, 2003). To test linearity, the standardized residual scores of the predictor variables were plotted against the criterion variable, PTSD symptoms.

Normality of the residual scores was checked using the Q-Q plot ensuring that residuals approximated a straight line. Homoscedasticity was inspected through plotting standardized residual scores against the predictor variables and the criterion variable. Independence was verified using the Durbin Watson test and multicollinearity was checked using the collinearity diagnostics option (tolerance, variance inflation factor) in SPSS. All of these assumptions were satisfactorily met.

After the data were examined, hierarchical multiple regression analysis was used to identify the utility of the models and what variables were significant predictors and moderators of PTSD symptoms in a sample of emergency management professionals. To test research questions one and two, the first step for the model was entering the personality variables, neuroticism and extraversion (N and E subscales), as estimates of baseline characteristics of the participants. The second step was to enter trauma exposure (frequency of events experienced), an environmental variable necessary for PTSD development that includes personal trauma history and work-related events. The third step was to enter burnout and compassion satisfaction (burnout and compassion satisfaction subscales), reactions that develop over time from work experience. For research question two, the final step was to enter the four multiplicative interaction terms (neuroticism x trauma exposure, extraversion x trauma exposure, burnout x trauma exposure, compassion satisfaction x trauma exposure) to assess the moderation effects. Before the interaction terms were computed, each of the predictor variables were centered by subtracting the mean value from the observed value as this is the suggested method described by Cohen, Cohen, West, and Aiken (2003) for equations containing interactions. For each step in the regression models, F-statistics, degrees of freedom, R^2 , R^2 change, t-statistics associated

with the predictors, and the significance level of each step was reported to assess each group of variables' and models' overall ability to predict PTSD symptoms. For analysis of the sub-hypotheses, the t-statistic associated with each individual predictor, degrees of freedom, and the corresponding significance levels of each predictor in the context of the full model was reported. To test exploratory research question three, the previously described hierarchical regression was repeated with the following additions: ethnic identity, a construct that usually forms in adolescence and young adulthood following interaction with one's ethnic group (Phinney, 2005), was entered into the model following the personality variables and another multiplicative interaction term (ethnic identity x trauma exposure) was entered in the final step of the model, with the same aforementioned statistics reported. Exploratory analyses were also conducted on the relationships between demographic variables and PTSD symptoms. The significance level for the data analysis of all statistical tests was set at the .05 level.

Design Limitations

Several limitations of the survey design deserve to be reviewed. The main limitations of the research were its cross-sectional nature and use of a convenient sample, making causal conclusions impossible and weakening external validity. Secondly, self-selection bias of emergency management professionals who are more comfortable with responding to survey research over the Internet or are likely to attend a conference may also have been a restraint. Also, the personality variables (neuroticism, extraversion) were significantly correlated with the work-related experience variables, burnout and compassion satisfaction. However, for this reason, personality was entered in the

regression model first in order to be able to determine if work-related experiences contributed additional variance over personality. Additionally, all of the instruments utilized were self-report, making shared variance and social desirability potential problems. Counterbalancing of measures was also not possible due to financial restraints, causing measure order bias.

Moreover, other limitations involve timeframes and aspects of reactions to trauma. It was not possible to determine between short-term and chronic posttraumatic stress reactions due to measurement of PTSD symptoms in the past month; however, since symptom levels have not been explored in the population, this differentiation is beyond the scope of this project. The length of time between the event(s) experienced and measurement of symptoms may have been influenced by other events as well (Bryant & Harvey, 1996). Problems with recollection in many types of trauma research include using retrospective self-reports and the effect of the participants' clinical states on how they remember an experience (e.g. the more PTSD symptoms, the worse one may remember an event) (McNally, 2003).

Human Participants and Ethics Precautions

Since individual emergency management professionals were used as research participants, several precautions will be described. Participants were treated in accordance with the George Washington University's Office of Human Research policies to limit risk and assure ongoing informed consent. Since there was the potential for participants to bring up or reflect on experiences that may have caused them some distress as they recollected past traumatic incidents, participants were informed of this in the information

about the research study document, and were provided a way to access mental health referrals if needed. Data collection was anonymous through a web-based survey, and there was no way to connect responses to the participants, although there was the potential of loss of confidentiality through Internet survey data collection. To minimize this risk, PsychData's option of excluding computer IP addresses of participants responding to the survey was utilized. During data collection, the research data were stored on the PsychData server, an isolated secure database that was only accessible by the researcher with a password. Following completion of data collection, the data were stored on the researcher's password-protected computer in an encrypted password-protected folder.

Chapter 4: Results

This chapter will describe the results of the study, namely data screening and testing of assumptions, characteristics of the sample, descriptive statistics, results of the hierarchical regression models testing the study's hypotheses, and exploratory analyses of the relationship between demographic variables and PTSD symptoms.

Data Screening and Testing of Assumptions

The data were imported from PsychData to Statistical Package for the Social Sciences (SPSS) version 16 and initially examined before analyzed. Variables were recoded to correspond with each instrument's scales and scoring methods. Missing data on the Trauma History Questionnaire (THQ) was considered a no response. Completed data on the THQ was cleaned for analyses in order for usage as a continuous variable. As there is no standardized scoring method for the THQ (Green et al., n.d.) and Green and colleagues allow for use of the instrument according to the purpose of the study, the researcher applied the following frequency decision rules to the "number of times" open-ended response portion of each crime-related and general disaster and trauma event question: approximate, plus or minus a number, or greater than a number became the number used in the response (e.g. approximately 6 times became 6); the average number was used when a range was given (e.g. 1-2 became 1.5); "rarely", "unknown", "unsure", "lost count", "part of the job" became 1; "few", "numerous", "several", "multiple" became 2; "dozens" and "hundreds" became 12 and 100 respectively; if participants responded with

“numerous” or “countless” and described various types of events, the researcher added up and counted the types (e.g. numerous; flood, hurricane, tornadoes became 3); sexual and physical abuse questions were counted as 1 or 0 as the specific frequency of the events was difficult for the researcher to determine (e.g. weekly, unknown, age range provided); the “other events” question responses were also counted as 1 or 0 since the information provided included age ranges, responses such as “periodically” as well as some specific frequency counts. These decision rules estimated exposure as the potential lowest amount of exposure. Missing data (.3% of total responses) on the NEO-FFI, MEIM-R, ProQoL, and PCL-C were imputed with the EM (expectation-maximization) algorithm, a maximum likelihood estimator method (Howell, 2007; McLachlan, & Thriyambakam, 1997), using EQS software.

Sixty-eight participants did not respond to most of the questions on the NEO-FFI, MEIM-R, ProQoL, and PCL-C. Of these 68 participants, seven indicated they did not have exposure to a disaster or emergency on the job. *t*-tests for continuous data (e.g. years of experience, number of work-related traumatic events experienced) and chi-squares for nominal data (e.g. gender, race) were conducted comparing the demographic information of the 61 individuals with exposure who had incomplete data with the 216 individuals who completed the survey in its entirety. The only significant result found was that the group with complete data was found to have experienced a greater number of general disaster and trauma events on the job compared to the group with incomplete data, $t(116.12) = 2.75$, $p = .01$. The complete data group had a mean of 16.22 and standard deviation of 34.48 of general disaster and trauma events experienced in comparison to a mean of 5.85 and standard deviation of 8.90 for the incomplete data group.

Since hierarchical regression was the method of analysis, the assumptions of regression—linearity between predictor and criterion variables—and assumptions of the prediction errors—normality, homoscedasticity (constant variances across scores), and independence—were tested first to ensure variability in the sample (Cohen, Cohen, West, & Aiken, 2003). Evidence for normality was found through inspection of the Q-Q plot where the residuals approximated a straight line with slight deviations in the tails of the distribution. Each variable was explored on its own for normality, and the greatest deviance from normality was found in trauma exposure. When the analysis was repeated without the three highest trauma exposure frequency outliers (943, 2013, 2021.5)—those that were four or more standard deviations away from the mean—the model improved. Deleting the lowest outliers, which were within a standard deviation away from the mean, did not change the model significantly. Therefore, the three highest outliers were replaced by the highest trauma exposure frequency value (452) in the accepted sample. There was no sign of violation of homoscedasticity, as the conditional variability of the residuals appeared the same. However, the casewise diagnostic option in SPSS identified two cases with residuals three standard deviations away from the mean. When the analysis was repeated without these outliers, the significance values of each variable in the model were similar to the analysis with the outliers in the model; therefore these cases were kept in the analysis. Independence was verified by a Durbin-Watson statistic of 1.95. Multicollinearity was checked using the collinearity diagnostics option (tolerance, variance inflation factor) in SPSS. All tolerances were between .50-.96 and variance inflation factors ranged from 1.12-2.00. Therefore, the data satisfactorily met all assumptions of regression.

Sample Description

The total sample included 175 males and 94 females with a mean age of 46.04 ($SD= 10.72$) years, 15.08 ($SD= 5.26$) years of education, and 13.06 ($SD= 9.66$) years of emergency management experience. Approximately 64% of the participants were married. Racially and ethnically the sample was homogenous with 236 participants identifying racially as White and 204 identifying ethnically as White, Caucasian, Anglo or European American. The majority of the participants worked full-time ($N= 248$) in government ($N= 173$) or the private sector ($N= 71$). The sample's composition was comparable to a study that explored demographics among a sample of emergency management professionals from the International Association of Emergency Management (IAEM) and North Dakota county emergency managers (Cwiak, Cline, & Karlgaard, 2004). The one exception to this observed similarity was that the current project included a higher representation of female participants (33%) than the IAEM subgroup (21%) in Cwiak and colleague's research.

Tables 2, 3, and 4 summarize the demographics of the complete sample of 284 participants. Table 2 describes the participants by gender, marital status, race, ethnicity, employment sector, and employment type. Table 3 presents the mean and standard deviation age, education level, and experience level of the participants in years while Table 4 represents participants' organizational membership.

Table 2

Sample Demographics by Frequency

| | <i>N</i> | % |
|--|----------|------|
| Gender | 269 | |
| Female | 94 | 33.1 |
| Male | 175 | 61.6 |
| Marital Status | 270 | |
| Single | 46 | 16.2 |
| Married | 183 | 64.4 |
| Living with partner | 13 | 4.6 |
| Separated | 2 | .7 |
| Divorced | 25 | 8.8 |
| Widowed | 1 | .4 |
| Race | 266 | |
| White | 236 | 83.1 |
| Black/African American | 12 | 4.2 |
| American Indian/Alaska Native | 3 | 1.1 |
| Asian | 3 | 1.1 |
| Native Hawaiian/Pacific Islander | 2 | .7 |
| Two or more races | 5 | 1.8 |
| Other | 5 | 1.8 |
| Ethnicity* | 251 | |
| Asian or Asian American | 3 | 1.1 |
| Black or African American | 11 | 3.9 |
| Hispanic or Latino | 3 | 1.1 |
| White, Caucasian, Anglo, European American | 204 | 71.8 |
| American Indian/Native American | 5 | 1.8 |
| Mixed; parents from two different groups | 11 | 3.9 |
| Other | 14 | 4.9 |
| Employment Sector | 277 | |
| Private | 71 | 25.0 |
| Government | 173 | 60.9 |
| Non-government Organization | 6 | 2.1 |
| Volunteer Organization | 7 | 2.5 |
| Other | 20 | 7.0 |
| Employment Type | 275 | |
| Full-time | 248 | 87.3 |
| Part-time | 27 | 9.5 |

*as endorsed on the MEIM-R

The 20 “other” responses to employment sector in Table 2 included educational settings (10), healthcare (2), a combination of sectors (2), all sectors (1), non-profit federal work (1), association work (1), county organization (1), military (1), and another response that could be categorized as a non-government organization (1).

Table 3

Mean Sample Demographics in Years

| | <i>N</i> | <i>M</i> | <i>SD</i> | Range |
|---------------------------------|----------|----------|-----------|-------|
| Age | 267 | 46.04 | 10.72 | 22-70 |
| Education Level | 216 | 15.08 | 5.26 | 1-27 |
| Emergency management experience | 275 | 13.06 | 9.66 | 0-40 |

In addition to individual characteristics, experience and educational level, further information on the participants’ professional lives was obtained through the demographics questionnaire; this will be described next. In examining the responses to the job title inquiry, 77 participants reported some combination of the words “emergency” and “manage” in their job title while 118 participants had “emergency” in their job title. Other titles included specialists, directors, managers, associates, officers, coordinators, and consultants in many areas such as: disaster, safety, preparedness, recovery, planning, continuity, risk, crisis, fire, medical/healthcare, paramedic, police, and military.

Job role narratives also varied but the most common descriptions found included the following responsibilities: emergency management, emergency communications, mitigation or crisis/risk management, preparedness or planning including development of

emergency plans and coordination of training exercises, direct service response and recovery roles, and continuity of operations. Additional tasks included outreach, safety compliance, damage assessment, public education, security, research, teaching, and 911 call center work. The areas in which these roles were conducted included general local, state, and national communities and within fields such as public health, mental health, medicine, fire, police, recreation facilities, and infrastructure.

Table 4

Participants' Organizational Membership

| <u>Organization</u> | <u>N</u> |
|--|------------|
| Association of Contingency Planners | 35 |
| Canadian Centre for Emergency Preparedness | 19 |
| Emergency Management Professional Organization for Women's Enrichment | 24 |
| Federal Emergency Management Agency | 24 |
| International Association of Emergency Managers | 177 |
| National Emergency Management Association | 18 |
| Ontario Association of Emergency Managers | 44 |
| The International Emergency Management Society | 5 |
| <u>Other</u> | <u>100</u> |

It was apparent from the data that participants belonged to many different professional organizations. Of note, there were many organizations referenced in the "other" category of emergency management associations or organizations. A significant proportion ($N= 46$) of the 100 "other" organizations described were local (e.g. county), state, or country (e.g. Australia, Canada) emergency management or preparedness associations. There were also 12 field specific associations mentioned in fields such as

social work, counseling, fire, public health, paramedic, police, and forensic examination. Other organizations ($N= 11$) mentioned included “disaster recovery” groups such as the Disaster Recovery Institute and Disaster Recovery International. Additionally some participants only included acronyms of their organizations making it difficult for the researcher to determine what organization they were referring to while others described organizations already included in question 4 of the demographics (e.g. EMPOWER). Three individuals indicated they belonged to “none” as well.

Trauma Exposure

Two hundred fifty-eight participants (90.8%) endorsed that they experienced at least one disaster or emergency in their role as an emergency management professional. On the demographic questionnaire, the mean number of general disaster and trauma incidents experienced while working on the job ranged from 0-250 with a mean of 14.69 and standard deviation of 32.21 while the number of crime-related events experienced ranged from 0-1000 with a mean of 11.01 and standard deviation of 82.63.

Past psychiatric diagnoses

Fifty-four of the participants (19.6%) reported that they had been diagnosed and/or treated for a psychological condition in the past ten years. This percentage is within the range of the general adult population rates of clinical disorders in the past year, which have been estimated between 18.5% (Narrow, Rae, Robins, & Regier, 2002) and 26.2% (Kessler, Chiu, Demler, & Walters, 2005). However, this rate is lower than a replication of the National Comorbidity Survey where lifetime prevalence of any mental disorder was

found to be 46.4% with lifetime prevalence of anxiety and mood disorders reported as 28.8% and 20.8% (Kessler, Berglund, Demler, Jin, & Walters, 2005).

Six individuals left the specific disorder blank, one listed “ischemic stroke” and 47 described Axis I conditions as listed in the *DSM-IV-TR* (APA, 2000). These included depressive disorders (19), PTSD (8), Anxiety Disorder (3), Adjustment Disorder (2), and Attention Deficit Disorder (1). Fourteen participants listed multiple Axis I disorders (e.g. depression and anxiety, PTSD and depression) using combinations of the aforementioned disorders as well as obsessive-compulsive disorder and bipolar disorder. PTSD was listed in 5 of these combination cases. No participants endorsed having a psychotic disorder or described any psychotic symptoms; therefore all participants were included in the analyses if they completed the majority of the survey and endorsed experiencing a disaster or emergency during their work ($N=41$). Eight of the individuals with past psychological conditions met the cut-off criteria for current PTSD; four of these individuals also endorsed being diagnosed or treated for PTSD in the past 10 years.

Response Rate

Two hundred eighty-four individuals completed the full or partial survey. Twenty-six individuals responded that they had not been exposed to a trauma or disaster on the job. Sixty-eight participants’ responses had mostly missing data, seven of which indicated they had no exposure during work. Therefore, 197 valid cases were used in analyses of the hypotheses.

Response rates are not calculated due to the Internet survey nature of the research. It was impossible for the researcher to determine how many members of the organizations

surveyed actually received a request to participate via email. The participants may also be members of more than one organization and may have received a request to participate from more than one source. However given the approximate membership levels provided by individuals of each of the sampled associations, the researcher projected that up to 5,100 email requests for participation may have been sent out. This number is an upper-bound estimate, as the assumptions that each member had an active email address and did not have membership in multiple associations would need to be met for this figure to be accurate.

Descriptive Statistics for Variables

The mean, standard deviation, possible and actual range of scores of the predictor variables and PTSD are presented in Table 5. The mean neuroticism score ($M= 17.12$, $SD= 8.68$) and extraversion score ($M= 30.33$, $SD= 6.32$) are both within the average ranges (Costa & McCrae, 1992). The sample mean on the MEIM-R was 3.23 ($SD= .88$). The MEIM-R mean for participants who identified as White or European Americans was 3.17 ($SD= .86$) while participants who identified ethnically as not White or not from a European background had a mean MEIM-R score of 3.60 ($SD= .83$). This difference was significant, $t(191)= -2.60$, $p= .01$. The mean burnout score of 15.50 ($SD= 6.75$) was lower than the mean reported in the ProQoL manual ($M= 23$, $SD= 6$) (Stamm, 2008). The compassion satisfaction mean of 39.20 ($SD= 7.58$) and compassion fatigue mean of 11.21 ($SD= 6.37$) were comparable to the manual's reported levels. Twenty-nine (14.7%) participants had compassion fatigue scores over 17, indicating they were at risk for compassion fatigue (Stamm). The average score on the PCL-C was 28.42 ($SD= 11.79$) with 26 participants

(13.2%) meeting the cut-off score of 44 for a PTSD diagnosis in a non-clinical population. This percentage is higher than the lifetime PTSD prevalence rate of 6.8% reported in the National Comorbidity Survey Replication (Kessler, Berglund, Demler, Jin, & Walters, 2005) and 8% rate described in the *DSM-IV-TR* (APA, 2000). However the current sample's rate is only slightly higher than additional prevalence ranges (8-12%) (Norris & Slone, 2007) and within PTSD rates reported in occupations working with traumatic material (e.g. Benedek et al., 2007; Perrin et al., 2007). Sixteen individuals were both at risk for compassion fatigue and met the cut-off score for a PTSD diagnosis. In summary the sample appeared to be lower on burnout and similar on rates of compassion satisfaction, compassion fatigue, and PTSD in comparison to past research.

The correlations between the independent variables and PTSD are presented in Table 6. Many significant correlations were found. PTSD significantly correlated with neuroticism, extraversion, burnout, and compassion satisfaction in the expected directions and correlated positively with ethnic identity strength.

Table 5

Descriptive Statistics: Predictor and Criterion variables

| | <i>M</i> | <i>SD</i> | Possible Range | Actual range |
|-------------------------|----------|-----------|----------------|--------------|
| Neuroticism | 17.11 | 8.68 | 0-48 | .48*-40 |
| Extraversion | 30.33 | 6.32 | 0-48 | 9-47 |
| Ethnic Identity | 3.23 | .88 | 1-5 | 1-5 |
| Trauma Exposure | 51.25 | 84.63 | N/A | 0-452 |
| Burnout | 15.50 | 6.75 | 0-50 | 0-35 |
| Compassion Satisfaction | 39.20 | 7.58 | 0-50 | 12-50 |
| PTSD | 28.42 | 11.79 | 17-85 | 17-71 |

Note. *Due to EM algorithm assumption of infinite continuous range.

Table 6

Pearson Correlation Coefficients between Predictor Variables and PTSD

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|----------------------------|---|-------|--------|------|-------|--------|--------|
| 1. PTSD | — | .55** | -.32** | .15* | .02 | .56** | -.19** |
| 2. Neuroticism | | — | -.47** | .12 | -.18* | .56** | -.39** |
| 3. Extraversion | | | — | .17* | .15* | -.53** | .63** |
| 4. Ethnic Identity | | | | — | -.12 | .04 | .16* |
| 5. Trauma Exposure | | | | | — | .03 | .08 |
| 6. Burnout | | | | | | — | -.53** |
| 7. Compassion Satisfaction | | | | | | | — |

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

Hypotheses Analyses

Research Question 1

To what extent do neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction predict PTSD symptoms in a sample of Emergency Management professionals?

Analysis of Hypothesis 1

It was hypothesized that a model containing the personality factors of neuroticism and extraversion, trauma exposure, and the repeated exposure variables of burnout and compassion satisfaction would account for the most variance in predicting PTSD symptoms as compared to individual predictors, namely, personality, frequency of trauma exposure, and repeated exposure symptomology.

The results of the hierarchical regression supported the hypothesis. In the first step neuroticism and extraversion accounted for a significant amount of variance in PTSD symptoms, $R^2 = .31$, $F(2, 194) = 43.42$, $p = .00$. In the second step trauma exposure

frequency accounted for a significant amount of variance in PTSD symptoms after controlling the variance explained by neuroticism and extraversion, $R^2 = .33$, R^2 change = .02, F change (1,193) = 4.72, $p = .03$. In the third step, burnout and compassion satisfaction also explained a significant amount of variance in PTSD symptoms after controlling for the variance explained by neuroticism, extraversion, and trauma exposure frequency, $R^2 = .42$, R^2 change = .10, F change (2,191) = 16.39, $p = .00$. Tables 7 and 8 describe details of each step of the model.

Sub-Hypotheses Analyses

To analyze the sub hypotheses, the t -statistic associated with each individual predictor, degrees of freedom, and the corresponding significance levels of each predictor in the full model were determined. The results follow:

a. Neuroticism will positively predict PTSD symptoms in a model with extraversion, trauma exposure, burnout, and compassion satisfaction.

This hypothesis was supported. Neuroticism was a significant predictor of PTSD symptoms in a model with extraversion, trauma exposure, burnout, and compassion satisfaction, $t(191) = 5.49$, $p = .00$.

b. Extraversion will negatively predict PTSD symptoms in a model with neuroticism, trauma exposure, burnout, and compassion satisfaction.

This hypothesis was not supported. Extraversion was not a significant predictor of PTSD symptoms in a model with neuroticism, trauma exposure, burnout, and compassion satisfaction, $t(191) = -.72, p = .47$.

c. Trauma exposure frequency will be a positive predictor of PTSD symptoms in a model including neuroticism, extraversion, burnout, and compassion satisfaction.

This hypothesis was not supported. Trauma exposure frequency was not a significant predictor of PTSD symptoms in a model with neuroticism, extraversion, burnout, and compassion satisfaction, $t(191) = 1.25, p = .22$.

d. Burnout will be a positive predictor of PTSD symptoms in a model including neuroticism, extraversion, trauma exposure, and compassion satisfaction.

This hypothesis was supported. Burnout was a positive predictor of PTSD symptoms in a model with neuroticism, extraversion, trauma exposure, and compassion satisfaction, $t(191) = 5.55, p = .00$.

e. Compassion satisfaction will be a negative predictor of PTSD symptoms in a model including neuroticism, extraversion, trauma exposure, and burnout.

This hypothesis was not supported. Compassion satisfaction was a *positive* predictor of PTSD symptoms in a model with neuroticism, extraversion, trauma exposure, and burnout, $t(191) = 2.78, p = .01$.

Research Question 2

To what extent do neuroticism, extraversion, burnout, and compassion satisfaction moderate the relationship between trauma exposure frequency and PTSD symptoms?

Analysis of Hypothesis 2

It was hypothesized that neuroticism, extraversion, burnout, and compassion satisfaction would moderate the relationship between trauma exposure frequency and PTSD symptoms in the following ways: For participants high in neuroticism, the association between trauma exposure frequency and PTSD symptoms will be strong and positive, for participants low in neuroticism, this association will be weakly positive or nonexistent; For participants low in extraversion, the association between trauma exposure frequency and PTSD symptoms will be strong and positive, for participants high in extraversion, this association will be weakly positive or nonexistent; For participants high in burnout the association between trauma exposure frequency and PTSD symptoms will be strong and positive, for participants low in burnout, this association will be weakly positive or nonexistent; For participants low in compassion satisfaction, the association between trauma exposure frequency and PTSD will be strong and positive, for participants high in compassion satisfaction, this association will be weakly positive or nonexistent. □

There was no support for the hypothesis that neuroticism, extraversion, burnout, and compassion satisfaction moderate the relationship between trauma exposure frequency and PTSD symptoms. The interaction terms did not contribute significant variance in PTSD symptoms over neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction, $R^2 = .44$, $R^2 \text{ change} = .01$, $F \text{ change} (4,187) = .99$, $p = .41$.

Table 7

Hierarchical Regression Analysis Showing Variance in PTSD symptoms Accounted for by the Predictor Variables and Interaction Terms

| | <i>R</i> | <i>R</i> ² | Adjusted <i>R</i> ² | ΔR^2 | <i>F</i> change | <i>df</i> 1 | <i>df</i> 2 | <i>p</i> |
|---------|----------|-----------------------|--------------------------------|--------------|-----------------|-------------|-------------|----------|
| Step 1: | .56 | .31 | .30 | .31 | 43.42 | 2 | 194 | .00 |
| Step 2: | .57 | .33 | .32 | .02 | 4.72 | 1 | 193 | .03 |
| Step 3: | .65 | .42 | .41 | .10 | 16.39 | 2 | 191 | .00 |
| Step 4: | .66 | .44 | .41 | .01 | .99 | 4 | 187 | .41 |

Note. Step 1: neuroticism and extraversion, Step 2: trauma exposure frequency, Step 3: burnout and compassion satisfaction, Step 4: interaction terms.

Research Question 3

Does ethnic identity strength moderate the relationship between trauma exposure frequency and PTSD symptoms in a model containing neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction?

Analysis of Hypothesis 3

There was no directional hypothesis concerning ethnic identity as a predictor or moderator of PTSD symptoms in a model with neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction. This hypothesis was exploratory since the research concerning this variable is varied and first responder and helping professionals have not been studied.

This hypothesis was conducted with 196 valid cases that completed the MEIM-R. The results of the hierarchical regression analysis did not lend support to the unique predictive utility of ethnic identity strength in the model when added to the model following neuroticism and extraversion, $R^2 = .32$, R^2 change = .01, F change (1,192) = 3.12, $p = .08$. The addition of ethnic identity strength in the final step as a moderator along with

neuroticism, extraversion, trauma exposure, burnout, and compassion satisfaction, and the interaction terms also did not have a significant effect, $R^2 = .45$, R^2 change = .02, F change (5, 184) = 1.24, $p = .29$.

Given the differences between the participants that identified as White and ethnic groups other than White on the MEIM-R, the exploratory hypothesis was also tested with the 161 participants that ethnically identified as White. The results of this analysis did not support the utility of ethnic identity strength in the model when added after the personality variables, $R^2 = .33$, R^2 change = .02, F change (1,156) = 3.61, $p = .06$. Ethnic identity strength did not act as a moderator with the other variables and hypothesized moderators in this sample, $R^2 = .50$, R^2 change = .03, F change (5,148) = 1.82, $p = .11$.

Table 8

Hierarchical Regression Results for Three Models Predicting PTSD Symptoms

| | <u>Model 1</u> | | | | <u>Model 2</u> | | | | <u>Model 3</u> | | | |
|---|----------------|------|---------|----------|----------------|------|---------|----------|----------------|------|---------|----------|
| | B | SE B | β | <i>t</i> | B | SE B | β | <i>t</i> | B | SE B | β | <i>t</i> |
| Constant | -1.78 | 5.96 | — | -.30 | 28.09 | .70 | — | 40.25*** | 28.14 | .70 | — | 40.30*** |
| Neuroticism | .52 | .10 | .38 | 5.49*** | .52 | .10 | .39 | 5.50*** | .52 | .10 | .38 | 5.35*** |
| Extraversion | -.10 | .14 | -.06 | -.72 | -.08 | .14 | -.05 | -.59 | -.15 | .15 | -.08 | -1.04 |
| Trauma Exposure | .01 | .01 | .07 | 1.25 | .00 | .01 | .00 | -.02 | .00 | .01 | .03 | .33 |
| Burnout | .73 | .13 | .42 | 5.55*** | .75 | .13 | .43 | 5.59*** | .70 | .14 | .40 | 5.12*** |
| Compassion Satisfaction | .32 | .12 | .21 | 2.78** | .33 | .12 | .21 | 2.76** | .31 | .12 | .20 | 2.60** |
| Neuroticism x Trauma Exposure | — | — | — | — | .00 | .00 | -.11 | -1.56 | .00 | .00 | -.07 | -.85 |
| Extraversion x Trauma Exposure | — | — | — | — | .00 | .00 | .02 | .22 | .00 | .00 | -.01 | -.15 |
| Burnout x Trauma Exposure | — | — | — | — | .00 | .00 | .14 | 1.56 | .00 | .00 | .12 | 1.34 |
| Compassion Satisfaction x Trauma Exposure | — | — | — | — | .00 | .00 | .03 | .42 | .00 | .00 | .05 | .67 |
| Ethnic Identity | — | — | — | — | — | — | — | — | 1.31 | .80 | .10 | 1.64+ |
| Ethnic Identity x Trauma Exposure | — | — | — | — | — | — | — | — | -.01 | .01 | -.10 | -1.30 |

Note. Predictor variables are centered for Models 2 and 3.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Exploratory Analyses of Demographic Variables and PTSD

Exploratory analyses were conducted examining the relationships between demographic variables and PTSD symptoms. There were only two significant findings. Single, separated, divorced and widowed individuals as a group had a significantly higher amount of PTSD symptoms ($M= 31.52$, $SD= 13.05$) than those participants married and living with a partner ($M= 27.28$, $SD= 11.12$), $t(195)= 2.26$, $p= .03$. Participants who reported being diagnosed or treated for a psychological condition in the past ten years also reported more PTSD symptoms ($M= 35.15$, $SD= 12.19$) than those who had not been diagnosed or treated ($M= 26.65$, $SD= 11.06$), $t(195)= 4.28$, $p= .00$. A finding that approached significance was the comparison of males and females on PTSD symptoms, $t(119.98)= 1.93$, $p= .06$. Males had an average total PCL-C score of 27.20 ($SD= 10.92$) compared to the female average of 30.76 ($SD= 13.07$). There were no significant differences on level of PTSD symptoms among primary employment sectors when compared in collapsed groups (private, government, and all other types) or between participants who identified ethnically as White, Caucasian, Anglo, or European American and all other ethnic groups.

Furthermore, there were no significant correlations between age, years of education, and years of emergency management experience and PTSD. Also, when using a median cut-off to divide and compare each of these groups, no significance differences were found. Comparisons using race and employment type were not made due to the majority of the sample identifying racially as White ($N= 177$), and having a full-time employment status ($N= 176$).

Chapter 5: Discussion

The purpose of this study was to examine levels of trauma exposure frequency, burnout, compassion fatigue/secondary traumatic stress, and posttraumatic stress disorder symptoms in emergency management professionals. Models exploring how neuroticism, extraversion, ethnic identity strength, trauma exposure frequency, burnout, and compassion satisfaction predict posttraumatic stress disorder symptoms were also tested.

This chapter presents the major findings of the study in regard to the existing traumatic stress literature. It is important for the reader to be aware that prior to this work, posttraumatic stress in emergency management professionals as a unified profession had not been studied. Therefore, the results should be viewed cautiously when compared to studies with related professional groups and other individuals exposed to traumatic events. Limitations of the study, suggestions for future research, and implications for counseling are also described in the chapter.

Major Findings

PTSD in Emergency Management Professionals

This is the first study to the researcher's knowledge that examined PTSD symptoms in emergency management professionals. The level of diagnosed PTSD (13%) assessed by the PCL-C in this study's sample of emergency management professionals was similar to levels reported in previous studies of disaster relief workers (Zimering et al., 2006), firefighters (Benedek, Fullerton, & Ursano, 2007; North et al., 2002), police officers (Pole,

2008), and a combined group of individuals from first responder and helping occupations (Perrin et al., 2007). Emergency management professionals appear to have a similar risk for developing PTSD as first responders and helping professionals, two groups that also work with traumatic material. This conceptualization as a professional group similar to first responders and helpers was supported by the job titles, job role narratives, and professional organizations described by the participants. However, it was also apparent that some of the participants may have also identified with a first responder (e.g. fire) or helping profession (e.g. social work) in addition to emergency management.

PTSD significantly correlated with all of the predictor variables in the expected directions. Of note is the low insignificant correlation between trauma exposure frequency and PTSD symptoms. Emergency management professionals that are exposed daily or frequently to various aspects of traumatic events may become desensitized to the effects of repeated exposure. Every event experienced may not qualify as a “traumatic” response—including the subjective experience of intense fear, helplessness, or horror (APA, 1994, 2000)—to each individual.

Burnout, Compassion Fatigue, and Compassion Satisfaction in Emergency Management Professionals

The sample of emergency management professionals had a low level of burnout and average levels of compassion fatigue and compassion satisfaction according to mean levels described in the Professional Quality of Life Scale manual (Stamm, 2008).

Correlational relationships between these repeated exposure variables and PTSD were significant and in the expected directions. Repeated exposure symptom levels vary in the

literature by profession type, exposure levels, and sampling methods (e.g. Jacobson, 2006; Kop et al., 1999; Roberts et al., 2003) making comparisons between studies problematical. However Wee and Myers' (2003) research used a sample that has some similarities to the current one. The levels of burnout and compassion satisfaction observed in this study were comparable to their research with Critical Incident Stress Management (CISM) professionals that consisted of a convenient sample of both first responder and helping professionals. The mean level of compassion fatigue was average in the current sample while the mean level of compassion fatigue was low in the CISM group. Although approximately 15% of the current sample had a compassion fatigue score indicating they were at risk while 40% of the CISM sample had moderate-to-high risk levels. The differences should be viewed considering: Wee and Myers' work used an older version of the ProQoL, the Compassion Satisfaction and Fatigue Test; and the CISM sample consisted of individuals from multiple professions with different types and amounts of exposure in their daily jobs, attending a workshop on the prevention of compassion fatigue while the emergency management professional sample may have been exposed to traumatic events as well as work related to crises (e.g. preparation duties) more regularly in both direct and indirect matters.

Trauma Exposure Frequency in Emergency Management Professionals

The level of trauma exposure frequency in this sample of emergency management professionals was on average, high, and varied tremendously. As previously mentioned, trauma exposure frequency had a very low insignificant positive correlation with PTSD symptoms. The amount of lifetime exposure events reported also had a low insignificant

correlation with work-related exposure events. The researcher expected both of these relationships to be higher due to research demonstrating that a greater number of exposure incidents leads to more symptoms (e.g. Bryant & Harvey, 1996) and the sharing of some exposure question content on the THQ and the demographic questionnaire. These results may illustrate the complexity inherent in measuring trauma exposure frequency, especially for those with multiple work-related exposures. It may be difficult for a highly exposed population such as emergency management professionals to accurately remember a total number of critical events experienced. Given the elevated level of exposure and low correlation with PTSD symptoms, it also seems likely that desensitization or emotional detachment may be a necessary response used by emergency management professionals to cope with high levels of exposure.

Model One: Personality, Trauma Exposure Frequency, Burnout and Compassion Satisfaction

The results of this research suggest that both personal and environmental factors explain variance in PTSD symptoms in emergency management professionals, similar to previous research in related professional groups (e.g. Hodgins, Creamer, & Bell, 2001; Marmar et al., 1999). The study's main hypothesis that explored the contributions of neuroticism, extraversion, trauma exposure frequency, burnout, and compassion satisfaction was supported. The interplay of personality, exposure frequency, and work-related reactions appear to have affected PTSD symptom level when considered together. However, when examining each variable individually the results found were not always

consistent with the hypotheses or past research. These results will be discussed further in the following sections.

The sample of emergency management professionals displayed average levels of both neuroticism and extraversion in accordance with the NEO-FFI manual (Costa & McCrae, 1992). Together these variables affected the variance in PTSD when considered in the first step of the initial hierarchical regression model, but individually only neuroticism had a significant effect in the context of the full model.

The significant results concerning neuroticism as a predictor of PTSD replicated the findings of previous research reviews (Hall & Wilson, 2005; Moran & Shakespeare-Finch, 2003) and individual studies with medical patients (Chung et al., 2006), burn victims (Fauerbach et al., 2000), firefighters (McFarlane, 1989), and Vietnam veterans (Hyer et al., 2003) that demonstrated that neuroticism is positively related to and/or contributes to the variance in PTSD symptoms. Although in the current sample, neuroticism remained significant in the context of the full model with additional individual and environmental predictors, which is in contrast to a longitudinal study of police officers (Hodgins et al., 2001) that found neuroticism did not remain significant in a subsequent model that also included trauma exposure frequency and additional factors. The disparity between studies may be due to the different sample types and variables examined. Since the significance of neuroticism was constant despite the addition of other predictors in this research, neuroticism seems to be a valuable individual and contextual predictor of PTSD for emergency management professionals. However, when considering the support for neuroticism as a predictor in this study, it is important to distinguish personality traits or styles from personality disorders. The NEO scales do not correlate to personality disorder

symptoms nor are they generally used for diagnosis of Axis II disorders for clinical or research purposes.

The current study found evidence that extraversion is negatively correlated with PTSD and contributes to the variance in PTSD symptoms when considered with neuroticism, but did not find support for extraversion serving as an individual negative predictor in the complete model. This finding is in contrast to research that has noted that extraversion may serve as protective factor in terms of PTSD symptom development (Fauerbach et al., 2000). Although considering extraversion has shown less definite support in past research compared to neuroticism (e.g. Chung et al., 2006) and emergency management professionals had not yet been studied, this finding is not totally unexpected. In view of the strong individual effect of neuroticism, it is evident that extraversion did not contribute much to the variance in PTSD symptoms when entered with neuroticism in the first step of the model. Negative emotionality seems more important than the tendency to engage with people or the environment in relation to posttraumatic stress symptoms. Despite extraversion's negative relationship to PTSD symptoms, when viewed with other personal and environmental factors, it did not remain a significant variable suggesting extraversion may only be a useful predictor when examined in conjunction with other facets of personality for this group of emergency management professionals.

Mixed results were found when considering the role of trauma exposure frequency in hypothesis one. Trauma exposure frequency accounted for additional significant variance in PTSD symptoms in the context of the first hierarchical model when entered following personality variables, but the amount of variance explained by this variable was low. Previous research supports the idea that increased exposure events leads to more

symptoms (e.g. Bryant & Harvey, 1996; Eriksson et al., 2001), providing a basis for exploration in exposed populations. Trauma exposure frequency did not remain a significant individual predictor in the context of the full model with the addition of repeated exposure variables suggesting it might not be an individually important predictor for emergency management professionals. A recent review of predictors of PTSD symptoms in police officers, published during data collection for this study, noted similar results. Pole (2008) found that for police officers with a mean cumulative work exposure of 250 critical incidents over the course of their careers, trauma exposure frequency was a poor predictor of PTSD. However, the research also reports that a history of childhood trauma was related to more posttraumatic stress symptoms when viewed in terms of the worst work-related traumatic event. Separating out the effects of personal history of trauma and incidents of work-related traumatic exposure on PTSD symptoms in emergency management professionals could clarify the results in future research.

There are various likely explanations for this study's findings. Perhaps the severity, the amount of direct exposure during an incident, may be more important than the actual number of events experienced as also seen in Hodgins and colleagues' (2001) study of police officers. An additional factor that may be involved in exposure to traumatic events is the quantity of time spent at the disaster site as seen in Robbers and Jenkin's (2001) research that found the amount of time police officers spent working at the Pentagon following September 11th was a positive predictor of PTSD symptoms. Alternatively, once individuals meet a certain threshold for exposure events, as incidents increase, additional events make less of an impact or future events make differential impacts depending on individuals' baseline symptoms or other personal factors. Emergency

management professionals also may be well prepared for the effects of trauma exposure through education or training minimizing the consequences of immense exposure frequency. A combination of multiple exposure experiences and training may help emergency management professionals learn how to cope with incidents in healthy ways including identifying their individual responses and ways to manage stress (e.g. compartmentalization) and knowing when they may need additional resources.

This study was also the first to determine if repeated exposure symptoms contributed to the variance in PTSD symptoms in a multifaceted model. Together burnout and compassion satisfaction explained significant additional variance in PTSD symptoms when entered into the first hierarchical model in the final step. Support was found for the idea that burnout is positively related to and a positive predictor of PTSD symptoms. This result was congruent with the findings of Betts Adams and colleagues' (2001) work that noted components of burnout were related to general somatic and/or affective symptoms in a group of social workers; Sirratt's (2001) research that found emotional exhaustion, a component of burnout, was predictive of PTSD symptoms in firefighters, paramedics, and emergency medical technicians; and to Bissett's (2002) study that noted that burnout positively correlated with and was predictive of posttraumatic stress in a sample of firefighter-paramedics.

In the current study, compassion satisfaction was negatively correlated with PTSD and contributed to the variance in PTSD when considered along with burnout in the final step of the hierarchical model. However, in the full model compassion satisfaction served as a positive predictor of PTSD symptoms which was in contrast to the individual exploratory hypothesis. The role compassion satisfaction may play concerning PTSD

symptoms in emergency management professionals is unclear. The data show relatively more compassion satisfaction than burnout in the sample and also suggest emergency management professionals have the potential for both compassion satisfaction and PTSD symptomology. Possibly, the more a professional engages in their work involving emergency events, the more likely they are to experience compassion satisfaction but at an increased risk for PTSD symptoms. The idea of positive responses being related to symptoms following traumatic exposure is supported by a research study with child welfare workers where the researchers found that as intrusion, avoidance, and depression symptoms increased, posttraumatic growth increased (Regehr et al., 2004). Given the cross-sectional nature of the study, more research is necessary to fully understand how the positive concept of compassion satisfaction may be related to PTSD symptom development for emergency management professionals.

Model Two: Moderation Effects

In the second model, the results indicated that the predictor variables did not act as moderators between trauma exposure frequency and PTSD symptoms for this group of emergency management professionals. The joint effect of the hypothesized risk (neuroticism, burnout) and protective (extraversion, compassion satisfaction) factors and trauma exposure frequency did not differ from their additive effects in the hierarchical model. The contribution of trauma exposure was not dependent on levels of neuroticism, extraversion, burnout, or compassion satisfaction in the sample. This could be due to reasons such as the low correlation between trauma exposure frequency and PTSD symptoms, exposure desensitization, inaccurate reporting, or measurement reliability error

causing analysis difficulties (Barron & Kenny, 1986). Given the measurement difficulties inherent in trauma exposure history, a more systematic measurement method such as longitudinal methodology with weekly tracking of work-related trauma exposure incidents or identification of the specific number of events in which the participant felt fear, helplessness, or horror, could help determine the role that trauma exposure may play in relation to PTSD symptoms for emergency management professionals. Since trauma exposure contributed a significant amount of variance in step two of the hierarchical model but did not remain significant in the context of the full model or serve as part of a moderator, this study's findings also questions the individual utility of exposure frequency as a predictor of PTSD in a highly exposed population such as the current sample. Emergency management professionals may be constantly dealing with traumatic material as part of their jobs, even if not directly. This quality associated with emergency management responsibilities may lead to habituation to the effects of exposure. Although exposure to trauma is a requisite context for posttraumatic stress symptom development, it may not be necessarily a good predictor of PTSD symptoms or interact with personality and repeated exposure symptomology in this population. Further research is needed to clarify more specific relationships.

Model Three: The Addition of Ethnic Identity

There were no differences in PTSD symptoms between participants when compared in two collapsed ethnic groups: 1) those who identified ethnically as White, Caucasian, Anglo, or European American; and 2) all other groups. Ethnic identity strength also did not have a main or moderating effect with trauma exposure frequency on PTSD

symptoms in the sample of emergency management professionals when explored as a contributing factor in the third hypothesis. However, ethnic identity strength showed a positive significant correlation with PTSD and approached significance when added in step two of the model and when considered as an individual predictor in the context of the full model. When the exploratory hypothesis was tested in a subgroup of those who identified ethnically as White or European American, similar results were found.

In interpreting the results, it is important for the reader to note that the majority of the sample identified ethnically as White or European American with a mean ethnic identity strength significantly less than the individuals who identified ethnically as a culture other than White or of European ancestry. Furthermore, the ethnic identity scores suggest that the amount of variance able to be explained within the sample was limited. Given Phinney's (1996) view that when considering ethnic identity as a potential factor in psychological outcomes the researcher makes the assumption that ethnicity is a "meaningful psychological variable to the extent that it has salience to the individual involved" (p. 922), it is probable that in the current study ethnic identity may not have been entirely significant to all of the participants, making the role ethnic identity plays in regards to PTSD inconclusive. This research supports the idea that for most Americans of European background, ethnic identity may not be critical to their sense of self or alternatively they can choose the level of importance ethnicity will have in their lives (Phinney). Future research on what this concept may mean for different European ethnic groups within this population could provide more information on the salience of ethnic identity for emergency management professionals from European American backgrounds.

Nevertheless, the idea that ethnic identity strength may be positively related to or a risk factor for PTSD is supported by Midlarsky and Midlarsky's (2004) conclusion that stronger ethnic identity is related to psychological symptoms for adults following war exposure and Khaylis et al.'s (2007) finding that stronger ethnic identity is related to PTSD symptoms for emerging adults' who experience high amounts of race-related stress. Given the positive significant correlation between PTSD and ethnic identity, it is possible that ethnic identity may affect symptoms in alternate ways such as serving as a mediator between personality traits and posttraumatic stress. However taking into account that ethnic identity strength is a contextual variable affected by both personal and environmental influences it may be difficult to interpret its meaning without considering additional factors (e.g. personal demographics, type of trauma exposure).

Another explanation for these results may be that participants who more strongly identify with an ethnic identity may have other personal or environmental risk factors in their lives that increase the likelihood of poorer mental health. Ethnic identity strength could be a proxy variable for factors such as self-blaming tendencies, less access to resources, more exposure to prejudice, and the presence of additional work or familial stressors. The stressors could also include increased probability for exposure to trauma. Previous exposure may increase symptomology or serve as a mediator as research has found support for exposure as a mediator between ethnicity and PTSD symptoms in minority groups (Perilla et al., 2002), which are likely to have a stronger ethnic identity. Additional research examining this variable using more sophisticated models and a more diverse sample may help further understanding of its possible relationship to or pathway in which it may affect PTSD symptoms.

Demographic Variables and PTSD

Only a few significant results were found in the exploratory analyses concerning demographic variables and level of PTSD symptoms in emergency management professionals. Given the somewhat homogenous nature of the sample and frequent non-significant results concerning demographics and PTSD symptoms in the traumatic stress research with helping (Grieger et al., 2000) and first responder groups (e.g. Carlier et al., 1997; Pole et al., 2001; Tucker et al., 2002), this finding is not surprising. Nevertheless, partnered individuals displayed significantly fewer symptoms than single individuals similar to past research with medical military professionals (e.g. Akbayrak et al., 2005). This finding could be interpreted as having a partner is a protective factor, perhaps due to the added social support or resources they may provide. Participants who reported being diagnosed or treated for a psychological condition in the past ten years also reported more PTSD symptoms, which is consistent with other research concerning individuals who have experienced a trauma (e.g. Norris, Friedman, & Watson, 2002; Shalev, 1996). Females had more PTSD symptoms than males at a level that approached significance. The difference is supported in PTSD research (e.g. Breslau, 2002; Vogt et al., 2007), but the lack of significant findings is consistent with research in first responder groups (e.g. Carlier et al., 1997; Pole et al., 2001; Tucker et al., 2002).

Limitations

The main limitation of this research is its use of a non-random volunteer sample decreasing external validity, causing unknown selection biases, and limiting generalizeability. Given the Internet survey nature of the research, it was impossible for

the researcher to determine the response rate and if there were any differences between individuals who responded to the request for participation and individuals who did not respond. The cross-sectional correlational nature of the study is another shortcoming since implications about causation cannot be implied.

There were also limitations in the study's instrumentation. The research used self-report measures, meaning that shared variance, social desirability, and lack of clinical symptom observation may have influenced the findings. Counterbalancing of the measures was not possible causing measure order bias as well. There was potential measurement content similarity between items on the PCL-C and items that measure neuroticism on the NEO-FFI and burnout on the ProQoL due to common negative affect or anxiety-based components in these constructs. Additional ways of capturing these factors should be considered in future research such as latent variable systems or clinical interviews.

The difficulty in measuring trauma exposure frequency precisely in a highly exposed population also may have affected the results. Although trauma exposure frequency was estimated at its lowest possible exposure amount, the large range and high standard deviation in the sample suggests that individuals may have had difficulty in retrospectively reporting the actual number of events experienced. The THQ was selected for its thoroughness in assessing types and frequency of trauma events, but the participants answered in varied ways the open-ended questions concerning frequency of repeated events. Personal and work-related events were also assessed simultaneously as total lifetime exposure making it difficult to determine if there are differences between events experienced in varying contexts.

There was also a restricted range of responses on the MEIM-R in the fairly homogenous sample of mostly White professionals. This limited the amount of potential variance that could be explained by ethnic identity strength. A more heterogeneous sample may help in increasing the range of responses on this variable. Improving sample variability should be a goal of future studies.

Suggestions for Future Research

The results of this project provide many additional directions for future research. Replicating the study in a random sample of more diverse emergency management professionals would help in increasing the generalizability and strength of the findings. Due to the various roles, responsibilities, and backgrounds of individuals within the emergency management profession, collecting data on participants' primary professional identity and if applicable, career prior to emergency management, or qualitatively studying individuals' motivations for career or position changes would provide further evidence of how personal qualities or work environments may be related to posttraumatic stress or repeated exposure symptoms. Given the difficulty in measuring trauma exposure frequency, alternate ways of measuring this variable should be considered. These methods could include asking participants to recall traumatic events experienced within a specific time frame (e.g. 30 days) and using or creating a measure that takes into account the amount of direct exposure to traumatic events and/or the individual's subjective appraisal of exposure events. Furthermore, collecting data one month after an event experienced by every participant in a sample could provide information regarding whether the combination

of personal and environmental factors researched in this study would be able explain a comparable amount of variance in PTSD symptoms following a specific exposure event.

Alternate conceptualizations of personality should be considered in future studies as well. Testing the hypotheses with other facets of personality such as the other factors in the Five-Factor Model (e.g. conscientiousness, openness to experience), utilizing different conceptualizations of personality (e.g. hardiness factors), or capturing overall personality trait patterns with an instrument such as the Millon Index of Personality Styles would provide further evidence of how individual qualities may contribute to the variance in PTSD symptoms for emergency management professionals. In addition to individual qualities, qualities of the environmental context might be considered since anecdotally disaster sites are chaotic by their very nature and might be assumed to exert some “press” for risk-taking and adventurous behaviors.

Ethnic and other aspects of cultural identity could also be further explored to systematically define these concepts’ significance. One way to gain further understanding of the relevance of cultural identity is to conduct qualitative research inquiring about the meaning that this construct holds for individuals. Additional cultural identities that might serve as risk or protective factors in regard to PTSD symptoms include gender identity, religious identity, and socioeconomic status identity. Alternatively, participants could choose which cultural identity is most salient for them and that identity could be included in qualitative and/or quantitative investigations.

Since some participants also reported varying past clinical diagnoses that may or may not have been related to their work exposure, another research direction is to explore the relationship of the same predictor variables to additional psychological outcomes.

These outcomes could include symptoms of depression or anxiety, two responses that also may develop following exposure to trauma (Fullerton et al., 2004; Norris et al., 2002).

Finally, since some of the hypotheses and interaction effects between trauma exposure frequency and the predictor variables were not supported, future research could examine alternative pathways in which the variables used in this study may contribute to level of PTSD symptoms. The exploration of risk and protective trajectories might be accomplished in ways such as alternate moderation (e.g. personality factors x repeated exposure variables) and mediation models as relationships between personal and environmental variables are likely complex and would benefit from further analyses. Since previous research supports the idea that childhood trauma is related to increased symptoms (e.g. Pole, 2008), future studies could examine the role of early life traumatic experiences as a mediator between personal and environmental factors and PTSD symptoms. Gathering baseline data on symptoms and psychological functioning and conducting longitudinal studies would also help clarify the effects of additional exposure incidents and provide more evidence for the relationship between personal and environmental variables and PTSD in emergency management professionals.

Implications for Counseling

Implications for counseling emergency management professionals will be described next. Since approximately 13% of the analyzed sample met the diagnostic criteria for PTSD and almost 20% of the complete sample reported a current or past psychiatric condition, mental health professionals should focus on both prevention and intervention when working with emergency management professionals. Considering the support for the

first hypothesis, this initially could include psycho-educational interventions focused on increasing emergency management professionals' awareness of their personality type, frequency of exposure, and levels of burnout and compassion satisfaction and how these personal and environmental qualities may be related to posttraumatic stress symptoms. Prevention efforts could also include educational presentations describing symptoms of burnout and posttraumatic stress and teaching coping mechanisms that may help to decrease burnout and PTSD symptoms. Another aim of preventative interventions would be to educate emergency management professionals on how to identify when a colleague may need further support, time off, or professional assistance.

Once awareness is raised concerning personal and environmental factors related to PTSD symptoms, individual or group counseling interventions provided by mental health professionals trained in trauma work may be helpful for at-risk individuals (e.g. those with high neuroticism and/or burnout levels). Possible goals of counseling include examining how specific individual or team qualities and environments influence responses to work-related exposure and determining what specific changes may be most useful for individuals or work teams. Additionally, prior to being deployed to an emergency scene or after a specific crises event, screenings for burnout may be helpful in identifying individuals who may be more at risk for developing posttraumatic stress symptoms. Extra support following traumatic exposure, such as a debriefing, could be offered to these individuals. A co-worker trained in identification of symptoms could also help monitor any symptoms of burnout or posttraumatic stress that may develop. In summary, a combination approach of prevention and early intervention using peers and mental health professionals could help

in decreasing the risk for PTSD and other negative outcomes and increasing resources for emergency management professionals.

Summary and Conclusions

As a whole the sample of emergency management professionals presented with the following attributes: average level of neuroticism and extraversion, low burnout, average compassion satisfaction, average level of ethnic identity strength, high frequency of trauma exposure, and a level of PTSD symptoms meeting diagnostic criteria similar to research with helping and first responder professionals exposed to traumatic events (e.g. Benedek, Fullerton, & Ursano, 2007; North et al., 2002; Perrin et al., 2007; Zimering et al., 2006). Both personal and environmental factors were found to affect PTSD symptoms as the hierarchical model investigating the effects of personality, trauma exposure frequency, burnout, and compassion satisfaction was supported and explained the greatest variance in symptoms. There was strong evidence for the hypotheses that neuroticism and burnout serve as individual positive predictors of PTSD. There was also support for the premise that compassion satisfaction may serve as a positive predictor of PTSD and a weak trend suggesting ethnic identity might act as a positive predictor of PTSD when considered in conjunction with other factors. Finally, the current study brought up questions concerning the effect of the frequency of exposure events in a highly exposed group while also highlighting potential exposure measurement difficulties.

Despite this study's limitations and the difficulty of researching following traumatic events, it is important to continue to study professionals whose work is to assist following crises, due to trauma's effects on individuals, families, and communities. Given

emergency management professionals' multiple roles before, during, and after traumatic events and contact with numerous systems, additional research with this population is essential. Further study will not only provide knowledge to improve emergency management professionals' personal outcomes following traumatic exposure, but to the individuals and groups they assist as well.

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Appendix: Instruments

Demographics Questionnaire

Please fill in your answers to questions 1-4.

1. Job Title: _____

2. Please describe your Main Job Role: _____

3. Years of Emergency Management Experience: _____

4. Please select those emergency management associations or organizations to which you belong:

- Association of Contingency Planners
- Canadian Centre for Emergency Preparedness
- Emergency Management Professional Organization for Women's Enrichment
- Federal Emergency Management Agency
- International Association of Emergency Managers
- National Emergency Management Association
- Ontario Association of Emergency Managers
- The International Emergency Management Society
- Other (Please Specify): _____

Please select the appropriate response for questions 5-7.

5. Primary Employment Sector:

- Private Government Non-Government Organization
- Volunteer Organization Other/Please describe: _____

6. Type of Employment:

Full-time Part-time

7. Have you experienced at least one disaster or emergency in your role as an emergency management professional?

Yes No

If yes to question 7,

For questions 8 &9, indicate the number of times you have experienced the following type of incidents on the job directly:

8. **General Disaster and Trauma** (e.g. serious accident, natural disaster, man-made disaster, exposure to chemicals or radiation, experience of serious injury, fear you might be killed or injured, being a witness to injury or death, handling of dead bodies)= _____

9. **Crime-Related Events** (e.g. attempted or actual mugging, robbery)= _____

Please select the appropriate response for questions 10-12.

10. Gender:

Male Female

11. Race:

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Two or more races

Other (specify): _____

12. Marital Status:

Single
Married
Living with partner
Separated
Divorced
Widowed

Please fill in your response to question 13 & 14.

13. Age: _____

14. Years of Education: _____

15. Have you been diagnosed and/or treated for a psychological condition in the past 10 years?

Yes No

16. If Yes to Question 15, what condition(s)? _____

NEO Five-Factor Inventory Sample Items

(Costa & McCrae, 1992)

Neuroticism Subscale

I often feel inferior to others.

Too often, when things go wrong, I get discouraged and feel like giving up.

Extraversion Subscale

I am a cheerful, high-spirited person.

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Multigroup Ethnic Identity Measure-Revised

(Phinney, 1992; Phinney & Ong, 2007)

In terms of ethnic group, I consider myself to be_____

Select the response that indicates how much you agree or disagree with each statement.

1. I have spent time trying to find out more about my ethnic group, such as its history, traditions and customs.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

2. I have a strong sense of belonging to my own ethnic group.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

3. I understand pretty well what my ethnic group membership means to me.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

4. I have often done things that will help me understand my ethnic background better.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

5. I have often talked with other people in order to learn more about my ethnic group.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

6. I have a strong attachment towards my own ethnic group.

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

7. My ethnicity is

- (1) Asian or Asian American
- (2) Black or African American
- (3) Hispanic or Latino
- (4) White, Caucasian, Anglo, European American
- (5) American Indian/Native American
- (6) Mixed; parents are from two different groups
- (7) Other (Please specify): _____

8. My father's ethnicity is

- (1) Asian or Asian American
- (2) Black or African American
- (3) Hispanic or Latino
- (4) White, Caucasian, Anglo, European American
- (5) American Indian/Native American
- (6) Mixed; parents are from two different groups
- (7) Other (Please specify): _____

9. My mother's ethnicity is

- (1) Asian or Asian American
- (2) Black or African American
- (3) Hispanic or Latino
- (4) White, Caucasian, Anglo, European American
- (5) American Indian/Native American
- (6) Mixed; parents are from two different groups
- (7) Other (Please specify): _____

Trauma History Questionnaire

(Green, 1996)

The following is a series of questions about serious or traumatic life events. These types of events actually occur with some regularity, although we would like to believe they are rare, and they affect how people feel about, react to, and/or think about things subsequently. Knowing about the occurrence of such events, and reactions to them, will help us to develop programs for prevention, education, and other services. The questionnaire is divided into questions covering crime experiences, general disaster and trauma questions, and questions about physical and sexual experiences.

For each event, please indicate whether it happened, and if it did, the number of times and your approximate age when it happened (give your best guess if you are not sure). Also note the nature of your relationship to the person involved, and the specific nature of the event, if appropriate.

Crime-Related Events

1. Has anyone ever tried to take something directly from you by using force or the threat of force, such as a stick-up or mugging? No Yes
If **Yes**: # of times _____ Approximate Age: _____

2. Has anyone ever attempted to rob you or actually robbed you (i.e. stolen your personal belongings)? No Yes
If **Yes**: # of times _____ Approximate Age: _____

3. Has anyone ever attempted to or succeeded in breaking into your home when you weren't there? No Yes
If **Yes**: # of times _____ Approximate Age: _____

4. Has anyone ever tried to or succeeded in breaking into your home while you were there? No Yes
If **Yes**: # of times _____ Approximate Age: _____

General Disaster and Trauma

5. Have you ever had a serious accident at work, in a car or somewhere else? No Yes
If yes, please specify

If **Yes**: # of times _____ Approximate Age: _____

6. Have you ever experienced a natural disaster such as a tornado, hurricane, flood, major earthquake, etc., where you felt you or your loved ones were in danger of death or injury? No Yes
If yes, please specify

If **Yes**: # of times _____ Approximate Age: _____

7. Have you ever experienced a "man-made" disaster such as a train crash, building collapse, bank robbery, fire, etc., where you felt you or your loved ones were in danger of death or injury? No Yes
If yes, please specify

If **Yes**: # of times _____ Approximate Age: _____

8. Have you ever been exposed to dangerous chemicals or radioactivity that might threaten your health? No Yes

If **Yes**: # of times _____ Approximate Age: _____

9. Have you ever been in any other situation in which you were seriously injured? No Yes
If yes, please specify

If **Yes**: # of times _____ Approximate Age: _____

10. Have you ever been in any other situation in which you feared you might be killed or seriously injured? No Yes
If yes, please specify

If **Yes**: # of times _____ Approximate Age: _____

11. Have you ever seen someone seriously injured or killed? No Yes
If yes, please specify who

If **Yes**: # of times _____ Approximate Age: _____

12. Have you ever seen dead bodies (other than at a funeral) or had to handle dead bodies for any reason? No Yes
If yes, please specify

If **Yes**: # of times _____ Approximate Age: _____

13. Have you ever had a close friend or family member murdered, or killed by a drunk driver? No Yes
If yes, please specify relationship (e.g. mother,

grandson,etc.) _____

If **Yes**: # of times _____ Approximate Age: _____

14. Have you ever had a spouse, romantic partner, or child die? No Yes
If yes, please specify relationship _____

If **Yes**: # of times _____ Approximate Age: _____

15. Have you ever had a serious or life-threatening illness? No Yes
If yes, please specify _____

If **Yes**: # of times _____ Approximate Age: _____

16. Have you ever received news of a serious injury, life-threatening illness or unexpected death of someone close to you? No Yes
If yes, please indicate _____

If **Yes**: # of times _____ Approximate Age: _____

17. Have you ever had to engage in combat while in military service in an official or unofficial war zone? No Yes
If yes, please indicate where _____

If **Yes**: # of times _____ Approximate Age: _____

Physical and Sexual Experiences

18. Has anyone ever made you have intercourse, oral or anal sex against your will? No Yes
If yes, please indicate nature of relationship with person (e.g. stranger, friend, relative, parent, sibling)_____

If Yes: Was it repeated?_____ Approx. how often & what age(s)_____

19. Has anyone ever touched private parts of your body, or made you touch theirs, under force or threat? No Yes
If yes, please indicate nature of relationship with person (e.g. stranger, friend, relative, parent, sibling)

If Yes: Was it repeated?_____ Approx. how often & what age(s)_____

20. Other than incidents mentioned in Questions 18 and 19, have there been any other situations in which another person tried to force you to have unwanted sexual contact? No Yes

If Yes: Was it repeated?_____ Approx. how often & what age(s)_____

21. Has anyone, including family members or friends, ever attacked you with a gun, knife or some other weapon? No Yes

If Yes: Was it repeated?_____ Approx. how often & what age(s)_____

22. Has anyone, including family members or friends, ever attacked you without a weapon and seriously injured you?

No Yes

If **Yes**: Was it repeated? _____ Approx. how often & what age(s) _____

23. Has anyone in your family ever beaten, "spanked" or pushed you hard enough to cause injury?

No Yes

If **Yes**: Was it repeated? _____ Approx. how often & what age(s) _____

Other Events

24. Have you experienced any other extraordinarily stressful situation or event that is not covered above?

No Yes

If yes, please specify.

If **Yes**: Was it repeated? _____ Approx. how often & what age _____

Professional Quality of Life Scale

Helping people puts you in direct contact with their lives. As you probably have experienced, your compassion for those you help has both positive and negative aspects. We would like to ask you questions about your experiences, both positive and negative as a helper. Consider each of the following questions about you and your current situation. Select the number that honestly reflects how frequently you experienced these characteristics in the last 30 days.

0=Never **1=Rarely** **2= A Few Times** **3=Somewhat Often**
4=Often **5=Very Often**

- _____ 1. I am happy.
- _____ 2. I am preoccupied with more than one person I help.
- _____ 3. I get satisfaction from being able to help people.
- _____ 4. I feel connected to others.
- _____ 5. I jump or am startled by unexpected sounds.
- _____ 6. I feel invigorated after working with those I help.
- _____ 7. I find it difficult to separate my personal life from my life as an emergency management professional.
- _____ 8. I am losing sleep over traumatic experiences of a person I help.
- _____ 9. I think I might have been “infected” by the traumatic stress of those I help.
- _____ 10. I feel trapped by my work as an emergency management professional.
- _____ 11. Because of my helping, I have felt “on edge” about various things.
- _____ 12. I like my work as an emergency management professional.
- _____ 13. I feel depressed as a result of my work as an emergency management professional.
- _____ 14. I feel as though I am experiencing the trauma of someone I have helped.
- _____ 15. I have beliefs that sustain me.
- _____ 16. I am pleased with how I am able to keep up with helping techniques and protocols.
- _____ 17. I am the person I always wanted to be.
- _____ 18. My work makes me feel satisfied.
- _____ 19. Because of my work as an emergency management professional, I feel exhausted.
- _____ 20. I have happy thoughts and feelings about those I help and how I could help them.
- _____ 21. I feel overwhelmed by the amount of work or the size of my workload I have to deal with.
- _____ 22. I believe I can make a difference through my work.
- _____ 23. I avoid certain activities or situations because they remind me of frightening experiences of the people I help.
- _____ 24. I am proud of what I can do to help.
- _____ 25. As a result of my helping, I have intrusive, frightening thoughts.

- _____ 26. I feel “bogged down” by the system.
- _____ 27. I have thought that I am a “success” as an emergency management professional.
- _____ 28. I can’t recall important parts of my work with trauma victims.
- _____ 29. I am a very sensitive person.
- _____ 30. I am happy that I choose to do this work.

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PTSD Checklist-Civilian Version

Instructions: Below is a list of problems and complaints that individuals sometimes have in response to stressful life experiences. Please read each one carefully, select the responses to indicate how much you have been bothered by that problem *in the past month*.

| No. | Response: | Not at all (1) | A little bit (2) | Moderately (3) | Quite a bit (4) | Extremely (5) |
|-----|---|-------------------|---------------------|-------------------|--------------------|------------------|
| 1. | Repeated, disturbing <i>memories, thoughts, or images</i> of a stressful experience from the past? | | | | | |
| 2. | Repeated, disturbing <i>dreams</i> of a stressful experience from the past? | | | | | |
| 3. | Suddenly <i>acting or feeling</i> as if a stressful experience <i>were happening again</i> (as if you were reliving it)? | | | | | |
| 4. | Feeling <i>very upset</i> when <i>something reminded</i> you of a stressful experience from the past? | | | | | |
| 5. | Having <i>physical reactions</i> (e.g., heart pounding, trouble breathing, or sweating) when <i>something reminded</i> you of a stressful experience from the past? | | | | | |
| 6. | Avoid <i>thinking about or talking about</i> a stressful experience from the past or avoid <i>having feelings</i> related to it? | | | | | |
| 7. | Avoid <i>activities or situations</i> because <i>they remind you</i> of a stressful experience from the past? | | | | | |
| 8. | Trouble <i>remembering important parts</i> of a stressful experience from the past? | | | | | |
| 9. | Loss of <i>interest in things that you used to enjoy</i> ? | | | | | |

| | | | | | | |
|------------|---|--|--|--|--|--|
| 10. | Feeling <i>distant</i> or <i>cut-off</i> from other people? | | | | | |
| 11. | Feeling <i>emotionally numb</i> or being unable to have loving feelings for those close to you? | | | | | |
| 12. | Feeling as if your <i>future</i> will somehow be <i>cut short</i> ? | | | | | |
| 13. | Trouble <i>falling</i> or <i>staying asleep</i> ? | | | | | |
| 14. | Feeling <i>irritable</i> or having <i>angry outbursts</i> ? | | | | | |
| 15. | Having <i>difficulty concentrating</i> ? | | | | | |
| 16. | Being “ <i>super alert</i> ” or watchful on guard? | | | | | |
| 17. | Feeling <i>jumpy</i> or easily startled? | | | | | |

Weathers, Litz, Huska, & Keane. *PCL-C for DSM-IV*. National Center for PTSD, Behavioral Science Division.