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Religious coping, trait forgiveness, and meaning as protective barriers for soldiers

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Religious coping, trait forgiveness, and meaning as protective barriers for soldiers

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But You Weren't There

"I've got a lot to tell
I've been to the other side of Hell
Where people die for nothing and there's
A lot of pain and suffering
Where bullets either leave creases
Or blow you to pieces
Where blood flows like wine
And you're scared all the time

I don't mean to freak you out but
This is what war's really about
So if in the night you hear screaming
You'll know it's me……dreaming

Where are they now?
The ones who survived the war
And were so close to death's dark door
That sent a lot of young men whose only sin
Was war.

When you called us we stepped forward
And risked all that we had
Of the combat experience you say
Was it really all that bad?

But to see in living color what
Comes out of the M-16 hit a human body
Bursting every seam
The war is over in history
But it never ended for me."

Nathan Marbly, 1981

To the members of my dissertation committee for demonstrating the standards of commitment and hard work, for providing the value of clarity in thought and in deed, and for showcasing the patience primary only to those who parent and to those who teach. I wish a special thanks to the co-chairs of my committee, Drs. Nathaniel Wade and Lisa Larson. Nathaniel, your generosity of spirit allowed me to pursue research in which I am impassioned, thus making this dissertation a labor of love rather than one of languish, thank you. Lisa, you are my model, my mage, my mentor. I will be forever grateful for the gentle guidance and endless support. I would follow you into battle anytime, anywhere.

To my beloved Bailey Bunch for standing beside me every step of the way, and oftentimes for giving me a boost up when I otherwise surely would have fallen. Aaron, Devan, and Kieran, I love you all very much.

Finally, to all those soldiers who have bravely served their country in the past or will step-up to serve it in the future. Thank you, thank you, thank you.

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ABSTRACT

This study is the first to examine the potential moderating effects of positive and negative religious coping, trait forgiveness, and meaning in military duties on the identified link between combat exposure and subsequent symptoms of generalized psychological distress and posttraumatic stress disorder (PTSD; Adler, Vaitkus, & Martin, 1996; Kaylor, King, & King, 1987).The sample included 366 U.S. Army soldiers who were currently deployed to Iraq. Due to the much smaller number of women in the sample (n = 43 vs. n = 323 men), the primary analyses testing for moderation were conducted for men only. The findings showed that none of the study variables directly moderated the relation between combat exposure and subsequent symptoms of distress and PTSD ($p > .007$). Significant main effects did emerge with negative religious coping accounting for an additional 4.7% of the variance, trait forgiveness accounting for an additional 13.3% of the variance, and meaning in military duties accounting for an additional 13.6% of the variance in psychological distress. Neither combat exposure nor positive religious coping significantly predicted symptoms of more generalized distress. For symptoms of PTSD, combat exposure significantly accounted for an additional 6.8% of the variance, positive religious coping accounted for an additional 1.4% of the variance, negative religious coping accounted for an additional 2.2% of the variance, trait forgiveness accounted for an additional 3.3% of the variance, and meaning in military duties accounted for an additional 2.5% of the variance in PTSD scores.

CHAPTER 1. INTRODUCTION

With the increase in world volatility and the subsequent escalation of soldier deployment, research on the mental and physical outcomes of combat exposure has become of paramount importance. It is well-documented that exposure to combat related stressful events can result in long-term psychological adjustment problems, including posttraumatic stress disorder (PTSD; Adler, Vaitkus, & Martin, 1996; Kaylor, King, & King, 1987). Posttraumatic stress disorder is a class of anxiety disorder which evokes "feelings of intense fear, helplessness, or horror" in persons exposed to an extreme stressor (*Diagnostic and Statistical Manual of Mental Disorders*, DSM-IV; American Psychiatric Association, 1994, p. 428).

Posttraumatic stress symptoms documented for combat-exposed soldiers include: reexperiencing of the trauma via intrusive thoughts and frightening dreams, avoidance of situational triggers that may lead to a reexperiencing episode, emotional numbing, withdrawal from intimate relationships, and hyperarousal (see Appendix A for specific diagnostic criteria according to the DSM-IV; American Psychiatric Association, 1994). Specifically, studies suggest that military service members exposed to combat are at risk for demonstrating numbing symptoms (e.g., Feinstein, 1989; Noyes, Hoenk, Kuperman, & Slymen, 1977), reduction in environmental awareness (e.g., Berah, Jones, & Valent, 1984; Hillman, 1981), derealization (e.g., Cardena & Spiegel, 1993; Freinkel, Koopman, & Spiegel, 1994; Noyes & Klette, 1977; Sloan, 1988), depersonalization (e.g., Cardena & Spiegel, 1993; Freinkel et al., 1994; Noyes et al., 1977; Sloan, 1988), dissociative amnesia (e.g., Cardena & Spiegel, 1993; Feinstein 1989; Madakasira & O'Brien, 1987), intrusive thoughts (e.g., Cardena & Spiegel, 1993; Feinstein, 1989; Sloan, 1988), avoidance behaviors (e.g., Bryant &

Harvey, 1996; Cardena & Spiegel, 1993; North, Smith, McCool, & Lightcap, 1989), insomnia (e.g., Cardena & Spiegel, 1993; Feinstein, 1989; Sloan, 1988), concentration deficits (e.g., Cardena & Spiegel, 1993; North et al., 1989), irritability (e.g., Sloan, 1988), and autonomic arousal (e.g., Feinstein, 1989; Sloan, 1988).

However, not all combat veterans fall prey to such problems. This is evidenced by the low neuropsychiatric casualty rates reported during the Vietnam conflict (President's Commission on Mental Health, 1978), and the lack of psychopathology found in subsets of combat trauma survivors in Vietnam (Wolfe, Keane, Kaloupek, Mora, & Wine, 1993), World War II (WWII; Sutker, Allain, & Winstead, 1993), and the Korean conflict (Sutker, Winstead, Galina, & Allain, 1991). In the more recent Persian Gulf War, researchers found that while 16-19% of combat troops did report suffering from problems with anxiety, depression, and PTSD within the first year of their return from war zone duty, the majority of Persian Gulf War veterans reported no significant problems (Sutker, Uddo, Brailey, & Allain, 1993).

Early attempts to elucidate the etiology of symptoms of psychological distress (e.g., anxiety, depression, PTSD) in combat-exposed veterans following the Vietnam war gave rise to a debate centering on whether primary attribution of symptoms should be given to the trauma itself (e.g., Figley, 1978) or to some inherent condition predating exposure to combat (Worthington, 1978). The resulting research over the next two decades assigned the stressor itself primary responsibility (e.g., Green, 1994), with a dose-response relation often emerging. That is, higher levels of combat exposure were associated with greater symptoms of distress (Jones & Wessely, 2001; Kulka, Schlenger, Fairbank, et al. 1990; Sutker et al., 1993). Though currently popular, some studies fail to support this dose-response relation (see

Bowman 1997, 1997 for reviews). One such study was that by Schnyder and colleagues (2001) who found measures of accident severity to be unrelated to PTSD symptoms in a sample of motor vehicle accidents. Thus, while revealing, the imperfection of this relation led researchers to focus on avenues of research on resiliency factors which may act to inhibit the stress response to combat.

In addition to the nature of the stressor, an individual's response to stress is considered to be influenced by the personal and environmental resources available to that person to deal with the stressor. This is consistent with the tenets of Lazarus' (1991, 1999) Cognitive-Relational conceptualization of stress which supposes that people strive to retain, protect, and build resources, and that they feel threatened when faced with the potential or actual loss of these valued resources. Lazarus' theory provides a framework from which to build understanding of some of the unanswered issues associated with the stress of combat by treating individual difference and environmental variables (such as hardiness, social support and religious coping) as resources that may moderate the relation between combat-exposure and symptoms of psychological distress. Essentially, the veteran's response to stress can be thought of as a function of the severity of the traumatic war zone stressor and the available personal and environmental resources that can be mobilized for more or less successful coping responses directed toward moderation of the impact of the stressor (Hobfoll, Spielberger, Breznitz, et al., 1991).

The present study attempts to expand upon the work of several studies that have attempted to identify possible resiliency factors that could help weaken the link between combat exposure and subsequent psychological distress and PTSD symptoms (Brewin, Andrews, & Valentine, 2000; King, King, Foy et al., 1999; Schnurr, Lunney, & Sengupta,

2004). The current study uses a conceptual model of coping which recognizes combat exposure as a specific type of trauma (or extreme stressor) with the potential of resulting in mental health problems (i.e., general psychological symptom distress and PTSD) among deployed army service members. Specifically, coping is defined as the cognitive and behavioral efforts people employ in an attempt to retain, protect, and build valuable resources (Hobfoll, 1989).

Following the recommendation of Forbes, Haslam, Williams and Creamer, (2005) and A. Ruscio, Ruscio, & Kean (2002), this study measures psychological distress resulting from combat exposure in two ways. First, a traditional categorical measure of PTSD will be used to gauge the presence of the clinically-defined symptoms associated with this disorder. Second, a broader measure of psychological distress assessing a fuller range of symptoms (e.g., depression, social role functioning, and anxiety) will be used. Use of both types of measures allows for a more thorough dimension-like examination of psychological distress due to combat exposure than presently found in the literature. It also allows for a more in-depth assessment of the contribution of multiple potential resiliency-recovery factors influential upon the relation of combat exposure and psychological distress in those failing to meet the full criteria of PTSD.

The potential negative impact of combat exposure on psychological well-being is well-documented in the literature. However, more recent studies have focused on the resiliency potential of traumatic experiences to serve as vehicles for “adversarial” posttraumatic growth (Tedeschi, Park, & Calhoun, 1998). A review of the literature reveals the most important of these resiliency factors to be social support (Tremblay, Hebert, & Piche, 1999), religion/spirituality (Tedeschi & Calhoun, 1995), dispositional optimism

(Cadell, Regehr, & Hemsworth, 2003), and finding meaning in the stressful event (Frazier, Tashiro, Berman, Steger, & Long, 2004). Researchers examining possible mediating and/or moderating resiliency factors between combat exposure and resultant psychological distress have focused considerable effort in studying two of these four factors, social support (e.g., Eggendorf, Kadushin, Laufer, Rothbart, & Sloan, 1981, Flannery, 1990; Fontana & Rosenheck, 1994; Fontana, Schwartz, & Rosenheck, 1997; King et al., 1998; Solomon, Mikulincer, & Hobfoll, 1987; Sutker, Davis, Uddo, & Ditta, 1995) and dispositional optimism (e.g., Affleck, Tennen, & Rowe, 1991; Durakovic-Belko, Kulenovic, & Dapic, 2003; Maddi, 1999; Moos & Schaefer, 1993 for a review). Less energy has been expended in studying the more existential factors of religious coping (Exline, Smith, Gregory, et al., 2005; Witvliet, Phipps, Feldman, & Bechkham, 2004) and finding meaning in the stressful event (Krause, 2005).

In an effort to address this gap in the literature, the present study examines three potential resiliency-recovery factors which may help soldiers better cope with the traumatic stress often inherent in combat-exposure: positive and negative religious coping, trait forgiveness, and meaning in military duties. One type of constructive response to trauma and stress found to have positive effects on mental health involves the construct of religious coping (Koenig, Cohen, Blazer et al., 1995; Pargament, Ishler, Dubow et al., 1994, Thompson & Vardaman, 1997). Research has shown measures of religious coping to add unique variance above and beyond non-religious measures of coping in the prediction of health and well-being (for a review, see Pargament, 1997).

Similar to religiosity, religious coping is multidimensional in its design to aid people by providing a means in which to search for a variety of significant resources during stressful

times (e.g., a sense of meaning, emotional comfort, personal control, intimacy, spirituality; Ellison, 1994; Pargament 1992,). Reframing this according to Lazarus' (1991; 1999) CR theory, using one's religion to help cope with combat-stress may provide an assortment of mechanisms for conserving valuable resources when exposure to traumata renders normative conservation efforts powerless, thus keeping enough weight on the resource side of the seesaw to maintain psychological well-being. However, not all religious coping is equal in its conservation ability (Pargament, 1996). Different forms of religious coping have been shown to have divergent implications in adjustment to traumatic stress. Research has shown positive, or collaborative, religious coping (e.g., religious forgiveness, seeking spiritual support, spiritual connection, and benevolent religious reappraisal; Pargament et al., 1998) to be associated with better physical and psychological health (Hathaway & Pargament, 1990; McIntosh & Spiklka, 1990); whereas the literature is mixed on the benefits of negative, or deferring, religious coping (e.g., spiritual discontent, punishing God reappraisals, interpersonal religious discontent; Bickel, Ciarrocchi, Sheers, et al., 1998; Pargament et al., 1998). In response to the potential divergent effects of religious coping, the present study will include a measure of both positive and negative religious coping.

One area that may provide a context for further understanding the relation between religious coping and health is trait forgiveness. Indeed, religious forgiveness has been found to play a pivotal role in the benefits provided by adoption of positive religious coping strategies (Pargament et al., 1998). Yet, over the last few years, several reviews of the forgiveness literature have concluded that trait forgiveness itself, operationalized a number of ways, is positively associated with mental health (McCullough & Witvliet, 2002; Thoresen et al., 1998, Witvliet, et al., 2001). One possible mechanism of protection against the stress of

trauma garnered through trait forgiveness is a reduction in the magnitude of experienced stress and associated negative emotional states (Lawler, Younger, Piferi, Jobe, Edmondson, & Jones, 2005). This explanation seems reasonable considering trait forgiveness has often been defined in the literature as the increased tendency to let go of negative affect such as hostility, anger, anxiety, and depression (McCullough, 2000; Witvliet, 2001).

A second possible method of protection against combat stress offered through trait forgiveness stems from the interpersonal nature of such traumata which often involves the harming or killing of another (Orcutt, Pickett, & Pope, 2005). Possession of a dispositional response style of forgiveness toward persons (including oneself) responsible for inflicting harm may act as a mechanism of healing and resilience following traumatic combat exposure. That is, a general disposition to forgive could aide combat soldiers in breaking the negative bond which keeps them cognitively attached to the debilitating aspects of their traumatic combat experiences (e.g., intrusive thoughts of powerlessness, victimization, sadness, and anger; Orcutt et al., 2005; Snyder & Heinze, 2005). The present study operationalizes trait forgiveness within this framework seeing it as a framing mechanism in which a negative attachment to a seeming transgression can be decreased (Thompson, Snyder, et al., 2005).

Just as trait forgiveness has been operationalized in a number of ways; it has also been measured in a number of ways. The present study will use a measure of trait forgiveness designed to assess a respondent's self-appraisal of his or her general disposition to forgive. Research indicates that while participants' scores on measures of dispositional forgiveness tend to be related to their scores on measures of mental health and well-being, no such

significant relation emerges when measures of forgiveness of specific transgressions are used (McCullough & Witvliet, 2002).

According to the literature, one of the most powerful resources of religious coping is the sense of meaning it can help provide (George, Larson, Koenig, & McCullough, 2000). According to Janoff-Bulman (1992), one of the reasons traumatic events are so damaging is because they tend to shatter people's sense of purpose and direction. This can result in questioning of the worldview and loss of goals and values with which to structure daily activities. Exposure to traumatic events has been hypothesized to shatter three core assumptions about the self and its relationship to the world: 1) the self is invulnerable, 2) the world is meaningful, and 3) the self is autonomous and positive (Janoff-Bulman & Hanson Frieze, 1983). These assumptions lead to a view of the world as understandable and controllable, a view splintered by exposure to traumatic events (Ebert & Dyck, 2004). This loss leads to an inability of the traumatized person to feel confident that interactions with the world remain based on meaningful pre-trauma appraisals of previously validated experiences (Kelly, 1955). Indeed, oftentimes one of the primary therapeutic goals of psychotherapy with trauma is to help restore this lost sense of meaning (Herman, 1992; Southwick, Gilmartin, McDonough, & Morrissey, 2006).

Operationalization of one's sense of meaning is a complex and difficult task. The present study adopts Suedfeld, Fell, and Krell's (1998) suggestion that three components of adaptation are compromised during exposure to traumata: comprehensibility, manageability (i.e., active coping skills), and the meaningfulness of one's actions (i.e., futility). The very nature of military combat-life lived within the confines of a unique 24-hour microcosm suggests that among service members, the meaning of daily life necessarily revolves around

their sworn roles and responsibilities to the military. The focus of this study is thus limited to the third of these components, the meaningfulness of one's military duties.

It is important to note that while the literature examining the potential increase in resiliency resulting from an ability to find a general sense of meaning in the trauma experience is an area of previous exploration (Ehlers & Clark, 2000; Fiarbrother & Rachman, 2006); the more specific construct of finding meaning in one's military duties represents uncharted territory. Therefore, the present study represents an initial, exploratory attempt to map the possible moderation of the link between combat exposure and subsequent psychological distress by the meaning derived from the military role. Accordingly, a measure of this construct specifically derived for this study will be used to measure the extent of meaning in one's military duties (e.g., "My role in the military is meaningful to me" and "The overall goals of the military are worth any difficulties or sacrifices I experience").

Importantly, this study attempts to overcome two major limitations found in previous research in this field. First, only two of the four most potent resiliency factors have been studied in depth, social support and optimism. While research on the two remaining factors has begun, the present study represents an effort to further close this gap by focusing on religious coping and sense of meaning in military duties (as well as trait forgiveness) as potential protective barriers between combat exposure and psychological distress. Second, the vast majority of research on potential resiliency factors has relied on samples of veterans many years post their combat exposure experiences. This study represents an attempt to bring the literature current via data collection from soldiers who were currently actively deployed in Iraq at the time of data collection rather than on relying on retrospective data samples (e.g., Vietnam War veterans).

Specifically, this study examined the potential moderating effect of positive and negative religious coping, trait forgiveness, and meaning in military duties on the link between combat exposure and psychological distress to include PTSD. Consistent with the literature, it was hypothesized that higher levels of positive religious coping, trait forgiveness, and meaning in military duties would significantly reduce levels of psychological distress due to combat exposure. Lower levels of negative religious coping were expected to be associated with lower levels of psychological distress.

Examination of the possible moderation of these three existential constructs (i.e., religious coping, trait forgiveness, and meaning in military duties) in the relation between combat exposure and subsequent psychological distress suggests clinical application. In his exploration of the etiology of combat-related PTSD, Jim Goodwin (1987) wrote:

> "Many veterans find it extremely uncomfortable to feel love and compassion for others. To do this, they have to thaw their numb reactions to the death and horror that surrounded them…; many of these veterans go through life with an impaired capacity to love and care for others. They have no feeling of direction or purpose in life. They are not sure why they even exist." (Goodwin, in Williams, 1980, p. 14)

These symptoms clearly speak of a sort of existential vacuum created in response to the barrage of inconsistencies, incongruities, and often grotesque absurdities too often encountered in combat (Jacob, 1987). While much has been done on finding ways to heal the body and the mind of the combat soldier, healing of the spirit wounded by exposures to the atrocities of combat has been relatively neglected. Adoption of a holistic, interdisciplinary approach to treating symptoms of psychological distress resulting from combat exposure has long been advocated (Fleming, 1985; Scriner, 1984). Examining religious coping, trait

forgiveness, and meaning in military duties may represent one inroad into helping heal the spirit wounded by exposure to warfare.

CHAPTER 2. REVIEW OF THE LITERATURE

The following review begins by providing definitions of the major constructs included in this study (i.e., stress, traumatic event, combat exposure, traumatic distress, posttraumatic stress disorder, coping, resiliency factor). Next, a brief overview of the mechanisms of psychological dysfunction post exposure to stressful life events within a framework of relevant theoretical models and assessment methods is presented. This is followed by an examination of the resiliency factors identified in the literature with potential to ameliorate symptoms of psychological distress post combat exposure. Next, an individual examination of the relation of each resiliency factor included in the present study (i.e., positive and negative religious coping, trait forgiveness, and meaning) is presented. Finally, a summary of the literature as it relates to the present study concludes the review.

2.1 Negative Outcomes of Exposure to Traumatic Stress Events

This section summarizes the existing scientific literature on the detrimental health effects of stress post exposure to traumatic life events. Due to the multiple conceptualizations inherent in the literature regarding the stressful traumatic event → resulting psychological distress link, definitions of the major constructs examined in this study opens the section. Next, conceptual models linking stress to negative health outcomes are presented. Finally, a review of the empirical research supporting the link between combat exposure and psychological distress as advocated in the present study concludes the section.

2.11 Definitions of major constructs examined in the present study. Many of the constructs examined in this study remain in the initial stages of the research process. Moreover, several of the constructs remain “under construction” with researchers still

debating their correct operational definition. The definitions of these constructs as used in the present study are presented below.

Stress. According to Darwin's theory of evolution, human beings survive by constantly adapting to the demands of an ever-changing environment. This constant adaptation results in the universal phenomenon known as stress defined as a "force: pressure: urgency: or strain" (*Webster's Dictionary,* 1990, p. 830). Thus, every person perceives stress, yet research acknowledges that the individual's perceptions of stress are not homogenous (Aldwin, Levenson, & Spiro, 1994) which has manifested in a number of perspectives and descriptions of the stress experience. For example, stress has been postulated as a response to an environmental situation (Selye, 1973), an environmental challenge (Dohrenwend, 2000), or as the relation between environmental demands and the ability to meet those demands (Taylor & Roberts, 1995).

For the purposes of the current study, stress is defined as a real or perceived imbalance between environmental demands required for survival following a traumatic event and an individual's capacity to adapt to these requirements (Lazarus & Folkman, 1984; Chrousos & Gold, 1992; Lovallo, 1997; Weiner, 1992). Crucial to this definition is the appraisal and coping resources of the individual, as stress represents the individual's subjective perceptions and interpretations more than an objective existence of a traumatic event or situation. Thus, the negative outcome of perceived stress may run along a continuum ranging from not at all to somewhat or mild to extreme severity of distress to a traumatic event (Dulmus & Hilarski, 2003).

Traumatic event. As currently conceptualized, a traumatic event is an event during which an individual experiences perceived threat and the experience of helplessness, terror,

or horror (American Psychiatric Association, 2000). The fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV, American Psychiatric Association, 1994) identifies numerous events as being potentially traumatic, including man-made disasters, combat, serious accidents, witnessing the violent death of others, being the victim of torture, rape, or terrorism, learning about trauma to others, and being exposed to sudden unexpected death.

The negative psychological impact of traumatic events may include emotional numbness with accompanying shock and disbelief. Disturbing images of the traumatic event may intrude into the victim's thoughts and dreams, with reminders of the event acting as triggers for these intrusive recollections. Repetitive dreams bring the survivor back to the situation of danger and surprise in order that he or she can attempt to master it (van der Kolk, 1987). The survivor of trauma may experience fear and anxiety as well as remain more vigilant for clues of the occurrence of another similar event (Comer, 2003). Those who live through traumatic experiences that others did not may experience survival guilt, and they may blame themselves for things they either did or did not do at the time. Studies have found that survivors of trauma may also be angry, irritable, or depressed. They may ruminate about the traumatic event in the attempt to comprehend why it happened without ever achieving an understanding (Comer, 2003). If symptoms appear immediately after the traumatic event and last less than a month, the pattern is diagnosed as acute stress disorder (American Psychiatric Association, 2000). If the symptoms continue longer than a month, then PTSD is diagnosed.

Traumatic event exposure is indexed in a variety of ways (e.g., structured interview, checklist) and has been defined in different ways across studies. For instance, reporting psychological distress after a natural disaster has been used to index traumatic event

exposure (Glesser et al., 1981), whereas other studies have required self-reported peri-traumatic helplessness, terror, or horror (Feldner et al., in press). While some studies measure exposure to any type of traumatic event, without controlling for type of exposure (Lipschitz et al., 2003), others measure exposure to a single type of event, such as combat exposure (e.g., Koenen et al., 2005). In the present study, the traumatic event under investigation is combat exposure experienced by U.S. soldiers deployed to Iraq.

Combat exposure. Combat exposure was redefined by the House Armed Services Committee in 1994 as follows: "*Direct ground combat is engaging an enemy on the ground with individual or crew served weapons, while being exposed to hostile fire and to a high probability of direct physical contact with the hostile force's personnel. Direct ground combat takes place well forward on the battlefield while locating and closing with the enemy to defeat them by fire, maneuver, or shock effect*" (Aspin, 1994). Because the present study centers on combat exposure, traumatic event exposure is thus indexed via a checklist designed to measure the frequency of exposure to identified traumatic events often occurring in combat (e.g., "How often have you been under enemy fire?" and "What percent of the people in your unit have been killed, wounded, or missing in action?"). For example, soldiers who experience higher levels of exposure to combat are more likely to react with fear and horror than soldiers who never see combat or who participate in minor skirmishes (Casella & Motta, 1990).

Traumatic distress. Though often confounded, it is important to separate a traumatic event from an individual's reaction to that event. A traumatic event is a potentially terrifying situation in which an individual fears severe personal injury to him or herself or witnesses a threat to another individual (American Psychiatric Association, 2000). The key word here is

"potentially." Two individuals can be in the exact same traumatizing situation and one will react with little or no discomfort while the other might experience high levels of distress. More specifically, traumatic distress refers to the emotional and psychological symptoms, or reactions, a traumatized individual experiences as a result of exposure to a traumatic event (Wilson, 1989). Phrases such as "traumatic distress" and "symptoms of PTSD" are general terms referring to some level of distress that might vary from mild (in the case of the former) to severe (in the case of the latter) resulting from exposure to a traumatic event.

The present study follows this precedent of distinguishing between mild and severe symptoms measuring each type of traumatic distress individually. Specifically, less severe symptoms such as milder forms of anxiety, depression, and relationship problems are labeled as symptoms of "psychological distress" and are measured via the Outcome Questionaire-45 (OQ-45; Lambert, Lunnen, Umphress, Hansen, & Burlingame, 1994). More severe symptoms of traumatic distress (e.g., dissociation, re-experiencing symptoms, and hyperarousal) are classified in the current study as symptoms of "posttraumatic stress disorder" and are measured with the Trauma Screening Questionnaire (TSQ; Brewin, Rose, Andrews, et al., 2002).

Posttraumatic stress disorder. Posttraumatic stress disorder (PTSD) is a disorder of recovery, characterized by an inability to cope with the stress reaction to a traumatic event (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). The first appearance of the diagnosis of PTSD in the psychiatric nomenclature occurred via the advent of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980). According to the most recent version of the DSM (DSM-IV; American Psychiatric Association, 1994), the distinguishing characteristic of PTSD is exposure to an

event defined as being outside normal human experience. Symptoms include recurrent intrusive memories of the traumatic event, recurrent dreams or flashbacks, numbed responsiveness to the external world, exaggerated startle response, sleep disturbance, memory loss, and difficulty concentrating (DSM-IV, 1994; see Appendix A for the full diagnostic criteria of PTSD).

Since this official introduction to the PTSD diagnosis, considerable debate has centered on the correct conceptualization of the disorder. Some researchers argue a dimensional conceptualization (Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992) while others argue a categorical classification (Yehuda & McFarlane, 1995). This distinction is important, as the impact of the disparate classifications is threefold. First, if a dimensional rather than a categorical classification is used, this broadens the scope of both clinical interventions and public initiatives to a wider range of traumatized populations than those captured within diagnostic thresholds (Forbes, Haslm, Williams, & Creamer, 2005). Second, adoption of a dimensional rather than a categorical classification impacts clinical assessment by avoiding the reduction of symptoms to a present/absent dichotomy which decreases both clinically-relevant information as well as lowering the statistical power of analyses in research (MacCallum, Zhang, Preacher, & Rucker, 2002). Third, use of a dimensional rather than a categorical conceptualization influences possible etiological explanations for distress symptoms. While categorical classification leads to the existence of a single possible dichotomous factor responsible for inclusion or exclusion; a dimensional classification allows for the additive effect of multiple causal influences (Meehl, 1992).

To date, the great majority of studies examining the link of combat exposure and PTSD have used categorical measures of PTSD, creating a false dichotomy of symptoms

versus no symptoms. However, support for assessing traumatic distress on more of a continuum arises from the finding that under certain circumstances, the majority of those exposed to potentially traumatic events do develop some sort of psychological distress and/or PTSD symptoms following the exposure (Rothbaum, Foa, Riggs, Murdock, & Walsch, 1992). In an effort to capture a more complete continuum of the psychological distress resulting from combat exposure, the current study will incorporate two measures of this construct. As alluded to previously, the first measure (OQ-45) is designed to capture milder symptoms of psychological distress (e.g., depression, poor interpersonal functioning), while the second measure (TSQ) is meant to capture PTSD, a more severe cluster of distress symptoms.

Coping. Coping has been defined as an individual's cognitive and behavioral efforts in response to the demands of the person-environment transaction perceived as exceeding his or her existing resources (Lazarus & Folkman, 1984; Folman & Lazarus, 1991). Studies have indicated that coping is critically related to adjustment following a wide range of traumatic events including combat exposure (Benotsch et al., 2000, Moos & Schaefer, 1993, Solomon, Mikulincer, & Arad, 1991). Researchers have paid particular attention to the differences in outcomes of those individuals using active or approach-based versus avoidance-based coping strategies. Active coping strategies are either behavioral or psychological responses designed to change the nature of the stressor itself or how one thinks about it, whereas avoidant coping strategies lead people into activities (such as alcohol use) or mental states (such as withdrawal) that keep them from directly addressing stressful events (Moos, 1993). Generally speaking, active coping strategies, whether behavioral or emotional, are thought to be better ways to deal with stressful traumatic events, and avoidant coping strategies appear

to be a psychological risk factor or marker for adverse responses to stressful traumatic events (Holahan & Moos, 1987; Moos, 1993).

For example, Benotsch et al. (2000) showed that more avoidance coping among military reservists who were deployed in Operation Desert Storm predicted more PTSD symptoms 13-months later. Similarly, Solomon, Mikulincer, and Flum (1988) found that more avoidance coping assessed following Israeli soldiers' participation in the Lebanon War predicted more PTSD symptoms 12-months later. Based on cross-sectional data, Sharkansky et al. (2000) found that a higher ratio of avoidance coping to approach coping, based on retrospective recollection of the coping strategies used during Operation Desert Storm, was associated with more PTSD symptoms assessed within five days of the soldiers' return from deployment. Finally, Fairbank, Hansen, and Fitterling (1991) found that former World War II prisoners of war (POWs) with PTSD reported more avoidant coping characterized by self-isolation, wishful thinking, and self-blame than did former WWII POWs without PTSD.

The current study examined the effect of two active coping strategies (i.e., positive religious coping and placing more meaning in one's military duties) and one avoidant coping strategy (i.e., negative religious coping) on the link between combat exposure and psychological distress. Additionally, the present study examined one personal resource associated with more positive, approach based coping (i.e., trait forgiveness; Pargament et al., 2000). Based on the preceding research, it was expected that the two active coping strategies, along with trait forgiveness, would lessen the impact of combat exposure while the avoidant strategy would strengthen the impact. This is discussed in further detail in the next section.

Resiliency factor. Resilience refers to individuals who effectively use internal (e.g., temperament) and external (family and community) coping strategies to overcome life circumstances and accomplish developmentally appropriate tasks (Garmezy, 1991; Masten, 2001; Rutter, 1987; Shalev, 2002). Resiliency is not a static trait but developmentally and contextually influenced, as individuals often become more resilient over time (Egeland, Carlson, & Sroufe, 1993; Rutter, 1987; Werner, 1986). Resiliency does not imply that perceived stress is without pain, but the response is effective coping in spite of the distress (Haggerty, Sherrod, Garmezy, & Rutter, 1994). The internal characteristic, mastery, is an example of a significant protector against perceived stress (Skaff, Pearlin, & Mullan, 1996). Mastery refers to the extent to which a person feels that he or she has control over life circumstances (Skaff et al., 1996) and plays a moderator role regarding stress (Gorman-Smith & Tolan, 1998). The specific resiliency factors included in the present study are trait forgiveness, religious coping, and meaning in one's military duties. Each of these factors is expounded upon later in this review.

2.12 Conceptual models linking stress to poor health. Researchers have posited several models conceptualizing the pathways by which stress might negatively impact health (Cohen, Kessler, & Gordon, 1995; Cohen & Rodiquez, 1995; Hobfoll, 1989, 2001; McEwen & Stellar, 1993, Steptoe, 1991). These models generally characterize stress as beginning when an individual appraises the demands of the environment as exceeding her or his adaptive resources. The perception of stress is a complex and individualized process. While certain objective circumstances have been identified as being inherently more stressful than others (e.g., combat exposure, sexual abuse, natural disasters; Miller and Rahe, 1997), whether or not a certain set of circumstances is appraised as stressful or not often depends on

an individual's unique life experiences as well as her or his personal, social, and biological resources and vulnerabilities. That is, according to current models, stress appraisals depend on an individual's repertoire of existing coping resources and personal vulnerabilities (Hobfoll, 1989, 2001; Lazarus & Folkman, 1984; Kessler, Price, & Wortman, 1985; McEwen & Stellar, 1993; Steptoe, 1991).

The current study adopts the theoretical perspective of the Cognitive-Relational theory of stress (CR; Lazarus, 1966, 1991, 1993; Lazarus & Folkman, 1984, 1987). The overarching premise of the CR theory is that stress is a product of the relative balance of forces between environmental demands (i.e., traumatic events) and personal resources and coping strategies (e.g., intelligence, social support, trait forgiveness, etc.; Lazarus, 2001). Figure 1 below presents an illustrative analogy of this person-environment relation in the form of a seesaw. This seesaw presents the multiple environmental demands which naturally arise from the experience of traumatic events on one side of the seesaw and the present resources and coping strategies available to an individual to cope with these environmental demands on the other (Lazarus, 1999, p. 59). Thus, it follows that PTSD and psychological distress emerge when either too many demands or too few resources are available to the traumatized individual.

Figure 1. Person-Environment Relation According to Cognitive-Relation Theory

As shown in Figure 1, the potential impact of stress can be thought of as a delicate balance between environmental demands brought upon by traumatic events and the personal resources available to cope more or less successfully with those demands (Lazarus, 1999). Importantly, in an expansion of Lazarus' CR theory, Hobfoll (2001) posited that because resources themselves are tapped to cope with environmental demands, individuals become increasingly vulnerable to negative stress sequelae. That is, because both environmental demands and chronic and acute resource loss are involved in individuals' attempts to successfully balance demands of traumatic events with resources, utilization of coping strategies intensifies as stress (or loss) occurs (Hobfoll, 2001).

This intensification results in the initialization of resource conservation strategies in an effort to successfully adapt to the increased environmental stress. If adaptation (or coping) is successful, new resources are generated which serve to replenish one's resource pools and offset the potential negative consequences of acute and chronic resource loss (Hobfoll, 2001). If adaptation (or coping) is unsuccessful, the result is diminishment of the invested resources leading to psychological distress (Hobfoll, 1989).

Within the realm of the present study, this translates into intensification of both approach and avoidant coping strategies as the environmental demands from combat exposure lead to resource loss and threaten psychological well-being. Thus, it was predicted that the more adaptive, approach strategies (i.e., positive religious coping, finding meaning in one's military duties, and trait forgiveness) would lessen the impact of combat exposure by keeping more weight on the resource side of the seesaw, while the less adaptive, avoidant strategy (i.e., negative religious coping) would increase its impact.

2.2 Empirical Evidence Linking Combat Exposure to Psychological Distress and PTSD

A review of the general scientific literature provides ample evidence that combat exposure can contribute to psychological symptoms ranging from mild to moderate complaints (e.g., anxiety, hostility, fatigue, and sleep disturbances) to severe forms of psychopathology meeting diagnostic criteria for PTSD (Ben-Zur & Zeidner, 1991; Bryant & Harvey, 1996; Gregg, Medley, Fowler-Dixon, et al., 1995; Phifer, 1990; Shalev, Bleich, & Ursano, 1990; Tranah & Farmer, 1994; Turner, Thompson, & Rosser, 1995; and Ursano, Fullerton, Kao, & Bhartiya, 1995). In the next sections, following a brief history of psychological distress post combat exposure, focus is placed first on examining the literature linking combat-related stress to psychological distress in veterans more generally. Second, an examination of the research linking combat-related stress to PTSD more specifically is presented.

2.21 History of psychological distress post combat exposure. As Walter B. Cannon once wrote, "*The business of killing and of avoiding death has been one of the prime interests of living beings throughout their long history on earth*." (Cannon, 1929; p. 377). Prior to World War I (WWI), an illusory worldview of the honor and grandeur to be found on the battlefield predominated (Herman, 1997). This paradigm shifted during WWI in response to the alarming number of soldiers breaking down under the conditions of unremitting exposures to the horror of trench warfare. The numbers of soldiers suffering from mental breakdown was so great in fact, that according to one estimate, they represented over 40 percent of British war causalities and inspired a new nomenclature, "shell shock" (Kardiner & Spiegel, 1947). This name was derived from the early belief posited by the British psychologist Charles Myers that the soldiers' symptoms of mental breakdown (e.g.,

uncontrollable weeping, frozen stature, loss of memory and ability to feel) were a result of the concussive effects of exploding shells (Myers, 1940). The name stuck despite the fact that observation of symptoms in soldiers experiencing no direct physical trauma soon discredited this belief and led to the gradual realization that the syndrome of “shell shock” must be due to psychological rather than to physical trauma (Herman, 1997).

Despite the realization by the military psychiatric community of the psychological nature of “shell shock”, a clear delineation of the symptoms associated with psychological distress post combat exposure did not emerge until World War II (WWII; Herman, 1997). Furthermore, it was not until the advocacy efforts of Vietnam veterans that the most severe continuum of psychological distress symptoms associated with combat exposure were officially recognized by the psychological community as a legitimate psychiatric disorder (aka PTSD) in the DSM-III (1980).

2.22 *Symptoms of general psychological distress experienced post combat.* Currently, there is a large body of literature examining the psychological morbidity associated with combat exposure (e.g., Centers for Disease Control, 1988; Friedman, Schnurr, & McDonagh-Coyle, 1994; Kaylor, King, & King, 1987; Solomon, 1995). Exposure to combat often leads to subjective meanings of loss, threat, and fear, all of which are important in the etiology of depression, anxiety, specific phobias, PTSD, and other psychiatric disorders (Kendler, Karkowski, & Prescott, 1998). Those who experience combat exposure often tend to develop characteristic symptoms that may include intrusive recollections of the event, avoidance behaviors with a numbing of general responsiveness, and/or increased physiological arousal. Table 1 below offers a more complete listing of the common symptoms of psychological

distress reported by those exposed to combat during the Vietnam War according to a report offered by the President's Commission on Mental Health (1978).

As shown in Table 1, those who are traumatized are likely to develop characteristics of psychological distress that may include symptoms of traumatic re-experiencing (items 1-4 in Table 1), efforts to avoid stimuli which are similar to the trauma as well as a general numbing of responsiveness (items 5-11), and symptoms of autonomic nervous system hyperarousal (items 12-17). The American Psychiatric Association (1994) provides a complete listing of all symptoms associated specifically with PTSD (see Appendix A).

Table 1.
Common Symptoms of Psychological Distress Following Combat Exposure during the Vietnam War as Reported by the President's Commission on Mental Health (1978)

Symptoms of Psychological Distress
1. Repeated, disturbing memories, thoughts or images of past trauma
2. Repeated, disturbing dreams of past trauma
3. Suddenly acting or feeling as if trauma from the past were happening again
4. Feeling very upset when something reminds one of past trauma
5. Avoiding thinking or talking about past trauma; avoiding having feelings related to it
6. Avoiding activities or situations because they remind one of past trauma
7. Trouble remembering important parts of past trauma
8. Loss of interest in activities which one previously enjoyed
9. Feeling distant or cut off from people
10. Feeling emotionally numb or unable to have loving feelings for others
11. Feeling as if one's future will be cut short
12. Having physical reactions (such as heart pounding, trouble breathing, sweating)
13. Trouble falling or staying asleep
14. Feeling irritable or having angry outbursts
15. Difficulty concentrating
16. Being "superalert" or watchful or on guard; feeling jumpy or easily startled

2.23 Evidence of the link between combat exposure and general psychological distress. With the exception of one study which relied on clinician assessment (i.e., the National Vietnam Veterans Readjustment Study, NVVRS, 1988), the remaining seven studies examining symptoms of general psychological distress post combat exposure presented in this section employed self-report checklists of psychiatric symptoms. The well-validated Hopkins Symptom Checklist SCL-90 (SCL-90; Derogatis, 1983) and its variant (i.e., the Brief Symptom Inventory [BSI; Derogatis and Spencer, 1982]) were the most commonly used psychiatric self-report measures. These instruments include subscales assessing various symptoms of psychiatric conditions (e.g., somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism) and yield domain-specific as well as overall measures of psychopathology.

Other well-validated instruments included the State-Trait Anxiety Inventory (STAI), a 40-item measure of anxiety (Spielberger, Gorsuch, and Lushene 1970), the Beck Depression Inventory (BDI), a 21-item measure of depression (Beck et al., 1961), and the General Health Questionnaire (GHQ; Goldberg and Hillier, 1979), an instrument similar to the SCL-90. In most instances, only total scores, reflecting overall psychological distress, were reported.

Similarly, the present study measured general psychological distress with a multidimensional self-report questionnaire with three subscales (i.e., social role functioning, symptom distress, and interpersonal relations) summing to a total score assessing overall distress level. Importantly, the OQ-45 (the measure to be used in the present study) showed strong positive correlations with many of the above measures (e.g, Symptom Checklist-90,

Beck Depression Inventory, State-Trait Anxiety Inventory), but offers a broader operationalization of general psychological distress (i.e., includes measures of social role and interpersonal dysfunction as well as measuring degree of depression and anxiety).

Research in this field has buttressed the need to capture a broader range of distress symptoms in order to capture the true impact of combat exposure on mental well-being. For example, in some studies, the link between stress exposure and mental health problems varied as a function of the manner in which mental health outcomes or stress exposure were measured (e.g., Labatte and Snow, 1992; Perconte, 1993a). For example, reservist survivors of a SCUD missile attack (SCUD = a series of tactical ballistic missiles first developed by the Soviet Union during the Cold War) reported greater psychological distress than did members of the same unit who were away from the site of the attack, as measured by the SCL-90 but not the BDI (Perconte et al., 1993a). In a study of troops who engaged in the ground war (n = 57), sleep disturbance and nightmares after the war were found to be related to personal injury during the war, but not related to exposure to dead bodies (Labatte and Snow, 1992).

Three studies of military Vietnam era veterans suggest that the psychological consequences of combat exposure are diverse and can persist for decades (Centers for Disease Control, 1988; O'Toole, Marshall, Grayson et al., 1996; Sutker et al., 1993). For example, a survey of a randomly selected sample of Australian Vietnam veterans (n = 641) revealed that a degree of self-reported combat exposure, assessed retrospectively, was associated with heightened six-month and lifetime prevalence of various mental health disorders (i.e., alcohol abuse and dependence, and somatization disorders; O'Toole et al., 1996). Similarly, a large-scale epidemiologic study of Vietnam veterans (n = 7924) and

Vietnam-era veterans who did not participate in combat (*n* = 7364) reported that Vietnam veterans suffered from higher rates of current depression (4.5 percent versus 2.3 percent), current anxiety (4.9 percent versus 3.2 percent), and current alcohol abuse or dependence (13.7 percent versus 9.2 percent; Centers for Disease Control, 1988).

More recent evidence of the negative impact of combat exposure on mental health heralds from five studies located which centered on Persian Gulf War veterans. Researchers in one study compared 215 Army National Guard and Army Reserve troops who were deployed to the Persian Gulf with 60 troops from these same units who were activated but not deployed overseas (Sutker, Uddo, Brailey, & Allain, 1993). The study scored subjects on a seven-item self-report war zone stress scale, dividing them into high- and low-stress groups based on the median split of that scale. The high-stress group had more extreme scores on measures of psychological distress (BDI depression score 8.25, and STAI anxiety score 43.6) than did either the low-stress group (3.7 and 36.1, respectively) or the non-deployed group (5.0 and 38.0, respectively) (*ps* significant at <.007; Sutker et al., 1993).

A similar study examining the prevalence of psychological and physical symptoms in Persian Gulf War veterans was conducted with 912 National Reserve and Guard veterans within one year of their return to the United States (Sutker, Davis, Uddo, & Ditta, 1995). Like the authors in the former study, the researchers conducted a between-group study comparing deployed combat exposed soldiers (*n* = 653) with troops stationed stateside during the same period of deployment (*n* = 259). Interestingly, this study conducted analyses by sex to determine difference in prevalence of symptoms for males (87% of samples) versus females (13% of samples). Analyses of STAI and BDI scores revealed that the sample of deployed veterans (both males and females) reported significantly more somatic and

depression symptoms than their non-deployed counterparts (Sutker et al, 1995). Significant sex differences were also found with females reporting more health complaints than males ($p < .05$; Sutker et al., 1995).

The Fort Devens Reunion Survey, a unique prospective study of Gulf War veterans, provided a source of information concerning stress exposure and perceived stress during the initial days following the return from the Gulf theater (Wolfe, Brown, & Kelley, 1993). The survey was administered to 2344 veterans who had deployed to the Persian Gulf from Fort Devens, MA, within five days of their return to the United States. The sample included service personnel with a wide range of military occupational specialties from more than 45 different units. It was administered as the units returned to undergo administrative processing. As a result, the survey captured 60-70 percent of those soldiers who had deployed through Fort Devens (Wolfe et al., 1996); however, only 11 percent of respondents were active-duty. Moreover, two-thirds of the active-duty troops surveyed were from Special Forces; thus, the bulk of the survey covered reserve and National Guard personnel.

The Fort Devens survey is unique in that it incorporated both structured and open-ended questions to elicit information about veterans' self-reported exposure to a number of potential stressors. The survey focused on several stressor categories: (a) wartime activities (e.g., troop engagements); (b) nontraditional wartime events (e.g., combat war-zone events specific to the Gulf War and significant noncombat war-zone occurrences); and (c) non-war-zone, deployment-related experiences (e.g., vocational, domestic, and psychological stressors).

The researchers found that the three most commonly endorsed war-zone experiences reported by Fort Devens male and female veterans were: 1) alerts of biological or chemical

attack (74 percent men; 78 percent women), 2) receipt of incoming fire from large arms (74 percent men; 70 percent women), and 3) witnessing deaths or the disfigurement of enemy troops (50 percent men; 45 percent women) (Wolfe et al., 1993). Additional multiple regression analyses adjusting for demographic characteristics, rank, prior service, and self-appraised preparedness for combat found a significant positive relationship between stress exposure and psychological distress, as measured by the BSI General Severity Index, a PTSD checklist, and the Mississippi Scale for combat-related PTSD (Wolfe et al., 1993).

One of the most comprehensive evaluations of the link between combat exposure and subsequent distress felt by deployed soldiers assessed over 4000 active-duty and reserve personnel from Pennsylvania and Hawaii who had served during Operation Desert Shield/Desert Storm (ODS/S; Walter Reed Army Institute, 1994). This collaborative study by the Walter Reed Army Institute of Research (WRAIR), conducted two to three years following service in the Gulf War, compared active-duty and reserve veterans, as well as deployed and non-deployed personnel, with respect to perceived sources of Gulf War theater stress, perceived levels of current stress, causal attributions concerning present problems, and the importance of deployment stressors compared to other recent life events.

As part of the self-administered survey, both deployed active-duty and reservist personnel were asked whether they had experienced various events during their deployment. If soldiers experienced the event(s), then they were asked the extent to which they found the event or events stressful. An overall finding from this study was that, two to three years following the Gulf War, many deployed veterans rated a number of experiences as being moderately to extremely stressful (WRAIR 1994, pp. A-19, A-22). The general pattern and magnitude of reported combat traumatic stressors were similar for both active-duty and

reserve deployed samples, as summarized below in Table 2. Although the WRAIR study failed to find significant differences between active duty and reserve personnel, it is worth considering if these results may have been different if the participants had been surveyed during their first year post-deployment.

Table 2.
Traumatic Events Reported as Experienced as Moderately to Extremely Stressful as a Function of Percentage of Exposure in the WRAIR study (1994)

Sample	Traumatic Event	% Experienced	% Rated Mod. to Extremely Stressful
Reserve (*n* = 764)	Threat of being killed or wounded	60	54
	Exposure to American soldiers killed or wounded	29	44
	Exposure to dead or dying	24	26
Active-duty (*n* = 710)	Being fired on by the enemy	36	58
	Having a buddy wounded or killed in action	15	34
	Being wounded or injured	11	34
	Having a confirmed kill	10	23
	Exposure to American soldiers killed or wounded by friendly fire	20	43
	Engaging enemy in a fire fight	18	43

Researchers collaborating in the WRAIR study (1994) also attempted to determine current levels of life stress in deployed and non-deployed personnel and to assess the degree to which veterans attributed their present-day problems to experiences during Operation Desert Shield/Desert Storm. To address this issue, personnel responded to a checklist of potential life stressors, including the degree of stress they experienced in the past two weeks

with respect to each circumstance. In general, results revealed that deployed troops tended to report significantly higher levels of current life stress in a number of domains than did nondeployed personnel ($p < .01$; WRAIR, 1994). This finding was consistent across both active-duty and reserve personnel.

Veterans were also asked about their present levels of life stress and to indicate what caused most of their recent problems. Deployed troops reported more current concerns than did non-deployed personnel. For example, 40 percent of both deployed active-duty and reserve troops reported at least moderate concern in the past two weeks regarding personal health matters, as compared to 21 percent of non-deployed active duty personnel and reservists (WRAIR, 1994). Similarly, approximately 20 percent of active-duty and reserve deployed troops noted moderate or greater concern in the past two weeks regarding their Operation Desert Shield/Desert Storm experiences (e.g., thoughts of fellow service personnel being killed or wounded in the Gulf War, or their relationship with their spouse or significant other since their return from Gulf War service; WRAIR, 1994).

2.24 Evidence of the link between combat exposure and PTSD. Due to the aforementioned controversy regarding the measurement of PTSD (i.e., dimensional vs. categorical), it is important to determine how this construct was measured before examining the empirical literature regarding the link between combat exposure and PTSD. Although administration of a diagnostic interview represents the gold standard (i.e., it is postulated as the most reliable and valid means of establishing a diagnosis of PTSD), a number of self-administered questionnaires have been developed that provide some information about PTSD symptoms. The brevity and ease of administration of these scales render them valuable for

use in situations in which it is not feasible to conduct a lengthy diagnostic interview (Brewin et al., 2002).

The Mississippi Scale for Combat-Related PTSD was used most frequently to assess PTSD or PTSD symptoms. This scale is a self-report scale developed expressly for use with persons exposed to combat-related trauma (Keane, Caddell, and Taylor, 1988) and was originally designed for use with veterans of Vietnam; it was adapted for use with veterans of the Persian Gulf War (e.g., Engel et al., 1993). One problem with this measure is that an individual could have an elevated score without having experienced a trauma, because some of the items assess symptoms that are not unique to a PTSD diagnosis. Sample items in the scale include "Unexpected noises make me jump" and "I am afraid to go to sleep at night".

The Impact of Events Scale (IES), another widely used self-administered scale assesses the presence and severity of symptoms of intrusion (e.g., "I had dreams about it") and avoidance (e.g., "I tried not to think about it") symptoms, but not hyperarousal symptoms. The IES has been found to be sensitive to change, in terms of detecting changes in clinical status over time and in terms of detecting the relevant differences in the response to traumatic events of varying severity by different groups (Corcoran & Fischer, 1994; Weiss & Marmar, 1997). This measure is similar to the one used in the present study (see Trauma Screening Questionnaire under Chapter 3, Methods section).

The largest study to date on PTSD in combat exposed Vietman veterans is the National Vietnam Veterans Readjustment Study (NVVRS) conducted in 1988. The primary purpose of the study was to answer a single question – what is the rate of PTSD among Vietnam Veterans? Each participant completed the National Survey of the Vietnam

Generation, a household interview lasting approximately 5 hours. The survey response rate was 83%.

The estimated lifetime prevalence of PTSD among American Vietnam theater veterans was 30.9% for men and 26.9% for women. An additional 22.5% of men and 21.2% of women had experienced partial PTSD at some point after discharge. Thus, the NVVRS found that more than half of all male Vietnam veterans and almost half of all female Vietnam veterans, approximately 1,700,000 in all, had experienced clinically significant traumatic stress reactions. Prevalence rates for PTSD at the time of the survey were 15.2% of all male Vietnam theater veterans and 8.5% of all female Vietnam theater veterans (Kulka et al., 1990). Table 3 presents a summary of the data on prevalence rates of PTSD from the NVVRS. Results of the survey demonstrated the chronic nature of the disorder, and provided further evidence of the existence of the positive association between the intensity of combat exposure experienced by military personnel and their subsequent degree of self-reported posttraumatic stress symptomology.

Of note is the high rate of comorbidity with depression that was found in the NVVRS; 26% of Vietnam veterans with PTSD also met criteria for major depressive disorder (Kulka et al., 1990). These results speak to the importance of including additional measures of psychological distress when assessing the mental health of combat exposure.

Table 3.
Rates of PTSD of Participants: National Vietnam Veteran Readjustment Study (NVVRS)

Rate	**Men**	**Women**
Lifetime rate of PTSD	30.9%	26.9%
Lifetime rate of partial PTSD	22.5%	21.2%
1988 rate of PTSD (at time of NVVRS study)	15.2%	8.5%

In one study using the IES to measure symptoms of PTSD, IES scores were correlated most highly with combat exposure and the intensity of the respondent's reaction to some combat situations (Stretch, Bliese, Marlowe, et al., 1996). Five items in particular explained about 28 percent of the variance for the IES avoidance subscale (noise from guns or artillery; exposure to dead or dying bodies; threat of enemy chemical weapons or agents; threat of terrorist attack; and threat of SCUDs). In addition, though not measured in the present study, non-combat war zone stressors (e.g., crowding in base camps) were also important in explaining some of the variance in IES scores.

One additional study assessed PTSD retrospectively by asking graves-registration veterans (n = 234) three to five months after the war to recall their symptoms at the height of the Persian Gulf War (McCarroll, Ursano, & Fullerton, 1995). These veterans were selected as their role as graves-registrars involves heavy exposure to the direct results of war atrocities, (i.e., the dead bodies of fallen comrades). The between-group study design examined the prevalence of PTSD symptoms via the IES and the SCL-90-R in Persian Gulf War veterans who had handled human remains (classified as the traumatic event; n = 116) versus those who had not handled such remains (n = 118). Veterans who handled human remains reported significantly more intrusive and avoidance symptoms on the IES ($p < .01$; McCarroll et al., 1995). However, no significant differences in SCL-90 scores were found between personnel who handled human remains and those who did not. That is, researchers found significant between-group differences with respect to symptoms of PTSD but not symptoms associated with other mental health problems (McCarroll et al., 1995).

Three additional studies provide further evidence of the link between combat exposure and PTSD in Persian Gulf War veterans. First, Baker et al., (1992) reported a

significant positive correlation between self-reported combat stressors and PTSD symptoms measured on the IES two to five months after the war among 325 Reservists deployed to the Persian Gulf (r = .40). Second, in a study comparing deployed troops with differing levels of stress exposure, troops who were on-site during the SCUD missile attack in Dhahran, Saudi Arabia, had elevated levels of PTSD symptoms compared to those on guard duty three to five miles away (Perconte, Wilson, Pontius, Dietrick & Spiro, 1993).

Finally, using the same measure of combat exposure used in the present study (e.g., the Combat Exposure Scale; CES; Keane et al., 1999), Stein and colleagues (2005) assessed the presence of PTSD in Persian Gulf War veterans (n = 120) with both the Clinician-administered PTSD Scale (CAPS; Blake et al., 1995) and with the Mississippi Scale for Combat-related PTSD (MISS, Keane et al., 1988). The authors performed logistic and multiple regression analyses to determine the main and moderating effects of childhood trauma, combat exposure, lifetime trauma, and avoidant coping on the above assessments of PTSD. Logistic regression analyses resulted in the correct classification of 88% of PTSD diagnoses, with significant effects emerging for combat exposure and avoidant coping. Additionally, 48 percent of the total variance in the CAPS ($F_{(10, 104)} = 9.752$, $p < .001$) and 63 percent of the total variance in the MISS ($F_{(10, 109)} = 18.87$, $p < .001$) was explained in the multiple regression analyses. These results showed that combat exposure, avoidant coping, and lifetime trauma were all significantly associated with more PTSD symptoms (Stein et al., 2005).

2.25 Summary and limitations of the literature linking combat-related stress to psychological distress and PTSD. The empirical literature on exposure to combat-related traumatic events provides ample evidence that the perceived or actual exposure to the

atrocities of combat can contribute to various psychological health problems. All of the reviewed studies reported a modest to moderate relation between combat exposure and symptoms of subsequent psychological distress. Some of the most common self-reported reactions to combat stress found in the literature include symptoms of depression, anxiety, impaired memory, concentration difficulties, irritability, fatigue, and PTSD. However, despite this uniform finding, the literature suffers from two major methodological problems that potentially hamper definitive conclusions regarding the relation between the traumatic events of combat and subsequent prediction of PTSD.

The first methodological and conceptual limitation apparent among many of the reviewed studies is that much of the research was retrospective in nature, often requiring respondents to recall events and reactions that happened months--or even years--earlier. Retrospective studies are well known to be vulnerable to recall bias (e.g., Chouinard and Walter, 1995). Assessments in the more recent studies, for example, extended from two to five years after the last troops withdrew from the Persian Gulf in July 1991. Many veterans who feel sick may be more likely to recall experiencing stress or other possible exposures during deployment because perception of illness can affect the recall or interpretation of the events leading up to the illness (Friedman and DiMatteo, 1989). In addition, recall of events may be affected by chronic psychological distress. Respondents may exaggerate the intensity or severity of the recalled event, giving a distorted picture of the relationship between stress and health. The second methodological problem is that, although reserve/National Guard personnel comprised only 17 percent of personnel deployed to the Persian Gulf, most studies conducted on veterans of this era focused on these samples. Thus, active-duty military service personnel were underrepresented.

The present study attempted to address these limitations in several ways. First, in an effort to diminish the effects of recall bias brought upon by retrospective studies, the present study surveyed deployed soldiers in the midst of their combat exposure. Specifically, the sampling population consisted of U.S. Army soldiers currently deployed to Iraq who were surveyed within their respective units while in the middle of their tour. Second, the present study attempted to address the recall bias caused by an experience of chronic distress due to multiple deployments/duties by controlling for time in service. Third, the present study attempted to address the under representation of active duty personnel found in the current literature. That it, the sample in the current study consisted of an active duty battalion in the U.S. Army which ensured an adequate sampling of this population.

2.3 Potential Resiliency Factors against the Development of Psychological Distress Post Combat Exposure

Although the literature reveals that symptoms of mild to severe psychological distress occur with a significant number of individuals exposed to the traumatic events inherent in combat, most people exposed to combat appear to resist or to recover. This disparity in outcome suggests that the traumatic events in combat alone are not sufficient to explain chronic traumatic stress reactions (King, King, Fairbank, Keane & Adams, 1998; King, Vogt & King, 2004).

Resilience in combat veterans first appeared in the literature when Grinker and Spiegel (1945) speculated why only some traumatized soldiers experienced war-related neurosis. In the past decade, resilience, or the ability to prevent, minimize, or overcome damaging effects of adversities (Greene & Conrad, 2000), has received increased attention as researchers have shifted their focus from posttraumatic pathology to posttraumatic growth.

This section focuses on a review of resiliency factors identified in the current literature. It begins with an overview of identified resiliency factors. Next, each of the specific resiliency factors examined within the present study is reviewed in detail beginning with religious coping (first positive then negative religious coping), followed by trait forgiveness, and then placing more positive meaning in one's military duties concludes the section.

2.31 Overview of identified resiliency factors. Resilience generally refers to a class of phenomena characterized by patterns of positive adaptation in the context of significant adversity or loss. Resilience as a dynamic process is influenced by protective factors (defined earlier), conceptualized as the specific skills and abilities necessary for the process of resilience to occur (Dyer & McGuinness, 1996). From this perspective, it is the product of a complex relationship between inner strengths and environmental resources (Greene, 2002). In a meta-analysis of the resilience research, Masten (2001) summarized three decades of research showing resilience to be a common phenomenon found in every person which results from the operation of basic human adaptation systems. If these adaptation systems are in optimal operating condition, development proceeds even in the context of severe adversity. If these systems are impaired, then a person may be unable to recover from risk and adversity. The resulting loss in coping capacities increases the likelihood of subsequent physical illness and psychopathology.

Research on resilience has more recently been extended to examining the potential protective factors between the link of combat exposure and subsequent psychological distress. Much of the research on identifying personal and environmental resources involved in coping with traumatic combat events has centered on interpersonal difficulties that often significantly impact the traumatic and posttraumatic experiences of combat veterans.

Researchers have focused on trying to determine both the pretrauma demographic and psychosocial characteristics (e.g., Brewin, Andrews, & Valentine, 2000; King, King, Foy et al., 1999; McCranie, Hyer, Boudewyns, & Woods, 1992) as well as the posttrauma resources and coping mechanisms (e.g., Pargament, Smith, Koenig, & Perez, 1998; Solomon, Waysman, & Mikulincer, 1990; Witvliet, Ludwig, & Vander Laan, 2001; Witviliet, Phipps, Feldman, & Beckham, 2004) that may exacerbate or ameliorate problems confounding the stress of battle fatigue. These findings have prompted a call for studies examining the mechanism by which war-zone stressors influence psychological distress, including PTSD, to take important resilience-recovery influences into consideration (King et al., 1999).

Despite this call, only five studies provided information relevant to determining whether psychological distress due to combat exposure varied as a function of personal or social resources. One such study examined the characteristics associated with the presence of PTSD symptoms in Persian Gulf War veterans 18-20 months after deployment and found that symptoms were higher in soldiers with more avoidant and passive forms of coping, poorer unit cohesion, and less family cohesion (Wolfe et al., 1996). A second study surveyed 775 troops (97 with PTSD diagnoses and 484 reporting no specific symptoms of psychological distress) deployed to the Persian Gulf to determine if factors such as personal hardiness and coping styles modified the impact of war-stress exposure (Sutker et al., 1995b). The researchers found that overall; soldiers classified as suffering from PTSD (a discriminant function correctly classified 87% of the soldiers with PTSD) were more likely to have fewer personal and social resources. In particular, individuals with PTSD reported less psychological resilience, employed more avoidant rather than problem-focused coping strategies, and were characterized by less-cohesive families and greater dissatisfaction with

social support provided by their social networks (*Wilks's* $\Lambda = .57$, $F_{(18, 562)} = 23.90$, $p < .01$; Sutker et al., 1995b).

Recent findings have reported that both war-zone stressors (e.g., traditional combat-events, exposure to atrocities) and postwar resilience-recovery variables (e.g., intrapersonal resources such as optimism and interpersonal resources such as perceived social support) emerge as strong contributors to psychological distress and PTSD, with the contribution of prewar risk factors falling a distant third (King et al., 1998; Stein, Tran, Lund et al., 2005). For example, King et al. (1998) used structural equation modeling to examine relations among several war zone stressor dimensions, resilience-recovery factors, and symptoms of PTSD in a sample of Vietnam veterans ($n = 1632$). For both sexes, hardiness (i.e., a sense of control over one's life, commitment in terms of the meaning ascribed to one's existence, and seeing change as a challenge) and functional social support emerged as predictors of PTSD ($rs = -.25$ and $-.42$ respectively).

Further examples arise from studies examining individual differences in means of coping with combat stress. One such study used logistic regression in a study of Persian Gulf War veterans to correctly classify 88 percent of participants with both combat exposure ($B = .179$, $p < .001$) and avoidant coping ($B = 1.746$, $p = .001$), showing a significant main effect for avoidant coping (Stein, Tran, Lund, et al., 2005). In a more extensive study of coping, Sharkansky and colleagues (2000), surveyed Gulf War veterans at two time periods, within 5 days of their return from the Gulf War in 1991 (Time 1; $n = 1058$) and between 18 and 24 months later (Time 2; $n = 845$). Measures used in the study included the MISS (Keane et al., 1988) to measure PTSD, the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982) to measure depression, the Laufer Combat Scale (Gallops, Laufer, & Yager, 1981) to measure

combat exposure, and the Coping Responses Inventory (Moos, 1990) to measure coping.

Hierarchical multiple regression was used to examine main effects as well as test for potential mediators and moderators. There were five significant predictors of PTSD symptomology in their final model at Time 1: combat exposure (β = .16, p < .001), female sex (β = .14, p < .001), officer status (β = -.10, p < .01), and coping (β = -.09, p < .01). The combat exposure X coping interaction was not significant (β = -.10, p < .10). Though failing to reach statistical significance, specifically regarding the interaction term, approach-based coping accounted for 5 percent of the variance in MISS cores at one standard deviation below the mean level of combat exposure, 10 percent of the variance at the mean, and 16 percent of the variance at one standard deviation above the mean (Sharkansky, King, King, et al., 2000). There were also five significant predictors of PTSD at Time 2: Time 1 PTSD scores (β = .55, p < .001), completion of Time 2 surveys by phone (β = -.13, p < .001), active duty status (β = -.10, p < .01), combat exposure (β = .12, p < .01), and intervening life stressors (e.g., death of a friend, serious accident; β = .22, p < .001). The interaction term was not significant at Time 2.

Despite these findings, most of the research has centered on identifying potential risk factors rather than on potential resiliency factors. Thus, the primary purpose of the present study is to examine the relation between potential protective factors (i.e., religious coping, trait forgiveness, and finding meaning in one's military duties) in a sample of U.S. combat soldiers deployed to Iraq.

A risk/protection model based on Lazarus' (1991, 1999) Conservation of Resources theory is used in the current study in order to determine the buffering effects of potential protective factors in Army troops who may be coping with traumatic events due to their

exposure to combat while serving in Iraq. Viewed through the lens of Cognitive Relational theory, protective factors such as positive religious coping, trait forgiveness, and finding meaning in one's military duties, can be seen as characteristics that promote adaptation to traumatic events (Greene & Conrad, 2000; Lazarus & Folkman, 1984). Each of these factors is explored further in the following sections.

2.32 Religious coping as a potential resiliency factor. "Everyone finds God in a foxhole." This old adage speaks to the common belief that using one's religious faith to cope with the traumatic events in combat is commonplace. However, empirical investigation into this belief is fairly recent. Partially due to the emergence of the concept of posttraumatic growth stemming from the positive psychology movement, there exists a small but growing body of research examining the relation between religious coping and the psychological outcomes of traumatic events (e.g., Koenig, 1994; Pargament, Smith, Koenig, & Perez, 1998).

Positive religious coping. It is hypothesized that traumatization affects the sense of well-being, resulting in an increase in religious coping (based on an increased spiritual need), which in turn stimulates the sense of well-being up to the pre-traumatic levels (Decker, 2007). This is related to the functions of positive religious coping: a connection to more powerful elements, the offering of hope and encouragement, the satisfaction of important personal needs, and the relationship with others (Ganje-fling & McCarthy, 1996). The inherent relation of religion and coping with crisis is evidenced in the theoretical framework of Pargament's (1997) psychology of religion and coping.

Within this framework, Pargament describes coping as a search for significance in times of stress, and religion as a search for significance in ways related to the sacred. Table 4

below presents several religious coping methods that have been identified in the literature as outlined by Pargament et al. (1998a).

Table 4.
Illustrative Methods of Religious Coping as Reported in Pargament et al. (1998)

Religious Coping Method	***Definition***
Benevolent Religious Reappraisal	Redefining the stressor through religion as benevolent and potentially beneficial
Punishing God Reappraisal	Redefining the stressor as a punishment from God for the individual's sins
Demonic Reappraisal	Redefining the stressor as the act of the Devil
Reappraisal of God's Powers	Redefining God's powers to influence stressful events
Collaborative Religious Coping	Seeking control through a partnership with God in problem solving
Deferring Religious Coping	Passively waiting for God to control the situation
Religious Focus	Seeking relief from the stressor through a focus on religion

Table 4. (Continued)

Religious Coping Method	***Definition***
Seeking Spiritual Support	Searching for comfort and reassurance through God's love and care
Religious Purification	Searching for spiritual cleansing through religious Actions
Spiritual Connection	Seeking connectedness with transcendent forces
Spiritual Discontent	Expressions of confusion and dissatisfaction with God
Seeking Support from Clergy or Members	Searching for comfort and reassurance through the love and care of congregation members and clergy
Religious Helping	Attempting to provide spiritual support to others
Interpersonal Religious Discontent	Expressions of confusion and dissatisfaction with clergy or members
Religious Forgiving	Looking to religious for help in letting go of anger, hurt, and fear associated with an offense

The shared notion of a search for significance supports the view that crises or traumatic events may give way to semantic innovation and thus growth. More specifically, it has been hypothesized that the protective properties of positive religious coping can be categorized according to the four "C's": 1) comfort, 2) collaboration, 3) control, and 4) connectedness (Koenig, McCullough, & Larson, 2001).

1) Comfort: According to Pargament et al. (1990), people seek God both as a source of comfort and love, and to gain a sense of meaning and purpose in the event (the latter of these is discussed further in a following section).

2) Collaboration: In an effort to cope with traumatic events, people use positive religious coping strategies to engage God as a partner to aid them in the management of their crisis (Pargament et al., 1998). Essentially, their relationship with God provides someone to go to for support which decreases isolation and engenders hope, thus increasing their perceptions of resources.

3) Control: When individuals are confronted with a traumatic event, they often feel out of control. This can cause them to turn to their religion in an effort to seek a greater power that they perceive as having control; in turn this increases perceived resources as a sense of control and reassurance is gained (Spilka, Shaver, & Kirpatick, 1985).

4) Connectedness: Religious faith entails a faith community of sorts for its followers via a shared belief system which can decrease the sense of isolation accompanying crisis or trauma (Pargament et al., 1990).

The combined benefits of the four “C’s” encompassing religious coping delineated above can result in lower perceived vulnerability, isolation, confusion, and therefore, lower posttraumatic stress response (Meisenhelder, 2002). In his book entitled, *The Psychology of Religion and Coping: Theory, Research, Practice,* Pargament (1997) tallies the results of 40 studies which examined the link between religious coping and negative life events. In his work, Pargament (1997) takes a micro-analytic approach, incorporating studies that assess specific, functionally oriented expressions of religious coping occurring in stressful situations. Of note is that the 40 studies reviewed by Pargament (1997) cut across a variety of samples confronting a variety of stressors such as: heart transplant patients (Harris et al., 1993), depressed elderly men (Koenig et al., 1992), hospital patients undergoing a kidney transplant (Tix & Frazier, 1998), and people diagnosed as positive for the human immunodeficiency virus (HIV; Sowell, Moneyham, Hennessy, et al., 2000). However, no study included in Table 5 focused on combat veterans or stresses resulting from combat exposure, thus the 40 individual studies are not reviewed (See Pargament, 1997 for review).

Notably, many of the 40 studies included in Table 5 used more than one outcome measure resulting in a total of 468 statistical relationships between religious coping and outcomes of negative stressful events (Pargament, 1997). As seen in Table 5, the overall tally of significant relations between religious coping and outcomes is 58% (Pargament, 1997); which seems to demonstrate the potential impact of religious coping on the stress experienced due to a variety of negative life events. However, the exact nature of this impact is unclear due to the mixed findings presented in the table.

While the number of studies substantiating the link between religious coping and the outcome of negative stressful events is well-investigated (Pargament, 1997), because the

overwhelming majority of studies are either conducted using a civilian sample, or some trauma other than combat exposure, only two studies were found which more closely examined the constructs of interest in the present study. That is, studies which included a military sample and/or combat exposure as the source of traumatic stress with measures of religious coping as potential mediators or moderators.

Table 5.
Tally of the Results of Research on the Statistical Relation between Religious Coping and the Outcomes of Negative Events as reported by Pargament (1997)

Measures of Religious Coping	**Significant Positive Relations**	**Significant Negative Relations**	**Non-Significant Relations**
I. Spiritual Coping			
Spiritual Support	46% (43)	2% (2)	52% (48)
Spiritual Discontent	0% (0)	56% (5)	44% (4)
II. Congregational Coping			
Congregational Support	37% 16)	2% (1)	60% (26)
Congregational Discontent	0% (0)	54% (26)	46% (22)
III. Religious Reframing			
God's will and love	53% (19)	0% (0)	47% (17)
God's punishment	0% (0)	52% (11)	48% (10)
IV. Approaches to Religious Control			
Self-Directing	4% (1)	31% (7)	65% (15)
Collaborative	46% (11)	8% (2)	46% (11)
Deferring	28% (9)	6% (2)	66% (21)
Pleading	19% (7)	59% (22)	22% (8)
V. Religious Rituals	40% (30)	23% (17)	37% (28)
VI. Patterns of Religious Coping	56% (15)	11% (3)	33% (9)
TOTAL	**32% (151)**	**21% (98)**	**47% (219)**

Note. Numbers in parentheses represent number of significant relations out of n = 468

The first of the two studies located used secondary exposure to combat (e.g., the effects of war via the witnessing of it through the media or through personal activities such as letter writing or having a relative deployed in the war) as the source of traumatic stress (Pargament, Ishler, Dubow, et al., 1994). Interestingly, Pargament et al. (1994) attempted to

measure the negative effects of the Gulf War on a sample consisting of college students (*n* = 215) rather than members of the military. The authors used both cross-sectional and longitudinal analyses to examine the relation of religious and non-religious coping methods to measures of psychological distress due to exposure to the 1990-1991 Gulf War. Specifically, students were given measures at two time points. The first set of measures were given two days prior to the allied ground assault on Kuwait, and the second set of measures were given two weeks after the suspension of hostilities against Iraq (Pargament et al., 1994).

Several measures were included in the Pargament et al. (1994) study. Religious coping methods were measured with the Religious Coping Activities Scale (Pargament et al., 1990) in which students reported the degree on a four point scale from 1 (Not at all) to 4 (A great deal) to which they used different types of religious coping activities specifically to "*cope with the Gulf War over the past month*". Non-religious coping methods were measured with 32 items from Moos, Cronkite, Billings, and Finney (1986). Similar to the previous measure, participants rated the degree to which they used each non-religious coping activity item to "*cope with the Gulf War over the past month*" on a four-point scale ranging from 1 (No) to 4 (Fairly often). Distress was measured with both a situation-specific distress measure aimed at directly measuring distress due to Gulf War exposure (The Positive Affectivity and Negative Affectivity Scales, PANAS; Watson, Clark, & Tellegen, 1988), and with a measure of global distress (General Health Questionaire-12, GHQ; Goldberg, 1978).

Not surprisingly, measures of religious and non-religious coping activities were associated (*r's* ranged from .07 to .43; *Md r* = .24), but were not found to be functionally redundant (Pargament et al., 1994). That is, both religious and non-religious coping activities were found to contribute unique variance to the prediction of psychological distress.

Specifically, using a series of hierarchical regression analyses, the authors found religious coping activities uniquely accounted for 6% of the variance in Positive Affectivity ($F_{[6, 208]}$ = 2.22, $p < .05$), 11% of the variance in Negative Affectivity ($F_{[6, 208]}$ = 4.26, $p < .001$), and 7% of the variance in the GHQ ($F_{[6, 208]}$ = 2.80, $p < .05$; Pargament et al., 1994). Non-religious coping activities were able to uniquely account for 13% of the variance in Positive Affectivity ($F_{[3, 211]}$ = 10.45, $p < .001$) and 11% in Negative Affectivity ($F_{[3, 211]}$ = 8.38, $p < .001$), but they added no significant variance to the prediction of more general distress as measured by the GHQ above and beyond religious coping activities (Pargament et al., 1994).

Hierarchical regressions were also used to test for significant prediction in changes of psychological distress over time. Specifically, measures of religious coping significantly accounted for 8% of the variance in Positive Affectivity ($F_{[6, 214]}$ = 3.20, $p < .01$), 6% of the variance in the GHQ ($F_{[6, 214]}$ = 2.32, $p < .05$), and non-significant results for Negative Affectivity (Pargament et al., 1994). The results differed for non-religious coping activities, with analyses garnering non-significant results for both Positive and Negative Affectivity (Pargament et al., 1994). However, non-religious coping activities did significantly predict changes in the GHQ, uniquely accounting for 5% of the variance ($F_{[3, 214]}$ =3.96, $p < .01$).

The second of the two studies located, Witvliet, Phipps, Feldman, and Beckham (2004), centered on the associations of both trait forgiveness and religious coping to posttraumatic mental and health outcomes. Because both constructs are measured, this study is reviewed further in the following section examining trait forgiveness as a potential resiliency factor.

Importantly, the effects of positive religious coping to deal with traumatic events have been found above and beyond the effects of non-religious coping, thus potentially

acting as an additional protective factor beyond other coping methods including social support, cognitive restructuring, and perceived control (Mickley et al., 1998; Pargament et al., 2001; Tix & Frazier, 1998). Based on previous research, the present study posited positive religious coping to be associated with decreased psychological distress due to the traumatic events experienced by soldiers in combat. Additionally, the present study attempted to add to this research base by examining the relation of positive religious coping and amount of psychological distress due to combat exposure.

Negative religious coping. Pargament (2000) distinguished between positive and negative religious coping strategies in the following way:

> "The pattern of positive religious coping methods…are derived from a secure relationship with God, a sense of spirituality, a belief that there is meaning to be found in life, and a sense of spiritual connectedness with others. Positive religious coping methods include benevolent religious appraisals of negative situations, collaborative religious coping, seeking spiritual support from God, seeking support from clergy or congregation members, religious helping of others, and religious forgiveness. In contrast, the pattern of negative religious coping methods grows out of a general religious orientation that is, itself, in tension and turmoil, marked by a shaky relationship with God, a tenuous and ominous view of the world, and a religious struggle in the search for significance. Negative religious coping methods include questioning the powers of God, expressions of anger toward God, expressions of discontent with the congregation and clergy, punitive religious appraisal of negative situations, and demonic religious appraisals." (p. 171)

Thus, while positive religious coping represents a turning to God and a positive faith in God, negative religious coping represent a viewing of God as punishing, abandoning, or uncaring, or questioning God's existence.

In contrast to positive religious coping, the use of negative religious coping strategies following exposure to traumatic events has been associated with higher depression and poorer mental health (Nelson-Pechota, 2003; Pargament et al., 1994; Pargament et al.,1998a; Pargament, Zinnbauer, Scott, et al. 1998). In particular, four studies were found which

examined the potential links between traumatic negative life events, negative religious coping, and symptoms of psychological distress. Of note, is that only one of these studies, Nelson-Pechota (2003) collected data from a military sample, namely Vietnam veterans. Additionally, one of these four studies, Pargament et al. (1994), was reviewed in the previous section as they examined both positive and negative religious coping activities. Thus, though two of the studies did not focus on a military sample or on exposure due to combat, they are reviewed in this section as they highlight the evidence in the literature for the differential effects of positive and negative religious coping strategies in attempting to cope with posttraumatic stress.

In the sole study containing a military sample, Nelson-Pechota (2003) retrospectively surveyed Vietnam veterans (n = 154) who experienced combat during their tour of duty during the Vietnam War. Of note is that the author did not specifically refer to religious coping as the construct of interest, but rather included measures of positive and negative spirituality. The study included three positive spiritual variables (i.e., life purpose, current worship attendance, and overall spirituality) and two components of negative spirituality (i.e., spiritual alienation and difficulty reconciling faith with Vietnam experiences; Nelson-Pechota, 2003).

Using hierarchical regression analyses, the author found that overall positive aspects of spirituality were significantly associated with less psychological distress as operationalized through measures of PTSD and affective guilt ($ps < .01$); while negative components of spirituality were associated with increased PTSD symptomology ($ps < .05$; Nelson-Pechota, 2003). Specifically, two out of the three positive spirituality variables were significantly related to better outcome. The two variables were satisfaction with one's life

(including a sense of meaning and purpose) and attendance at church worship services (Nelson-Pechota, 2003). Both dimensions of negative spirituality were significantly associated with more severe PTSD symptomology, whereby veterans who reported feeling more alienated from God and/or had difficulty reconciling their faith with their Vietnam experiences reported increased levels of distress (Nelson-Pechota, 2003).

The second study used three different samples that had experienced various traumatic events: 1) survivors of the bombing of the federal building in Oklahoma (n = 296), 2) hospitalized medical patients (n = 540), and 3) college students who had experienced a serious traumatic event (n = 551; Pargament et al., 1998a). Positive and negative religious coping strategies were measured using the same measure used in the present study, the Brief Religious Coping Scale (R-COPE; Pargament, et al., 1998a). Additionally, several health-related outcomes were measured including a measure of PTSD symptoms (Foa, Riggs, Dancu, & Rothbaum, 1993).

In all three samples, positive religious coping strategies were significantly positively associated with stress-related growth while negative religious coping strategies were significantly positively related to stress, depression, and a lower self-reported quality of life (Pargament et al., 1998a). Additionally, positive and negative religious coping were uncorrelated in the Oklahoma City sample (r = .03, *NS*), and modestly correlated in the college student sample (r = .17, p < .001) and in the hospital sample (r = .18, p < .001).

A final study compared the effect of using negative religious coping strategies in a sample (n = 245) consisting of two groups experiencing traumatic events (one group from a Roman Catholic church, n = 49; and one group of college students, n = 196; Pargament et al., 1998b). The main purpose of the study presented an attempt to identify religious warning

signs (what the authors termed “red flags”) of people in crises due to the experience of a major negative life event (Pargament et al., 1998b).

In line with the authors’ purpose, a new measure of negative religious coping strategies was created for the study entitled the Religious Red Flags scale (Pargament et al., 1998b). Mental health measures used in the study included a measure of self-esteem (Rosenberg, 1965), a measure of trait anxiety (Trait Anxiety Inventory, TAI; Spielberger, Gorsuch, & Lushene, 1970), and a measure of active, purposeful problem solving skills (the Behavioral Attributes of Psychosocial Competence scale; BAPC; Tyler, 1978). Finally, three event-related outcome measures were used including: a 10-item measure of negative affect based on the work of Watson, Clark, and Tellegen (1988), a 3-item measure of religious outcome focusing on “perceived changes in closeness with God, closeness to the church, and spiritual growth in response to the event” (Pargament et al., 1990, p. 806), and a 5-item measure of general outcome derived from Lazarus & Folkman (1984).

Using correlational analyses, the authors found that the negative religious coping dimensions of religious apathy, feeling punished by God, being angry at God, having religious doubts, experiencing interpersonal religious conflict, and conflict with church dogma to be the most clearly related to poorer mental health outcome ($ps < .01$; Pargament et al., 1998b). However, two posited negative religious coping dimensions were modestly significantly related to positive mental health outcome, the self neglect and religious denial dimensions ($ps < .05$; Pargament et al., 1998b).

In sum, the existing literature on religious coping with traumatic events, though in its infancy, points to positive and negative strategies which generally reflect opposite attitudes regarding God. These discrepant views of God tend to result in respective positive and

negative mental health and stress outcomes. In accordance with these results, the current study included a measure of religious coping shown to capture both positive and negative religious coping strategies. It was expected that the use of more positive religious coping strategies would act as a resiliency factor in the face of the traumatic events of combat exposure; while the use of more negative religious coping strategies would increase the severity of psychological distress experienced post combat.

2.33 Trait forgiveness as a potential resiliency factor. Forgiveness represents an important coping response to a fundamental human challenge faced by every soldier engaged in war – how to maintain relatedness with fellow humans in the face of being harmed by them or, alternatively, in his or her harming of others (Fincham, Jackson, & Beach, 2005). Essentially, harm to self and/or harm to others within the combat arena can be thought of as types of battlefield transgressions. Due to the nature of transgressions often forcing people to grapple with dissonant information with previous held assumptions about themselves, others, or the world, they can cause considerable psychological distress in the form of extreme dissonance, guilt for past behaviors, and feelings of hostility that can be difficult to resolve (Janoff-Bulman, 1992). Research has shown that difficulty forgiving transgressions is associated with poorer health outcomes (e.g., Mauger et al., 1992). Conversely, research has shown that the ability to forgive is associated with better psychological health and physical functioning (e.g., McCullough & Witvliet, 2002; Toussaint, Williams, Musick, & Everson, 2001).

Combat veterans frequently express guilt over past behaviors. Research has shown a link between this felt guilt and negative mental health problems including PTSD (e.g., Henning & Frueh, 1997). Furthermore, hostile feelings are one of the hallmark symptoms of

PTSD (American Psychiatric Association, 1994). Though forgiveness and combat-related PTSD have both individually been extensively studied in the literature, the potential of forgiveness to act as a resiliency factor in the relation between combat exposure and psychological distress has just recently been initially examined (Witvliet, Phipps, Felman, & Beckham, 2004).

Data for this landmark study was drawn from a Veteran Affairs Medical Center outpatient PTSD clinic located in the southeast United States. The sample consisted of 213 male and female veterans who completed three assessment sessions – a questionnaire packet, a personality test, and the Clinician–Administered PTSD scale (CAPS; Blake et al., 1990). Combat exposure was measured with the same questionnaire to be administered in the current study, the Combat Exposure Scale (CES; Keane, Fairbank, Caddell, et al., 1989). Trait forgiveness was measured with the Forgiveness of Others and Forgiveness of Self Scales (Mauger, Perry, Freeman, et al., 1992). The authors also included the same measure of religious coping used in the present study, the Brief RCOPE (Pargament et al., 1998a).

Multivariate regression analyses resulted in significant associations between dispositional difficulty forgiving others, difficulty forgiving oneself, and negative religious coping with difficulties in mental health for military veterans with PTSD ($p < .001$; Witvliet et al., 2004). Contrary to previous research, positive religious coping (e.g., seeking spiritual support, collaboration with God in solving the problem, positive religious appraisals of the problem) was not significantly associated with better health outcomes (Witvliet et al., 2004).

Recently, Snyder, Thompson and their colleagues (e.g., Thompson, Snyder, et al., in press) have derived a theory that may provide insight into the possible relation between forgiveness and the psychological distress occurring after the experience of a traumatic

event. In their theory, the authors operationalize forgiveness as "*the adaptive framing of a seeming mistreatment or transgression such that one is no longer constrained by a negative attachment to it*" (Thompson et al., in press, p. 5). In essence, the authors conceptualize transgressions as events with the tendency to result in a perceived negative bond to the outcome of the transgressing (or traumatizing) event. This tendency manifests in a propensity to remain cognitively attached to the event leading to intrusive thoughts and a desire to withdraw (Thompson et al., in press).

Research shows that intrusive thoughts are the dominant symptom in the immediate aftermath of trauma (McFarlane, 1992). So, essentially, forgiveness can decrease psychological distress in the traumatized person by allowing him or her to "let go" of the traumatic event such that the mental negative connection to the traumatic event (or person as the case may be) is no longer perceived (Snyder & Heinze, 2005). Following the tenets of this theory, the present study postulated a moderating role of trait forgiveness in the link between combat exposure and both mild and severe symptoms of psychological distress.

2.34 Meaning in military duties as a potential resiliency factor. Sustaining an important commitment in life is enhanced by a sense of coherence of the world (Antonovsky, 1979). A helpful sense of coherence includes the beliefs that the world is safe and predictable, that it is worthy of investing energy in, and that individuals can exercise some reasonable mastery in daily life events. However, as Janoff-Bulman (1992) has documented, traumatic events shatter all of these assumptions; claiming that posttraumatic symptoms result from an individual's conscious or unconscious attempts to cope with this loss of meaning. For some, after a traumatic event, the world no longer seems orderly and safe, nor worthy of one's investment. When these basic assumptions about the world are askew due to

exposure to traumatic events and become misaligned with previous beliefs, this mismatch can result in a disorganized memory structure as manifested in PTSD (McFarlane, 2000).

Following a traumatic event, often traditional purposeful meanings in life may seem inadequate and empty, leaving individuals without a definitive sense of direction. Contrarily, taking a positive outlook on traumatic events my buffer their negative effects somewhat by providing a background purpose to the events, decreasing the tendency for these events to misalign previously held assumptions (Decker, 2007).

As alluded to previously, the present study adopted Suedfeld, Fell, and Krell's (1998) suggestion that three components of adaptation are compromised during exposure to trauma: comprehensibility, manageability (i.e., active coping skills), and the meaningfulness of one's actions (i.e., futility). More specifically, the present study focused on the meaningfulness of one's actions. The reason for this focus was twofold. First, duties performed while in the military role take on great significance for service members, especially when adequate performance in these duties could be the difference between living and dying as is the case during combat. Second, it has been argued in the literature that a possible explanation for the higher prevalence rates of PTSD witnessed in Vietnam veterans is that as the popularity of the war decreased; soldiers lost meaning in their military roles (Bremner, Southwick, Darnell, & Charney, 1987; Foy et al., 1984).

Though the specific construct of meaning in military duties is new to the present study, three related studies were located. The first two studies looked at the impact of positive appraisals of one's military service on the link between combat exposure and psychological distress. The third study examined the impact of loss of meaning on this same relation.

The first study included a sample of male Vietnam veterans taken from the NVVFRS (Kulka et al., 1990; *n* = 1183). Outcome was measured via the Mississippi Scale for Combat-Related PTSD (M-PTSD; Keane et al., 1988). Tertiary appraisals, defined as the long-term ongoing appraisals of the impact produced from a negative trauma experience (Janoff-Bulman, 1992) were adapted from the NVVFRS (Kulka et al., 1990). Specifically, two salience items ("How much would you say the Vietnam war has affected your everyday life?" and "Being in the Vietnam war was the biggest event in my life up until now.") and two valence items ("Overall, do you feel that you personally benefited in the long run or were set back in the long run by having been involved in the Vietnam war?" and "What effect has military service had on your life?") were adapted for use as measures of tertiary appraisals (Dohrenwend, Neria, Turner, et al., 2004).

After controlling for combat exposure (as measured through perusal of military records), using logistic regression analyses, Dohrenwend and colleagues (2004) found that veterans with low-salience positive appraisals of their past military service had lower levels of PTSD than veterans with both low- and high-salience negative appraisals. That is, veterans who reported placing relatively less (versus relatively more) significance in their appraisals of their *positive* experiences in Vietnam fared significantly better than did the veterans who placed either more or less import on their *negative* experiences in Vietnam (Dohrenwend et al., 2004).

In the second study conducted to examine whether appraisals of desirable and undesirable effects of military service mediated the effect of combat stress on PTSD, researchers found among an older sample of male veterans aged 44-91 years (*M* = 63.56, *SD* = 7.46; *n* = 1287), that although lifelong negative consequences of combat exposure were

observed, the perception of positive meaningful benefits from the stressful experience mitigated the effects (Aldwin, Levenson, & Spiro, 1994). The researchers used path analyses to determine if reports of desirable experiences in the military mitigated the effects of combat exposure (as measured by the CES, Keane et al., 1989) on PTSD (as measured by the MISS, Keane et al., 1988). Though no significant relation emerged between the report of desirable and undesirable experiences in the military, taken together these two variables accounted for 15 percent of the variance in PTSD symptoms ($F_{(3, 1283)} = 78.24$, $p < .0001$). Specifically, those who reported more undesirable military experiences reported more symptoms of PTSD in later life, whereas those who reported more desirable military experiences reported fewer symptoms of PTSD (Aldwin et al., 1994).

Finally, in the third study, Fontana and Rosenheck (2005) studied the help-seeking behaviors of Vietnam veterans ($n = 1198$) using data from the National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990). Using chi-square tests of the relations between meaning (high vs. low) and use of clerical (yes vs. no) and mental health services (yes vs. no), the researchers found that veterans who suffered a greater loss of meaning from their war experiences were more likely to seek help for symptoms of psychological distress ($\chi^2_{(1, n = 1168)} = 12.99$, $p < .01$).

Again, it is important to reiterate that while the literature examining the potential increase in resiliency resulting from an ability to find a general sense of meaning in the trauma experience is an area of previous exploration (Ehlers & Clark, 2000; Fiarbrother & Rachman, 2006); the more specific construct of finding positive meaning in one's military duties represents uncharted territory. Therefore, the present study used a measure of this construct specifically derived for this study in an exploratory attempt to examine the

potential moderation of the link between combat exposure and subsequent psychological distress by the meaning derived from the military role.

2.4 The Present Study

The primary purpose of this dissertation research was to examine whether psychological distress arising from combat exposure was moderated by the potential resiliency factors positive religious coping, trait forgiveness, and meaning in one's military duties in a sample of U.S. soldiers who were currently deployed to Iraq. Negative religious coping was also examined for its potential to exacerbate the relation between combat exposure and psychological distress.

2.41 Conceptual model tested in the current study. A conceptual model of the relation between the main variables examined in the current study is presented in Figure 2 below. This model, which is congruent with both Lazarus' CR theory (1999) and Hobfoll's expansion of CR theory, Conservation of Resources Theory (COR; 2001), depicts how negative coping strategies (i.e., negative religious coping) following combat exposure (replete with environmental demands) influence the potential development of secondary losses such as psychological distress and PTSD. In turn, positive coping strategies and personal resources (i.e., positive religious coping, generating increased meaning in one's military duties, and trait forgiveness) are likely to lessen the negative impact of combat exposure by providing more "weight" on the coping side of the seesaw by either increasing or helping to more readily refill the resource reservoir (Lazarus, 1999).

More specifically presented in Figure 2, adaptive approach coping strategies (i.e., positive religious coping, trait forgiveness, and placing more meaning in one's military duties) were posited to act as resiliency factors, thus negatively moderating the link between

combat exposure and psychological distress (Hobfoll, 2001). Conversely, negative religious coping was posited to act as a source of increased cognitive and psychological environmental demand. This was hypothesized to result in a greater shift in balance towards the environmental demands side of the seesaw.

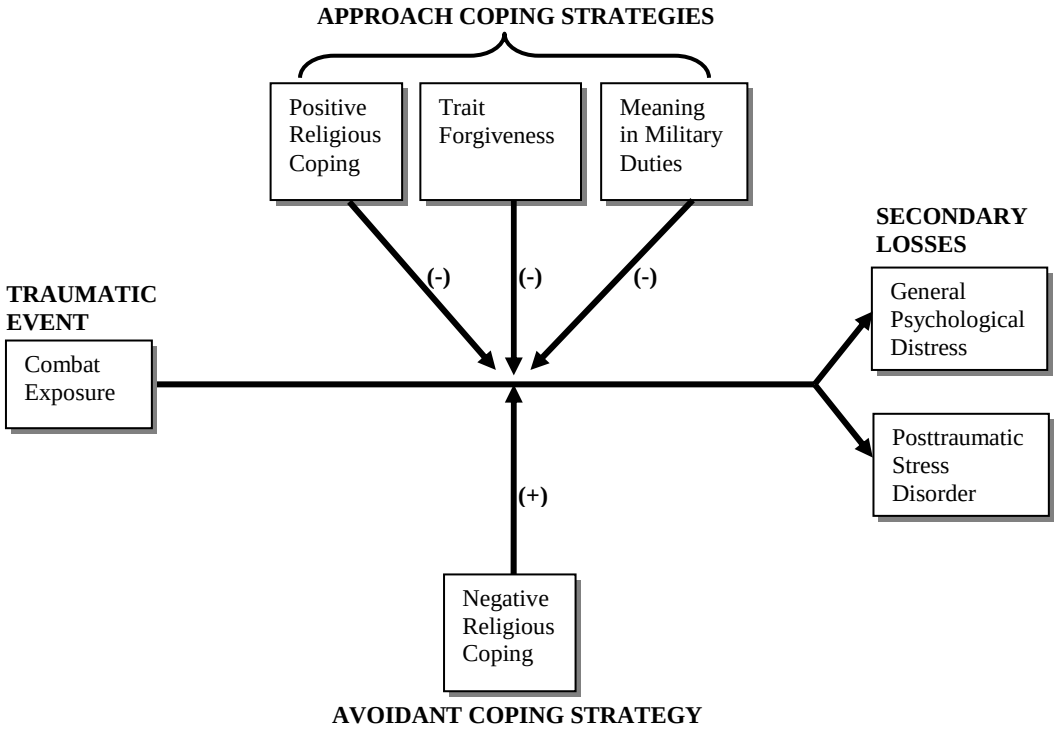

Figure 2. Moderation of Psychological Distress following Exposure to Combat

As a personal resource, trait forgiveness was presented as negatively moderating the link between combat exposure and psychological distress by increasing or decreasing one's tendency to let go of negative affect (Witvliet et al., 2004). Additionally, the CR-based model in the current study hypothesized that an increased tendency to be forgiving (i.e., possession of high trait forgiveness), would serve as one buttress supporting the key internal resource of social connectedness thus increasing social support, a key external resource identified in the literature. (e.g., Eggendorf et al., 1981, Flannery, 1990; Fontana & Rosenheck, 1994;

Fontana et al., 1997; King et al., 1998; Solomon et al., 1987; Sutker, et al., 1995). Conversely, as delineated above, as a hypothesized avoidant coping strategy, negative religious coping was posited to act as a positively moderating link between combat exposure and psychological distress with increased use of negative religious coping associated with increased psychological distress.

2.42 Research questions and hypotheses. Based on the above review of the relevant literature and the conceptual and theoretical framework for this study, the following research questions and hypotheses were investigated:

Research Question #1: Would U.S. soldiers currently involved in the Iraqi War experiencing greater exposure to traumatic combat events be more likely to report both milder and more severe symptoms of psychological distress than those with less combat exposure? Relevant studies in the above literature review report a positive relationship between the amount of combat exposure and the intensity of distress experienced (e.g., King et al., 1998; Kulka et al., 1990). Hypothesis #1 predicts that combat exposure will be positively associated with symptoms of psychological distress including PTSD.

Research Question #2: Does positive religious coping buffer the negative impact of combat exposure? When examined through the theoretical framework of Cognitive Relational theory (CR; Lazarus, 1991), adoption of more adaptive approach-based religious coping strategies lead to appraising past traumatic events less negatively (Lazarus & Folkman, 1984). There is evidence in the literature that positive religious coping acts as a resiliency factor against experiencing psychological distress due to combat exposure. Hypothesis #2 predicted that positive religious coping would significantly moderate the relation between combat exposure and symptoms of psychological distress including PTSD.

Research Question #3: Would negative religious coping exacerbate the relation between combat exposure and subsequent psychological distress? Conversely to positive religious coping, negative religious coping has been found in previous studies to exacerbate the negative impact of trauma on physical health and mental health (e.g., Pargament et al., 1998b). Hypothesis #3 predicted that negative religious coping strategies will significantly moderate the relation between combat exposure and symptoms of psychological distress including PTSD.

Research Question #4: Does trait forgiveness buffer the negative impact of combat exposure? When examined through the theoretical framework of Cognitive Relational theory (CR; Lazarus, 1991), adoption of more adaptive approach-based religious coping strategies lead to appraising past traumatic events less negatively (Lazarus & Folkman, 1984). There is conceptual reasoning provided in the literature to posit that trait forgiveness may act as a resiliency factor against experiencing psychological distress due to combat exposure. Hypothesis #4 predicted that trait forgiveness would significantly moderate the relation between combat exposure and symptoms of psychological distress including PTSD.

Research Question #5: Does placing positive meaning in one's military duties buffer the negative impact of combat exposure? According to Janoff-Bulman (1992), traumatic events shatter previous assumptions of how the world works resulting in a loss of meaning that has been associated with PTSD. Hypothesis #5 predicted that positive meaning in one's military duties would significantly moderate the relation between combat exposure and symptoms of psychological distress including PTSD.

CHAPTER 3. METHODS

This section begins by describing the sampling population and procedures used during the data collection process. Next, each measure used in this study is presented in detail. This is followed by a narrative of each of the specific hypotheses to be tested in this study. Finally, an overview of the design analyses used to test these hypotheses concludes the section.

3.1 Participants

In an effort to retrieve data from soldiers in the midst of combat (rather than retrospectively), it was necessary to collaborate with two U.S. Army officers, both of whom are mental health professionals who were forward deployed with the surveyed battalion at the time of data collection. At their request, the present study omits information delineating specific deployment locations and enemy engagements.

Data was collected from 366 U.S. Army infantry soldiers deployed to Iraq between the fall of 2004 and the spring of 2005. Respondents were given the opportunity to participate in the study by their commanding officers as part of a larger investigation of the mental health of forward deployed soldiers. The overall mean age of the participants was 25 years, (SD = 5.1). Of the 366 participants, 323 were male and 43 were female. The participants represented a fairly diverse ethnic make-up with 52% Caucasian (n = 189), 19% African American (n = 68), 15% Latino (n = 55), and 14% Other (n = 27). The demographics of the present study are presented in Tables 6, 7, 8, and 9 below. Specifically, Table 6 presents the demographic proportions of the sample by sex, Table 7 presents the means and standard deviations of the demographic variables by sex, Table 8 presents the means and

standard deviations by rank, and Table 9 presents the means and standard deviations by ethnicity.

Table 6.
Proportions of Demographics by Sex

Variable		**Men (*n* = 323)**		**Women (n = 43)**	
Ethnicity	Caucasian	178	(55.1%)	11	(25.6%)
	Latino/a	52	(16.1%)	6	(14.0%)
	African-American	49	(15.2%)	21	(48.8%)
	Other	42	(13.6%)	4	(11.6%)
Rank	Soldiers (E1-E4)	185	(57.3%)	27	(62.8%)
	Non-Commissioned Officer/Officers	138	(42.7%)	16	(37.2%)
Military Status	Active Duty	320	(99.1%)	42	(97.7%)
	National Reserve	1	(0.3%)	1	(2.3%)
	National Guard	2	(0.6%)	0	
Marital Status	Married	174	(53.9%)	18	(41.9%)
	Single	149	(46.1%)	25	(58.1%)
Have Children	Yes	135	(41.8%)	15	(34.9%)
	No	188	(58.2%)	28	(65.1%)

Table 7.
Means and Standard Deviations of Demographics by Sex

Variable	**Men (*n* = 323)**		**Women (*n* = 43)**	
	Mean	***SD***	**Mean**	***SD***
Age	25.15	4.78	26.05	6.16
Time in Service (in years)	4.68	3.93	5.22	5.67
Combat Exposure (in months)	17.10	5.14	11.91	3.92

Table 8.
Means and Standard Deviations of Demographics by Rank for Men, Women, and Total Sample

Variable	Soldiers			NCOs/Officers		
	Men (*n* = 185)	**Women (*n* = 27)**	**Total (*n* = 212)**	**Men (*n* = 138)**	**Women (*n* = 16)**	**Total (*n* = 154)**
Age	23.51 (3.61)	23.48 (4.11)	23.50 (3.67)	27.39 (5.26)	30.06 (6.89)	27.67 (5.49)
Time in Service (in years)	2.85 (1.94)	2.41 (1.14)	2.79 (1.86)	7.20 (4.55)	9.51 (7.20)	7.44 (4.91)
Combat Exposure (in months)	17.43 (5.08)	11.74 (4.02)	16.71 (5.30)	16.63 (5.23)	12.44 (3.83)	16.19 (5.26)

Table 9.
*Means and Standard Deviations of Demographics by Ethnicity for Men**

Variable	Ethnicity		
	Caucasian (*n* = 181)	**African-American (*n* = 51)**	**Latino (*n* = 49)**
Age	24.63 (4.17)	27.25 (6.35)	24.41 (4.37)
Time in Service (years)	3.94 (3.01)	6.96 (5.61)	4.80 (3.73)
Combat Exposure (months)	17.95 (5.07)	15.47 (6.04)	16.26 (4.40)

*Note: Descriptives on women are not reported due to insufficient cell size

3.2 Procedures

Surveys were assembled at Iowa State University and then sent to two mental health professionals (one U.S. Army psychologist and one U.S. Army social worker) to be administered to the soldiers in their battalion. Both U.S. Army officers were currently

forward deployed in Iraq as part of a first response mental health team during the time of data collection. In a collaborative effort and with permission from the battalion commanding officers, the two Army mental health officers agreed to administer the measures used in the present study as part of their greater research efforts on the exploration of the detrimental impact of combat on the mental health of soldiers (see Appendix B for Institutional Review Board information). All participants were informed that their responses were anonymous (i.e., contained no identifying information) and that the results of the surveys were to be used for research purposes only. Thus, careful attention was paid to ensuring all participants understood that no one within their battalion would see their responses (including their commanding officers), and that no part of the survey would ever be included or mentioned in their military personnel or medical records.

Specifically, the soldiers completed a 160-item questionnaire packet including the 45-items of the OQ-45 as well as additional items measuring demographic variables, religious commitment, positive and negative religious coping, trait forgivingness, degree of combat exposure, symptoms of PTSD, and meaning in military duties (see Appendix C for a full copy of all measures used). The survey measures were then returned to Iowa State University to be input and analyzed for the present study.

3.3 Measures

3.31 Combat Exposure Scale (CES; Keane, Fairbank, Caddell, Zimering, Taylor, & Mora, 1989). The CES is a 7-item self-report measure that assesses wartime stressors experienced by combatants. Items are rated on a 5-point frequency (1 = “no” or “never” to 5 = “more than 50 times”), a 5-point duration (1 = “never” to 5 = “more than 6 months”), a 4-point frequency (1 = “no” to 4 = “more than 12 times”) or a 4-point degree of loss (1 = “no

one" to 4 = "more than 50%") scale. Participants are asked to respond based on their exposure to various combat situations, such as firing rounds at the enemy or being on dangerous duty (example, "Were you ever surrounded by the enemy?", 1 = "no" to 5 = "more than 12 times"). The total CES score (ranging from 0 to 41) is calculated by using a sum of weighted scores, which can be classified into 1 of 5 categories of combat exposure ranging from "light" to "heavy." Moderate exposure was indicated by a score of 17 to 24, moderate-heavy exposure by a score of 25 to 32, and heavy exposure by a score of 33 to 41.

The CES was developed for use in the National Vietnam Veterans Readjustment Study (NVVRS), a retrospective study of the effects of exposure to trauma and traumatic military events. In the assessment of its psychometric properties, the CES demonstrated an internal consistency value of .85. The internal consistency within the current study was somewhat lower (α = .754). Test-retest reliability with a one-week interval was assessed using three groups of heterogeneous veterans. The calculation for the three groups combined was r = .97. There were no between-group differences in the test-retest correlations, with excellent stability indicated over the one-week interval.

A principal-components analysis conducted by Keane et al. (1989) using varimax rotation generated a single factor with an eigenvalue greater than 1.0. Because a single factor accounted for 57.6% of the common variance among the items, the authors concluded that the scale measured a single construct of combat exposure. Construct validity was established by comparing Vietnam veterans' scores on the CES with whether or not they had been previously diagnosed with PTSD using DSM-III (1980) criteria. The veterans with a diagnosis of PTSD scored significantly higher on the CES (t = 2.98, p < .005) than veterans without a diagnosis of PTSD. Scores on the CES significantly correlated with scores on the

Mississippi Scale for Combat related PTSD, an established scale measuring combat exposure. The CES was developed to be easily administered and scored and is useful in both research and clinical settings.

3.32 Outcome Questionnaire-45 (OQ-45; Lambert, Lunnen, Umphress, Hansen, & Burlingame, 1994). The OQ-45 is a symptom and distress inventory originally developed to assess client functioning. The items of the OQ-45 were developed to reflect three broad content areas cited as critical in measuring patient status and psychotherapy outcome (Horowitz, Lambert, & Strupp, 1994). According to the authors, these three areas reflect, "the need to evaluate changes that occur within the client, in the client's intimate relationships, and in the client's participation in community and social roles" (Lambert & Hill, 1994; p. 79). Thus, the OQ-45 is a 45-item questionnaire that results in a total score assessing level of client distress, as well as scores on three subscales assessing Symptom Distress (SD), Social-Role functioning (SR) and Interpersonal Relationships (IR). The measure's 45-items address the most commonly occurring problems spanning a variety of disorders. Each item is scored on a five-point scale (0 = never, 1 = rarely, 2 = sometimes, 3 = frequently, 4 = almost always) yielding a possible range of scores from 0 to 180. Higher scores on the OQ-45 indicate higher levels of client distress. More specifically, an OQ-45 total score $\geq$ 64 is considered to fall in the clinical range (Lambert, Burlingame, Umphress, Hansen et al., 1996). Of the 366 soldiers sampled in this study, 96 (25%) scored at or above this cut-off.

The reliability and validity of the OQ-45 total score is well-established. Psychometric evaluations resulted in internal consistency levels of .93 (Lambert et al., 2004) and in a three-week test-retest reliability of .84 (Kadera, Lambert, & Andrews, 1996; Umphress, Lambert,

Smart, & Barlow, 1997). The internal consistency level within the current study was .947. Concurrent validity figures were calculated by comparing the OQ-45 total score with total scores from similar measures including the Symptom Checklist-90 (SCL-90; Derogatis, 1977), Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988), Zung Depression Scale (Zung, 1965), and the State-Trait Anxiety Inventory (STAI: Spielberger, 1983). All of the concurrent validity figures with the OQ-45 total score and the above instruments were significant at the .01 level with *rs* ranging from .50 to .85 (Umphress et al., 1997).

The construct validity of the OQ-45 total score was demonstrated via examination of differences in mean scores between patients and community samples, as well as with various clinical samples presenting with varying levels of psychopathology. Discriminant validity figures, obtained using a one-way Analysis of Variance (ANOVA) and pairwise comparisons, found statistically significant mean differences between the above samples with the inpatient unit sample mean OQ- 45 total score being significantly higher than the mean scores from either the college counseling center or community samples, and the community sample mean OQ-45 score being significantly lower than the mean scores from the college counseling center sample (Umphress et al., 1997).

Though theoretically sound, due to their high intercorrelations, there is some question in the literature concerning the empirical ability of the three subscales of the OQ-45 to measure the three domains of interest independently (Anderson & Lambert, 2001; Mueller, Lambert, & Burlingame, 1998). In their examination of the construct validity of the OQ-45 using a confirmatory factor analysis, Mueller et al. (1998) failed to support the multifactor structure of the OQ-45 concluding that though perhaps of clinical interest, independent use of the three subscales is not recommended. Rather, strong support was found for the use of the

OQ-45 total score (composed of the sum of the three subscales) as a measure of psychological symptom distress. Following this recommendation, only the total score, which provides a global assessment of functioning, was used in this study.

3.33 Trauma Screening Questionnaire (TSQ; Brewin, Rose, Andrews, Green, Tata, McEvedy, Turner, & Foa, 2002). The TSQ, based on items from the PTSD Symptom Scale – Self-Report (PSS-SR; Foa et al., 1993), is a brief 10-item symptom-based screening instrument for the diagnosis of posttraumatic stress disorder (PTSD). Each of the ten items is derived from the DSM-IV (1994) criteria for the diagnosis of PTSD and describes either a reexperiencing symptom (items 1-5) or an arousal symptom (items 6-10). The TSQ is scored via the use of a frequency threshold allied to a 'YES/NO' response format such that positive endorsement of any six or more items (representing the optimal cut-off point) is required for indication of PTSD. The Kuder-Richardson 20 (KR-20) reliability estimate within the current study was .835.

The TSQ has undergone initial validation with diverse populations in a two-part study which assessed its' reliability and validity (Brewin et al. 2002). Participants in the first part of the study had all been passengers on one of two trains that crashed into one another at Ladbroke Grove, London, on October, 5, 1999. There were high levels of injury and death in this accident, both from the impact and from the smoke inhalation. Three groups of respondents were studied: 18 patients treated at St Mary's Hospital, Paddington; 15 patients treated at the Royal Berkshire Hospital, Reading; and 8 members of a survivors group set up after the crash. The sample consisted of 21 men and 20 women with an average age of 38 years (*SD* = 3). All participants took part in a structured clinical interview to diagnose the

presence or absence of PTSD one week after answering the ten questions of the TSQ. Results indicated that there was excellent prediction of a PTSD diagnosis with a sensitivity of 0.86 and a specificity of 0.93 (Brewin et al., 2002). That is, a PTSD diagnosis was present in 86% of individuals who made a YES response to at least six reexperiencing or arousal symptom items, in any combination, and was not present in 93% of individuals who made a YES response to fewer than six items, in any combination (Brewin et al., 2002). The authors then replicated these findings using data from a previous study of 157 crime victims finding a sensitivity of .91 and a specificity of .92 (Bewin et al., 2002).

Further demonstration of the TSQ's concurrent validity was shown in a study of 562 individuals who presented at a hospital emergency room following physical assault, and who then subsequently completed the TSQ between one and three weeks later. Respondents also completed the Davidson Trauma Scale (DTS; Davidson, 2003) at one month and six months following the assault to determine the presence of PTSD. Statistical analyses demonstrated the predictive validity of the TSQ resulting in a sensitivity of .85, and a specificity of .89 in the prediction of PTSD (Walters, Bisson, & Sheppard, 2007).

3.34 Trait Forgivingness Scale (TFS; Berry, Worthington, O'Connor, Parrott, & Wade, 2005). The TFS consists of 10 items designed to assess a respondent's self-appraisal of his or her disposition to forgive. The TFS was adapted from a 15-item scale designed to measure trait forgivingness in an earlier study examining this construct along with relationship quality and cortisol level (Berry & Worthington, 2001). The TFS is scored on a five-point Likert-type scale from (1 = Strongly Disagree) to (5 = Strongly Agree). Scores range from 0 to 50 with higher scores indicating more tendency to be forgiving.

In a set of four studies, the authors revealed the TFS to have satisfactory internal consistency with alphas of .80, .78, .79, and .74 and corrected item-total correlations for all items, across all studies, ranging from .30 to .63 (Berry et al., 2005). The internal consistency within the current study was .759. Pairwise correlations were also computed for the four studies resulting in correlations ranging from .81 to .95 (all *ps* < .01; Berry et al.). In the third study, the authors examined the test-retest reliability of the TFS by administering it twice (with an interval of eight weeks) finding a reliability estimate of $r(60) = .78$ ($p < .001$; Berry et al.).

Rasch scaling, based on Andrich's (1978) rating scale model, was also employed by the authors in all four studies to locate each test item along a linear continuum. This continuum is then used as a "yardstick" to measure test respondents on the variable of interest (in this case, trait forgivingness). There are three indices revealed in Rasch scaling useful in determining item and test quality: a) person separation reliability, b) item separation reliability, and c) mean square fit statistics (Berry et al., 2005). The first of these, person separation reliability, is in essence the proportion of "true" variance (i.e., the upper limit of the proportion of variance not attributable to measurement error). Across the studies, the Rasch person separation reliabilities were .81, .79, .79, and .76 (Berry et al.). The second of these, item separation reliability, again represents an estimate of the "true" variance with large item reliability (i.e., greater than .90) indicating sufficient item separation and acceptably small estimation errors. Across the studies, the Rasch item separation reliabilities were .95, .97, .96, and .90 (Berry et al.). The third and final of these, the mean square fit statistics, estimate each item's contribution to the construction of a unidimensional scale.

According to Linacre (2003), values less than 1.50 are indicative of productive items. The item mean-square statistics across the four studies ranged from .60 to 1.38 (Berry et al.).

A separate study by Berry et al. (2001) provides evidence of the TFS's concurrent validity by correlating individual's responses on the TFS to those provided by their romantic partners, and by then correlating the scores obtained on the TFS with respondents' scores on the Transgression Narrative Test of Forgivingness (TNTF; Berry et al., 2001). In this study, participants (n = 54) were undergraduates from an urban, mid-Atlantic university with a mean age of 24.4 years (SD = 5.5). All participants were couples in a current romantic relationship. The correlation between the individuals' self-ratings and those of their partners was statistically significant $r(51) = .35$ ($p < .01$); as was the Pearson correlation between the TFS and the TNTF $r(49) = 5.5$ ($p < .001$; Berry et al.).

3.35 Brief Religious Coping Scale (R-COPE; Pargament, Smith, Koenig, & Perez, 1998). The R-COPE measures two dimensions of religious coping, one positive (e.g., collaborating with God, seeking spiritual support) and one negative (e.g., questioning the power of God, attributing problems to being punished by God). The R-COPE is a 14-item measure with each item being measured on a 4-point Likert-type scale ranging from (0 = Not at all to 3 = A great deal). There are seven items which measure dimensions of positive religious coping and seven items which measure dimensions of negative religious coping. The internal consistency within the current study for the seven items measuring positive religious coping was .942. The internal consistency within the current study for the seven items measuring negative religious coping was .855.

Preliminary investigations involving participants in three diverse samples have demonstrated the R-COPE's reliability and validity (Pargament et al., 1998). The first sample

consisted of participants who were members of two churches in Oklahoma City during the bombing of the federal building (*n* = 296), the second sample consisted of college students (*n* = 540) who had all experienced a serious negative life event (e.g., death of a family member or friend, problems with romantic relationships), and the final sample consisted of medical patients (all over the age of 55; *n* = 551) coping with medical illness.

Factor analyses in each of the three samples yielded two factor solutions consistent with the hypothesized patterns of positive and negative religious coping. The two patterns were also associated with different mental health outcomes. Positive religious coping was correlated with lower levels of psychological distress, greater self-reported growth, and more positive interviewer ratings. Negative religious coping was tied to higher levels of depression, lower quality of life, more psychological symptoms, and greater callousness toward others.

Specifically, this study found the negative and positive religious coping scales to be uncorrelated to each other in the Oklahoma City and hospital samples (*rs* = .17, .18; respectively), and minimally significantly correlated to each other in the college sample (r = .17, $p < .001$; Pargament et al., 1998). Internal consistency was adequate across samples with Cronbach's coeeficient alphas ranging from .69 to .87 (Pargament et al.). Confirmatory factor analyses resulted in adequate goodness of fit indices (GFI) ranging from .945 to .934 (with values greater than .9 being considered acceptable; Gerbing & Anderson, 1992).

3.36 Meaning in Military Duties Scale. The MMD was created for this study. The items were written to assess how meaningful active duty soldiers believed their military duties and activities to be. Items such as "The work that I am doing is worthwhile" and "My role in the military is meaningful to me", showed adequate internal consistency (α. = .654).

Items are scored on a five-point Likert-type scale ranging from (1 = Strongly Disagree) to (5 = Strongly Agree), with scores ranging from 0 to 50. The higher score, the more meaning the soldier places in her or his military duties.

The psychometric properties of the MMD were examined in a separate sample from the present study of 384 army personnel actively deployed in a military zone. Exploratory principal components factor analysis indicated that the MMD had a single predominant factor. A second factor did emerge in the initial computation; however, the eigenvalue for this factor was only 1.06. Furthermore, the items that loaded on this factor were those that were reverse-scored, suggesting a method factor due to the way the items were asked rather than a separate construct being assessed. The principal components analysis was therefore rerun restricting the factor structure to 1. This resulted in all 10 items loading on that single factor at .61 or above. This single factor accounted for 49.8% of the variance. This suggests that the scale is measuring one single construct.

Internal consistency reliability was estimated at .89 (Cronbach's alpha). Concurrent validity was supported with a significant bivariate correlation between the MMD and a 5-item scale measuring the participants' perception of their military efficacy (measured with items such as "I will be able to perform effectively during the deployment"), $r_{(375)} = .61$, $p < .001$. Predictive validity was assessed by comparing scores on the MMD across military rank to explore whether higher rank predicted higher scores on the MMD. A significant one-way analysis of variance ($F_{(2, 373)} = 9.51$, $p < .001$), indicated that, as expected, officers reported significantly greater meaning in their military duty than enlisted soldiers. In addition, non-commissioned officers also reported greater meaning than soldiers. A significant linear trend

($F_{(1, 373)} = 18.59$, $p < .001$), indicated that as rank increased so did reported meaning in military duty.

3.4 Hypotheses

The following set of hypotheses was tested. It was expected that several protective factors would be statistically significant predictors of symptom distress and PTSD. Specifically, it was expected that after accounting for variation due to ethnicity, time in service, and rank (i.e., soldier [Private to Specialist; E1-E4]) versus non-commissioned officer/officer (i.e., those at or above the rank of Sergeant [E5 and above]), the following relations would emerge.

1) Positive religious coping would significantly moderate the relation between combat exposure and symptoms of psychological distress as measured by the OQ-45.

2) Negative religious coping would significantly moderate the relation between combat exposure and symptoms of psychological distress as measured by the OQ-45.

3) Trait forgiveness would significantly moderate the relation between combat exposure and symptoms of psychological distress as measured by the OQ-45.

4) Meaning in military duties would significantly moderate the relation between combat exposure and symptoms of psychological distress as measured by the OQ-45.

5) Positive religious coping would significantly moderate the relation between combat exposure and symptoms of posttraumatic stress disorder as measured by the TSQ.

6) Negative religious coping would significantly moderate the relation between combat exposure and symptoms of posttraumatic stress disorder as measured by the TSQ.

7) Trait forgiveness would significantly moderate the relation between combat exposure and symptoms of posttraumatic stress disorder as measured by the TSQ.

8) Meaning in military duties would significantly moderate the relation between combat exposure and symptoms of posttraumatic stress disorder as measured by the TSQ.

CHAPTER 4. RESULTS

This chapter presents the preliminary results of two distinct sets of analyses, followed by a third set of analyses which tested the above hypotheses. First, the results of the independent samples *t*-tests and analyses of variance (ANOVAs) used to determine the existence of differences in degree of psychological distress and PTSD as a function of demographic variables (i.e., sex, ethnicity, rank, time in service, and combat exposure) are presented. Next, the second set of analyses calculating the bivariate correlations by sex between demographic variables, symptoms of PTSD, combat exposure, degree of trait forgiveness, amount of meaning in military duty, positive and negative religious coping, and level of psychological distress are presented by sex. Finally, the third set of analyses consisting of hierarchical multiple regressions which tested the study's hypotheses are examined.

4.1 Means and Standard Deviations of Study Variables by Sex

Table 10 below presents the means and standard deviations of the variables included in the present study by sex. Statistically significant mean differences ($p < .007$) between men ($n = 323$) and women ($n = 43$) for all variables of interest in the current study are denoted in bold.

Table 10 also presents a comparison of the characteristics of the current sample with adult samples surveyed with the same measures used in the present study. Though none of the comparison samples were separated by sex, presenting means and standard deviations from additional samples helps provide a richer description of the current sample. A brief description of each comparison sample is provided in the notes section located directly at the bottom of Table 10.

Table 10.
Means and Standard Deviations of Study Variables by Sex and of Comparison Studies including Combat Exposure, Trait Forgiveness, Positive Religious Coping, Negative Religious Coping, Meaning in Military Duty, Psychological Distress (OQ-45), and Posttraumatic Stress Disorder (TSQ) by Sex

Variable	**Current Sample Men (*n* = 323)**		**Current Sample Women (*n* = 43)**		**Comparison *Samples****		
	Mean	***SD***	**Mean**	***SD***	**Mean**	***SD***	***N***
Combat Exposure	**17.10**	5.15	**12.00**	3.92	19.45	11.97	1198
Trait Forgiveness	31.91	6.08	32.79	6.87	34.10	7.20	59
Positive Religious Coping	**9.02**	6.80	**13.16**	6.70	12.08	3.76	735
Negative Religious Coping	2.62	3.84	2.72	3.42	4.63	1.27	735
Meaning in Military Duties	29.70	4.56	28.47	5.20	36.13	8.22	384
Psychological Distress (OQ-45)	47.31	23.69	52.12	25.84	48.87	20.05	284
PTSD (TSQ)	2.27	2.54	2.81	2.67	1.87	1.09	605

Note: Numbers in bold indicate *p*-value < .001
*Comparison samples were drawn from the following studies: combat exposure sample consisted of 1,198 Vietnam theater veterans (Fontana & Rosenheck, 1998); trait forgiveness sample consisted of 59 clients from 3 university counseling centers (Wade, Bailey, & Shaffer, 2005); positive and negative religious coping samples consisted of 735 members of a Presbyterian church (Pargament, Tarakeshwar, Ellison, & Wulff, 2001); meaning in military duties sample consisted of 384 U.S. Army soldiers (Bailey, Wade, Maier, & Schobitz, 2008); psychological distress consisted of 284 college undergraduates (Lambert & Burlingame, 2000); symptoms of PTSD sample consisted of 605 young adults who had experienced a natural disaster (Parslow & Jorm, 2007)

As shown in Table 10 above, most of the means and standard deviations between samples were comparable with a less than one standard deviation difference between the current sample and the comparison samples, with one notable exception. The sample used to

compare the current sample's average amount of meaning placed in their military duties fell more than one standard deviation below that of the comparison sample. A possible explanation for this difference may be that the comparison sample was measured at the beginning of their deployment to Iraq, while the current sample was measured mid-point through their Iraq deployment. This supports the tenet in the present study that as soldiers are increasingly exposed to warfare, their meaning in their military duties declines.

4.2 Independent-Subjects t-tests for Sex Differences

In an effort to determine the existence of sex differences within the sample, independent samples t-tests were run comparing the mean scores of women and men on several variables of interest. In all, eight comparisons were run prompting the use of a Bonferonni-adjustment for the *p*-value (.05/8 comparisons = .006). Of the eight comparisons, two proved to be statistically significant and six showed no statistically significant mean differences between women and men. Each of these sets will be discussed in turn. Table 11 below presents the results of these *t*-tests.

As can be seen from Table 11, two variables demonstrated statistically significant mean differences between women and men. The first of these was combat exposure ($t_{(364)}$ = 6.24, $p < .001$), with men reporting significantly more combat exposure on average (M = 17.10, SD = 5.15) than women (M = 12.00, SD = 3.92) as expected. The second factor was positive religious coping ($t_{(364)}$ = -4.15, $p < .001$), with the average scores for women (M = 13.16, SD = 6.70) being significantly higher than those for men (M = 9.02, SD = 6.80). No statistically significant differences between sex was observed for time in service, trait forgiveness, the use of negative religious coping, meaning in military duties, and the amounts of reported psychological distress and PTSD.

Table 11.
Independent-Subjects t-tests between Sex for Time in Service, Combat Exposure, Trait Forgiveness, Positive Religious Coping, Negative Religious Coping, Meaning in Military Duty, Psychological Distress (OQ-45), and Posttraumatic Stress Disorder (TSQ)

Variable	***Mean Difference***	***SD***	***Lower***	***Upper***	***T***	***df***	***Sig***
Time in Service	-.35	.68	-1.68	.98	-.52	364	.606
Combat Exposure	5.09 **a**	.82	3.48	6.69	6.24	364	***<.001***
Trait Forgiveness	-.88	1.00	-2.85	1.09	-..88	364	.380
Positive Religious Coping	-4.15 **b**	1.10	-6.32	-1.98	-3.76	364	***<.001***
Negative Religious Coping	-.10	.62	-1.32	1.11	-.17	364	.865
Meaning in Military Duty	1.24	.75	-.24	2.72	1.64	364	.101
Psychological Distress	-4.81	3.89	-12.45	2.84	-1.24	364	.217
PTSD	-.59	.42	-1.42	.24	-1.41	364	.160

Note: Bolded italics = significant at the $p < .006$ level
a = higher mean scores for men; **b** = higher mean scores for women

4.3 Two-way Analyses of Variance of Differences in Ethnicity and Rank

To test for the potential differences by rank (soldiers vs. NCOs/officers) and ethnicity (Caucasian vs. African-American vs. Latino), two-way between-groups Analyses of Variance (ANOVAs) were conducted on the variables of interest in the current study. Due to an insufficient sample size of women in each ethnic group, all analyses were run solely on the sample of men. Of note is the use of a Bonferroni adjustment to control for elevated Type I error due to multiple tests .007 (.05/7).

As shown in Tables 12 thru 18 below, a total of seven individual analyses were run on the following variables: 1) combat exposure, 2) trait forgiveness, 3) positive religious coping, 4) negative religious coping, 5) meaning in military duties, 6) psychological distress, and 7) PTSD. Eta-squared (η^2), or the correlation ratio, was calculated as the effect size. Eta squared falls on a continuum from 0 to 1 and represents the proportion of variance in the dependent variable (e.g., combat exposure) that is explained by the group variable (e.g., ethnicity). Cohen's (1988) guidelines can be used to interpret the eta values, with .01, .06, and .14 representing small, medium, and large effect sizes respectively.

First, Table 12 presents the results of the two-way ANOVA on levels of combat exposure. The analysis yielded no significant main effects for ethnicity ($p > .007$) or for rank ($p > .007$). The interaction effect was also non-significant ($p > .007$).

Table 12.
Two-way Analyses of Variance between Rank and Ethnicity for Combat Exposure

Source of Variation	***df***	**Sums of Squares**	**Mean Square**	***F***	***p*-value**	η^2
Rank	1	40.38	40.38	1.56	.213	.01
Ethnicity	2	231.42	115.71	4.46	.012	.03
Rank x Ethnicity	2	199.21	99.61	3.84	.023	.03
Error	275	7131.19	25.93			

Second, Table 13 below presents the results of the two-way ANOVA conducted to explore the differences of rank and ethnicity in trait forgiveness. There were no statistically significant main effects observed for either rank or ethnicity ($p > .007$). The interaction was also non-significant ($p > .007$).

Table 13.
Two-way Analyses of Variance between Rank and Ethnicity for Trait Forgiveness

Source of Variation	*df*	Sums of Squares	Mean Square	*F*	*p*-value	η^2
Rank	1	55.07	55.07	1.42	.235	.01
Ethnicity	2	86.97	43.48	1.12	.328	.01
Rank x Ethnicity	2	91.52	45.76	1.78	.310	.01
Error	275	10695.08	38.89			

Third, the results of the two-way ANOVA examining the differences in rank and ethnicity in reported use of positive religious coping are presented in Table 14 below. As shown in Table 14, the only significance (which resulted in a medium effect size) was observed for the main effect of ethnicity ($F_{(2, 281)} = 10.00$, $p < .001$, $\eta^2 = .07$). There was no significant difference found for the main effect of rank. Likewise, the ethnicity x rank interaction failed to produce statistical significance.

Post hoc analyses of the medium significant main effect for ethnicity showed that African-Americans ($M = 12.61$, $SD = 6.28$) reported using significantly more positive religious coping than Caucasians ($M = 7.61$, $SD = 6.65$; $p < .001$). There were no statistically significant differences observed between African-Americans and Latinos or between Caucasians and Latinos (*ps* > .007).

Table 14.
Two-way Analyses of Variance between Rank and Ethnicity for Positive Religious Coping

Source of Variation	*df*	Sums of Squares	Mean Square	*F*	*p*-value	η^2
Rank	1	2.18	2.18	.05	.823	<.01
Ethnicity	2	868.27	434.13	10.00	<.001	.07
Rank x Ethnicity	2	89.70	44.85	1.03	.357	.01
Error	275	11943.53	43.43			

Fourth, Table 15 below presents the results of the two-way ANOVA which tested for the differences in rank and ethnicity in reported use of negative religious coping. As presented in Table 15 below, the analysis failed to yield any significant effects. That is, no main effect was found for either rank ($p > .007$) or ethnicity ($p > .007$). There was also no significant rank x ethnicity interaction effect observed ($p > .007$).

Table 15.
Two-way Analyses of Variance between Rank and Ethnicity for Negative Religious Coping

Source of Variation	*df*	Sums of Squares	Mean Square	*F*	*p*-value	η^2
Rank	1	98.54	98.54	6.76	.010	.02
Ethnicity	2	9.13	4.57	.31	.731	<.01
Rank x Ethnicity	2	85.87	42.93	2.95	.054	.02
Error	275	4007.14	14.57			

Fifth, the results of the two-way ANOVA examining the rank and ethnic differences in meaning in military duties are presented in Table 16 below. As shown in Table 16, the main effect for rank was statistically significant ($F_{(1, 281)} = 7.31$, $p = .007$, $\eta^2 = .03$), with NCOs/officers ($M = 30.64$, $SD = 4.18$) reporting significantly higher amounts of meaning in their military duties than soldiers ($M = 28.82$, $SD = 4.77$). The main effect for ethnicity was non-significant ($p > .007$). Similarly, no significant effect was found for the interaction of ethnicity x rank ($p > .007$).

Table 16.
Two-way Analyses of Variance between Rank and Ethnicity for Meaning in Military Duties

Source of Variation	***df***	**Sums of Squares**	**Mean Square**	***F***	***p*-value**	η^2
Rank	1	160.65	160.65	7.31	.007	.03
Ethnicity	2	16.92	8.46	.39	.681	<.01
Rank x Ethnicity	2	51.11	25.56	1.16	.314	.01
Error	275	6047.31	21.99			

Sixth, Table 17 below presents the results of the two-way ANOVA which tested for the differences between rank and ethnicity in amount of psychological distress. As shown in Table 17, the only significance was observed for the main effect of rank ($F_{(1, 281)} = 14.17$, $p < .001$, $\eta^2 = .05$). The modest significant main effect for rank showed that soldiers ($M = 51.76$, $SD = 23.61$) reported significantly higher amounts of psychological distress than NCOs/officers ($M = 41.35$, $SD = 22.54$; $p < .001$). There was no significant difference found

for the main effect of ethnicity ($p > .007$). Likewise, the ethnicity x rank interaction failed to produce statistical significance ($p > .007$).

Table 17.
Two-way Analyses of Variance between Rank and Ethnicity for Psychological Distress as Measured by the OQ-45

Source of Variation	*df*	Sums of Squares	Mean Square	*F*	*p*-value	η^2
Rank	1	7633.95	7633.95	14.17	<.001	.05
Ethnicity	2	3022.80	1511.40	2.80	.062	.02
Rank x Ethnicity	2	1222.00	611.00	1.13	.323	.01
Error	275	148184.69	538.85			

Seventh, the final two-way ANOVA tested for differences between rank and ethnicity in reported levels of posttraumatic stress disorder (PTSD) symptoms as measured by the TSQ. As shown in Table 18 below, no significant main effects were found for rank or ethnicity (*ps* > .007). Results of the ANOVA also indicated that there was no significant effect observed for the rank x ethnicity interaction term ($p > .007$).

Table 18.
Two-way Analyses of Variance between Rank and Ethnicity for PTSD Symptoms

Source of Variation	*df*	Sums of Squares	Mean Square	*F*	*p*-value	η^2
Rank	1	5.78	5.78	.84	.360	<.01
Ethnicity	2	23.40	11.70	1.70	.184	.01
Rank x Ethnicity	2	7.86	3.93	.57	.565	<.01
Error	275	1891.83	6.88			

Table 19 above presents the means and standard deviations of the variables included in the present study (i.e., combat exposure, trait forgiveness, positive and negative religious coping, meaning in military duties, level of psychological distress, and symptoms of PTSD) by rank and ethnicity for men. The sample is first divided by rank (NCOs/officers vs. soldiers) and then broken down by ethnicity (African-Americans vs. Latinos vs. Caucasians) for each variable of interest. Statistically significant mean differences ($p \leq .001$) between rank and/or ethnicity are denoted in bold.

Table 19.
Means and Standard Deviations of Study Variables by Rank and Ethnicity for Men

Variable	Rank	Ethnicity	Mean	*SD*	*N*
Combat Exposure	Soldier	African-American	17.57	6.59	23
		Caucasian	18.21	4.82	117
		Latino	15.33	4.87	24
		Total	17.70	5.17	164
	NCO/Officer	African-American	13.75	5.04	28
		Caucasian	17.47	5.51	64
		Latino	17.16	3.77	25
		Total	16.51	5.27	117
	Total	African-American	15.47	6.04	51
		Caucasian	17.95	5.07	181
		Latino	16.27	4.40	49
		Total	17.21	5.24	281
Trait Forgiveness	Soldier	African-American	31.13	7.24	23
		Caucasian	31.75	5.29	117
		Latino	30.54	5.50	24
		Total	31.49	5.61	164
	NCO/Officer	African-American	34.07	8.34	28
		Caucasian	31.63	5.79	64
		Latino	30.92	8.17	25
		Total	32.06	7.04	117
	Total	African-American	32.75	7.93	51
		Caucasian	31.71	5.46	181
		Latino	30.73	6.92	49
		Total	31.73	6.24	281

Note: Bold values denote *p*-value < .001

Table 19. (Continued)

Variable	Rank	Ethnicity	Mean	*SD*	*N*
Positive Religious Coping	Soldier	African-American	12.43	6.13	23
		Caucasian	7.03	6.37	117
		Latino	9.54	6.29	24
		Total	8.15	6.58	164
	NCO/Officer	African-American	12.75	6.52	28
		Caucasian	8.69	7.08	64
		Latino	8.20	7.09	25
		Total	9.56	7.12	117
	Total	African-American	**12.61**	6.28	51
		Caucasian	**7.61**	6.65	181
		Latino	8.86	6.67	49
		Total	8.74	6.83	281
Negative Religious Coping	Soldier	African-American	3.21	4.19	23
		Caucasian	2.56	4.18	117
		Latino	3.96	4.78	24
		Total	2.85	4.27	164
	NCO/Officer	African-American	2.50	3.29	28
		Caucasian	2.28	3.35	64
		Latino	0.68	1.73	25
		Total	1.99	3.12	117
	Total	African-American	2.82	3.70	51
		Caucasian	2.46	3.90	181
		Latino	2.29	3.90	49
		Total	2.49	3.85	281
Meaning in Military Duties	Soldier	African-American	28.74	4.88	23
		Caucasian	29.43	4.84	117
		Latino	28.29	5.39	24
		Total	**28.82**	4.77	164
	NCO/Officer	African-American	29.86	4.11	28
		Caucasian	30.45	4.54	64
		Latino	31.60	3.98	25
		Total	**30.64**	4.18	117
	Total	African-American	29.35	4.46	51
		Caucasian	29.79	4.75	181
		Latino	29.98	4.96	49
		Total	29.74	4.73	281

Note: Bold values denote *p*-value < .001

Table 19. (Continued)

Variable	Rank	Ethnicity	Mean	*SD*	*N*
Psychological Distress	Soldier	African-American	47.70	29.07	23
		Caucasian	53.46	21.93	117
		Latino	50.29	26.73	24
		Total	**51.76**	23.61	164
	NCO/Officer	African-American	39.89	24.33	28
		Caucasian	43.81	21.52	64
		Latino	30.16	22.58	25
		Total	**41.35**	22.54	117
	Total	African-American	43.41	26.59	51
		Caucasian	50.05	22.21	181
		Latino	40.02	26.47	49
		Total	47.10	24.09	281
Symptoms of PTSD	Soldier	African-American	2.52	2.97	23
		Caucasian	2.45	2.57	117
		Latino	1.92	2.65	24
		Total	2.38	2.63	164
	NCO/Officer	African-American	1.75	2.43	28
		Caucasian	2.55	2.76	64
		Latino	1.56	2.35	25
		Total	2.15	2.62	117
	Total	African-American	2.10	2.69	51
		Caucasian	2.49	2.63	181
		Latino	1.73	2.48	49
		Total	2.28	2.62	281

Note: Bold values denote *p*-value < .001

4.4 Bivariate Correlations between Study Variables by Sex

Table 20 below presents the correlations between several variables of interest by sex. The decision to separate correlations by sex was two-fold. First, it followed logically from the statistically significant differences in sex observed above (please see Table 11). Second, separating the correlations by sex is in line with the effort to delineate protective factors against deployment (and combat exposure in particular) with the recognition that males and females may have different experiences due to the non-combatant role traditionally believed to be played by women. Results of the correlations for men are presented first followed by

the results of the correlations for women. Results of tests conducted to determine significant differences between male and female correlations concludes the section.

4.41 Bivariate correlations between study variables for men. As seen in Table 20, an analysis of the correlations revealed that, for men, several significant correlations emerged where expected. The strength of observed correlations are presented in accordance to the standards set forth by Cohen (1988) such that strong correlations fell between |.50| and |1.00|, medium correlations between |.30| and |.49|, and small correlations between |.10| and |.29|.

Table 20.
Bivariate Correlations between Age, Time in Service, Combat Exposure (CE), Trait Forgiveness (TFS), Positive Religious Coping (+R-COPE), Negative Religious Coping (-R-Cope), Meaning in Military Duty (MMD), Symptoms of Psychological Distress (OQ-45), and Symptoms of PTSD (TSQ) by Sex

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. Age		**83**	-06	-01	-18	16	36	-16	-24
2. Time in Service	**71**		-06	08	-10	22	**41**	-33	-28
3. Combat Exposure	**-21**	**-24**		09	16	-24	-28	35	18
4. Positive Religious Coping	**16**	13	-10		26	18	29	-23	10
5. Negative Religious Coping	-13	-11	-11	**24**		-29	-18	04	11
6. Trait Forgiveness	**18**	**18**	-05	**18**	-10		27	**-56**	**-41**
7. Meaning in Military Duties	13	06	09	12	-13	**28**		**-54**	-39
8. Psychological Distress	-13	**-20**	-02	-07	**25**	**-39**	**-40**		**60**
9. PTSD	-01	-04	**26**	09	12	**-19**	-14	**48**	

Note: n = 323 for men and n = 43 for women. Decimal points have been omitted.
Data on the right hand side are for women and on the left hand side are for men.
Values in bold indicate p-value < .01

As can be seen from Table 20, the strongest correlations for men were between age and time in service (r = .71) and between psychological distress and self-reported symptoms

of PTSD (r = .48). Though more modest, several other statistically significant correlations |.20| emerged for men including the following: 1) combat exposure was negatively correlated with both age and time in service (rs = -.21 and -.24, respectively) and was positively correlated with symptoms of PTSD (r = .26), 2) symptoms of psychological distress were positively correlated with negative religious coping (r = .25) and were negatively correlated with time in service, trait forgiveness and meaning in military duties (rs = -.20, -.39 and -.40, respectively), 3) positive and negative religious coping were positively related (r = .24), and 4) trait forgiveness was positively related to meaning in military duties (r = .28).

4.42 Bivariate correlations between study variables for women. As with the men, the correlations for women can be found in Table 20. One strong, three medium, and two small correlations were observed for women including the following: 1) time in service was positively related to both age and meaning in military duties (rs = .83 and .41, respectively), 2) symptoms of psychological distress and PTSD were positively correlated (r = .60), 3) symptoms of psychological distress were negatively correlated with both trait forgiveness and meaning in military duties (rs = -.56 and -.54, respectively), and 4) trait forgiveness was negatively related with symptoms of PTSD (r = -.41).

4.43 Results of tests to determine significant correlations between sexes. An online calculator was used to test for significant differences between male and female correlations (Preacher, 2002). Of all tests conducted, three correlations were found to be statistically significantly different. For all three of the significantly different relations, the magnitude of the correlations was greater for women than for men. The first statistically significant difference was found for the relation of combat exposure with psychological distress (rs = -.02 and .39 for men and women, respectively; p = .023). The second statistically significant

difference was found for the relation of combat exposure with meaning in military duties (*rs* = .09 and -.28 for men and women, respectively; *p* = .027). Finally, the third statistically significant difference was found for the relation of time in service with meaning in military duties (*rs* = .06 and .41 for men and women, respectively; *p* = .026).

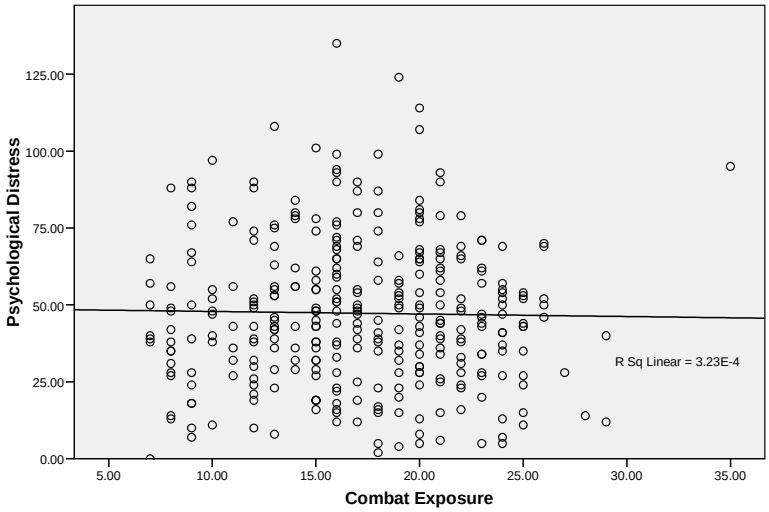

Figure 3. Scatterplot of the Relation between Combat Exposure and Psychological Distress for Men

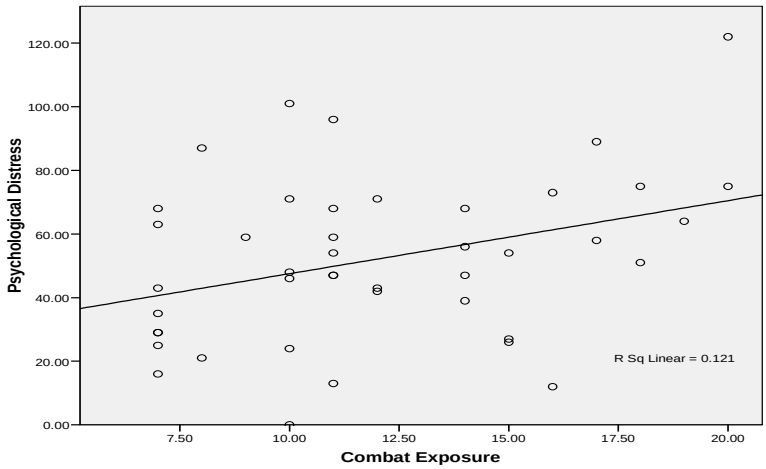

Figure 4. Scatterplot of the Relation between Combat Exposure and Psychological Distress for Women

Of note is that the first research question (that combat exposure would be significantly related to psychological distress and symptoms of PTSD) was differentially supported for men and women. That is, the expectancy that combat exposure would be significantly related to symptoms of PTSD was supported only for men (r = .26). Contrarily, a moderate correlation between combat exposure and psychological distress was found only for women (r = .35). This relation most likely failed to reach statistical significance due to lack of power resulting from small sample size.

One potential explanation for this difference between sexes may be the existence of a threshold effect. As can be seen in Figures 3 and 4 above, scatterplots of the relation between amount of combat exposure (CE) and psychological distress reveal that, for men, initial exposure to combat events resulted in a level of distress that remained fairly constant. This consistency remained intact even in the onslaught of additional self-reported exposure to combat events. Dissimilarly, for women, increased level of self-reported exposure to combat events was associated with a higher level of psychological distress.

4.5 Testing the Hypotheses

The hypotheses were examined with a series of hierarchical multiple regressions conducted for men to explore the hypotheses that specific protective factors would moderate the relation between combat exposure and both symptoms of general psychological distress as measured by the Outcome Questionnaire-45 (OQ-45; Lambert et al., 1994), as well as symptoms of PTSD as measured by the Trauma Screening Questionnaire (TSQ; Brewin et al., 2002) above and beyond time in service, rank, and combat exposure. There were two sets of regressions conducted, one for each criterion variable (i.e., psychological distress and

PTSD). Results from these hierarchical regressions are presented separately by hypotheses in Tables 21 through 28 below.

In an effort to control for the effects of time in service and rank, these factors were always entered in the first block. Of note is that due to the relatively high correlation between age and time in service (r = .71), and because only time in service was significantly correlated with either of the dependent variables (psychological distress; r = -.20), time in service and not age was entered into the regressions. Next, combat exposure was entered into the second block in an effort to ensure any significant moderation effects observed were above and beyond the effect of this predictor. In the third step, the protective factors of interest were entered. Finally, to test for moderation, an interaction term consisting of the predictor variable of interest x combat exposure was entered. For example, in the first regression, time in service and rank were entered first. This was followed by entering combat exposure in the second step. Positive religious coping was entered in the third step. Finally, the interaction term combat exposure x positive religious coping was entered in the last step. The next regression analysis replaced positive religious coping with negative religious coping in blocks three and four. In this manner, each of the possible interactions of the predictor variables with combat exposure was explored.

4.51 Predicting symptoms of psychological distress. Tables 21 through 24 below present the results of the regressions testing the first four hypotheses. Specifically, this section presents the results of the regressions run to test the ability of the four main independent variables to moderate the link between combat exposure and symptoms of psychological distress.

Hypothesis 1 – that positive religious coping would significantly moderate the relation between combat exposure and symptoms of psychological distress – was not supported. As shown in Table 21 below, only the first block of predictors (i.e., time in service + rank) produced a statistically significant effect ($F_{2,320} = 9.49$, $p < 0.001$; $R^2_{adj} =$ 5%). This effect was significant in all regressions conducted with symptoms of psychological distress as the criterion variable. None of the other sets of predictors were significant.

Table 21.

Hierarchical Multiple Regression of Positive Religious Coping (R-COPE) for Psychological Distress as Measured by the OQ-45.

		R	***R^2***	**Adjusted *R^2***	***R^2* Change**	***F* for Change in *R^2***	***p***
Criterion Variable	**Predictors**						
OQ-45	1. Time in Service + Rank	.24	.06	.05	--	--	<.001
	2. Combat Exposure (CE)	.24	.06	.05	.003	1.15	.284
	3. Positive R-COPE	.25	.06	.05	.002	.69	.405
	4. CE x Positive R-COPE	.26	.07	.05	.006	1.99	.159

Note: OQ-45 = Outcome Questionnaire-45; CE = Combat Exposure; R-COPE = Religious Coping

Hypothesis 2 – that negative religious coping would significantly moderate the relation between combat exposure and symptoms of psychological distress – was not supported. As shown in Table 22 below, the first block of predictors (time in service + rank) was significant. Additionally, negative religious coping significantly predicted 4.7% of the variance in OQ-45 scores ($F_{1,318} = 16.64$, $p < 0.001$) beyond time in service, rank, and combat exposure. More specifically, a positive effect was found for negative religious coping

(t_{318} = 4.08, p < .001, β = 1.36) with levels of symptom distress increasing for each incremental increase in the reported use of negative religious coping. The interaction effect was not significant.

Table 22.

Hierarchical Multiple Regression of Negative Religious Coping (R-COPE) for Psychological Distress as Measured by the OQ-45.

		R	***R²***	**Adjusted *R²***	***R²* Change**	***F* for Change in *R²***	***p***
Criterion Variable	**Predictors**						
OQ-45	1. Time in Service + Rank	.24	.06	.05	--	--	<.001
	2. Combat Exposure (CE)	.24	.06	.05	.003	1.15	.284
	3. Negative R-COPE	.33	.11	.10	.047	16.64	<.001
	4. CE x Negative R-COPE	.33	.11	.10	.006	2.02	.157

Note: OQ-45 = Outcome Questionnaire-45; CE = Combat Exposure; R-COPE = Religious Coping

Hypothesis 3 – that trait forgiveness would significantly moderate the relation between combat exposure and symptoms of psychological distress – was likewise not supported. As shown in Table 23 below, the first block of predictors (time in service + rank) was significant. Moreover, trait forgiveness significantly predicted 13.3% of the variance in OQ-45 scores ($F_{1,318}$ = 52.22, p < 0.001) after controlling for the variance accounted for by time in service, rank, and combat exposure. That is, a significant negative effect was found for trait forgiveness (t_{318} = -7.23, p < .001, β = -1.45) with levels of symptom distress decreasing for each incremental increase in the level of trait forgiveness. The interaction term failed to result in statistical significance.

Table 23.

Hierarchical Multiple Regression of Trait Forgiveness for Psychological Distress as Measured by the OQ-45.

Criterion Variable	Predictors	*R*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*p*
OQ-45	1. Time in Service + Rank	.24	.06	.05	--	--	<.001
	2. Combat Exposure (CE)	.24	.06	.05	.003	1.15	.284
	3. Trait Forgiveness	.44	.19	.18	.133	52.22	<.001
	4. CE x Trait Forgiveness	.44	.19	.18	.002	.80	.372

Note: OQ-45 = Outcome Questionnaire-45; CE = Combat Exposure

Table 24.

Hierarchical Multiple Regression of Meaning in Military Duties (MMD) for Psychological Distress as Measured by the OQ-45.

Criterion Variable	Predictors	*R*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*p*
OQ-45	1. Time in Service + Rank	.24	.06	.05	--	--	<.001
	2. Combat Exposure (CE)	.24	.06	.05	.003	1.15	.284
	3. Meaning in Military Duties (MMD)	.44	.20	.19	.136	53.88	<.001
	4. CE x MMD	.44	.20	.18	.001	.09	.766

Note: OQ-45 = Outcome Questionnaire-45; CE = Combat Exposure; MMD = Meaning in Military Duties

Hypothesis 4 – that meaning in military duties would significantly moderate the relation between combat exposure and symptoms of psychological distress – was not supported. As shown in Table 24, the first block of predictors (time in service + rank) was significant. In addition, meaning in military duties was significant ($F_{1,318}$ = 53.88, p = <.001)

explaining an additional 13.6% of the variance in psychological distress scores above and beyond time in service, rank, and combat exposure. More specifically, reported symptoms of psychological distress moderately decreased by each incremental increase in meaning in military duties scores (t_{318} = -7.34, p < .001; β = -1.95). The interaction term was not significant.

4.52 Predicting symptoms of posttraumatic stress disorder. Tables 25 through 28 below present the results of the regressions testing the final four hypotheses. Specifically, this section presents the results of the regressions run to test the ability of the four main independent variables to moderate the link between combat exposure and symptoms of posttraumatic stress disorder.

Hypothesis 5 – that positive religious coping would significantly moderate the relation between combat exposure and symptoms of posttraumatic stress disorder (PTSD) – was not supported. As shown in Table 25 below, the second predictor set in which combat exposure was entered as the sole predictor after controlling for time in service and rank in step one, provided a significant increase in R^2 (R^2_{adj} = 6.8%; $F_{1,319}$ = 23.28, p < .001). That is, a significant positive effect was found for combat exposure with the amount of reported symptoms of PTSD increasing with each incremental increase in exposure to combat (t_{318} = 4.83, p < .001; β = .135). Additionally, positive religious coping showed a modest significant increase in percentage of variance in reported symptoms of PTSD explaining an additional 1.4% of the variance after time in service, rank, and combat exposure were controlled (t_{318} = 2.17, p = .031; β = .045). No other predictors were significant.

Table 25.

Hierarchical Multiple Regression of Positive Religious Coping (R-COPE) for Symptoms of Posttraumatic Stress Disorder (PTSD) as Measured by the TSQ.

Criterion Variable	Predictors	*R*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*P*
TSQ	1. Time in Service + Rank	.05	.003	-.004	--	--	.658
	2. Combat Exposure (CE)	.27	.070	.062	.068	23.28	<.001
	3. Positive R-COPE	.29	.084	.072	.014	4.71	.031
	4. CE x Positive R-COPE	.29	.086	.071	.002	.65	.421

Note: TSQ = Trauma Screening Questionnaire; CE = Combat Exposure; R-COPE = Religious Coping

Hypothesis 6 – that negative religious coping would significantly moderate the relation between combat exposure and symptoms of PTSD – was not supported. As shown in Table 26 below and as delineated above, combat exposure was significantly related to symptoms of PTSD. Also similarly to above, negative religious coping significantly predicted an additional 2.2% of the variance in PTSD scores after controlling for time in service, rank, and combat exposure. That is, a significant positive effect was found for negative religious coping (t_{318} = 2.77, p = .006, β = .102) with symptoms of PTSD increasing for each incremental increase in the level of negative religious coping.. The interaction term (combat exposure x negative religious coping) was not significant.

Table 26.

Hierarchical Multiple Regression of Negative Religious Coping (R-COPE) for Symptoms of Posttraumatic Stress Disorder (PTSD) as Measured by the TSQ.

Criterion Variable	Predictors	*R*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*P*
TSQ	1. Time in Service + Rank	.05	.003	-.004	--	--	.658
	2. Combat Exposure (CE)	.27	.070	.062	.068	23.28	<.001
	3. Negative R-COPE	.30	.092	.081	.022	7.65	.006
	4. CE x Negative R-COPE	.30	.093	.078	<.001	.11	.742

Note: TSQ = Trauma Screening Questionnaire; CE = Combat Exposure; R-COPE = Religious Coping

Hypothesis 7 – that trait forgiveness would significantly moderate the relation between combat exposure and symptoms of PTSD – was again not supported. As shown in Table 27 below, increased levels of reported military combat exposure was significantly related to increased symptoms of PTSD.

Moreover, as displayed in Table 27, trait forgiveness significantly predicted an additional 3.3% of the variance in PTSD scores after controlling for time in service, rank, and combat exposure. More specifically, a significant negative effect was found for trait forgiveness (t_{318} = -3.44, p = .001, β = -.079) with symptoms of PTSD decreasing for each incremental increase in the level of trait forgiveness. The interaction term was not significant.

Table 27.

Hierarchical Multiple Regression of Trait Forgiveness for Symptoms of Posttraumatic Stress Disorder (PTSD) as Measured by the TSQ.

Criterion Variable	Predictors	*R*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*P*
TSQ	1. Time in Service + Rank	.05	.003	-.004	--	--	.658
	2. Combat Exposure (CE)	.27	.070	.062	.068	23.28	<.001
	3. Trait Forgiveness	.32	.104	.093	.033	11.85	.001
	4. CE x Trait Forgiveness	.32	.104	.090	.001	.001	.980

Note: TSQ = Trauma Screening Questionnaire; CE = Combat Exposure

Hypothesis 8 – that meaning in military duties would significantly moderate the relation between combat exposure and symptoms of PTSD – was not supported. In accordance with the above hypotheses and as shown in Table 28 below, those reporting more exposure to combat also reported significantly more symptoms of PTSD. Also similarly to the three hypothesis above, meaning in military duties significantly predicted an additional 2.5% of the variance in PTSD scores after controlling for time in service, rank, and combat exposure. That is, a significant negative effect was found for meaning in military duties (t_{318} = -2.94, p = .003, β = -.091) with symptoms of PTSD decreasing for each incremental increase in the reported level of meaning in military duties. The interaction of combat exposure x meaning in military duties was not significant.

Table 28.

Hierarchical Multiple Regression of Meaning in Military Duties (MMD) for Symptoms of Posttraumatic Stress Disorder (PTSD) as Measured by the TSQ.

Criterion Variable	Predictors	*R*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*p*
TSQ	1. Time in Service + Rank	.05	.003	-.004	--	--	.658
	2. Combat Exposure (CE)	.27	.070	.062	.068	23.28	<.001
	3. Meaning in Military Duties (MMD)	.31	.095	.084	.025	8.67	.003
	4. CE x MMD	.31	.097	.083	.002	.718	.397

Note: TSQ = Trauma Screening Questionnaire; CE = Combat Exposure; MMD = Meaning in Military Duties

In summary, as shown in Tables 21 through 28 above, none of the regression analyses conducted on symptoms of psychological distress or on posttraumatic stress disorder resulted in statistically significant interactions. Therefore, none of the eight hypotheses regarding the possible moderation of the relation between combat exposure and subsequent symptoms of psychological distress or posttraumatic stress disorder reached significance. It is important to note; however, that significant main effects were found for negative religious coping, trait forgiveness, and meaning in military duties for symptoms of psychological distress. Similarly, significant main effects were also found for all four predictors (i.e., both positive and negative religious coping, trait forgiveness, and meaning in military duties) for predicting symptoms of posttraumatic stress disorder.

4.6 Additional Analyses

In an effort to determine the overlapping nature of the significant main effects found above, a new set of hierarchical regressions was run for each dependent variable. That is, two sets of multiple hierarchical regressions were run (one with symptoms of psychological distress and one with symptoms of PTSD as the criterion variable), with time in service and rank entered in Step 1, combat exposure entered in Step 2, and positive and negative religious coping, trait forgiveness, and meaning in military duties simultaneously entered in Step 3.

Again, as in the analyses testing the main hypotheses above, due to a low sample size, the following regressions were run on men only. Table 29 below presents the results of the hierarchical regressions testing the overlap of the four main predictor variables on each criterion. Specifically, this section presents the results of the regressions run to test the incremental ability of the four main independent variables to predict symptoms of psychological distress and symptoms of posttraumatic stress disorder (PTSD).

Table 29.

Hierarchical Regressions of Positive and Negative Religious Coping (R-COPE), Trait Forgiveness (TFS) and Meaning in Military Duties (MMD) for Symptoms of Psychological Distress as Measured by the OQ-45 and Posttraumatic Stress Disorder (PTSD) as Measured by the TSQ.

		Psychological Distress		***PTSD***	
		B	***t***	***B***	***t***
Step 1.	Time in Service	-.111	-1.706	-.025	-.370
	Rank	-.157	-2.425[b]	-.033	-.499
	R^2	.056[c]		.003	
Step 2.	Combat Exposure (CE)	-.060	-1.073	.269	4.825[c]
	R^2 Change	.003		.068[c]	

Table 29. (Continued)

		Psychological Distress		*PTSD*	
		β	***t***	***β***	***t***
Step 3.	Positive R-COPE	-.013	-.255	.136	2.433[b]
	Negative R-COPE	.170	3.367[c]	.089	1.599
	TFS	-.276	-5.408[c]	-.167	-2.974[c]
	MMD	-.277	-5.477[c]	-.118	-2.128[a]
	Adjusted R^2	.280		.128	
	R^2 Change	.236[c]		.077[c]	
	F for Change in R^2	26.364[c]		7.084[c]	

Note. n = 323; [a] = $p < .05$; [b] = $p < .01$; [c] = $p < .001$

As shown in Table 29 above, when symptoms of psychological distress was entered as the criterion variable, several significant predictors emerged. In Step 1, rank significantly predicted psychological distress (β = -.157, $t_{(323)}$ = 2.425; $p < .01$) with the negative relation indicating that lower enlisted soldiers reported experiencing higher levels of distress. In Step 3, three of the four predictors reached statistical significance. Specifically, there was a significant positive relation observed with negative religious coping (β = .170, $t_{(323)}$ = 3.367; $p < .001$), a significant negative relation observed with trait forgiveness (β = -.276, $t_{(323)}$ = -5.408; $p < .001$), and a significant negative relation observed with meaning in military duties (β = -.277, $t_{(323)}$ = -5.477; $p < .001$).

When posttraumatic stress disorder (PTSD) was entered as the criterion variable, there were also several significant predictors which emerged. In Step 2, combat exposure was a significant positive predictor of PTSD (β = .269, $t_{(323)}$ = 4.823; $p < .001$). In Step 3, there was a significant positive relation observed with positive religious coping (β = .136, $t_{(323)}$ = 2.433; $p < .01$), a significant negative relation observed with trait forgiveness (β = -.167, $t_{(323)}$ = -2.974; $p < .001$), and a significant negative relation observed with meaning in military

duties (β = -.118, $t_{(323)}$ = -2.128; p < .05). These results are discussed in detail in the following Discussion section.

CHAPTER 5. DISCUSSION

This chapter begins with a summary of the research questions tested in this study. This is followed with a review of the results of the analyses conducted to determine differences between demographic variables, as well as by a discussion of the eight specific hypotheses tested in the current study. Within this review, major findings will be explored within the context of the current literature base. This is followed by a discussion of the results of the additional analyses conducted to determine the degree of overlap in the prediction of symptoms of psychological distress and PTSD. A discussion of the limitations of this study including suggestions of additional areas in need of further research is presented next. Finally, the clinical implications of this study and final conclusions are presented.

5.1 Summary of Research Questions

It has long been known that human warfare results in physical causalities on the battlefield; one needs only to count the bodies of the fallen warriors. It has only more recently become known that human warfare results in psychological causalities – for no broken minds or broken spirits are left strewn across the battlefield to count. The present work reflects the increasing impetus to identify possible resiliency factors which could help decrease the number of these psychological casualties of war stemming from the known link between combat exposure and subsequent symptoms of psychological distress and PTSD (Brewin et al., 2000; King et al., 1999; Schnurr et al., 2004).

Work has begun seeking to examine the possibility of protective factors which could aid soldiers in increasing their resilience to traumatic events experienced on the battlefield (e.g., Centers for Disease Control, 1988; Friedman et al., 1994; Kaylor et al., 1987; Solomon, 1995). Most of this work has centered on identifying possible interpersonal and intrapersonal resources which could be mobilized to help combat troops cope more effectively with the

psychological collateral damage they endured during battle (e.g., Stein et al., 2005; Sharkansky et al., 2000), with four factors emerging as particularly salient (i.e., perceived social support, optimism, religious coping, and personal meaning). However, the literature has focused almost exclusively on two of these four factors – social support and optimism. The present study was the first to examine religious coping, trait forgiveness, and sense of meaning in military duties as potential protective barriers against the positive relation of combat exposure and psychological distress.

Specifically, the present study sought to investigate eight research hypotheses involving four possible protective factors. First, would increased use of positive religious coping decrease the negative effects of combat exposure which can lead to PTSD? What about more generalized symptoms of psychological distress? Second, would negative religious coping serve to increase the link between combat exposure and symptoms of PTSD? How about symptoms of more generalized psychological distress? Third, would the tendency to be more forgiving serve as a protective factor for combat troops at risk for developing symptoms of PTSD? Would it decrease symptoms of more generalized psychological distress? Finally, would placing more meaning in one's military duties, the fourth potential protective factor, serve as a barrier to the negative psychological effects of combat, both specifically for PTSD and more broadly for symptoms of psychological distress?

5.2 Observed Differences between Demographic Variables

Research has shown that combat soldiers are at risk for developing a surfeit of psychological symptoms (e.g., Adler et al., 1996; Kaylor et al., 1987; Schnurr et al., 2004). Yet, not all soldiers exposed to combat return home with such symptoms. This may be due in part to individual differences, but it may be due in part to differences in important demographics such as the sex of the soldier, the soldier's rank, or her or his ethnicity. Thus, it

was important for this study to look first to differences in demographics before exploring the research questions delineated above.

5.21 Observed differences between sexes. It was not surprising that the results of the t-tests conducted to search for sex differences showed men reported significantly higher levels of combat exposure than women. Though an ever increasing number of military occupational specialties (MOSs) are opening for women bringing them in the midst of combat, the job of "infantry soldier" remains closed for women. Indeed, this was one of the major limitations of this study. Because the participants were recruited from an infantry battalion, there were many more men than women in the study necessitating that the major hypotheses within the study be tested for men only (see Hypotheses section below). The importance of future studies sampling more female soldiers is further highlighted within the current study by the significantly higher positive correlation between combat exposure and psychological distress found for women than for men ($p = .023$). This finding also corresponds with that of Sutker and colleagues (1995) whose research showed that female soldiers reported significantly more health complaints after deployment than did male soldiers ($p < .05$).

Perhaps due to the greater positive link shown between combat exposure and psychological distress for women ($r = .39$ for women; $r = -.02$ for men), they also reported significantly greater use of positive religious coping than did men ($p < .001$). Whether this difference stems from the tendency of female soldiers to be more religious, or rather arises from a tendency for female soldiers to be more strongly negatively impacted by combat (Sutker et al., 2005) is a question for future study.

Women, unlike men, also showed a significantly negative relation between combat exposure and meaning in military duties ($r = -28$ for women; $r = .09$ for men; $p = .027$), with higher levels of combat exposure being associated with lower levels of meaning in their military duties. This is a noteworthy finding as the results of the hierarchical regressions

showed that meaning in military duties accounted for a significant amount of the variance in reported symptoms of both generalized psychological distress and PTSD for men ($p < .001$ and $p = .003$, respectively). Though it is not possible to generalize this finding per se to the women soldiers in the current study due to their lower sample size, it nonetheless seems logical that had the sample of women been larger, it is highly likely that more meaning in military duties would have proved a significant predictor of symptoms of psychological distress and PTSD. Given their increased propensity to be negatively impacted by combat exposure, it seems particularly important to learn more about how meaning in military duties relates to both combat exposure and distress for women.

One possible starting point to understanding more about this relation may lie in the statistically significant difference found between the sexes in the relation of time in service to meaning in military duties. The magnitude of the correlation between these variables was significantly stronger for women than for men ($rs = .41$ and $.06$, respectively). This indicates that for women, the longer they serve in the military, the more meaning they derive from their military duties. When combined with their increased relations between combat exposure, meaning in military duties, and symptoms of psychological distress, one practical application of this finding may be that women would be less negatively impacted by combat exposure the longer they were able to serve in the military before being deployed to the war zone.

5.22 Observed differences between rank and ethnicity. Again, due to an insufficient number of female soldiers per cell, differences between rank and ethnicity were tested between male soldiers only. Of the seven variables tested for differences between rank (enlisted soldiers vs. NCOs/officers) and different ethnic groups (Caucasian vs. African-American vs. Latino), three proved to demonstrate significant differences. There was one statistically significant difference between ethnic groups. African-Americans reported significantly higher levels of positive religious coping than Caucasians ($p < .007$). This

finding is interesting as it may point to positive religious coping being a potentially stronger protective factor for African-American soldiers than for other ethnicities.

There were also two statistically significant differences found for rank. First, NCOs/officers (M = 30.64, SD = 4.18) reported placing significantly more meaning in their military duties than did soldiers (M = 28.82, SD 4.77; p = .007). Similar to the differences found between the sexes in meaning in military duties explored above, the importance of this finding may lay within the second significant difference found for rank. That is, soldiers (M = 51.76, SD = 23.61) reported significantly more symptoms of psychological distress than NCOs/officers (M = 41.35, SD = 22.54; $p < .001$). Unlike their more seasoned superiors who have had longer to integrate their military roles, perhaps younger soldiers have not yet fully integrated their identities as soldiers. The military has long embraced the tradition of "breaking down the man to build up the soldier" in the basic training regime all new soldiers go through, and a sense of camaraderie (or band of brothers) has been a well-known source of motivation and comfort for battlefield soldiers. Perhaps the U.S. Army was on to something when they changed their motto from "Be all that you can be" to "An army of one". Emphasizing the unique importance each soldier plays, in addition to imparting the import of the military unit as a whole, may prove beneficial especially for lower enlisted soldiers.

5.3 Significant Correlations by Sex

5.31 Significant correlations for men. Several significant correlations emerged between study variables for men. First, strong positive correlations emerged between age and time in service (r = .71) and between reported symptoms of generalized psychological distress and PTSD (r = .48). Both of these relations are reasonable as soldiers with more time in service naturally tend to be older, and also as those who report experiencing symptoms of PTSD also tend to report symptoms of more generalized psychological distress such as feelings of anxiety or depression (Sutker et al., 1993).

In a similar vein, consistent with previous research (Pargament, 2000) a more modest positive relation existed between positive and negative religious coping (r = .24). Both types of coping involve turning to one's religious beliefs to help cope with stress, however the relatively modest correlation offers support for the tenet in the current study that positive and negative religious coping represent different coping styles. This tenet is supported by the significant relation between negative religious coping and psychological distress (r = .25) which suggests that increased use of negative religious coping is associated with increased levels of psychological distress. Whether it is the use of more negative religious coping strategies which causes more distress, or rather more distress that causes the use of more negative religious coping strategies is unclear due to the correlational nature of this relation. However, what is clear is that negative religious coping, as opposed to positive religious coping, is hurtful. This finding also speaks to the second and third research questions posed in the present study. While it is as yet uncertain as to whether the hypothesis that positive religious coping will help ameliorate the effect of combat is born out; this finding does show that the use of negative religious coping appears to negatively relate to psychological distress.

Moreover, though neither trait forgiveness nor meaning in military duties were significantly associated with positive or negative religious coping, they were significantly positively related to each other (r = .28). That is, as level of trait forgiveness increased, so did reported amount of meaning in military duties. One possible explanation for this finding may be that it becomes easier to forgive or justify transgressions (both the enemies' as well as one's own) if one places more meaning in the military role. It would be interesting in future studies to test whether this relation holds true for different types of forgiveness (e.g., forgiveness of others versus forgiveness of self), as current research has shown a positive link between survivor's guilt and PTSD (Nader, Pynoos, Fairbanks, & Frederick, 1990; Schwarz & Kowalski, 1992). The importance of investigating this possibility is further

evidenced by the significant negative relations found for both trait forgiveness and meaning in military duties with symptoms of psychological distress (*rs* = -.39 and -.40, respectively). Clearly, being more forgiving and placing more meaning in one's military duties are both associated with a decrease in reported symptoms of psychological distress.

Next, a rather surprising significant negative relation emerged between age and combat exposure (*r* = -.21) and between time in service and combat exposure (*r* = -.24). On the surface, it would seem logical that the older a soldier and the longer the soldier has served in the military, the greater amount of combat to which that soldier would be exposed. However, one plausible explanation for this observed relation could reside in the self-reported nature of the data. To determine their level of combat exposure, soldiers were asked to circle the number of times they were exposed to certain experiences associated with combat (e.g., number of times fired upon; see Appendix C for further items). It may be that more seasoned soldiers see some of these experiences as more par for the course than do less seasoned soldiers, and so more seasoned soldiers may have underreported on some of these items. Alternately, it may be that some of these experiences are more salient to "green" soldiers, and so may be more readily accessible for those less seasoned to combat and the military life in general. To determine if this finding represents an anomaly or a trend remains to be seen in future studies. Interestingly, the significant relation between time in service and psychological distress was in the assumed direction (*r* = - 20), with more time in service (i.e., more "seasoning") being associated with less psychological distress.

Finally, a significant positive relation emerged between combat exposure and PTSD for men (*r* = .25), which offers support for the first research question posed in this study. That is, consistent with prior research, as levels of combat exposure increased for male soldiers, the more they reported experiencing symptoms of PTSD (Brewin et al., 2000; Schnurr et al., 2004). However, contrary to expectations, there was no significant relation between combat exposure and symptoms of more generalized psychological distress. This

might be due to how generalized psychological distress was operationalized in this study, or perhaps due to the timeframe of data collection. Research has shown that a dose-response relation exists between combat exposure and symptoms of psychological distress (Green, 1994). Data for this study was collected roughly at the midpoint of a 12-month deployment. Perhaps data collected at the end of the deployment period after increased exposure to combat would garner different results, with greater numbers of soldiers reporting experiencing symptoms of psychological distress. Importantly, this possibility also underscores the importance of the significant relation which did emerge between combat exposure and symptoms of PTSD, as it is likely, based on prior research (Green, 1994; Sutker et al., 1993), that as levels of combat exposure increase, so should reported symptoms of PTSD.

5.32 Significant correlations for women. Most likely due to the decreased power arising from the much smaller sample of female soldiers, there were fewer significant correlations for women (n = 43) than for men (n = 323). Despite this decreased power, however, six significant relations emerged for women. Four of these were similar to the men; there was a significant positive relation between symptoms of general psychological distress and symptoms of PTSD (r = .60) and between age and time in service (r = .83), and there was a significant negative relation found between symptoms of psychological distress and both trait forgiveness (r = -.56) and meaning in military duties (r = -.54).

Of the two unique significant relations to women, the first was the significant positive relation which emerged between time in service and meaning in military duties (r = .41). That is, the longer women had served in the military, the greater amount of meaning they placed in their military duties. This finding seems to speak to the non-traditional nature of women serving in the military; after all it is the G.I. Joe® action figure that is found under the Christmas tree, not the G.I. Jane action figure. Therefore, it is possible that women simply

require longer immersion within the military sub-culture before being able to more fully integrate their roles as soldiers.

The second of the unique significant relations to women was the significant negative correlation found between trait forgiveness and symptoms of PTSD (r = -.41). While the trend for this relation was in the same direction for men (r = -.19), the correlation failed to reach the |.20| cut-off. Thus, for women, a higher level of trait forgiveness was significantly associated with decreased reported symptoms of both generalized psychological distress and PTSD. This finding aligns with that of Witvliet et al. (2004) who found a significant association between dispositional difficulty forgiving others and difficulty forgiving oneself (along with negative religious coping) and mental health difficulties in military veterans with PTSD ($p < .001$).

According to Janoff-Bulman (1992), harm to self and/or harm to others (aka transgressions) can lead to psychological distress in the forms by extreme dissonance, guilt, and feelings of hostility as we are forced to struggle with dissonant information with our previously held assumptions regarding who we are, who others are, and how the world is supposed to work.. It may be that women facing battlefield transgressions, who have been socialized to be nurturing rather than aggressive, find it particularly difficult to re-align their self, other, and world viewpoints which have been hitherto tuned to peace rather than to war. Alternatively, it may simply be that women are at risk for experiencing more transgressions due to their increased risk of sexual harassment and discrimination, and thus have a greater likelihood of forgiveness playing a larger role in decreasing their level of psychological distress.

5.4 Hypotheses Tested in the Present Study by Protective Factor

This section centers on a discussion of the results of the specific hypotheses testing for moderation conducted in the current study. A more in-depth discussion of the significant main effects which emerged from these analyses appears in the following section. As a discussion aid, the results of all of the regressions run in this study are presented for each dependent variable in Tables 30 and 31 below.

Table 30.

Results of all Regressions with Symptoms of Psychological Distress as the Criterion Variable.

		β	***p***	R^2	**Adjusted** R^2	R^2 **Change**	***F* for Change in** R^2	***p***
Predictors	**Steps**							
Step1.								
1a. Time in Service +		-.111	.089					
1b. Rank		-.157	.012	.056	.050	--	--	<.001
Step 2.								
2. Combat Exposure (CE)	1, 2	-.060	.284	.059	.051	.003	1.15	.284
Step 3.								
3. Positive R-COPE	1,2,3	-.046	.405	.061	.050	.002	.69	.405
4. Negative R-COPE	1,2,4	.220	<.001	.106	.095	.047	16.64	<.001
5. TFS	1,2,5	-.371	<.001	.192	.182	.133	52.22	<.001
6. MMD	1,2,6	-.375	<.001	.196	.186	.136	53.88	<.001
7. All	1-6			.295	.280	.236	26.36	<.001
Step 4.								
8. Positive R-COPE x CE	1,2,3,8	.078	.159	.067	.053	.006	1.99	.159
9. Negative R-COPE x CE	1,2,3,9	-.090	.157	.112	.098	.006	2.02	.157
10. TFS x CE	1,2,3,10	.045	.372	.194	.181	.002	.80	.372
11. MMD x CE	1,2,3,11	-.015	.766	.196	.183	.001	.09	.766

Table 31.

Results of all Regressions with Symptoms of Posttraumatic Stress Disorder (PTSD) as the Criterion Variable.

Predictors	Steps	*β*	*p*	R^2	Adjusted R^2	R^2 Change	*F* for Change in R^2	*p*
Step1.								
1a. Time in Service +		-.025	.712					
1b. Rank		-.033	.618	.003	-.004	--	--	.658
Step 2.								
2. Combat Exposure (CE)	1, 2	.269	<.001	.070	.062	.068	23.28	<.001
Step 3.								
3. Positive R-COPE	1,2,3	.118	.031	.084	.072	.014	4.71	.031
4. Negative R-COPE	1,2,4	.150	.006	.092	.081	.022	7.65	.006
5. TFS	1,2,5	-.186	.001	.104	.093	.033	11.85	.001
6. MMD	1,2,6	-.159	.003	.095	.084	.025	8.67	.003
7. All	1-6			.147	.128	.077	7.08	<.001
Step 4.								
8. Positive R-COPE x CE	1,2,3,8	.044	.421	.086	.071	.002	.65	.421
9. Negative R-COPE x CE	1,2,3,9	.021	.742	.093	.078	.001	1.08	.742
10. TFS x CE	1,2,3,10	-.001	.980	.104	.090	.001	.001	.980
11. MMD x CE	1,2,3,11	-.045	.397	.097	.083	.002	.72	.397

5.41 Positive religious coping. This was the first of the possible protective factors tested in the present study. Positive religious coping did significantly account for part of the variance in PTSD scores (1.4%). This implies that though positive religious coping did not moderate the link between combat exposure and psychological distress or PTSD as hypothesized, it cannot be ruled out as a possible resiliency factor for combat soldiers. As seen in Table 30, of note here is that the relation between combat exposure and psychological distress was not significant. Thus, there was no significant link with which to moderate by any of the study's variables of interest.

The association between the use of positive religious coping and decreased psychological distress due to traumatic events has been previously demonstrated (Mickley et al., 1998; Pargament et al., 2001; Tix & Frazier, 1998). In all of these studies, however, measures were taken several months to several years after the trauma occurred. Thus, it may be possible that the failure to find significant moderation in the current study lies in the recent nature of the combat exposure.

5.42 Negative religious coping. As with positive religious coping and as shown in Tables 30 and 31 above, no significant moderating effect between combat exposure and psychological distress/PTSD was found for negative religious coping. Importantly, in accordance with previous research, negative religious coping did significantly account for 4.7% of the variance in psychological distress and 2.2% of the variance in symptoms of PTSD above and beyond combat exposure, rank, and time in service (Nelson-Pechota, 2003; Pargament et al., 1994; Pargament et al., 1998a). Pargament and colleagues (1998b) referred to the use of negative religious coping strategies as “red flags” for people experiencing extreme negative life events for their belief that the use of these strategies served as warning signs that people were in crisis. It may be that the use of negative religious coping strategies by a combat soldier could also serve as a “red flag” that the soldier is experiencing psychological distress.

5.43 Trait forgiveness. No significant moderating effects emerged for trait forgiveness for either more general symptoms of psychological distress or for symptoms of PTSD (see Tables 30 and 31 above). Two significant relations did emerge; however, with trait forgiveness significantly accounting for 13.3% of the variance in symptoms of psychological distress and for 3.3% of the variance in symptoms of PTSD after variance due

to rank, time in service, and combat exposure was removed (*ps* < .001). These results support the findings by Witvliet et al. (2004) who found significant associations between dispositional difficulty forgiving others, difficulty forgiving oneself, and difficulties in mental health for military veterans with PTSD. Trait forgiveness has been theorized to help decrease psychological distress in the traumatized by allowing them to essentially "let go" of the mental negative connection to the traumatic event and thus reduce distressing intrusive thoughts (McFarlane, 1992).

5.44 Meaning in military duties. Once again, as shown in Tables 30 and 31 above, no significant moderating effect was observed for meaning in military duties for either more general symptoms of psychological distress or for symptoms of PTSD. There was a significant main effect, however, for the relations between meaning in military duties and symptoms of both psychological distress and PTSD. More specifically, meaning in military duties accounted for 13.6% of the variance in symptoms of psychological distress and 2.5% of the variance in symptoms of PTSD after removing the variance accounted for by rank, time in service, and combat exposure.

Combat soldiers are trained to view the mission and their role in the military as the ultimate purpose for their actions. Indeed, when soldiers enter basic training their current views of what was meaningful in the civilian world are often broken down in order to cement their identities as soldiers above all else. When faced with traumatic events or distressing cognitions and emotions accompanying questioning of the worldview, soldiers may experience a loss of meaning in their mission and begin to question the veracity of their role as a military soldier. This supports the argument that one of the reasons Vietnam veterans experienced higher levels of PTSD than in previous wars is due to the loss of meaning in

their military roles as the popularity of the war decreased (Bremner et al., 1987; Foy et al., 1984).

It may be that the true protective mechanism behind these significant relations is support for the troops, both from their homeland as well as from within themselves. Helping soldiers to maintain some semblance of meaning in their military duties may buffer the negative effects of being deployed to the frontlines by providing an overarching purpose to their actions. Aiding soldiers in maintaining a more positive outlook by giving them a deeper sense of purpose may buffer the negative effects of deployment and warfare somewhat by decreasing the tendency for them to misalign previously held assumptions (Decker, 2007).

5.5 Additional Analyses

In order to determine the nature of the overlapping relation of the significant main effects found in the above analyses testing the main hypotheses, additional hierarchical regressions were run on each dependent variable. The results of these analyses appear in Table 29 above. A discussion of these results is presented by criterion (i.e., symptoms of psychological distress and symptoms of PTSD) below.

5.51 Symptoms of psychological distress. Several significant predictors emerged for symptoms of psychological distress. As shown in Table 30, the results of the hierarchical regression demonstrated that when combined, trait forgiveness, positive and negative religious coping, and meaning in military duties significantly predicted symptoms of psychological distress after controlling for rank, time in service, and combat exposure ($p < .001$). Specifically, they accounted for 23.6% of the variance in reported symptoms of psychological distress. An examination of the standardized beta weights revealed the

contribution of each variable. Three of the four predictors made significant contributions; positive religious coping was the only variable which proved to be non-significant ($p > .05$).

As shown in Table 29 above, a significant positive relation was found for negative religious coping ($\beta = .170$; $t_{(323)} = 3.367$; $p < .001$), with symptom distress increasing for each incremental increase in the use of negative religious coping. Significant negative relations were found both for trait forgiveness ($\beta = -.276$; $t_{(323)} = -5.408$; $p < .001$) and for meaning in military duties ($\beta = -.277$; $t_{(323)} = -5.477$; $p < .001$), with symptom distress decreasing for each incremental increase in trait forgiveness and meaning.

These results highlight the importance of expanding the scope of the current research examining potential risk and resiliency factors for combat soldiers. Though previous research has begun to look more closely at how religion impacts one's well-being under stressful conditions (Pargament et al., 1994; 2001), whether one's religious beliefs are used to cope in a positive versus a negative manner is scant. According to the results of the present study, researchers need to place more emphasis on the potential role negative religious coping may play in increasing soldiers' psychological distress. While most of the research being conducted today centers on the potential positive impact of religious coping, this relation did not emerge as strong in the present study for symptoms of psychological distress. Reframing these results according to Cognitive-Relational theory (CR; Lazarus, 1966, 1991, 1993), it is possible that religious beliefs could fall on both sides of the see-saw. That is, positive religious may well decrease distress by adding to one's available resources; while negative religious coping may well increase distress by adding to one's environmental stress.

Researchers also need to take a closer look at the potential resiliency role trait forgiveness and placing more meaning in one's military duties plays in protecting the soldier

against psychological distress. For several years now, many clinicians treating soldiers returning from combat have focused on helping soldiers through the use of interventions specifically targeting forgiveness. For several decades, many clinicians treating Vietnam era soldiers have intuitively understood the importance of helping these combat veterans make some sort of meaning out of their military duties during the conflict. Though much more research needs to be done to clearly understand the roles these two protective factors play; the results in the current study provide initial empirical evidence for what clinicians have already known for years.

5.52 Symptoms of posttraumatic stress disorder (PTSD). Several significant predictors also emerged for symptoms of PTSD. As shown in Table 31, when combined, trait forgiveness, positive and negative religious coping, and meaning in military duties significantly predicted symptoms of PTSD after controlling for rank, time in service, and combat exposure ($p < .001$), accounting for 7.7% of the variance. Three of the four predictors made significant contributions; with negative religious coping being the only variable which proved to be non-significant ($p > .05$).

As shown in Table 29 above, contrary to expectations, a significant positive relation was found for positive religious coping ($\beta = .136$; $t_{(323)} = 2.433$; $p < .01$), with symptoms of PTSD increasing for each incremental increase in the use of positive religious coping. Significant negative relations were again found both for trait forgiveness ($\beta = -.167$; $t_{(323)} = -2.974$; $p < .001$) and for meaning in military duties ($\beta = -.118$; $t_{(323)} = -2.128$; $p < .001$), with symptom distress decreasing for each incremental increase in trait forgiveness and meaning. Thus, unlike positive religious coping, the relation with these two constructs was much the same for both symptoms of psychological distress and PTSD.

As the saying goes, “Everyone finds God in a foxhole.” According to C-R theory, positive religious coping should increase one’s resources by providing support through one’s relationship with God. Results of the present study show that for symptoms of more generalized psychological distress, this may indeed hold true. Interestingly, in the current study, for symptoms of PTSD positive religious coping seems to hurt rather than to help. Perhaps this finding is an anomaly to the current study due to the measurement of this construct. Alternatively, it may be something inherent within the experience of traumatic stress itself which causes a shift in the balance of environmental stress to available resources. One possible explanation for this shift may be that relying on God to help cope with a traumatic experience may keep people from making use of other available coping resources such as confiding in friends, seeking professional assistance, or exercising more active coping strategies. This finding must be replicated in further research studies before it can be more fully understood.

5.6 Limitations of the Present Study

One theme that has played out in the results of the present study is that while efforts to bring the literature current via data collection from currently deployed soldiers has its benefits; it also has its limitations. If a dose-response relation indeed does exist between combat exposure and subsequent psychological distress/PTSD (Green, 1994), it appears that it may prove more fruitful to look for potential moderators of this relation further towards the end of a soldier’s tour of combat duty. Alternatively, perhaps religious coping, trait forgiveness, and meaning in military duties may play a different role than that of moderator of the link between combat exposure and resulting psychological distress. Perhaps it is the case that these factors protect against any kind of trauma, thus making the distinction of

combat-related trauma moot. Finally, perhaps these factors simply either do not moderate the relation between combat exposure and symptoms of psychological distress and PTSD, or there is no dose-response relation between combat exposure and distress to moderate (McNally, 2003). More research on this potential relation is required before any conclusion can be reached.

A second limitation of the current study lies in the population being sampled. While it seems most logical to look to combat infantry soldiers to examine the psychological effects of combat, this population does not contain very many women. Some important differences emerged between male and female soldiers, but due to an insufficient number of women, the major hypotheses of the present study could only be tested on male soldiers. It appears that combat exposure may have more detrimental effects for women than for men, but this study was unable to test this hypothesis.

A third limitation of the present study was that baseline measures were not taken prior to soldier deployment. It may be that a threshold effect of sorts was at play with the anxiety and stress resulting from preparing for deployment and the actual deployment itself generating such high levels of psychological distress that specific exposure to combat events did not significantly increase these levels of distress.

Closely related, a fourth limitation was the cross-sectional rather than longitudinal design of the present study. One of the major foundations for the current study is that combat causes a change in the soldier's worldview which in turn thrusts the soldier into a sort of existential crisis. Both of these factors would have increased the meaningfulness of the study by allowing an examination of the actual changes that occur within a soldier who enters the battlefield.

Finally, a fifth limitation of the current research lies in its correlational nature. While it seems theoretically sound for varying levels of trait forgiveness and meaning in military duties to impact symptoms of psychological distress and PTSD; a causal relation within the scientific literature has yet to be established. It may be the case that experiencing higher levels of psychological distress and symptoms of post traumatic stress disorder may lead to one trying to cope by becoming more forgiving or by trying to place more meaning in one's military duties. Clearly, more research is needed before the true relation of these constructs can be revealed.

5.7 Future Directions for Research

Based on the limitations listed above, one of the most important future directions for research lies in the undertaking of a longitudinal study which can track the psychological health of a soldier pre-deployment, mid-deployment, and post-deployment. Research has clearly shown that combat exposure is detrimental to psychological health, however it is much more nebulous as to the how and why it is so detrimental. Additionally, as more women are being assigned to increasing numbers of combat or combat-related duty assignments, it is imperative that more research is done looking at the effects of combat on women. Almost all of the research on the effects of combat exposure has been conducted exclusively on male soldiers. However, as demonstrated in the present study, the effect of combat exposure may not be the same for men and women.

5.8 Implications for Clinical Practice

As stated previously, while much research has been conducted examining inroads into helping to heal the body and the mind of the combat soldier, healing of the spirit wounded in battle has been relatively neglected. The findings in the present study buttress the call for the

adoption of a holistic, interdisciplinary approach to treating symptoms of psychological distress resulting from military deployments (Fleming, 1985; Scriner, 1984).

Specifically, for chaplains and forward-deployed mental health professionals, assessing the type of religious coping strategies being employed by the soldiers in their care could provide invaluable information into the soldiers' levels of psychological distress. More use of negative religious coping strategies as opposed to positive religious coping strategies could serve as a "red flag" that more intense intervention is needed.

Additionally, the present study provides empirical support that interventions specifically centering on forgiveness could benefit both active duty and veteran soldiers. Currently, many Veterans Administration hospitals are beginning to incorporate forgiveness groups as part of the treatment for veterans diagnosed with PTSD. The Veterans Administration is well-known for placing emphasis on using empirically supported treatments within its mental health services line (see Kramer & Glazer, 2001 for a review); this study helps provide some of this empirical support.

Finally, the monitoring of soldiers' feelings regarding their roles as military service members could also be beneficial by offering valuable insight into their current state of well-being. This may be especially true for women and for lower enlisted soldiers. This becomes even more critical as the popularity of the Gulf War lessens.

5.9 Conclusion

In his poem, *But You Weren't There,* Nathan Marbly poignantly portrays the eternal impact of war on the combat soldier, "*The war is over in history, but it never ended for me.*" This study elucidates the complexity of symptoms of psychological distress which often occur during a wartime deployment.

Reviews of the literature indicate that future researchers may do best to adopt an integrated, or biopsychosocial model of treatment of this psychological distress (including PTSD) in order to expand understanding and better help individuals with this disorder (Fleming, 1985; Scriner, 1984). Yet, to date most treatment modalities fail to truly address these symptoms holistically. One reason for this may be the scarcity of research on important psychological factors such as religious coping, trait forgiveness and meaning.

The current study provided an attempt to identify three factors which may provide some protection against the known link between combat exposure and subsequent symptoms of psychological distress. More specifically, this study looked at the potential protective moderating effects of positive and negative religious coping, trait forgiveness, and meaning in military duties. None of these factors were shown to have a significantly moderating effect on this link. However, numerous questions remain to be investigated before it can be stated with confidence that religious coping, trait forgiveness, and meaning in military duties do not play a protective role in this relation. Much more research is needed in order to fully highlight the interactive role of these factors and to map the theoretical pathways in play in the development and maintenance of symptoms of psychological distress and PTSD.

APPENDIX A. DSM-IV-TR DIAGNOSTIC CRITERIA FOR PTSD*

A. The person has been exposed to a traumatic event in which both of the following were present:
1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
2. The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.

B. The traumatic event is persistently reexperienced in one (or more) of the following ways:
1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
2. Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.
4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma.
2. Efforts to avoid activities, places, or people that arouse recollections of the trauma.
3. Inability to recall an important aspect of the trauma.
4. Markedly diminished interest or participation in significant activities.
5. Feeling of detachment or estrangement from others.
6. Restricted range of affect (e.g., unable to have loving feelings).
7. Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span).

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by tow (or more) of the following:
1. Difficulty falling or staying asleep.
2. Irritability or outbursts of anger.
3. Difficulty concentrating.
4. Hypervigilance.
5. Exaggerated startle response.

E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning. Specify if:
   1a. Acute: if duration of symptoms is less than 3 months.
   1b. Chronic: if duration of symptoms is 3 months or more.
   2. With Delayed Onset: if onset of symptoms is at lest 6 months after the stressor.

*Note: These diagnostic criteria for posttraumatic stress disorder (DSM-IV-TR code 309.81) is taken from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision. Washington, D.C., American Psychiatric Association, 2000. Copyright © 2000.

APPENDIX B. INSTITUTIONAL REVIEW BOARD MATERIALS

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Compliance
Vice Provost for Research and
Advanced Studies
2810 Beardshear Hall
Ames, Iowa 50011-2036
515 294-4566
FAX 515 294-7288

DATE: July 26, 2004

TO: Nathaniel Wade

FROM: Ginny Austin, IRB Coordinator

RE: **IRB ID # 04-341**

STUDY REVIEW DATE: July 26, 2004

The Institutional Review Board has reviewed the project, *"Protective Factors in Active Duty Soldiers"* requirements of the human subject protections regulations as described in 45 CFR 46.101(b) 4. The applicable exemption category is provided below for your information. Please note that you must submit all research involving human participants for review by the IRB. Only the IRB may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

The IRB determination of exemption means that this project does not need to meet the requirements from the Department of Health and Human Service (DHHS) regulations for the protection of human subjects, unless required by the IRB. We do, however, urge you to protect the rights of your participants in the same ways that you would if your project was required to follow the regulations. This includes providing relevant information about the research to the participants.

Because your project is exempt, you do not need to submit an application for continuing review. However, you must carry out the research as proposed in the IRB application, including obtaining and documenting (signed) informed consent if you have stated in your application that you will do so or required by the IRB.

Any modification of this research must be submitted to the IRB on a Continuation and/or Modification form, prior to making any changes, to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

cc: Psychology

ORC 04-21-04

Applicable exemption category(s):

The Administrator will choose one.

(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

(5) Research and demonstration projects which are conducted by or subject to the approval of Department or Agency heads, and which are designed to study, evaluate, or otherwise examine: (i) Public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

(6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

ORIGINAL

For IRB Use Only	Review Date: 7/26/04 Approval Date: Approval Expiration Date: EXEMPT per 45 CFR 46.101(b): 4 Date: 7/26/04 EXPEDITED per 45 CFR 46.110(b) Category _____ Letter _____	IRB ID: 04-341 Length of Approval: FULL Committee Review: Minimal Risk: ✓ More than Minimal Risk: Project Closed Date:

ISU NEW HUMAN SUBJECTS RESEARCH FORM

IRB
JUL 21 2004

SECTION I: GENERAL INFORMATION

Principal Investigator (PI): Nathaniel Wade, PhD	Phone: 4-1455	Fax: 515-294-6424
Degrees: PhD	Correspondence Address: Lagomarcino w112, Ames, IA 50011	
Department: Psychology	Email Address: nwade@iastate.edu	
Center/Institute:	College: LAS	
PI Level: ☒ Faculty ☐ Staff ☐ Postdoctoral ☐ Graduate Student ☐ Undergraduate Student		

Title of Project: Protective Factors in Active Duty Soldiers

Project Period (Include Start and End Date): 08/01/04 to 08/01/05

FOR STUDENT PROJECTS

Name of Major Professor/Supervising Faculty:	Signature of Major Professor/Supervising Faculty:
Phone:	Campus Address:
Department:	Email Address:

Type of Project: (check all that apply)
☒ Research ☐ Thesis ☐ Dissertation ☐ Class project
☐ Independent Study (490, 590, Honors project) ☐ Other. Please specify:

KEY PERSONNEL

List all members of the research team including the principal investigator, his/her degrees, their position at ISU (or other organization) and role on the project, their training and most recent date of their training if known. Please use additional space as necessary. For projects involving animals, please include the veterinary, animal caretakers and technical staff. For projects involving human subjects, please include anyone who will have contact with the subjects.

NAME & DEGREE(S)	POSITION AT ISU & ROLE/SPECIFIC DUTIES ON PROJECT	TRAINING & DATE OF TRAINING
e.g., John Jones, MD, PHD	*M.D. at Mary Greeley Medical Center, Co-Principal Investigator. For animal studies please list specific duties, e.g., will perform surgery, will perform blood draws, responsible for animal care, will perform biopsies, daily monitoring, etc.*	*ISU Human Subject Training, 10/13/02; Radiation Safety Training, 10/01/02; Blood Borne Pathogen Training, 11/13/02; Eleven years of laboratory use of blood borne pathogens.*
1. Nathaniel Wade, PhD	Assistant Prof of Psychology Principal Investigator	ISU Human subjects training, 08/27/03
2. Donna Bailey, BA	Graduate Research Assistant	ISU Human subjects training 08/27/03
~~3. Julia Meyer, BS~~ delete	Graduate Research Assistant	Expected by 9/04

per 7/21/04 per PI email

FUNDING INFORMATION

If internally funded, please provide account number: NONE
If externally funded, please provide funding source and account number:
If funding is pending please provide OSPA Record ID on GoldSheet:
Title on GoldSheet if Different Than Above:
Other: *e.g., funding will be applied for later.*

SCIENTIFIC REVIEW

Although the compliance committees are not intended to conduct peer review of research proposals, the federal regulations include language such as "consistent with sound research design," "rationale for involving animals or humans" and "scientifically valuable research," which requires that the committees consider in their review the general scientific relevance of a research study. Proposals that do not meet these basic tests are not justifiable and cannot be approved. If a compliance review committee(s) has concerns about the scientific merit of a project and the project was not competitively funded by peer review or was funded by corporate sponsors, the project may be referred to a scientific review committee. The scientific review committee will be ad hoc and will consist of your ISU peers and outside experts as needed. If this situation arises, the PI will be contacted and given the option of agreeing that a consultant may be contacted or withdrawing the proposal from consideration.

☒ Yes ☐ No Has or will this project receive peer review?

If the answer is "yes," please indicate who did or will conduct the review: The Department of Psychology Research Ethics Review Committee will conduct the review

If a review was conducted, please indicate the outcome of the review: The signature of the Department Chair, Craig A. Anderson or his designated representative, indicates review and approval of this proposal by the department research ethics committee.

NOTE: RESPONSE CELLS WILL EXPAND AS YOU TYPE AND PROVIDE SUFFICIENT SPACE FOR YOUR RESPONSE.

COLLECTION OR RECEIPT OF SAMPLES

Will you be: (Please check all the apply.)

☐ Yes ☒ No Receiving samples from outside of ISU? See examples below.
☐ Yes ☒ No Sending samples outside of ISU? See examples below.

Examples include: genetically modified organisms, body fluids, tissue samples, blood samples, pathogens.

If you will be receiving samples from or sending samples outside of ISU, please identify the name of the outside organization(s) and the identity of the samples you will be sending or receiving outside of ISU:

Please note that some samples may require a USDA Animal Plant Health Inspection Service (APHIS) permit, a USPHS Centers for Disease Control and Prevention (CDC) Import Permit for Etiologic Agents, a Registration for Select Agents, High Consequence Livestock Pathogens and Toxins or Listed Plant Pathogens, or a Material Transfer Agreement (MTA) (http://www.ens.iastate.edu/bs/shipping.htm).

STUDY OBJECTIVES

Briefly explain in **language understandable to a layperson** the specific aim(s) of the study.

The primary aim of this study is to investigate the factors that protect active duty soldiers from mental and emotional injury (such as PTSD, anxiety, and depression). Factors under consideration are meaning in one's duties, coping styles, previous history of mental disorder, and other psychological variables.

BENEFIT

Explain in **language understandable to a layperson** how the information gained in this study will benefit participants or the advancement of knowledge, and/or serve the good of society.

The research has no direct benefit on the participants except as it might influence decisions made about the military, the army, and the soldiers' individual battalions. However, the research will help with the understanding of what helps people in combat situations to retain a level of mental health, to recover from traumatic experiences, and to thrive in hostile and difficult situations. This understanding may in turn influence the prevention and treatment of soldiers, and people in other types of traumatic experiences.

ASSURANCE

- I certify that the information provided in this application is complete and accurate and consistent with any proposal(s) submitted to external funding agencies.
- I agree to provide proper surveillance of this project to ensure that the rights and welfare of the human subject or welfare of animal subjects are protected. I will report any problems to the appropriate compliance review committee(s).
- I agree that I will not begin this project until receipt of official approval from all appropriate committee(s).
- I agree that modifications to the originally approved project will not take place without prior review and approval by the appropriate committee(s), and that all activities will be performed in accordance with all applicable federal, state, local and Iowa State University policies.

CONFLICT OF INTEREST

A conflict of interest can be defined as a set of conditions in which an investigator's or key personnel's judgment regarding a project (including human or animal subject welfare, integrity of the research) may be influenced by a secondary interest (e.g., the proposed project and/or a relationship with the sponsor). ISU's Conflict of Interest Policy requires that investigators and key personnel disclose any significant financial interests or relationships that may present an actual or potential conflict of interest. By signing this form below, you are certifying that all members of the research team, including yourself, have read and understand ISU's Conflict of Interest policy as addressed by the ISU Faculty Handbook (http://www.provost.iastate.edu/faculty.) and have made all required disclosures.

☐ Yes ☒ No Do you or any member of your research team have an actual or potential conflict of interest?
☐ Yes ☐ No If yes, have the appropriate disclosure form(s) been completed?

SIGNATURES

N Wade 7/15/04
Signature of Principal Investigator Date

Craig A. Anderson / by
Signature of Department Chair Date
Norman A. Scott 7/19/04

PLEASE NOTE: Any changes to an approved protocol must be submitted to the appropriate committee(s) before the changes may be implemented.

2) ☐ Yes ☒ No Is the ***magnitude*** of the harm or discomfort greater than that encountered ordinarily in daily life, or during the performance of routine physical or psychological examinations or tests?

3) Describe any risks or discomforts to the subjects and how they will be minimized and precautions taken.

Data collection has already been completed, and represented minimal likelihood of distress or discomfort.

4) If this study involves vulnerable populations, including minors, pregnant women, prisoners, educationally or economically disadvantaged, what additional protections will be provided to minimize risks?

N/A

PART K: COMPENSATION

1) ☒ No ☐ Yes Will subjects receive compensation for their participation? If yes, please explain.

Do not make the payment an inducement, only a compensation for expenses and inconvenience. If a person is to receive money or another token of appreciation for their participation, explain when it will be given and any conditions of full or partial payment. (E.g., volunteers will $5.00 for each of the five visits in the study or a total of $25.00 if he/she completes the study. If the subject withdraws from participation, they will receive $5.00 for each of the visits completed.) It is considered undue influence to make completion of the study the basis for compensation.

PART L: CONFIDENTIALITY

1) Describe below the methods you will use to ensure the confidentiality of data obtained (*e.g., who has access to the data, where the data will be stored, security measures for web-based surveys and computer storage, how long data (specimens) will be retained, etc.)*

The data were collected anonymously, such that no individual will be able to be identified from the information collected.

Checklist for Attachments

The following are attached (please check ones that are applicable):

☐ A copy of the informed consent document **OR** ☐ Letter of information with elements of consent to subjects
☐ A copy of the assent form if minors will be enrolled
☒ Letter of approval from cooperating organizations or institutions allowing you to conduct research at their facility
☐ Data-gathering instruments (including surveys)
☐ Recruitment fliers or any other documents the subjects will see

Two sets of materials should be submitted for each project – the original signed copy of the application form, one copy and two sets of accompanying materials. Federal regulations require that one copy of the grant application or proposal must be submitted for comparison.

FOR IRB USE ONLY:

Initial action by the Institutional Review Board (IRB):

☑ Project approved. Date: 7/26/04 04-341
☐ Pending further review. Date: _____
☐ Project not approved. Date: _____

Follow-up action by the IRB:

Rick Shep
IRB Approval Signature

7/26/04
Date

APPENDIX C. MEASURES USED IN THE CURRENT STUDY

Please enter your 4 digit code (last 4 SS# or last 4 of weapon #):_____

Age:_____ Gender (Circle): Male Female

Rank (Circle): SOLDIER NCO WARRANT OFFICER OFFICER

Have you been deployed in the past? YES NO If yes, how long? _____months

Time in Service (in years and months)_____yrs _____months

Race/Ethnicity: (Circle) African American Asian Caucasian Hispanic Native American Pacific Islander Other

What unit are you in?_____ Time in unit (in years and months)_____yrs_____months

What is your primary MOS_____ Are you: ACTIVE DUTY RESERVE NATIONAL GUARD

Are you married? YES NO Do you have children? YES NO

During the past 30 days, about how often did you feel…

1…tired out of no good reason	Never	Rarely	Sometimes	Frequently	Always
2…nervous	Never	Rarely	Sometimes	Frequently	Always
3…so nervous that nothing could calm you down	Never	Rarely	Sometimes	Frequently	Always
4…hopeless	Never	Rarely	Sometimes	Frequently	Always
5…restless or fidgety	Never	Rarely	Sometimes	Frequently	Always
6…so restless you could not sit still	Never	Rarely	Sometimes	Frequently	Always
7…depressed	Never	Rarely	Sometimes	Frequently	Always
8…so depressed that nothing could cheer you up	Never	Rarely	Sometimes	Frequently	Always
9…that everything was an effort	Never	Rarely	Sometimes	Frequently	Always
10…worthless	Never	Rarely	Sometimes	Frequently	Always

To what extent are you currently bothered by…

11…health problems	Never	Rarely	Sometimes	Frequently	Always
12…family/relationship problems	Never	Rarely	Sometimes	Frequently	Always
13…work problems	Never	Rarely	Sometimes	Frequently	Always
14…financial problems	Never	Rarely	Sometimes	Frequently	Always
15…legal problems	Never	Rarely	Sometimes	Frequently	Always

Please answer the following questions by circling one of the following…

16…I feel close with other soldiers in my unit.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
17…The commanding officer(s) in my unit are supportive of my effort.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
18…I will be able to perform effectively during the deployment.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
19…I will be able to cope with the challenges I face during the deployment.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
20…I feel well prepared to perform my duties during the deployment	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Outcome Questionnaire (OQ® -45.2)

	Never	Rarely	Sometimes	Frequently	Always
1. I get along well with others…….	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
2. I tire quickly…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
3 I feel no interest in things……...…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
4. I feel stressed at work/school……..…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
5. I blame myself for things……..……...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
6. I feel irritated…….……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
7. I feel unhappy in my marriage/significant relationship…...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
8. I have thoughts of ending my life…….…...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
9. I feel week…….....	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
10. I feel fearful…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
11. After heavy drinking, I need a drink the morning to get going. (If you do not drink, mark ”never”)…….…….…...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
12. I find my work/school satisfying…….……	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
13. I am a happy person……..……...	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
14. I work/study too much…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
15. I feel worthless…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
16. I am concerned about family troubles…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
17. I have an unfulfilling sex life……..….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
18. I feel lonely…….…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
19. I have frequent arguments……..…….…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
20. I feel loved and wanted…….……..	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
21. I enjoy my spare time……..……	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
22. I have difficulty concentrating…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
23. I feel hopeless about the future……	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
24. I like myself…….……	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
25. Disturbing thoughts come into my mind that I cannot get rid of……...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
26. I feel annoyed by people who criticize my drinking (or drug use)……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
27. I have an upset stomach……...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
28. I am not working/studying as well as I used to……	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
29. My heart pounds too much……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
30. I have trouble getting along with friends and close acquaintances……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
31. I am satisfied with my life……...	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
32. I have trouble a t work/school because of drinking or drug use (if not applicable, mark “never”)……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
33. I feel that something bad is going to happen……...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
34. I have sore muscles……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
35. I feel afraid of open spaces, of driving, or being on buses, subways, and so forth……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
36. I feel nervous……...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
37. I feel my love relationships are full and complete……..	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
38. I feel that I am not doing well at work/school…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
39. I have too many disagreements at work/school……...	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
40. I feel something is wrong with my mind…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
41. I have trouble falling asleep or staying asleep…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
42. I feel blue…….	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
43. I am satisfied with my relationships with others…….	☐ 4	☐ 3	☐ 2	☐ 1	☐ 0
44. I feel angry enough at work/school to do something I might regret……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4
45. I have headaches……..	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4

Indicate the degree to which you agree or disagree with each statement below by using the following scale:

1= Strongly Disagree, 2= Mildly Disagree, 3= Agree/Disagree Equally, 4= Mildly Agree, 5= Strongly Agree

_____ 1. People close to me probably think I hold a grudge too long.
_____ 2. I can forgive a friend for almost anything.
_____ 3. If someone treats me badly, I treat him or her the same.
_____ 4. I try to forgive others even when they don't feel guilty for what they did.
_____ 5. I can usually forgive and forget an insult.
_____ 6. I feel bitter about many of my relationships.
_____ 7. Even after I forgive someone, things often come back to me that I resent.
_____ 8. There are some things for which I could never forgive even a loved one.
_____ 9. I have always forgiven those who have hurt me.
_____ 10. I am a forgiving person.

Instructions: Read each of the following statements. Using the scale to the right, CIRCLE the response that best describes how true each statement is for you, ***if the responsibilities of your deployment did not interfere.***

Not at all true of me **1**	**Somewhat** true of me **2**	**Moderately** true of me **3**	**Mostly** true of me **4**	**Totally** true of me **5**

1. I often read books and magazines about my faith_____	1	2	3	4	5
2. I make financial contributions to my religious organization_____	1	2	3	4	5
3. I spend time trying to grow in understanding of my faith_____	1	2	3	4	5
4. Religion is especially important to me because it answers many questions about the meaning of life_____	1	2	3	4	5
5. My religious beliefs lie behind my whole approach to life_____	1	2	3	4	5
6. I enjoy spending time with others of my religious affiliation_____	1	2	3	4	5
7. Religious beliefs influence all my dealings in life_____	1	2	3	4	5
8. It is important to me to spend periods of time in private religious thought and reflection_____	1	2	3	4	5
9. I enjoy working in the activities of my religious affiliation_____	1	2	3	4	5
10. I keep well informed about my local religious group and have some influence in its decisions___	1	2	3	4	5

Instructions: Read each of the following statements. Using the scale below, rate how often you use the following methods for dealing with problems that you face.

Never **1**	**Sometimes** **2**	**Often** **3**	**Very Often** **4**	**Always** **5**

_____ 1. When I have a problem, I talk to God about it and together we decide what it means.
_____ 2. Rather than try to come up with the right solution to a problem myself, I let God decide how to deal with it.
_____ 3. When faced with trouble, I deal with my feelings without God's help.
_____ 4. When a situation makes me anxious, I wait for God to take those feelings away.
_____ 5. Together, God and I put my plans into action.
_____ 6. When it comes to deciding how to solve a problem, God and I work together as partners
_____ 7. I act to solve my problems without God's help.
_____ 8. When I have difficulty, I decide what it means by myself without help from God.
_____ 9. I don't spend much time thinking about the troubles I've had; God makes sense of them for me.
_____ 10. When considering a difficult situation, God and I work together to think of possible solutions.
_____ 11. When a troublesome issue arises, I leave it up to God to decide what it means for me.
_____ 12. When thinking about a difficulty, I try to come up with possible solutions without God's help.
_____ 13. After solving a problem, I work with God to make sense of it.
_____ 14. When deciding on a solution, I make a choice independent of God's input.
_____ 15. In carrying out the solutions to my problems, I wait for God to take control and know somehow he'll work it out.

____ 16. I do not think about different solutions to my problems because God provides them for me.
____ 17. After I've gone through a rough time, I try to make sense of it without relying on God.
____ 18. When I feel nervous or anxious about a problem, I work together with God to find a way to relieve my worries.

Use the scale below to answer the following questions about how you see yourself in the military.

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree

____1. My role in the military is meaningful to me.
____2. There is no point to the duties that I perform.
____3. My efforts here in Iraq are worthless.
____4. Although I cannot always see the purpose, I believe in what I am currently doing.
____5. My role in the military makes me feel like I am part of something larger than myself.
____6. There is no meaningful purpose to my role in the military.
____7. The work that I am currently doing is worthwhile.
____8. My life currently feels meaningless.
____9. I am frustrated by the lack of purpose I feel in my military duties.
____10. The overall goals of the military are worth any difficulties or sacrifices I experience.

Combat Exposure: Please circle the response that most closely fits your experience.

1. Have you ever gone on combat patrols or had other dangerous duty?
   1=No 2=1-3 times 3=4-12 x 4=13-50 x 5= 51+x
2. How often have you been under enemy fire?
   1=Never 2=<1 month 3=1-3 mos 4=4-6 mos 5= 7 mos or more
3. Have you ever been surrounded by the enemy?
   1=No 2=1-2 times 3=3-12 x 4=13-25 x 5= 26 x or more
4. What percent of the people in your unit have been killed, wounded, or missing in action?
   1=None 2=1-25% 3=26-50% 4=51-75% 5=76% or more
5. How often have you fired rounds at the enemy?
   1=Never 2=1-3 times 3=4-12 x 4=13-50 x 5=51 + x
6. How often have you seen someone get hit by incoming or outgoing rounds?
   1=Never 2=1-3 times 3=4-12 x 4=13-50 x 5=51 + x
7. How often have you been in danger of being injured or killed in the line of duty?
   1=Never 2=1-3 times 3=4-12 x 4=13-50 x 5=51 + x

Since your deployment, have you experienced any event or situation that you would consider significantly upsetting or traumatic (circle one)? YES NO UNSURE

If so, when did this occur?_____

If you are willing to describe the event, what happened?_____
_____
_____

Please consider the following reactions which sometimes occur after such an event. Please indicate (YES/NO) whether or not you have experienced any of the following AT LEAST TWICE IN THE PAST WEEK.

YES NO 1. Upsetting thoughts or memories about the event that have come in your mind against your will.
YES NO 2. Upsetting dreams about the event.
YES NO 3. Acting or feeling as though the event was happening again
YES NO 4. Feeling upset by reminders of the event
YES NO 5. Bodily reactions (such as fast heartbeat, stomach churning, sweatiness, dizziness) when reminded of the event.
YES NO 6. Difficulty falling asleep or staying asleep.
YES NO 7. Irritability or outbursts of anger.

YES NO 8. Difficulty concentrating.
YES NO 9. Heightened awareness of potential dangers to yourself and others
YES NO 10. Being jumpy or being startled at something unexpected.

Please indicate the extent to which you used the following methods of religious coping to deal with the event or situation described above. Please use the following scale:

0 = Not at all 1 = Slightly 2 = Moderately 3 = A great deal

_____1. Looked for a stronger connection with God.
_____2. Wondered whether God had abandoned me.
_____3. Sought God's love and care.
_____4. Felt punished by God for my lack of devotion.
_____5. Sought help from God in letting go of my anger.
_____6. Tried to see how God might be trying to strengthen me in this situation.
_____7. Tried to put my plans into action together with God.
_____8. Questioned God's love for me.
_____9. Wondered what I did for God to punish me.
_____10. Wondered whether my church had abandoned me.
_____11. Asked forgiveness for my sins.
_____12. Decided the devil made this happen.
_____13. Focused on religion to stop worrying about my problems.
_____14. Questioned the power of God.

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