

The Effects of Hope, Rumination, Resilience, and Unit Support on Post-traumatic Stress
Disorder Symptom Severity in Veterans

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DEDICATION

I would like to dedicate this research project to all of the men and women who are currently serving or who have served in the U.S. Armed Forces. Thank you for your commitments and sacrifices that have kept our country safe. I would also like to specially thank the veterans who took the time to participate in this research study.

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ABSTRACT

The current study investigated potential protective resources: hope, rumination, resilience and unit support as they related to PTSD symptom severity among service members who deployed to Iraq or Afghanistan and experienced combat ($N = 191$). We also investigated each variable for possible interactions with combat exposure. Correlational analyses and hierarchical linear regression were used to analyze the data. Hope, resilience and unit support were all negatively correlated with PTSD symptom severity and combat exposure. Deliberate rumination and intrusive rumination were positively correlated with PTSD symptom severity. In the regression, significant predictors were rank, combat exposure, resilience and intrusive rumination, with enlisted rank, higher combat exposure, and higher intrusive rumination predicting higher levels of PTSD symptom severity and resilience predicting lower levels. Resilience moderated the relationship between combat exposure and PTSD symptom severity, such that participants who had higher levels of resilience had lower levels of PTSD symptom severity at all levels of combat exposure. These findings suggest the importance of increasing resilience in combat veterans, specifically those of enlisted rank and veterans exposed to higher levels of combat. Findings also suggest that teaching veterans how to control or minimize intrusive rumination may help lower the risk that a veteran will develop PTSD.

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Chapter 1

Introduction

Mental health disorders are common among United States military veterans, with one study reporting that 25% of veterans seeking treatment at federal Veterans Administration Medical Centers (VAMCs) met criteria for one or more psychological disorders (Seal, Bertenthal, Miner, Sen, & Marmar, 2007). Post-traumatic stress disorder (PTSD) is one of the most frequent mental health problems reported among combat veterans after deployment (Buydens-Branchey, Noumair, & Branchey, 1990; Foy, Sipprelle, Rueger, & Carroll, 1984; Hoge, Auchterlonie, & Milliken, 2006; Lapierre, Schwegler, & LaBauve, 2007; Seal et al., 2007), with estimates of PTSD among combat veterans ranging from 10-30% depending on the service era (Kulka et al., 1990; Milliken, Auchterlonie, & Hoge, 2007; Gradus, 2011).

Numerous studies have demonstrated strong associations between combat exposure and mental health diagnoses, such as PTSD (Buydens-Branchey et al., 1990; Foy, Sipprelle, Rueger, & Carroll, 1984; Hoge et al., 2004; Hoge et al., 2006; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). For example, longer and more intense combat experiences were correlated with a high rate of and more chronic PTSD symptoms among Vietnam veterans (Buydens-Branchey et al., 1990). Similarly, in a sample of OIF veterans, PTSD was associated with exposure to combat with 80% of those who screened positive for PTSD reporting intense combat experiences such as witnessing others being wounded or killed or engaging in direct combat (Hoge et al., 2006). Although these high frequencies of PTSD are concerning, most returning military personnel do not meet criteria for PTSD, and this disparity cannot be explained solely by combat exposure differences. Therefore, examining potential coping mechanisms or “protective factors” that

buffer against combat exposure, and thus reduce veterans risk for higher PTSD symptomatology is important.

Transactional Theory of Stress and Coping

The transactional theory of stress and coping suggests that individuals have resources available to them that they can tap into when met with stressful events (Lazarus & Folkman, 1984) and provides a theoretical structure to examine the effects of combat exposure. In their theory, Lazarus and Folkman (1984) defined coping as, “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p.141). According to this theory, stressful events are cognitively appraised in two different ways: the primary appraisal and the secondary appraisal. During primary appraisal, individuals assess whether or not an event will affect their well-being, judging an event to be irrelevant, positive, or stressful. If the event is determined to be stressful, individuals then appraise it as either signaling harm or loss (damage is already done), threat (potential for harm or loss), or a challenge (opportunity to grow or improve) and then prepare to use the appropriate resources (Folkman, 1984).

During secondary appraisal, individuals assess what available resources (physical, material, social, and psychological) they have to deal with the environmental demand of the stressor (Folkman, 1984). Physical resources include individuals’ health, stamina, and strength, while material resources consist of tools, money, and other tangible items. Social resources include social networks and support systems, while psychological resources include individuals’ beliefs that help to maintain hope, problem solving skills, self-esteem and morale (Folkman, 1984). This study will focus on the secondary appraisal level of coping with stress and examine several potential psychological resources (i.e., hope, rumination, and resilience) as well as a

social resource (i.e., unit support) that may be associated with lower levels of PTSD severity following a traumatic event.

Hope

One psychological resource that may buffer against the impact of combat stress is hope. Hope can be defined as a way of thinking that is composed of both a sense of determination to achieve one's goals as well as the ability to meet one's goals (Snyder et al., 1991). People who experience high levels of hope tend to have a stronger sense of well-being and thus experience less distress (Irving, Telfer, & Blake, 1997). Research with various civilian trauma populations has indicated a negative association that exists between hope and PTSD severity, with higher levels of hope associated with lower levels of PTSD (Gallaher & Resick, 2012; Wu, 2011).

Limited research has been conducted on the relationship between hope and PTSD in veterans, however, and the findings of studies that have focused on this relationship are mixed. Hassija, Luterek, Naragon-Gainery, Moore, & Simpson (2012) found that less hope was significantly associated with higher depression symptom severity in a trauma-exposed veteran sample, but the same relationship was not significant for PTSD symptoms. However, only 44% of participants in the Hassija et al. study reported combat exposure and hope was only examined as a single construct rather than also investigating its components. Other research supports a significant negative relationship between hope and PTSD severity. One study examining protective variables among Vietnam veterans seeking treatment for PTSD found that the veterans had significantly lower levels of hope as compared to a non-clinical sample and patients being treated for stress-related issues and chronic mental illness (Irving et al., 1997). In addition, higher levels of hope were linked to greater perceived social support and more use of adaptive coping (Irving et al., 1997). Other research with veterans in PTSD treatment found that pre- and

mid-treatment hope levels negatively predicted PTSD symptom severity, although the reverse was not true -- PTSD symptom severity did not predict changes in hope over time (Gilman, Schumm, & Chard, 2012). These results suggest two things: 1) current treatments for PTSD may not result in improvement in levels of hope and, 2) if hope is restored, veterans may be better able to make use of other known protective factors for PTSD such as social support and approach coping strategies. Given these mixed findings related to hope and PTSD, and limitations of prior work, further investigation of this relationship is warranted.

Two components of hope as defined by Snyder et al. (1991) will be assessed in the current study, “agency” and “pathways.” The agency component of hope can be defined as determination that helps one move towards obtaining a goal, while the pathways component is one’s perceived abilities or available ways that a person has to meet a goal (Snyder et al., 1991). Several studies have examined differences in the agency and pathways of hope. A longitudinal study of undergraduate students found that high agency hope at baseline was related to lower depression and anxiety at one and two month follow-ups, while this relationship was not found for pathways of hope (Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007). A difference in the components of hope has also been found in veterans with PTSD based on their employment status, with employed veterans reporting more agency, pathways, and overall hope than those who were unemployed (Crowson, Frueh, & Snyder, 2001). In the same study, currently unemployed veterans reported having more pathways and overall hope during combat when compared with present day (Crowson et al., 2001). Finally, agency and pathways appear to impact adherence to treatment, with participants in a self-help intervention who had high levels of agency hope being more likely to use the techniques for a two-week period and those with high pathways being more likely to drop out of the study (Geraghty, Wood, & Hyland,

2010). These findings suggest that participants who have high pathways may view themselves as having more options available to achieve their goals, while those with high agency seem to be determined to stick with a certain route of achieving a goal. These studies highlight the importance of examining various aspects of hope in their potential to serve as protective factors against psychological distress, such as PTSD.

Rumination

Rumination is another psychological resource that may be an important barrier against PTSD symptom severity. Rumination is a broad term that is used to organize many styles of recurrent thinking, including reminiscing, future focused thinking, making sense, and problem solving (Martin & Tesser, 1996). Most research to date on rumination has focused on its negative effects and how they correlate with mental health symptoms such as depression and anxiety (Cheung, Gilbert, & Irons, 2004; Cox, Enns, & Taylor, 2001; McEvoy & Brans, 2013). However, some studies suggest that ruminating does not necessarily always have harmful effects and that both intrusive and deliberate rumination can be associated with negative as well as positive events (Cann et al., 2011). For example, research with civilian assault survivors suggests that rumination is not uncommon, with approximately 50% of survivors without PTSD reporting ruminative thoughts (Michael, Halligan, Clark, & Ehlers, 2007). Another study with civilians indicated that those who talked about the positive aspects of dealing with a recent trauma reported more deliberate rumination following the event and less stress associated with the trauma (Lindstrom, Cann, Calhoun, & Tedeschi, 2011), emphasizing the potential positive benefits of certain types of rumination.

Michael et al. (2007) found an association between the content and style of rumination and development of PTSD, with survivors having PTSD reporting more “unproductive thinking”

such as “what if” and “why” type thoughts than individuals without PTSD. These individuals were more likely to feel compelled to continue ruminating and to report negative emotions associated with rumination. The researchers stressed the importance of investigating the relationship between the content and style of rumination (Michael et al., 2007).

Studies examining posttraumatic growth have also suggested that rumination has distinct components that should be examined separately and that may lead to different outcomes (Stockton, Hunt, & Joseph, 2011; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012). Indeed, prior work suggests that intrusive rumination may actually precede deliberate rumination in the process leading to posttraumatic growth (Cann et al., 2011). One study of civilians who had experienced a recent trauma suggests that deliberate rumination may be a precursor for posttraumatic growth (Stockton et al., 2011). Other research suggests that disruption of one’s core beliefs following a trauma is likely to increase deliberate rumination and posttraumatic growth, which in turn can lead to improved life satisfaction (Triplett et al., 2012). These associations between deliberate rumination and positive outcomes further support the concept of deliberate rumination as a protective factor against PTSD symptom severity.

Given these findings, the current study will examine two types of rumination as they relate to PTSD severity: intrusive and deliberate. Intrusive ruminations are defined as cognitions about an experience that are unwanted and invasive that an individual does not purposefully bring to mind. Deliberate ruminations, on the other hand, are cognitive processes that one intentionally engages in and that can be decisively focused on trying to understand the meaning and implications of events (Cann et al., 2011). Since limited research exists in the domain of deliberate rumination after trauma, the proposed study will also examine whether deliberate rumination may buffer against PTSD symptom severity.

Resilience

A third psychological resource that appears to have promise in guarding against PTSD symptom severity is resilience. Resilience can be thought of as the ability to successfully manage stress (Connor & Davidson, 2003). Research has consistently shown a negative correlation between PTSD symptom severity and resilience (Green, Calhoun, Dennis, & Beckham, 2010; King, King, Fairbank, Keane, & Adams, 1998; Pietrzak et al., 2010; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009; Zakin, Solomon, & Neria, 2002), even when demographics and combat exposure were controlled for (Pietrzak et al., 2009). Some evidence suggests that resilience may be especially crucial for veterans who report high combat exposure (Green et al., 2010). In addition, it has been suggested that bolstering resilience may help people build a larger and more multifaceted support network (King et al., 1998). Unfortunately, however, research seems to indicate that little focus is given to resilience following return from deployment. A longitudinal study of Gulf War veterans found that resilience decreased significantly as time since return from deployment increased, while PTSD symptom severity also increased (Benotsch et al., 2000). Thus, research indicates that resilience may be an important buffer in the relationships between combat exposure and PTSD symptom severity.

Indeed, the importance of resilience has been recognized by the military. Currently, the Army utilizes a program referred to as “Comprehensive Soldier Fitness” (CSF) that is designed specifically to enhance resiliency (Lester, McBride, Bliese, & Adler, 2011). The goal of CSF is to develop resilience in five areas of a soldier’s life: physical, social, emotional, spiritual and family. Soldiers are assessed for their individual needs in each area and the program is then tailored based on the identified needs to strengthen the areas of resilience that are not as well-developed (Casey, 2011). In addition, CSF is believed to be most successful

when unit support is high (Lester et al., 2011). The wealth of research supporting the link between resilience and PTSD and the Army's focus on increasing this psychological resource makes it an important factor for further study.

Unit Support

Following the transactional model of stress and coping, unit support could be considered a social resource that can directly benefit military personnel in coping with combat stress. Prior research has indicated an association between higher unit support and lower levels of mental health problems such as PTSD (Dickstein et al., 2010; Goldmann et al., 2012; Pietrzak et al., 2010; Smith et al., 2013). Specifically, Pietrzak and colleagues (2010) found that lower levels of unit support were associated with higher PTSD severity among a sample of OEF and OIF veterans, suggesting that unit support may serve a buffering role in the relationship between combat exposure and PTSD symptom severity while lack of support may put veterans more at risk. Other research with veterans found that higher unit support was associated with a person experiencing fewer stressful events related to his or her PTSD symptoms (Brailey, Vasterling, Proctor, Constans, & Friedman, 2007). Unit support has also been shown to predict post-deployment social support from family and friends as well (Pietrzak et al., 2010), which in turn, has consistently been negatively correlated with PTSD symptom severity (Guay, Billette, & Marchand, 2006; Holeva, Tarrier, & Wells, 2001; Pietrzak et al., 2010). Additionally, a recent study examined PTSD symptom severity in a group of Marines before and after completing training and found that the moderating role of unit support with perceived stressfulness of the training became more important as perceived stressfulness increased, while civilian support did not offer the same protection (Smith et al., 2013).

Other research suggests that unit support may not always be enough to influence PTSD severity. In a sample of Vietnam veterans, Fontana, Rosenheck, and Horvath (1997) found that at high levels of combat exposure and unit support, PTSD symptom severity was higher than with lower levels of unit support. However, at low to moderate levels of combat exposure, unit support did seem to serve a buffering role against PTSD symptom severity (Fontana, Rosenheck, & Horvath, 1997). These findings suggest that at the most severe levels of combat exposure, unit support itself has limited to no buffering effects against PTSD, even though it may prove beneficial at lower levels of combat exposure. Another study of Operation Iraqi Freedom and Operation Enduring Freedom veterans, tested unit support as a potential predictor of PTSD symptom severity, but found no significant associations (Whitesell & Owens, 2011). The mixed results regarding the protective relationship of unit support with PTSD symptom severity emphasizes the importance of continuing to study this perplexing variable in veterans of the most recent eras.

Rank

Although it is not considered a protective factor, a number of studies have found associations between military rank, combat exposure, and PTSD symptom severity (Adler, Vaitkus, & Martin, 1996; Seal et al., 2009), warranting its inclusion as a control variable in the current study. A study with Vietnam veterans found that lower rank was a significant predictor of PTSD symptoms (MacDonald, Chamberlain, & Lon, 1997). Another study conducted with Gulf War veterans found that officers were two to three times less likely to meet criteria for PTSD than enlisted veterans (Adler et al., 1996). In addition, research with Iraq and Afghanistan veterans found higher levels of combat exposure among enlisted veterans (Seal et al., 2009), a

factor that is known to be associated with PTSD symptom severity (e.g., Buydens-Branchey et al., 1990).

Purpose of the Current Study

With the war in Iraq ending and the Afghanistan war still ongoing, much attention has turned to veterans returning home from combat who may be dealing with psychological distress, such as PTSD (LaPierre et al., 2007; Seal et al., 2007). To date, most research has focused on variables that increase veterans' risk for developing or worsening PTSD symptom severity. However, little research has been conducted investigating the resources that may buffer against the possible negative mental health effects of combat exposure, and their relationships with PTSD. Hope, deliberate rumination, resilience, and unit support all have the potential for being protective resources for PTSD symptom severity, but they have not been examined in the same study as possible buffers for PTSD in past research. Examination of potential buffers of PTSD is crucial, given its associations with a number of problems, including decreased quality of life as well as social and occupational functioning (Rapaport, Endicott, & Clary, 2002). The 10-30% rate of PTSD found among combat veterans (Kulka et al, 1990; Milliken, Auchterlonie, & Hoge, 2007; Gradus, 2011) suggests that the majority of veterans have built in coping mechanisms that may buffer against the negative effects of combat exposure. Hope, rumination, and resilience are all psychological resources that could be focused on and increased in veterans before deployment, and unit support is a social resource that could also be encouraged. If there are differences in PTSD symptom severity in veterans with higher and lower levels of these resources, such findings would highlight the importance of developing interventions to increase these resources. Thus, the current study seeks to examine the possible protective roles of hope,

deliberate rumination, resilience, and unit support in a veteran sample in relation to PTSD symptom severity.

Based on the research literature outlined above, we hypothesized the following:

Hypothesis 1: Hope, deliberate rumination, resilience, and unit support will be negatively associated with PTSD symptoms. Also, since intrusive rumination is believed to precede deliberate rumination (Cann et al., 2011), there will be a positive relationship between intrusive and deliberate rumination as well as a positive relationship between intrusive rumination and PTSD severity. Veterans who report higher levels of hope, deliberate rumination, resilience, and unit support will have lower levels of PTSD symptom severity, and veterans with higher levels of intrusive rumination will have higher deliberate rumination and PTSD severity.

Hypothesis 2: Military rank has been associated with PTSD symptom severity in past literature, with enlisted service members reporting higher levels of PTSD symptoms (Adler, Vaitkus, & Martin, 1996). Therefore, when controlling for rank, hope, deliberate rumination, resilience, and unit support will both have direct associations with PTSD severity, but also will moderate the effects of combat exposure on PTSD symptom severity. Combat exposure and intrusive rumination are expected to have significant positive relationships with PTSD severity. Four potential interactions, hope x combat exposure, deliberate rumination x combat exposure, resilience x combat exposure, and unit support x combat exposure, will be investigated as they relate to PTSD symptom severity.

Chapter 2

Method

Participants

The original sample consisted of 348 veterans. Individuals who dropped out of the survey before completing it (e.g., at least one measure not complete, $n = 78$) were removed. Since we wanted to focus on the most recent service eras, veterans who served in other eras besides Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn were also removed ($n = 37$). Additionally, given that combat exposure was a requirement for participation, any veterans who reported no combat exposure were also removed ($n = 42$). Participants were 191 veterans who served in Iraq or Afghanistan. The majority of participants were male (86%). Eighty-two percent of the sample was Caucasian, 3% African American, 5% Hispanic-American/Latino, 1% Native American, 3% Asian American, and 7% other ethnicities. Half of participants reported that they served in the Army, 26% reported that they were in the Marines, 14% were in the Air Force, 12% were in the Navy, and less than 1% were in the Coast Guard. The majority of participants served in Operation Enduring Freedom (63%) and Operation Iraqi Freedom (73%), with 23% serving in Operation New Dawn. Participants could select multiple service eras. Seventy-four percent of the sample were enlisted. Mean age of participants was 31.49 years ($SD = 7.56$). The majority of participants reported completing some college (49%), 33% reported a college degree, and 15% held a graduate degree. Half of participants reported being current students. Most participants (65%) reported that they were separated from service, while 22% reported that they were active duty, and 11% reported that they were retired.

Measures

All measures for the study are detailed below. Demographic items are included in the Appendix.

Demographic Items. The demographic portion of the survey included questions about age, sex, highest education level completed, racial and/or ethnic identification, and employment status. Participants were asked to identify their branch of service (Army, Marines, Navy, Air Force); duty status (Active, Reserve, National Guard, Active Guard); service era; and rank.

Combat Exposure Scale (CES; Keane et al., 1989). The CES is a 7-item measure designed to assess wartime stressors experienced by combatants. Items were rated on a 5-point scale ranging from 1 to 5 with item-specific anchor points. Total scores on the CES range from 0 to 41, with higher scores indicating more severe combat exposure. Sample items included, “Did you ever go on combat patrols or have other dangerous duties?” and “Were you ever under enemy fire?” The CES has good internal consistency reliability ranging from .75-.85 and test-retest reliability at .97 over a one week period and has also demonstrated convergent validity (Keane et al., 1989). Internal consistency reliability in this study was .81.

The PTSD Checklist-Military version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item measure that is used to assess PTSD symptom severity. Items consisted of the symptoms of PTSD as outlined in the Diagnostic and Statistical Manual 4th Edition, Text Revision (American Psychiatric Association, 2000), which was the current version at the time of this study. Veterans rated items on a scale from 1 (*not at all*) to 5 (*extremely*) to indicate their experiences of symptoms over the past month. Total scores for the PCL-M range from 17 to 85, with higher scores reflecting higher PTSD symptom severity. A score of 50 or higher indicates a probable diagnosis of PTSD (Weathers et al., 1993). The PCL-M has

demonstrated good internal consistency reliability ranging from .52-.87 and test-retest reliability of .96 (Weathers et al., 1993), as well as convergent validity demonstrated by its strong correlations with other PTSD measures (Keen, Kutter, Niles, & Krinsley, 2008; Weathers et al., 1993). Internal consistency reliability (coefficient alpha) for this study was .95.

Adult Hope Scale (AHS; Snyder et al., 1991). The AHS is a 12-item scale designed to measure levels of hope in respondents. The measure is divided into 2 subscales (Agency and Pathways), consisting of 4 items each, and 4 filler items. Respondents rated each item from 1 (*definitely false*) to 8 (*definitely true*) to indicate their level of agreement with each statement. Total scores on the AHS range from 8 to 64, with higher scores indicating greater levels of hope. Sample items included “I energetically pursue my goals” (agency) and “I can think of many ways to get out of a jam” (pathways). The AHS has good internal consistency reliability ranging from .74 - .84 for the total scale, .71-.76 for the Agency subscale, and .63-.80 for the Pathways subscale. The scale also has demonstrated good test-retest reliability with a coefficient of .85 over a 3-week interval and .76-.82 over a 10-week interval, as well as good convergent and divergent validity (Snyder et al., 1991). The AHS has been used previously with veterans (Irving et al., 1997). Internal consistency reliability for Agency, Pathways, and the total AHS in this study was .87, .80, and .89 respectively.

The Event Related Rumination Inventory (ERRI; Cann et al., 2011). The ERRI is a 20-item measure designed to assess frequency of intrusive rumination and deliberate rumination. The scale consists of two subscales containing 10 items each. Items were rated on a 4-point scale ranging from 0 (*not at all*) to 3 (*often*), with total scores ranging from 0 to 60. Examples of sample items include, “I thought about the event when I did not mean to” (intrusive rumination) and “I thought about whether I could find meaning from my experience” (deliberate rumination).

The ERRI has good internal consistency reliability for both sections (intrusive = .94, deliberate = .88) and has demonstrated convergent validity (Cann et al., 2010). Internal consistency reliability for the ERRI in this study was .96 for the intrusive rumination subscale and .93 for the deliberate rumination subscale.

Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). The CD-RISC is a 25-item measure designed to evaluate an individual's ability to cope with stress. Items were rated on a 5-point scale ranging from 0 (*rarely true*) to 4 (*true nearly all of the time*) based on the individual's experiences over the past month. Scores on the CD-RISC range from 0-100 with higher scores indicating greater resilience. Examples of scale items include, "Able to adapt to change" and "See the humorous side of things." The CD-RISC has good internal consistency reliability (coefficient alpha = .89) and good test-retest reliability at .87 based on scores of subjects whom had no known clinical change between two consecutive visits. The scale has also demonstrated good convergent and discriminant validity (Connor & Davidson, 2003). The CD-RISC has been used in a number of studies with veterans (Morey, Florin, Petty, Cooper, & Hayes, 2009; Pietrzak et al., 2009; Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012). Internal consistency reliability in this study was .93.

Unit Support Scale of the Deployment Risk and Resilience Inventory (DRRI; King, King, & Vogt, 2003). The 12-item Unit Support scale is designed to evaluate a service member's perceived level of support from his or her unit. Items were rated on a 5-point scale to indicate level of agreement with each statement, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Total scores on the Unit Support Scale range from 12 to 60, with higher scores indicating greater unit support. Participants were given instructions to "Please briefly describe the military "unit" you identified most strongly with during deployment," so that they had a particular unit in mind

while responding. Example items include “My unit was like family to me” and “Members of my unit understood me.” The Unit Support Scale of the DRRI has demonstrated strong internal consistency reliability ($\alpha = .94$) and good convergent validity (King, King, & Vogt, 2003). Internal consistency reliability in this study was .93.

Procedure

Research announcements (see Appendix) were sent via email to online veterans’ resource groups and university veterans’ groups, as well as distributed through personal contacts of the researcher. The researcher also contacted Army Bases and requested their assistance with forwarding the research announcement to their email list. Interested individuals used a hypertext link to connect to the survey website, where they were provided with informed consent information explaining the purpose of the study (see Appendix). Participants who completed the survey were given the option to enter a raffle drawing for one of twelve \$50 gift cards to Amazon.com. All procedures were in compliance with the university Institutional Review Board.

Data Analysis

Data analysis was completed using SPSS software (version 21.0, IBM Corp.). Means, standard deviations, internal consistency reliability analysis, and inter-correlations were conducted for all continuous variables. To investigate the first hypothesis, a Pearson r correlational analysis was used to identify significant associations between possible protective factors (hope, deliberate rumination, resilience, and unit support), rank, intrusive rumination, and PTSD symptom severity. In order to investigate hypothesis 2, a hierarchical linear regression analysis was conducted to assess predictors of PTSD symptom severity, including potential moderators of the relationship between combat exposure and PTSD severity: (1) deliberate

rumination, (2) unit support, and (3) resilience. All variables that were used in interaction terms were mean-centered and the centered values were multiplied to obtain 3 interaction terms (combat exposure x deliberate rumination, combat exposure x resilience, and combat exposure x unit support) (Aiken & West, 1991). Step 1 included rank and all centered variables and Step 2 included all three interactions. An equation including terms for the main effects and the interaction term with the corresponding regression coefficients and regression constant was used to plot a graph to assist in interpreting significant interactions (Aiken & West, 1991). Low, moderate, and high levels of combat exposure and potential moderators were calculated and plotted on graphs using points one standard deviation above and below the mean to show their relationships with PTSD severity (Aiken & West, 1991).

Chapter 3

Results

Mental Health and Related Measures

The mean combat exposure for this sample was 16.16($SD = 9.26$), suggesting a light to moderate level of combat exposure (Keane et al., 1989). Forty-four percent of participants reported a combat exposure level at or above the moderate range. The mean for PTSD symptom severity on the PCL-M was 39.09($SD = 16.42$), below the clinical cutoff of 50 on the measure (Weathers et al., 1993). However, 25% of participants in the sample were above this cutoff that suggests a probable PTSD diagnosis.

To investigate the first hypothesis, correlational analyses were conducted to examine the relationships between independent variables and PTSD symptom severity. Combat exposure, intrusive rumination, and deliberate rumination were significantly positively associated with PTSD symptom severity. Significant negative correlations were found between PTSD symptom severity and rank, hope, hope agency, resilience, and unit support. Our hypothesis was supported with the exception of the result for deliberate rumination. We had hypothesized that deliberate rumination would be negatively associated with PTSD, but the reverse was true with this sample. Therefore, our first hypothesis was only partially supported.

Prediction of PTSD Symptom Severity

Prior to regression analyses, independent variables were examined for their appropriateness for multivariate analysis. Skewness and kurtosis were in acceptable ranges for all study variables. Multicollinearity seemed problematic between two variables, hope and resilience, with a significant, high correlation of .81. Since the measures of these variables

seemed to be assessing similar constructs, after examination of items on both scales, we opted to include resilience rather than hope in regression analyses.

To investigate hypothesis 2, a hierarchical multiple regression was performed to assess whether independent variables (rank, combat exposure, deliberate and intrusive rumination, unit support, and resilience) were significantly associated with PTSD severity, using all variables with significant correlations. The regression included a second step in the model to investigate the potential moderating effects of deliberate rumination, resilience, and unit support in the relationship between combat exposure and the dependent variable, PTSD severity. To determine whether moderation existed, variables included in the interaction terms were mean-centered and these centered values were multiplied to produce the resulting interaction terms (Aiken & West, 1991). Rank, intrusive rumination, and centered values for combat exposure, deliberate rumination, resilience, and unit support were entered as Step 1 in the model. In step two, the three interaction terms were added. Significant interaction terms were then interpreted by calculating and plotting high and low categories of each variable in the interaction term using values one standard deviation above and below the mean (Aiken & West, 1991).

The overall model predicting PTSD severity was significant ($F(7, 159) = 39.96, p < .001$, adjusted $R^2 = .63$). Rank ($\beta = -.15, p < .01$), combat exposure ($\beta = .17, p < .01$), intrusive rumination, ($\beta = .58, p < .001$), resilience ($\beta = -.18, p < .01$), and the combat exposure x resilience interaction ($\beta = -.12, p < .05$) were significant predictors in the model. Deliberate rumination and unit support were not significant predictors of PTSD severity in the regression model. Since only the combat exposure x resilience interaction was significant, the remaining two interactions were dropped from the final model presented in Table 2. The interaction plot (see Figure 1) showed that when resilience is high, PTSD severity is similar at across all levels of combat exposure.

However, when resilience is low, as combat exposure levels increased, PTSD severity also increased.

Table 1

Means, Standard Deviations, and Correlations among Variables for Total Sample (N = 191)

Variable	Mean (SD)	1	2	3	4	5	6	7	8	9
1. PTSD severity	39.09 (16.42)	--	--	--	--	--	--	--	--	--
2. Rank		-.15*	--	--	--	--	--	--	--	--
3. Combat Exposure	16.16 (9.26)	.41**	.06	--	--	--	--	--	--	--
4. Hope Agency	25.73 (4.98)	-.36**	.13	-.05	--	--	--	--	--	--
5. Hope Pathways	25.93 (4.43)	-.14	.03	.14	.70**	--	--	--	--	--
6. Hope	51.66 (8.69)	-.27**	.09	.04	.93**	.91**	--	--	--	--
7. Intrusive Rum.	13.56 (8.60)	.74**	-.01	.44**	-.20*	-.06	-.14*	--	--	--
8. Deliberate Rum.	14.86 (7.93)	.47**	.09	.39**	.00	.13	.07	.57**	--	--
9. Resilience	74.56 (15.38)	-.25**	.20**	.09	.79**	.70**	.81**	-.13	.06	--
10. Unit Support	44.29 (9.68)	-.18*	.12	.06	.40**	.30**	.39**	-.07	.08	.41

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

Table 2

Hierarchical Multiple Regression Predicting PTSD Severity

Predictors ^a	b	SE	<i>t</i>	<i>p</i>
Step 1				
Rank	-6.65	1.90	-3.49	.001
Combat Exposure ^b	.26	.10	2.69	.008
Resilience ^b	-.18	.06	-3.10	.002
Intrusive Rumination	1.10	.12	9.02	.000
Deliberate Rumination	.22	.13	1.71	.090
Unit Support	-.06	.10	-.65	.516
Step 2				
Rank	-5.80	1.90	-3.05	.003
Combat Exposure ^b	.29	.10	3.06	.003
Resilience ^b	-.19	.06	-3.36	.001
Intrusive Rumination	1.08	.12	8.99	.000
Deliberate Rumination	.25	.12	1.97	.050

Table 2. Continued.

Predictors ^a	b	SE	<i>t</i>	<i>p</i>
Unit Support	-.06	.09	-.59	.554
Combat Exposure x Resilience	-.01	.01	-2.47	.015

Note. $N = 191$ Adj. $R^2 = .63$, ΔR^2 Step 1 = .63, $F\Delta p = .00$; ΔR^2 Step 2 = .01, $F\Delta p = .02$.

^aThe interactions between combat exposure x deliberate rumination and combat exposure x unit support were not significant and were dropped from the final model.

^bCentered values

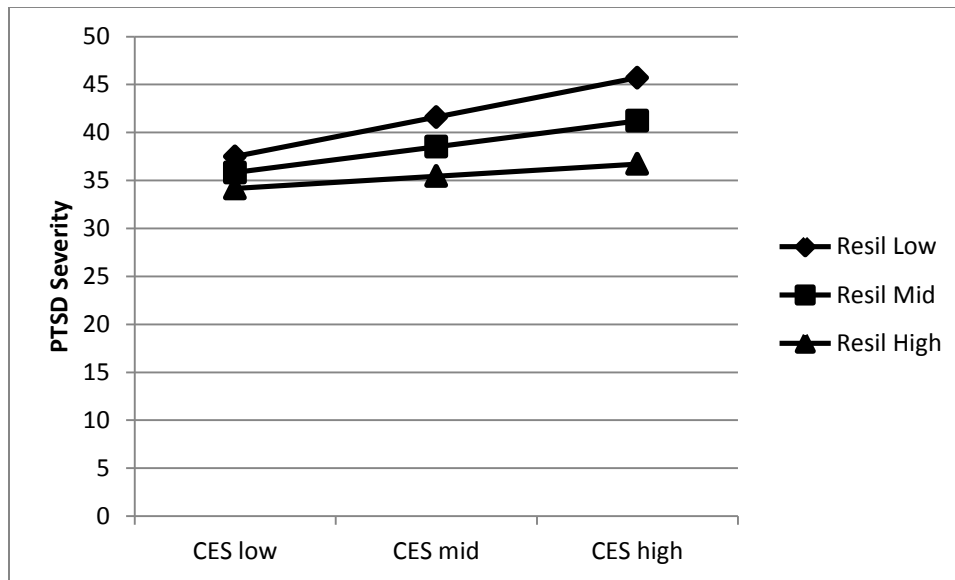


Figure 1
Interaction between Combat Exposure and Resilience

Chapter 4

Discussion

The current study examined hope, deliberate rumination, resilience, and unit support as possible protective resources in the relationship between combat exposure and PTSD symptom severity. Significant findings add to the current literature regarding veterans and potential buffers of PTSD symptom severity.

Associations Among Independent and Dependent Variables

In correlational analyses, rank, hope, resilience and unit support were all negatively associated with PTSD symptom severity. Combat exposure, intrusive rumination, and contrary to our hypothesis, deliberate rumination, were all positively associated with PTSD symptom severity. Thus, hypothesis 1 was only partially supported. As expected, combat exposure was significantly correlated with PTSD symptom severity, similar to findings in prior research (Buydens-Branchey et al., 1990; Hoge et al., 2006), suggesting that veterans were more vulnerable to PTSD symptom severity as combat exposure increased. Also supporting our hypothesis, intrusive rumination was highly positively correlated with PTSD symptom severity. This is consistent with past findings that “what if” and “why” type rumination is linked to increased PTSD symptom severity (Michael et al., 2007), and with the cognitive model for PTSD which suggests that intrusive rumination plays a part in the maintenance of PTSD symptoms (Ehlers & Clark, 2000). Past research also has shown associations among officer rank, hope, resilience, and unit support and lower PTSD symptom severity (Adler et al., 1996; Brailey et al., 2007; Dickstein et al., 2010; Gilman et al., 2012; Green et al., 2010; Irving et al., 1997; King et al., 1998; Pietrzak et al., 2010; Smith et al., 2013; Zakin, Solomon, & Neria, 2002). Although deliberate rumination was significantly associated with intrusive rumination, consistent

with earlier findings (i.e., Cann et al., 2011), in contrast to our prediction, deliberate rumination was positively associated with PTSD symptom severity. Given findings regarding deliberate rumination and posttraumatic growth (Stockton et al., 2011; Triplett et al., 2012), we expected a negative relationship to our distress measure (PTSD). Our finding may suggest that veterans who were engaged in deliberate rumination were also more likely to have the more maladaptive intrusive rumination, thus leading to increased PTSD symptom severity. It is also possible that deliberate rumination increased intrusive rumination, causing any positive effects of deliberate rumination to be outweighed by the negative effects of intrusive rumination. However, no research could be located that has specifically examined the relationship between deliberate rumination and PTSD symptom severity, so our findings should be replicated with future trauma samples.

Prediction of PTSD Symptom Severity

In the linear regression (Hypothesis 2), since resilience and hope were highly correlated, we did not include hope, but included all other proposed variables in the analyses and looked for possible interactions between combat exposure and three potential moderating variables. We hypothesized that rank, deliberate rumination, resilience, and unit support will both have direct, negative associations with PTSD severity, but also that deliberate rumination, resilience, and unit support would moderate the effects of combat exposure on PTSD symptom severity. Combat exposure and intrusive rumination were hypothesized to have significant positive relationships with PTSD severity. Our hypotheses were supported with a few exceptions: deliberate rumination and unit support were not significant predictors of PTSD severity, nor were the moderating roles of deliberate rumination and unit support in the relationship between combat exposure and PTSD severity.

Officer rank was a significant predictor of lower PTSD symptom severity, suggesting that officers are less vulnerable to PTSD symptom severity than enlisted veterans. These results are consistent with past research on Gulf War veterans that found that enlisted ranking veterans were two to three times more likely to meet criteria for PTSD than officers (Adler et al., 1996). This variance between enlisted rank and officers makes sense because enlisted service members tend to have much less control over their experiences on deployments, which may affect their abilities to employ the necessary resources to cope following combat exposure. As hypothesized, combat exposure and intrusive rumination were both significant positive predictors of PTSD symptom severity, supporting previous research (Buydens-Branchey et al., 1990; Hoge et al., 2006; Michael et al., 2007). Our findings suggest that veterans who experienced more combat exposure and took part in more unproductive thought processes regarding their experiences, were at increased risk for PTSD symptoms. Therefore, it is crucial that clinicians teach veterans at risk for PTSD how to properly process their experiences during combat in order to prevent or halt intrusive rumination.

Resilience was the only significant negative predictor of PTSD symptom severity that also moderated the relationship between combat exposure and PTSD symptom severity. Our results suggest that veterans with higher levels of resilience were less vulnerable to PTSD symptom severity and, furthermore, that resilience moderated the effects of combat exposure on PTSD symptom severity. Our findings support previous research with veterans, which has shown a direct relationship between resilience and lower PTSD and also has examined resilience as a moderator of PTSD severity (Green et al., 2010; Zakin, Solomon, & Neria, 2002).

Contrary to our hypothesis, deliberate rumination was not a significant predictor of PTSD symptom severity. It is possible that the higher levels of intrusive rumination among those who

engaged in more deliberate rumination outweighed the potential benefits of deliberate rumination as a potential protective psychological resource against PTSD symptom severity. The association between intrusive and deliberate rumination suggests that veterans who were engaged in deliberate rumination may have also been more likely to be engaged in intrusive rumination. Because intrusive rumination was a predictor of higher PTSD symptom severity, potential protective influences of deliberate rumination may have been blocked by the negative impacts of intrusive rumination in this sample. This idea makes sense, since intrusive rumination is believed to precede deliberate rumination (Cann et al., 2011). Also contrary to our hypothesis, unit support was not a significant predictor of PTSD severity nor did it moderate the relationship between combat exposure and PTSD symptom severity. Our finding was inconsistent with prior research that has found a negative association between unit support and PTSD symptom severity (Dickstein et al., 2010; Smith et al., 2013). It is possible that unit support may be protective among some veterans, but not among others. For example, veterans with certain personality characteristics may be less able to tap into unit support as a social resource to protect against the effects of combat exposure than others. However, this could not be explored in the current study.

Clinical Implications

The results of this study have a number of clinical implications. First of all, because rank, hope, resilience and unit support were all negatively associated with PTSD symptom severity, these are all important factors to focus on when preparing service members for deployment and upon return from deployment to combat zones. Although clinicians cannot control a veteran's rank, they can be aware that officers are less at risk for PTSD symptom severity. This may mean that clinicians should pay close attention to veterans of enlisted rank in

order to bolster their psychological and social resources before and after deployments. Our results also suggest that resilience is an especially important psychological resource that may buffer against the effects of combat exposure in its relationship to PTSD symptom severity. Therefore, if clinicians can help veterans tap into this psychological resource by teaching strategies that bolster resilience (e.g., learning from past successes and failures or viewing barriers as challenges), PTSD levels may be lower than they might otherwise. This finding supports the Army's use of Combat Soldier Fitness to increase resilience before a deployment (Lester et al., 2011) and emphasizes the importance of continuing to strengthen this training.

Our results also demonstrated a significant positive relationship between combat exposure, deliberate rumination, and intrusive rumination with PTSD symptom severity. Therefore, clinicians who are working with veterans who are exposed to higher levels of combat exposure should continue evaluating these veterans soon after their return from deployment to assess for potential PTSD symptoms and to educate them on resources they can employ as they process their experiences. The complicated relationship between intrusive rumination, deliberate rumination and PTSD symptom severity suggests that clinicians should be aware of this interplay and should encourage veterans to reduce this less productive cognitive style.

Limitations

There were several limitations to this study that should be taken into account when considering the results. All participants were volunteers and there may be differences among those who participated and those who chose not to complete the survey. For instance, some veterans may have been motivated to participate by the raffle drawing. Others may have participated due to an interest in mental health outcomes. The survey was primarily distributed through online resources, thus veterans with lower socio-economic status may have been less

likely to receive the announcement and, therefore, participate in the study. Thus, our results may not be generalizable to the entire veteran population. Some of the measures (CES and DRRI) required participants to recall their perceptions and experiences from their deployments. Therefore, it is possible that their memories were not completely accurate upon recall. Additionally, since the majority of participants were male, it was not possible to examine potential differences between male and female veterans. Therefore, future research should focus on recruiting a sizable number of female participants so that possible gender differences can be explored. It is important that further research be conducted on the relationships among rumination, resilience and unit support with PTSD symptom severity, including longitudinal studies that would allow examination of causal relationships. Also, because resilience was found to moderate the effects of combat exposure, research should also be conducted to ensure that the current Combat Soldier Fitness training is effective in increasing resilience and buffering against the negative effects of combat exposure.

Conclusions

With the ongoing conflicts overseas, it is important to remember that most combat veterans do not develop psychopathology as a result of their experiences and thus examination of differences between those who develop PTSD and those who do not is critical. Results of this study suggest that resilience may buffer against the negative effects of combat exposure in relation to PTSD symptom severity. Additionally, both intrusive rumination and deliberate rumination may place veterans at increased risk for PTSD symptoms. It is possible that deliberate rumination does protect against PTSD symptoms when intrusive rumination is low, but we did not test this hypothesis in this study. Therefore, it is important that further research

be conducted on potential protective resources that veterans can tap into when exposed to combat stressors.

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Appendix

Online Informed Consent Coping and Mental Health Among Veterans

Dear Participant:

You are invited to participate in a research study being conducted by Laura Blackburn, B.S., a doctoral student at the University of Tennessee. The purpose of this study is to obtain information about experiences, mental health, and characteristics such as coping skills of military veterans.

To be eligible for this study, you must be a military veteran who is at least 18 years old, has experienced combat, and served between 1990 and the present. Your participation in this study is strictly voluntary. You may choose not to participate or to discontinue participation at any time. If you choose to participate, you will be asked to select responses to a questionnaire that takes approximately 10-20 minutes to complete. Any information obtained in connection with this study will remain confidential. The data will be summarized and reported in group form.

Some individuals may experience discomfort when answering survey questions if they consider the information to be sensitive. Thus, you may choose not to answer any question that you do not want to answer. If you do experience distress or discomfort as a result of participating in this survey, we encourage you to contact your local mental health professional or one of the following organizations:

American Psychological Association (APA) Help Center: <http://www.apahelpcenter.org/>

National Center for PTSD: <http://www.ncptsd.va.gov/>

The information you provide may be helpful in increasing our understanding of veterans' experiences and mental health, although the information collected may not benefit you directly.

If you have any questions or comments about this research project, please contact Laura Blackburn at lblackb3@utk.edu or her faculty advisor, Dr. Gina Owens at gowens4@utk.edu or 865-974-2204. If you would like to receive a brief written summary of the results when the study is complete, please send a request to Laura Blackburn via e-mail at lblackb3@utk.edu (please write "Psychological Health Results" in the subject line). This protocol has been reviewed and approved by the Institutional Review Board for protection of human subjects at the University of Tennessee-Knoxville. If you have questions about your rights as a participant, please contact the University of Tennessee Office of Research Compliance Officer at (865) 974-3466. It is suggested that you print this information page for future reference.

Sincerely,

Laura Blackburn, B.S.
Doctoral Student

Gina P. Owens, Ph.D., Faculty Advisor
Associate Professor

In-Person Informed Consent Coping and Mental Health Among Veterans

Dear Participant:

You are invited to participate in a research study being conducted by Laura Blackburn, B.S., a doctoral student at the University of Tennessee. The purpose of this study is to obtain information about experiences, mental health, and characteristics such as coping skills of military veterans.

To be eligible for this study, you must be a military veteran who is at least 18 years old, has experienced combat, and served between 1990 and the present. Your participation in this study is strictly voluntary. You may choose not to participate or to discontinue participation at any time. If you choose to participate, you will be asked to select responses to a questionnaire that takes approximately 10-20 minutes to complete. Any information obtained in connection with this study will remain confidential. The data will be summarized and reported in group form.

Some individuals may experience discomfort when answering survey questions if they consider the information to be sensitive. Thus, you may choose not to answer any question that you do not want to answer. If you do experience distress or discomfort as a result of participating in this survey, we encourage you to contact your local mental health professional or one of the following organizations:

American Psychological Association (APA) Help Center: <http://www.apahelpcenter.org/>

National Center for PTSD: <http://www.ncptsd.va.gov/>

The information you provide may be helpful in increasing our understanding of veterans' experiences and mental health, although the information collected may not benefit you directly.

Your consent to participate will be indicated by your completion of this survey.

If you have any questions or comments about this research project, please contact Laura Blackburn at lblackb3@utk.edu or her faculty advisor, Dr. Gina Owens at gowens4@utk.edu or 865-974-2204. If you would like to receive a brief written summary of the results when the study is complete, please send a request to Laura Blackburn via e-mail at lblackb3@utk.edu (please write "Psychological Health Results" in the subject line). This protocol has been reviewed and approved by the Institutional Review Board for protection of human subjects at the University of Tennessee-Knoxville. If you have questions about your rights as a participant, please contact the University of Tennessee Office of Research Compliance Officer at (865) 974-3466. It is suggested that you print this information page for future reference.

Sincerely,

Laura Blackburn, B.S.
Doctoral Student

Gina P. Owens, Ph.D., Faculty Advisor
Associate Professor

Research Announcement:**Attention Military Veterans**

A research study examining veterans' experiences with military service and reactions to these experiences is being conducted by Laura Blackburn, B.S., doctoral student at University of Tennessee-Knoxville. The online survey assesses experiences with military service, current mental health symptoms, coping skills, and other thoughts related to your service experience. If you are a military veteran who is at least 18 years old, has experienced combat and served between 1990 and the present, you are eligible to participate.

The survey is anonymous and takes approximately 10-20 minutes to complete.

[SURVEY LINK]

This will take you to the consent form and questionnaire. This research protocol has been reviewed and approved by the Institutional Review Board for protection of human subjects at the University of Tennessee. Please feel free to forward this announcement to eligible friends/colleagues you know who may wish to participate. Thank you in advance for your help with this project! Your participation may help improve veterans' mental health.

Sincerely,
Laura Blackburn, B.S.
Department of Psychology
University of Tennessee
Phone: 865-974-2204
E-mail: lblackb3@utk.edu

Faculty Advisor:
Gina P. Owens, Ph.D.
Department of Psychology
University of Tennessee
Phone: 865-974-2204
E-mail: gowens4@utk.edu

Measures:**Demographic Information**

Please answer the following questions.

1. What is your age (in years)?
2. What is your sex?
 - Female
 - Male
3. What is your highest level of education completed?
 - Some high school
 - High school graduate
 - Some college
 - College degree
 - Graduate/professional degree
4. What is your Race/Ethnicity?
 - Caucasian/White/European-American
 - African-American
 - Asian-American/Pacific Islander
 - Hispanic-American/Latino
 - Native American/First Nations/Native Alaskan
 - Multiracial/Other (please specify)
5. What is your employment status?
 - Not employed
 - Student
 - Employed part-time
 - Employed full-time
7. In what branch of service did you/do you serve:
 - Army
 - Navy
 - Marine Corps
 - Air Force
 - Coast Guard
8. When you served in the military, were/are you: (Check all that apply.)
 - Active duty
 - Reserve
 - National Guard
9. During which service era(s) did you serve?
 - Persian Gulf War

Iraq (OIF)
Iraq (OND)
Afghanistan (OEF, current)
Other (please list)

10. What is your current military rank ?

- | | |
|--------------------------------|-------------------------|
| ☐ Officer | ☐ 1 |
| ☐ Enlisted | ☐ 2 |
| | ☐ 3 |
| | ☐ 4 |
| | ☐ 5 |
| | ☐ 6 |
| | ☐ 7 |
| | ☐ 8 |
| | ☐ 9 |

11. Please indicate in the space provided how many years it has been since your returned from deployment: ____ years

12. Are you currently:

Retired

Separated from service

Active duty

Vita

Laura Blackburn was born in Birmingham, AL, to her parents, Warren Blackburn and Kathleen Berube. She is the youngest of three daughters: Jenny and Julia. She attended Edgewood Elementary and continued to Homewood High School in Homewood, Alabama. After graduating high school, she began her undergraduate years at Florida State University in Tallahassee, Florida where she majored in Psychology. She completed her Bachelors of Science degree from Florida State University in April 2008. She accepted a position as a research assistant working at the Birmingham and Tuscaloosa VA Medical Centers with Dr. Lori Davis. After her first year there, she was promoted to research coordinator at the Birmingham VA Medical Center. In August 2010 she began as doctoral student in the Counseling Psychology program at the University of Tennessee, Knoxville. She is now preparing for her internship at Central Alabama Veterans Healthcare System in Tuskegee, Alabama.