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Associations Between Combat Exposure, Moral Injury, and Suicidality Among U.S. Military Members: The Moderating Impact of Positive Rumination

Jeffrey M. Gabelmann
Old Dominion University, jmgabelmann@gmail.com

ASSOCIATIONS BETWEEN COMBAT EXPOSURE, MORAL INJURY, AND SUICIDALITY AMONG U.S. MILITARY MEMBERS: THE MODERATING IMPACT OF POSITIVE RUMINATION

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Jeffrey M. Gabelmann
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Approved by:

Michelle L. Kelley (Director)

James F. Paulson (Member)

Cathy Lau-Barraco (Member)

ABSTRACT

ASSOCIATIONS BETWEEN COMBAT EXPOSURE, MORAL INJURY AND SUICIDALITY AMONG U.S. MILITARY MEMBERS: THE MODERATING IMPACT OF POSITIVE RUMINATION

Jeffrey M. Gabelmann
Old Dominion University, 2024
Director: Dr. Michelle L. Kelley

Numerous studies have documented the risk for suicide among recent-era veterans with combat experience. Recently, moral injury has emerged as a possible contributor to suicidality in veterans. To that end, no study has approached the combat exposure-moral injury-suicidality link with a focus grounded in positive psychology. Specifically, the present study explored whether positive rumination, or the reflection on positive emotions and moods, may buffer the deleterious effects of potentially traumatic experiences in warzones on moral injury and suicidality. This study was a secondary analysis of 250 current or former U.S. military members (M_{age} = 33.3 years) who had deployed at least one time as part of their occupational duties. Participants completed an online survey that assessed combat exposure, moral injury, suicidality, and responses to positive affect. Combat exposure, moral injury, and suicidality were all positively associated. In the mediation model, moral injury did not mediate the relationship between combat exposure and suicidality. In the moderated mediation model, positive rumination moderated the indirect effect of combat exposure on suicide via moral injury, as well as all three direct relationships between combat, moral injury, and suicidality. These findings provide much needed insight into the effects of combat on military mental health. Additionally, results suggest positive rumination may serve as a buffer to reduce the associations between combat exposure, moral injury, and suicidality. Implications from the present study may be used to promote

awareness of positive affective states and encourage research on positive rumination inducing strategies for combat veterans, at-risk military members, or as prevention strategies for general military populations.

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

Seventeen U.S. military veterans die of suicide every day and those who served in post-9/11 wars are 57% more likely to die by suicide compared to their civilian counterparts (Department of Veterans Affairs [VA], 2022). Given these rates and the severity of this preventable outcome, the White House (2021) and the VA (2022) have issued calls to address suicide among military members to which there is "no single cause and no single solution" (The White House, 2021, p. 4). In response, researchers have examined the association between combat exposure and suicidality (see meta-analysis from Bryan et al., 2015). Others have inquired into risk factors which exacerbate the combat-suicidality relationship (see meta-analysis from Schafer et al., 2022). In doing so, researchers have examined moral injury, that is, the strong negative emotions (e.g., anger, shame, guilt) that result from transgressions by oneself or trusted others which violate one's deep-held moral code (Litz et al., 2009; Shay, 1994), as a contributing factor associated with suicidality among military members (Frankfurt & Frazier, 2016; Jamieson et al., 2023; Kelley et al., 2021; Wisco et al., 2017). While the importance of examining factors that contribute to suicidality cannot be stressed enough, an additional focus has been placed on searching for factors that might protect combat veterans who are at risk of death by suicide (e.g., employment, resilience, social support; Elbogen et al., 2020; Pietrzak et al., 2010). However, no known research has examined the benefits of positive rumination (e.g., reflecting on positive moods and emotions) in the context of military populations at risk for moral injury and suicidality. Thus, the present study tested a moderated mediation model in which moral injury was hypothesized to explain associations between combat exposure and

suicidality and was further hypothesized to be moderated by positive rumination among a sample of current and former U.S. military members.

Combat Exposure and Suicidality

Military service entails a broad range of unique experiences and stressors which includes intense training, absence from one's family, and engagement in armed conflicts such as the recent wars in Iraq and Afghanistan. Although not all servicemembers are exposed to combat, many endure warzone experiences that have lasting outcomes on their physical and mental health to include an increased risk for suicidality (Bryan et al., 2015; Thomas et al., 2017). Suicidality is a complex concept, encompassing both suicidal thoughts (e.g., ideation) and suicidal behavior (e.g., attempts). Understanding how military members may think about or act in relation to suicide often relies on two important theoretical frameworks: the interpersonal-psychological theory of suicide (IPTS; Joiner, 2005) and the fluid vulnerability theory (Rudd, 2006).

IPTS is one of the most influential theories for conceptualizing suicidality (Spencer-Thomas & Jahn, 2012) and has received robust empirical support (Chu et al., 2017). According to IPTS, three factors must be present for a service member or veteran to die by suicide: a thwarted belongingness, perceived burdensomeness, and acquired capability (Joiner, 2005; Van Orden et al., 2010). First, the IPTS posits that suicidality begins with a thwarted belongingness, or a fundamental yet unmet need to belong or preserve connectedness. For many military members, their sense of belonging may be challenged upon returning home from deployments or by the end of service as they are no longer part of something bigger than themselves (Demers, 2011; Lynn, 2016). Additionally, those with exposure to combat and other warzone experiences may struggle to maintain relationships with individuals who might not have endured the same unique hardships. Second, IPTS suggests that when thwarted belongingness is combined with a

perceived burdensomeness, that is, feelings of self-hatred or feeling they are a strain to others that are mistakenly translated into feelings of expendability, the individual is at an increased capability for suicide (Joiner, 2005; Van Orden et al., 2010). For military members who are exposed to atrocities during war and experience the darker side of humanity, they are more likely to experience remorse and self-hatred (Singer, 2004). Oftentimes they may feel unforgivable and seek reparations for their actions by taking their own life. Finally, individuals may painstakingly overcome their innate instinct for survival and engage in suicidal behavior once they acquire the capability to do so. This acquired capability is theorized to arise from repeated exposure to challenging or painful experiences which in turn elevates one's pain tolerance and fearlessness of death and dying (Joiner, 2005). Specifically, military members may learn of or acquire the capability for suicide following consistent exposure to warzone experiences, such as being responsible for the death of an enemy combatant or seeing injured women/children they were unable to help during combat (Kimbrel et al., 2014). In fact, these types of experiences have been shown to lower military members fear of dying (Bryan et al., 2010). Thus, through the lens of the IPTS, military members with exposure to combat exposure should be at an increased risk of suicidality.

With this understanding, researchers have examined associations between combat and suicidality among post-9/11 servicemembers and veterans (see meta-analysis from Bryan et al., 2015). However, due to the complex nature of both variables, the literature appears somewhat inconsistent (see Reger et al., 2018 for a review). Specifically, in contradiction to the IPTS, Dillon et al. (2018) and Naifeh et al. (2019) found negative relationships between combat and suicidality with samples of post-9/11 active-duty Army soldiers and veterans, respectively. In contrast, in a longitudinal study with veterans between 2001 and 2007, no significant

associations where found between combat experience, or even deployments, and suicide risk (LeardMann et al., 2013). That said, warzone atrocities, such as killing during war, were found to be positive predictors of suicidality (Battles et al., 2018; Kelley, Bravo, Hamrick, et al., 2019). Additionally, in a meta-analysis of 22 studies, Bryan et al. (2015) found an overall positive relationship between combat experiences and suicidality; however, the effect size across studies was small ($r = .07$; Cohen, 1992). The inconclusive findings may be due to any number of things, including how combat or suicidality were measured, the nature of the samples, and whether the participants were attached to combat units. Although the IPTS is an important theory for understanding how combat exposure and suicidality may be associated among servicemembers and veterans, inconsistencies and small effect sizes in the literature suggest other factors may be contributing to the relationship. These inconsistent results highlight the complexity of the combat-suicidality relationship among military members.

The fluid vulnerability theory of suicide (Rudd, 2006) theorizes that suicide risk exists over time as a function of both chronic and acute risk factors. Chronic risk is synonymous with a baseline level of suicide risk that remains relatively stable over time (e.g., prior experiences in combat as potentially traumatic and dormant risk factors). Acute risk is associated with present and intense responses to triggers that may escalate suicide risk in short-term fluctuations (e.g., emotional triggers, rumination, negative symptomologies; Rudd, 2006). As it relates, veterans may not always internalize traumatic warzone events as they occur; rather, they may develop negative symptomologies (i.e., acute risk factors) long after the events have taken place, contributing to suicidality above and beyond the effects of combat exposure alone. For example, deployments to warzones are associated with the development of various mental health problems, such as mood disorders, anxiety, sleep problems, and adjustment problems, which are

also associated with suicide (Department of Defense [DoD], 2022; LeardMann et al., 2013). Additionally, researchers using mediation frameworks have found indirect effects of combat exposure on suicidality through PTSD (Bryan, Hernandez, et al., 2013), depression (Bjork et al., 2021; Bryan, Hernandez, et al., 2013), problem-focused rumination (Kelley, Bravo, Davies, et al., 2019) and various other mental health symptoms and factors (Maguen et al., 2011). Understanding the relevance of the fluid vulnerability theory, researchers continue to examine other acute risk factors for suicidality beyond combat exposure alone, to include the distinct trauma response of moral injury.

Moral Injury as a Mediator between Combat Exposure and Suicidality

Moral injury is the inner conflict and resulting negative emotions in response to traumatic events, whereby an individual believes their personal moral code or belief system has been violated (Litz et al., 2009; Shay, 1991). Moral injury typically develops following perceived transgressions (i.e., potentially morally injurious experiences [pMIEs]), whereby the individual engages in, bears witness to, fails to prevent, or learns about events that violate their basic sense of humanity (Currier et al., 2018; Jinkerson, 2016; Litz et al., 2009). When these pMIEs are left unresolved or individuals are unable to make meaning from these experiences, they are at risk of developing distress and strong negative emotions, including guilt, shame, anger, anxiety, depression, and others, long after the traumatic events have taken place; collectively, this constellation of symptoms is known as moral injury (Frankfurt & Frazier, 2016; Jinkerson, 2016; Litz et al., 2009).

Research on moral injury has grown substantially in recent years, especially for servicemembers who served in Iraq and Afghanistan where the battlefield picture was unconventional and typically involved morally ambiguous situations. Notably, adversaries would

commonly use controversial tactics, such as improvised explosive devices (IEDs), suicide bombs, and women or children as combatants, whereby U.S. military members were forced to make split-second, yet long-lasting decisions (Bird & Fairweather, 2007). These situations were often complex, and personal ethics were pitted against social norms, rules of engagement, or political pursuits. Depending on the nature or extremity of these combat events, many warzone experiences are likely to be perceived and classified as pMIEs, placing veterans at a heightened risk of moral injury. For example, a study with 564 combat exposed veterans from Wisco et al. (2017) found that almost half endorsed at least one pMIE. Further, combat severity among these veterans was a positive predictor of pMIE endorsement, where greater exposure to combat situations as measured by the Combat Exposure Scale (CES; Keane et al., 1989) was indicative of greater endorsement of all types of pMIEs (Wisco et al., 2017). Additionally, combat veterans have reported experiencing the cognitive dissonance associated with having to engage child soldiers as part of their duty (Mental Health Advisory Team, 2006). Lastly, soldiers and Marines who entered combat and were subsequently exposed to compounding warzone experiences, such as own unit casualties or handling dead bodies, were more likely to perpetrate unethical behaviors towards civilians and non-combatants (Office of the U.S. Army Surgeon General, 2006). While some servicemembers are resilient and able to cope with these morally ambiguous events, others are unable to make meaning from them or incorporate them into their worldview and are at a heightened risk of experiencing moral injury.

Continued research on moral injury is imperative, as various studies have demonstrated its association with suicidality (Bryan et al., 2014; Hamrick et al., 2020; Jinkerson, 2016). While the potentially traumatic thoughts, experiences, or physical outcomes of past combat may remain dormant risk factors, the present experiences of morally injurious symptoms, such as guilt, anger,

shame, or depression, may serve as acute risk factors that propel the military members towards suicidality. Specifically, guilt and shame are associated with suicidality (Frankfurt et al., 2017), and have been found to impact suicidality above and beyond the effects of PTSD and depression (Bryan, Morrow, et al., 2013). Researchers have continued to support this idea, in which positive associations were found between moral injury and suicidality, even after controlling for demographics and military characteristics (Ames et al., 2019), and severity of warzone experiences (Nichter et al., 2020).

These findings support the notion that combat experiences may lead to an elevated predisposition for suicide, in which the negative emotions from moral injury may serve as the catalyst in an acute suicide trigger according to the fluid vulnerability theory. However, when examining the indirect effects of the complex and somewhat inconsistent associations between warzone experiences and suicidality, few studies have examined moral injury as a mediator. Of those that have, moral injury was found to both mediate (Hamrick et al., 2020) and not mediate (Battles et al., 2018) the combat-suicidality relationship. To help delineate these findings and build on the literature, moral injury was examined as a mediator in the association between combat exposure and suicidality in the present study.

Positive Rumination as a Moderator

While much of the literature has focused on factors that intensify the relationship of combat exposure and suicidality (i.e., moral injury, PTSD, depression), there is a dearth of research that has explored the impact of positive, adaptational factors to protect against the negative outcomes (i.e., moral injury, suicidality) associated with combat. Positive rumination, or, taking the time to reflect on positive affect (i.e., emotions and moods), may be one such

factor that has yet to be examined among combat veterans who endorse moral injury and suicidal thoughts and/or behaviors.

Positive affect and affective states can be understood as all-encompassing terms to represent feelings, emotions, and moods that are evaluated as being enthusiastic, active, and alert, and can lead to high energy, concentration, and pleasurable engagement (Gross, 2015; Watson et al., 1988). Researchers in contemporary psychology have encouraged a shift towards embracing positive psychology, or "knowledge of what makes life worth living" (Seligman & Csikszentmihalyi, 2000, p. 5), which has stimulated the exploration of positive affective states and their benefits across a broad range of outcomes (Fredrickson, 1998). Within this domain, Fredrickson (1998) posited the broaden-and-build theory of positive emotions, in which positive affect (e.g., joy, interest, love) *broaden* one's consciousness, encouraging exploratory thoughts and actions, which further serve to *build* adaptive resources (e.g., resilience, social support, etc.). These resources have been examined across physical, social, and psychological domains, where the benefits can be called upon to mitigate future threats (Fredrickson, 2001; Gruber et al., 2014). Together, positive emotions initiate upward spirals of positive experiences, in which a positive mindset initiates broadened awareness, which leads to the building of new resources that increase the likelihood of subsequent positive emotions and adaptive coping to adversity (Fredrickson, 2013).

Military members, especially those who must encounter combat as required by their duties, are at a heightened risk of exposure to traumatic experiences and stress. Interestingly, the adaptive benefits of positive emotions appear to be greatest among individuals experiencing elevated levels of stress (Ong et al., 2006). Specifically, individuals appraised positive affect as a psychological breather to help mitigate intense bouts of stress (Ong et al., 2006). When viewed

as a *building* function within the broaden-and-build theory, positive affect may also protect against maladaptive stress responses; that is, positive emotions prevent prolonged stress recovery by restoring and building personal resources to inhibit stress from turning into future negative affect (Fredrickson & Levenson, 1998; Ong et al., 2006). Additionally, an individual's positive affectivity may have the ability to promote resilience (Fredrickson, 2001; Gloria et al., 2013; Tugade & Fredrickson, 2004), with those experiencing more positive emotions becoming more resilient to adversity over time (Fredrickson, 2004). For example, Gloria et al. (2013) found that positive affect mediated the relationship of work-stress and resilience, suggesting that enduring stress and hardships may not directly create resilient individuals. Rather, an individual's ability to experience positive affect may serve as a mechanism to build adaptive resources (e.g., resilience) in an upward spiral that protects against stress and stress-related outcomes associated with war.

While experiencing positive affect is important, cognitive researchers have further examined ways in which people manage their affective states via emotion regulation (Gross, 1998). Specifically, individuals make efforts to actively regulate positive and negative affect, rather than passively endure them, and these regulatory responses are associated with positive and negative health outcomes (Aldao et al., 2010; Quoidbach et al., 2010). Nolen-Hoeksema (1987) originally explored this idea by examining sex differences in regulation strategies (i.e., response styles) to depressive moods. They found that while men responded to depressed moods by distracting themselves and further dampening the negative affect state, women prolonged the duration of their depressed mood by ruminating on the negative affect state and its etiology. This *rumination* response style was further defined as "a pattern of behaviors and thoughts that focus [an] individuals' attention on their emotional state and inhibit any actions that might distract the

individual from their mood" (Nolen-Hoeksema, 1987, p. 569). Although the concept of rumination can be applied to either positive or negative affect states, most contemporary research has focused on negative rumination and adverse outcomes such as those associated with trauma (Kelley, Bravo, Hamrick, et al., 2019; Nolen-Hoeksema & Morrow, 1991; Szabo et al., 2017) and suicidality (Kelley, Bravo, Hamrick, et al., 2019; Rogers & Joiner, 2017). Importantly, these studies shed light on the powerful effects of rumination, in which a ruminative response to positive affect states may provide buffering for adverse challenges, such as the risk for moral injury and suicidality following combat.

Positive rumination is an enhancing strategy in which individuals have a tendency to respond to positive affect and affective states with recurrent thoughts about "positive self-qualities, positive affective experience, and one's favorable life circumstances" (Feldman et al., 2008, p. 509). It is typically examined along two distinct rumination styles: emotion-focused (e.g., ruminating on positive moods and somatic experiences) and self-focused (e.g., ruminating on aspects of the self, positive-self qualities, and the pursuit of personal goals). Positive rumination is considered to be a specific emotion-regulation strategy that falls under the more broad concept of savoring, or the ability to recognize, attend to, and enhance any positive experiences in an individual's life (Bryant, 2021; Bryant & Veroff, 2017). While literature within this field of positive psychology is relatively sparse, Yang et al. (2020) drew support for positive rumination with findings that it shares positive correlations with favorable psychological outcomes (e.g., life satisfaction, optimism) and negative correlations with unfavorable psychological outcomes (e.g., loneliness, depression, stress), factors known to be related to moral injury and suicidality. Additionally, positive rumination was found to protect against depression, with the most benefits occurring on days in which depression was at its highest (Li et al., 2017).

Positive rumination may provide the greatest protective effects when positive experiences are low, which is often the case for combat veterans. The most encouraging results in this evolving domain may be from Yang (2019) who developed a preliminary positive rumination intervention that was effective in a student counseling settings. Further studies utilizing this intervention have shown that positive rumination groups exhibited significant decreases in negative rumination, depression, and anxiety (Yang & Guan, 2022) and increases in psychological adjustment and working memory (Yang & Li, 2020).

Understanding rumination response styles and using the broaden and build theory, the present study addressed the absence of literature regarding positive rumination and suicide among military members. Given the deleterious effects of both traumatic combat exposure and moral injury, as well as the severity of suicidality, it was of utmost importance to understand how positive rumination may impact the theorized mediational relationship between these variables. Being the first study to examine this conditional process, equally important too was examining how positive rumination may weaken any relationships in this complex model. Identification of a positive rumination buffering effect at any one path in the combat-moral injury-suicidality relationship may ultimately provide insight into ways to reduce military distress and veteran suicide.

Purpose of the Present Study

Given the above discussion, it is evident that the association between combat exposure and suicidality warrants continued examination (see Reger et al., 2018). In addition, the growing moral injury research suggests further empirical investigations are needed to support moral injury as a pathway through which combat exposure and suicidality are linked. Lastly, no known

studies have examined positive rumination as a moderator in the complex association between combat exposure and suicidality via moral injury.

Therefore, among a sample of post 9/11 U.S. military members and veterans, the present study first examined the relationship between combat exposure and suicidality. Second, the current study examined whether moral injury mediated the association between combat exposure and suicidality and was assessed via a simple mediation model (Figure 1a). Third, the current study examined whether the indirect effect of combat exposure on suicidality through moral injury, as well as the direct effects, were conditional on levels of positive rumination and was assessed via a moderated mediation model (Figure 1b). Based on these aims and the existing research, the following hypotheses were proposed:

Hypothesis 1. Combat exposure would be positively associated with suicidality.

Hypothesis 2. Moral injury would mediate the association between combat exposure and suicidality, such that combat exposure would be associated with higher moral injury, which in turn would be associated with increased suicidality.

Hypothesis 3. Positive rumination would moderate the indirect effect of combat exposure and suicidality via moral injury.

Hypothesis 4a. Positive rumination would moderate and buffer the direct effect of combat exposure on moral injury (a-path).

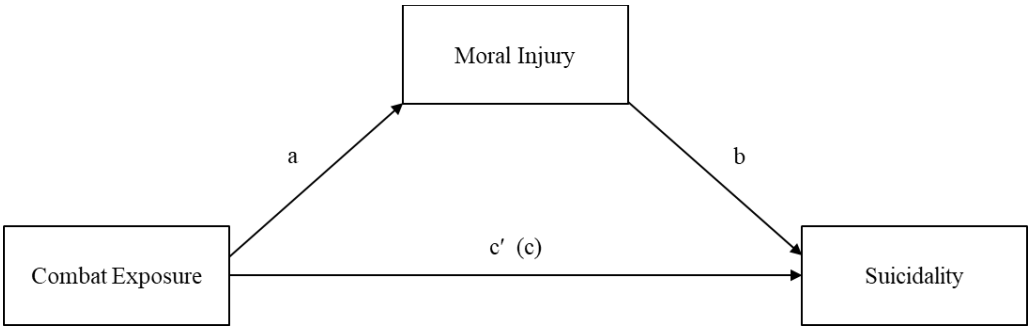
Hypothesis 4b. Positive rumination would moderate and buffer the direct effect of moral injury on suicidality (b-path).

Hypothesis 4c. Positive rumination would moderate and buffer the direct effect of combat exposure on suicidality (c′-path).

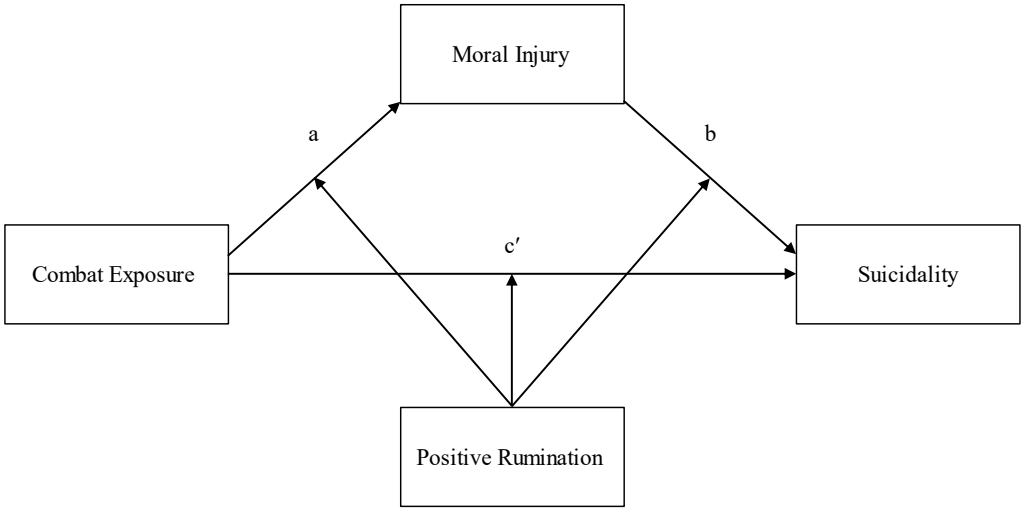
Figure 1

Conceptual Mediation Model (a) and Moderated Mediation Model (b)

a.



b.



Note. Model a is PROCESS Macro model 4. Model b is PROCESS Macro model 59.

CHAPTER II

METHOD

Data and Design

The present study was a secondary analysis of data extracted from the “Moral Elevation" study (see McGuire et al., 2024). Data were collected between July 2021 and July 2022 as part of a multi-university, longitudinal study to understand how the induction of moral elevation among military members impacts various emotional, psychological, and behavioral health outcomes. Analyses for the present study were conducted on the baseline data for only those participants who completed relevant measures (i.e., demographics, covariates, suicidality, combat exposure, moral injury, and positive rumination).

Participants and Procedure

A total of 675 prospective participants were recruited via online advertising (Facebook, listservs, student veteran organizations, student announcements at one of two participating universities, the psychology department research pool at one of the universities, and word of mouth). To have been eligible for the Moral Elevation study, participants must have: (1) been 18 years of age or older, (2) served in the U.S. military, (3) deployed one or more times, and (4) correctly answered two military-specific screening validation questions (i.e., “What is the acronym for the generic term that the military uses for various job fields?” and “What is the acronym for the location where the final physicals are taken prior to shipping off for basic training?”; Lynn & Morgan, 2016).

Of the initial 675 interested participants that clicked the secure survey link, n = 343 were excluded for not providing consent (n = 90) or not meeting inclusionary criteria (n = 253). The remaining 332 participants who met study screening criteria were invited to complete the study

survey in its entirety. Of those, 61 participants completed only the demographic portion of the survey and were excluded from analyses. Of the remaining 271 participants, 21 participants had missing data for all items of at least one measure from the present study. The analytic tool used in the present study (PROCESS macro for SPSS) automatically removes cases with missing data on any of the variables for each model. Thus, the final analytic sample for the present study yielded N = 250 current or former U.S. military members.

Among the final analytic sample (N = 250), the mean age was 33.30 years (SD = 8.65, range = 19-78). The majority of participants identified as White (n = 180, 72.00%), married (n = 150, 60.00%), males (n = 173, 69.20%). Most were active duty (n = 120, 48.00%), had served in the Army (n = 107, 42.46%), and had served for 8.45 years on average (SD = 6.14; range = 1-40). Participants resided in 40 of the 50 U.S. states, with the majority located in Virginia (20.0%), California (15.6%), New York (9.2%), Florida (6.8%), and Texas (5.6%). Additional demographic information can be found in Table 1.

Participation was anonymous, which facilitates honesty in participant responses as well as participation from individuals who might not otherwise partake due to stigma, fears, apprehensions, or other issues involving disclosure of sensitive issues (e.g., combat trauma, moral injury, suicide behavior). Additionally, participation in the study was voluntary and individuals gave written consent prior to their involvement. Student participants recruited via the participating university's psychology research pool were offered research credit as compensation. All study materials were approved by the author's human subjects committee.

Table 1

Analytic Sample Demographic Information

Age *M* (SD)	33.3 (8.7)
Race/Ethnicity *n* (%) [a]	
White or Caucasian	180 (72.0)
Black or African American	53 (21.2)
American Indian or Alaskan Native	6 (0.2)
Hispanic or Latino/a	5 (0.2)
Asian	4 (0.2)
Other	3 (5.2)
Marital status *n* (%) [a]	
Married	150 (60.0)
Single	70 (28.0)
Divorced or Separated	24 (9.6)
Cohabitating, not married	19 (7.6)
Widowed	1 (0.4)
Highest education *n* (%)	
Some high school	3 (1.2)
High school diploma or GED	14 (5.6)
Some college or Associate's degree	102 (40.8)
Bachelor's degree	75 (30.0)
Graduate degree	56 (22.4)
Employment status *n* (%) [a]	
Employed full-time	185 (74.0)
Employed part-time	44 (17.6)
Student	22 (8.8)
Retired	13 (5.2)
Unemployed	2 (0.8)
Military Branch *n* (%) [a b]	
Army	107 (42.8)
Navy	78 (31.2)
Air Force	62 (24.8)
Marines	43 (17.2)
Coast Guard	16 (6.4)
National Guard	2 (7.6)

Note. $N = 250$. [a] Totals may not sum to 100% due to multiple responses.
[b] Reserve components are categorized under their respective branches.

Measures

Suicidality. Suicidality was measured with the 6-item suicidality subscale from the Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007). The suicidality subscale of the IDAS assesses an individual's suicidal thoughts and behaviors (e.g., "I had thoughts of suicide" and "I hurt myself purposefully"). Participants were instructed to endorse how much they have felt or experienced each item over the past week using a 5-point scale ranging from 1 (*Not at all*) to 5 (*Extremely*). Item scores were summed to construct a total score with higher scores reflecting higher levels of suicidality. In the present sample, internal consistency for the suicidality subscale of the IDAS was $\alpha = .89$.

Initial psychometric testing established support for the reliability of the IDAS. Specifically, the suicidality subscale demonstrated excellent internal consistency among a sample of students ($\alpha = .90$) and good internal consistency among a sample of general population adults ($\alpha = .82$; Watson et al., 2007). Additionally, the suicidality subscale exhibited good temporal stability with a test-retest reliability correlation of $r = .77$ between one-week, time-delayed experiments (Watson et al., 2007); this correlation exceeded the minimum benchmark ($r = .70$) for test-retest reliabilities with brief durations (Joiner, 2005). More relevant to the present study, the suicidality subscale of the IDAS exhibited excellent internal consistency ($\alpha = .91$) among a sample of 244 veterans who had deployed at least one time during their service (Battles et al., 2018).

Initial psychometric testing also helped to establish the validity of the suicidality subscale of the IDAS. Convergent validity was demonstrated externally through significant positive correlations with the self-reported Beck Depression Inventory—II ($r = .63$, $p < .01$; BDI-II; Beck et al., 1996), as well as with a suicidality symptom composite from the Interview for Mood and

Anxiety Symptoms (IMAS; Kotov et al., 2005) semi-structured interview (r = .62, p < .01; Watson et al., 2007). Discriminant validity for the suicidality subscale was also demonstrated through internal and external investigations during initial psychometric testing. Internally, mean correlations between the suicidality subscale and all nine other specific subscales of the IDAS were conducted; of the nine correlations, suicidality was found to have low to moderate correlations ranging from r = .17 (appetite gain) to r = .47 (traumatic intrusions), suggesting good discriminant validity. Externally, correlations between the suicidality subscale of the IDAS and seven symptom composites of the IMAS (that directly parallel the IDAS) were also conducted. Suicidality was found to have low to moderate correlations ranging from r = .19 (irritability) to r = .35 (PTSD intrusions), further suggesting good discriminant validity.

Combat Exposure. Combat exposure was measured with the Critical Warzone Experiences (CWE) scale (Kimbrel et al., 2014). The CWE scale consists of 7-items that assess an individual's experiences during combat and combat situations (e.g., "Being directly responsible for the death of an enemy combatant" and "Seeing ill/injured women/children who you were unable to help"). Participants were instructed to endorse how often they have had any of these experiences using a 5-point scale ranging from 0 (*Never*) to 4 (*10+ times*). Item scores were summed to construct a total score, with higher scores reflecting higher levels of combat exposure. In the present sample, internal consistency for the CWE was α = .91.

Initial psychometric testing with samples of post-9/11, men and women veterans who had deployed to warzones established support for reliability of the CWE scale, to which it demonstrated good internal consistency across three independent studies (average α = .83; Kimbrel et al., 2014). Additionally, the CWE scale exhibited good temporal stability with a test-retest reliability of r = .73 over a one-year period (Kimbrel et al., 2014).

In terms of validity, initial psychometric testing from Kimbrel et al. (2014) examined concurrent validity of the CWE scale in relation to two subscales of the Deployment Risk and Resilience Inventory (DRRI; King et al., 2006). Specifically, the CWE scale was found to be strongly associated with both the Combat Experiences (CE) subscale ($r = .76$, $p < .001$), and the Aftermath of Battle (AB) subscale ($r = .72$, $p < .001$) of the DRRI, suggesting good concurrent validity (Kimbrel et al., 2014). Additionally, the CWE scale was demonstrated to have acceptable predictive validity in relation to mental health outcome symptomologies (e.g., PTSD, anxiety, and depression). A latent CWE factor was strongly associated with a post-deployment mental health latent variable ($\beta = .49$, $p < .001$), comprised of total scores on the BDI-II, Depression-Anxiety-Stress Scales (DASS; Lovibond & Lovibond, 1995) and PTSD Checklist-Military Version (PCL-M; Weathers et al., 1993).

Moral Injury. Moral injury was measured utilizing the 17-item Expressions of Moral Injury Scale – Military Version (EMIS-M; Currier et al., 2018). It was designed as an adaptation from the original Expressions of Moral Injury Scale (EMIS) to assess self-directed (9 items; e.g., "I am ashamed of myself because of things that I did/saw during my military service.") and other-directed/betrayal-based (8-items; e.g., "I feel anger over being betrayed by someone who I had trusted while I was in the military") moral injury specifically among military members and veterans. Participants were instructed to endorse how much they agreed with each item using a 5-point scale ranging from 1 (*Totally disagree*) to 5 (*Totally agree*). Item scores were summed to construct a total moral injury score, with higher scores reflecting higher endorsement of moral injury symptoms. In the present sample, internal consistency for the EMIS-M was $\alpha = .95$.

Initial psychometric testing with samples of veterans who had previously deployed to warzones and areas in which combat was likely, helped to establish the reliability of the EMIS-M

and its subscales. Across two studies, the overall EMIS-M internal consistency was excellent (average α = .95; Currier et al., 2018). More precisely, the other-directed moral injury subscale demonstrated excellent internal consistency (average α = .91), and the self-directed moral injury subscale (average α = .93; Currier et al., 2018). In addition, temporal stability was found to be satisfactory over a six-month period with overall EMIS-M test-retest reliability r = .80), other-directed moral injury subscale test-retest reliability r = .80, and the self-directed moral injury subscale test-retest reliability r = .74 (Currier et al., 2018).

Construct validity was also assessed during initial testing. Convergent validity of the EMIS-M was demonstrated with 11 related measures and constructs (e.g., PTSD, depression, anger, guilt, etc.), all of which were statistically significant at p-values less than .001 (correlations ranging from r = .18 to r = .73; Currier et al., 2018).

Positive Rumination. Positive rumination was measured using the Responses to Positive Affect (RPA) questionnaire (Feldman et al., 2008). RPA is a 17-item self-report measure that assesses an individual's level of rumination or dampening in response to positive affect along 3 distinct subscales: (a) emotion-focused positive rumination (5 items; e.g., "Think about how strong you feel"), (b) self-focused positive rumination (4 items; e.g., "Think 'I am living up to my potential'"), and (c) dampening (8 items; e.g., "Think 'I don't deserve this'"). Participants were instructed to endorse how much they generally *do*, rather than think about doing, each item during the previous week. Participant responses were self-reported using a 4-point scale ranging from 1 (*Almost never*) to 4 (*Almost always*).

In contrast to the positive rumination subscales, dampening entails emotion-regulation strategies that reduce or suppress positive affect (Feldman et al., 2008; Nelis et al., 2016). Additionally, dampening showed no significant correlations with emotion-focused (r = .03, p =

.593) or self-focused (r = .11, p = .081) positive rumination. Given the focus on positive rumination in the present study, and the theoretical and correlational distinctions, only the emotion-focused and self-focused positive rumination subscales were used. Additionally, empirical support for examining the two positive rumination subscales as one parsimonious construct comes from Nelis et al. (2016) who found that a two-factor RPA model (i.e., dampening and a combined positive rumination factor) exhibited acceptable levels for RMSEA, SRMR, and chi-squared-degrees of freedom ratio's, with minimal to no differences in model fit indices compared to a three-factor model (i.e., dampening, emotion-, and self-focused positive rumination). Further, among 14 studies examined, correlations between the PR subscales were all high (above r=.60), suggesting these subscales may represent one single construct (Nelis et al., 2016). In the present study, the subscales were also highly correlated at r = .74. Thus, item scores for the two subscales (i.e., emotion- and self-focused positive rumination) were collectively summed to yield a total positive rumination score, with higher scores reflecting higher levels of overall positive rumination. In the present sample, internal consistency for the positive rumination measure was α = .90.

Initial psychometric testing with samples of men and women university students examined the reliability of the RPA questionnaire. Acceptable values of internal consistency were found for both the emotion-directed rumination subscale (α = .76) and the self-directed rumination subscale (α = .73; Feldman et al., 2008). In a study with young adults from Nelis et al. (2016), they found a combined positive rumination factor to exhibit good internal consistency (α = .82).

In terms of validity, psychometric testing from Feldman et al. (2008) first examined the replicability of RPA's factor structure, where a two-factor model consisting of dampening and a

combined positive rumination factor was an acceptable fit to the data. For convergent and discriminant validity, item scores on the self-focused positive rumination subscale were positively associated with the similar constructs of self-esteem ($r = .20$, $p < .01$), manic symptomology ($r = .25$, $p < .01$), and vulnerability to mania ($r = .16$, $p < .05$) while being inversely related to a theoretically dissimilar construct in depression ($r = -.15$, $p < .05$). Additionally, the emotion-focused positive rumination subscale was also positively associated with the similar constructs of self-esteem ($r = .19$, $p < .05$), manic symptomology ($r = .19$, $p < .05$), and vulnerability to mania ($r = .30$, $p < .01$), however, it was not found to be significantly related to depression ($r = -.07$, *n.s.*). Lastly, incremental validity was demonstrated in which the total RPA measure predicted mania above rumination measured with the brooding subscale of the Response Styles Questionnaire (RSQ, Nolen-Hoeksema & Morrow, 1991); specifically, RPA contributed an additional 8% of variance in levels of mania after controlling for rumination (Feldman et al., 2008).

Covariates. According to the DoD (2022), enlisted military personnel who are under the age of 30 disproportionately die by suicide. Additionally, time since a military members last deployment has been associated with increased psychological distress (Rona et al., 2016). Thus, years served in the military (i.e., "Time in service") and time elapsed since one's previous deployment ("Time since last deployment") were controlled for in the present study.

Demographics. In addition to the covariates, participants reported their age, race/ethnicity, marital status, education level, employment status, military branch, and military status (e.g., active duty, etc.).

Data Analysis

Data were compiled and analyzed using SPSS version 29.0 software package (IBM Corp., 2022) and the PROCESS Macro for SPSS (version 4.2; Hayes, 2022). Data for all respondents (N = 675) were first cleaned and n = 90 cases were removed for participants that did not provide consent. An additional n = 253 cases were removed for not meeting inclusionary criteria. Specifically, n = 36 did not endorse an age of 18 years or older, n = 11 did not serve in the military, n = 54 had never deployed as part of their military service, and n = 152 failed to answer the two military specific screening questions. Next, participants who did not complete any measures of the original study were also removed (n = 61). Lastly, the PROCESS macro is currently unable to integrate with stacked multiple-imputed data sets and instead uses listwise deletion to remove cases with missing data on any variable in a model. Specifically, n = 19 did not complete any items for the dependent variable (suicidality) and at least one other measure from the present study (i.e., combat exposure, moral injury, and/or positive rumination). An additional n = 2 did not complete any items for the mediating variable (moral injury). These 21 cases were automatically removed by the PROCESS macro. A total 250 cases remained following data cleaning as the final analytic sample.

Outliers. Potential univariate outliers for each variable were independently examined using the standard boxplot approach (Tukey, 1977). Using this method, cases outside the adjacent values, that is, the minimum and maximum whisker boundaries for the boxplots of each individual variable, are considered to be outliers and potentially problematic for inferential statistics. No variables in the present study had any univariate outliers.

Multivariate outliers were assessed in regards to case-wise influence, leverage, and discrepancy as outlined by Darlington and Hayes (2016). Cases were examined using various

statistics and critical cutoff values as outlined below for each model of the present study: (1) the mediation model containing combat exposure, moral injury, and the two covariates as the four predictors with suicidality as the dependent variable, and (2) the moderated mediation model containing combat exposure, moral injury, positive rumination, and the two covariates as the five predictors with suicidality as the dependent variable.

Influence. Cases with high influence are considered to be potential outliers of both the x- and y-axes and are especially problematic as they may impact the regression line when present in a model (Darlington & Hayes, 2016; Sullivan et al., 2021). To detect highly influential cases, the Cook's distance (*d*) statistic (Cook, 1977) was compared to a critical cutoff value. Cook's d is an omnibus measure of how much a case affects all estimated regression slopes. Thus, the critical cutoff values were based on an *F* distribution, with a probability of .5 and degrees of freedom = (k+1, n-k-1), where k is the number of predictors in the model (Sullivan et al., 2021). Analyses revealed there were no influential cases in either model. While this outcome was favorable, it is recommended to additionally assess cases for outliers on both the x-axis (leverage) and y-axis (discrepancy) individually as some outliers may not be detected when investigating influence (Sullivan et al., 2021).

Leverage. A case may have high leverage and be considered unusual if it exhibits an atypical pattern of values across the combination of variables in the model (Darlington & Hayes, 2016). That is, while a case may have relatively normal values on a single predictor variable, its mixture with other predictors in a multivariate model may be unusually distributed when examined collectively. Based on recommendations (Darlington & Hayes, 2016; Sullivan et al., 2021), leverage was assessed using critical values for the Mahalanobis distance, which is measure of a case's uniqueness across the range of predictor variables in a model. Of note, the

Mahalanobis critical value was based on a chi-square distribution, using a probability of $p < .001$ and degrees of freedom as n-1. Cases that exceed the Mahalanobis distance critical value are considered to have high leverage. One case exceeded the Mahalanobis distance cutoff value for each model and was considered as a potential outlier. However, complete outlier assessment showed that this case exhibited acceptable discrepancy and influence. It was therefore retained in the study and is further outlined below.

Discrepancy. Discrepancy, also known as distance, is a measure of how far a case's observed value on the dependent variable (i.e., suicidality) deviates from the estimate value (i.e., the regression line; Darlington & Hayes, 2016). The further a case is from the regression line, the greater the discrepancy, and the more likely that case is considered to be an outlier. High discrepancy cases can statistically "pull" the regression line towards themselves, impacting the data and further interpretations. To assess whether any cases for either model have particularly extreme discrepancy, *t*-residuals (i.e., studentized deleted residuals) are compared to a cutoff value to determine how much they differ from the raw residuals. The cutoff values for each model were based on a *t*-distribution, with a Bonferroni corrected probability = α/n, and degrees of freedom = $n - k - 2$, where k is equal to the number of predictors in the model (Sullivan et al., 2021). No *t*-residuals exceeded the cutoff values in either the mediation (cutoff = 3.5897) or moderated mediation (cutoff = 3.5899) models.

Collectively, one total case was found to be a potential multivariate outlier and leverage point (i.e., had high leverage). However, given the subjective nature of outlier assessment (Darlington & Hayes, 2016) and the fact that this case exhibited relatively normal influence and discrepancy, the case was preserved in both models.

Assumptions. Similar to the outlier detection analyses, assumption analyses were conducted for each model (i.e., the mediation and the moderated mediation models). It is also important to note that the PROCESS macro utilize the bootstrapping method to address statistical inference. Bootstrapping resamples the observed data with replacement over thousands of replications in order to derive a sampling distribution that better estimates the true population distribution of the dependent variable (Hayes, 2022). Thus, bootstrapping is a rather rigorous method that can withstand certain assumption failures, such as non-normal or skewed distributions (Mooney et al., 1993).

Linearity. To ensure proper statistical inference in regression analyses, relationships between the dependent variable and predictors in a model are required to be approximately linear (Hayes, 2022). To determine if there was a linear relationship between independent variables collectively, the unstandardized residuals were plotted against the unstandardized predicted values. The scatterplots with superimposed Lowess lines exhibited relatively linear form for both models suggesting linearity between study variables.

Homoscedasticity. The assumption of homoscedasticity assumes residuals have constant variance across predictors (Darlington & Hayes, 2016). In other words, the error that exists when estimating values of the dependent variable is relatively constant across values of all predictors. This assumption was assessed visually with a scatterplot of standardized residuals plotted against standardized predicted values as recommended by Hayes (2022) and Ho (2013). The resulting scatterplots for both models displayed relatively random spreads of data points with no clear pattern, providing support that the assumption of homoscedasticity was upheld for the mediation and moderated mediation models.

Normality. Normality of the data was assessed via histograms and quantile-quantile (QQ) plots for standardized residuals, that is, the standardized error that occurs when estimating the dependent variable, suicidality (Hayes, 2022; Tranmer et al., 2020). Visual inspection of histograms with superimposed normality curves suggested the data are relatively normal distributed for both models, as they were not positively or negatively skewed. QQ plots display the standardized residuals from the models in relation to a perfectly normal distribution as reference. Distribution of the residuals were aligned along the reference line with minor deviations at the extreme ends. This residual plot fit the expected pattern well enough to again suggest data for both models was relatively normally distributed.

Independence. The assumption of independence for each model posits that residuals must be statistically independent, that is, information from one case should not influence information on another case (Hayes, 2022). Violation of this assumption is known as autocorrelation of error terms and with one of the best performing tests to detect autocorrelation being the Dubin-Watson test (Durbin & Watson, 1950; Uyanto, 2020). The Durbin-Watson test provides a statistic ranging from 0 to 4, in which values in the range of 1.5 to 2.5 suggest there is no linear autocorrelation among the residuals (Ho, 2013). Results of the present study showed the Durbin Watson statistic for both models was 1.80, providing support that the assumption of residual independence was met.

Multicollinearity. Multicollinearity is present when predictor variables are highly correlated in a linear fashion; that is, the variables are no longer considered to be independent, with one or more predictor variables determining another (Kim, 2019). Multicollinearity leads to inaccurate results and subsequent interpretation problems. To detect multicollinearity in a regression model, it is common to examine the variance inflation factor (VIF) and/or its

reciprocal, the tolerance value. The standard when examining these values is that multicollinearity exists in a model if any variable has a VIF above 10 or a tolerance below 0.2 (Kim, 2019; O'Brien, 2007). No variable in either model exhibited a VIF above 10 or a tolerance below the 0.2 threshold. Within the mediation model, VIF values ranged from 1.03 to 1.26 and tolerance values ranged from .80 to .96. Within the moderated mediation model, VIF values ranged from 1.15 to 1.33 and tolerance values ranged from .75 to .87. Thus, there was evidence that multicollinearity did not exist in either of the models.

PROCESS Model Analyses. Statistical significance for model analyses was determined with 95% confidence intervals (based on 10,000 bootstrapped samples) that do not contain zero. One of the models contains a moderating variable that is continuous, therefore significant interactions were probed to examine conditional direct and indirect effects at various levels of the moderator (i.e., -1 SD, Mean, +1 SD) based on recommendations from Hayes (2022) and Preacher et al. (2007).

To address the hypotheses that combat exposure would be positively associated with suicidality (Hypothesis 1) and that moral injury would mediate the combat exposure-suicidality relationship (Hypothesis 2), a simple mediation analysis was conducted using PROCESS Macro Model 4 (version 4.2; Hayes, 2022) for SPSS. A conceptual diagram of this mediation model is depicted in Figure 1a. A mediation analysis can be used to assess how a predictor variable indirectly effects a dependent variable through a third mechanism known as a mediating variable (Hayes, 2022). This model was chosen since the present study was interested in examining how combat exposure not only directly impacts one's degree of suicidality, but also indirectly effects suicidality through the mediating mechanism of moral injury. Collectively, the direct and indirect effects can be combined to derive the total effect of combat exposure on suicidality, which is

represented by the c-path. This total effect is simply the regression coefficient of regressing suicidality on combat exposure while controlling for the covariates without the mediator moral injury in the model. For Hypothesis 1, however, the researcher sought to examine the effects of combat exposure on suicidality above and beyond the effects of other variables. Fortunately, this model also provides the regression coefficient representing the direct effect of combat exposure on suicidality (c′-path) while controlling for all variables in the model, including moral injury. This effect considers variability from all sources in the model and was utilized for addressing Hypothesis 1. For Hypothesis 2, the model also estimates the indirect effect (ab-path), that is, the mathematical product of the direct effect of combat on moral injury (a-path) and the direct effect of moral injury on suicidality controlling for combat exposure (b-path). Therefore, the coefficient representing the indirect effect will inform us how much two cases that differ by one unit on combat exposure are estimated to differ on suicidality as a result of the effect of combat on moral injury and moral injury on suicidality.

Moderated mediation analyses (also referred to as conditional process analyses) are concerned with understanding how variables exert effects through a mediation framework that is contingent on one or more moderating variables. Therefore, to determine whether the indirect effect of combat exposure on suicidality via moral injury (ab-path) was conditional on and moderated by levels of positive rumination (Hypothesis 3), a test for moderated mediation was conducted. The PROCESS Macro Model 59 (version 4.2; Hayes, 2022) for SPSS was used to examine if there was an effect of moderated mediation. A conceptual diagram of this model is depicted in Figure 1b. There are various PROCESS models to examine conditional indirect effects and provide evidence of moderated mediation. The differences between models depend on various analytic components, such as the number of moderators or at what path(s) in the

model the moderation is hypothesized to occur. Model 59 was specifically chosen as it allows the researcher to examine conditional indirect effects with moderation of all three relationships (i.e., paths) of the model, aligning with the researcher's interests and aims for the present study. Thus, while this analysis tested for moderated mediation (Hypothesis 3), it also addressed the hypotheses that positive rumination would moderate the direct relationships between combat exposure and moral injury (a-path; Hypothesis 4a), moral injury and suicidality (b-path; Hypothesis 4b), and combat exposure and suicidality (c′-path; Hypothesis 4c).

In conditional process analyses, there is evidence for moderated mediation as long as one pairwise comparison of conditional indirect effects is significant as determined by bootstrap confidence intervals that do not contain zero (Hayes, 2022). That is, to determine whether positive rumination moderates the indirect effect of combat on suicidality through moral injury, at least one indirect effect at one value of positive rumination must be significantly different than an indirect effect at another value of positive rumination. Indication of a significant moderated mediation was further probed by examining indirect effects at different levels of positive rumination (i.e., -1 SD, Mean, +1 SD). PROCESS model 59 also provides interaction terms with tests of significance to determine whether positive rumination moderated any of the direct paths in the model. Similar to the conditional indirect effect, significant interactions for direct effects were probed at various levels of the moderator (i.e., -1 SD, Mean, +1 SD) to provide detailed insight as to how effects change based on levels of positive rumination.

Covariates. Time in service and time since last deployment were modeled as predictors of all variables (i.e., covariates) in both statistical models.

CHAPTER III

RESULTS

Descriptive Statistics and Bivariate Correlations

Means, standard deviations, bivariate correlations, and internal consistency among study variables are displayed in Table 2. Suicidality, combat exposure, and moral injury were all significantly positively correlated. Positive rumination was significantly positively correlated with combat exposure and significantly negatively correlated with moral injury. Positive rumination and suicidality were negatively correlated; however, this relationship was nonsignificant. The covariates (i.e., years in service and time since last deployment) were negatively correlated with all other study variables. Additionally, years in service and time since last deployment were significantly positively correlated with each other.

Table 2

Descriptive Statistics and Correlations Among Study Variables

	1	2	3	4	5	6
1. Suicidality	-					
2. Combat Exposure	**.28*** **	-				
3. Moral Injury	**.65*** **	**.15***	-			
4. Positive Rumination	-.09	**.30*** **	**-.32*** **	-		
5. Years in service	-.10	**-.22*** **	-.06	**-.17****	-	
6. Years since deployment	**-.13***	**-.35*** **	**-.14***	**-.21*** **	**.34*** **	-
M	11.69	18.56	43.45	22.08	8.45	5.40
SD	5.72	7.54	15.82	6.34	6.14	4.59
Min.	6	7	17	9	1	1
Max.	27	35	85	36	40	22
α	.89	.91	.95	.90	-	-

Note. $N = 250$. Significant correlations are in bold. *$p < .05$, **$p < .01$, ***$p < .001$.

Mediation Model Effects

The total, direct, and indirect effects in the relationship between combat exposure, moral injury, and suicidality were estimated using a simple mediation model (PROCESS macro model 4; Hayes, 2022). The model was statistically significant, $F(4, 245) = 51.38$, $p < .001$, $R^2 = .46$. Results of the total path revealed combat exposure was positively associated with suicidality (c-path; $B = 0.20$, 95% CI [0.10, 0.30]). This means that for every one unit increase in combat exposure, suicidality is estimated to increase by 0.20 units while years in service and time since last deployment are held constant. Examination of the direct effect revealed similar results such that combat exposure was statistically positively associated with suicidality (c′-path; $B = 0.15$, 95% CI [0.07, 0.23]). Thus, controlling for covariates and moral injury, suicidality is estimated to increase by 0.15 units for every one unit increase in combat exposure. These findings provide support for Hypothesis 1, suggesting increases in exposure to combat are associated with increases in suicidality among military members.

The a-path, representative of the association between combat exposure and moral injury, was non-significant ($B = 0.23$, 95% CI [-0.05, 0.51]). The b-path, representative of the association between moral injury and suicidality when controlling for other variables, was positive and significant, suggesting suicidality is estimated to increase as moral injury symptoms increase ($B = 0.22$, 95% CI [0.19, 0.26]). Ultimately, the indirect effect (ab-path) from this model was not significant ($B = 0.05$, 95% CI [-0.01, 0.12]), signifying moral injury did not mediate the association between combat exposure and suicidality, nor did it support Hypothesis 2. Results from this model are displayed in Table 3 and visually in Figure 2.

Further investigation into these findings revealed that removal of the time since last deployment covariate, and only this covariate, led to significant positive relationships between

combat exposure and moral injury (*B* = 0.30, 95% CI [0.03, 0.56]), as well as moral injury and suicidality (*B* = 0.22, 95% CI [0.19, 0.26]). As a result, a significant indirect effect of combat on suicidality via moral injury was found as hypothesized (*B* = 0.07, 95% CI [0.002, 0.13]). Given the negative correlations between time since last deployment with moral injury (*r* = -.14, *p* = .024) and suicidality (*r* = -.13, *p* = .035), these results suggest the passage of time since one's most recent deployment may have important beneficial implications for the caustic relationship of combat, moral injury, and suicidality among military members.

Table 3

Total, Direct, and Indirect Effects of Combat Exposure on Suicidality through Moral Injury

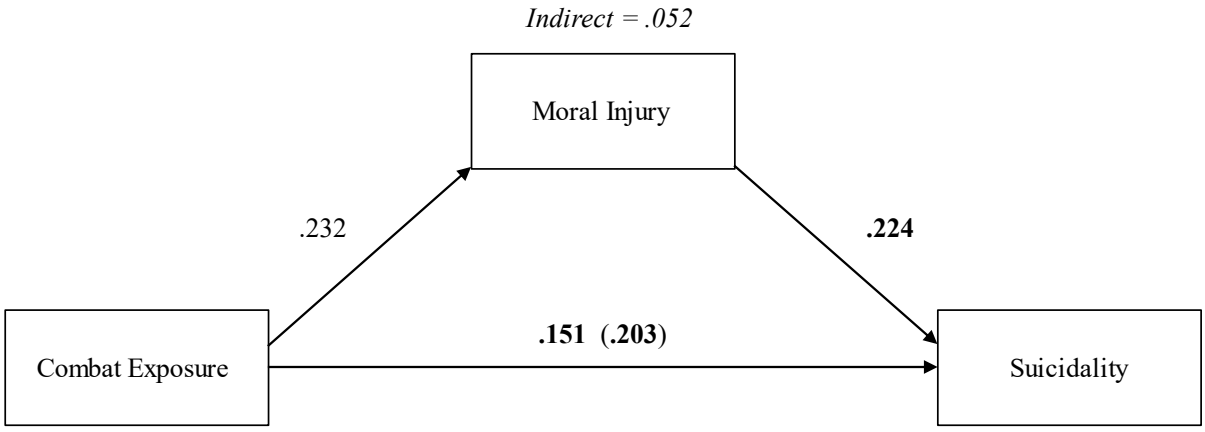
Effects/Predictors	DV	*B*	*SE*	95% CI
1. Total				
CE (c-path)	Suicidality	**.203**	**.050**	**[0.104, 0.301]**
2. Direct				
CE (a-path)	MI	.232	.142	[-0.047, 0.511]
MI (b-path)	Suicidality	**.224**	**.017**	**[0.190, 0.259]**
CE (c′-path)	Suicidality	**.151**	**.039**	**[0.074, 0.227]**
3. Indirect	Suicidality	.052	.034	[-0.014, 0.119]
R^2		.456		
F		51.38***		

Note. *N* = 250. DV = Dependent Variable. CE = Combat Exposure. MI = Moral Injury. Significant effects as determined by 95% bootstrapped confidence intervals that do not contain zero are in bold.

*** $p < 0.001$.

Figure 2

Results of the Mediation Model Showing Total, Direct, and Indirect Effects



Note. Significant effects as determined by 95% bootstrapped confidence intervals that do not contain zero are in bold. The total effect of the model (c-path) is in parentheses.

Moderated Mediation Model Effects

The conditional direct and indirect effects of the relationship between combat exposure, moral injury, and suicidality were estimated using a moderated mediation model with moderation examined at all model paths (PROCESS macro model 59; Hayes, 2022). Significant interactions were probed to determine how variables are related at different levels of the moderator using simple slopes analyses of conditional effects at low (-1 SD below the mean), average (mean), and high (+1 SD above the mean) levels of positive rumination. For reference, values of positive rumination (as self-endorsed scores on the RPA questionnaire) used for probing moderated mediation effects as follows: -1 SD below the mean = 15.74, the mean = 22.08, and +1 SD above the mean = 28.42.

The moderated mediation model was statistically significant, $F(7, 242) = 38.91$, $p < .001$, $R^2 = .53$. Results of the direct paths and interaction terms from this model are displayed in Table 4 and visually in Figure 3. To determine if the indirect effect of combat exposure on suicidality through moral injury was conditional on levels of positive rumination (i.e., a moderated mediation), bootstrap confidence intervals were constructed for pairwise comparisons between the indirect effect at low ($B = 0.12$, 95% CI [0.06, 0.18]), average ($B = 0.11$, 95% CI [0.05, 0.18]), and high ($B = 0.06$, 95% CI [-0.03, 0.16]) levels of positive rumination. All bootstrap confidence intervals for these comparisons contained zero, indicating there were no significant differences between indirect effects for those specific levels of the moderator. However, further examination of comparisons at other levels of positive rumination using pairwise contrasts revealed that the indirect effect at the lowest frequency of positive rumination (9; $B = .07$, 95% CI [0.01, 0.16]) was significantly different than those who had slightly higher, albeit still low, positive rumination (12; $B = 0.10$, 95% CI [0.04, 0.17]). The contrast for this comparison was

Table 4

Moderated Mediation Model Direct Effects and Interactions

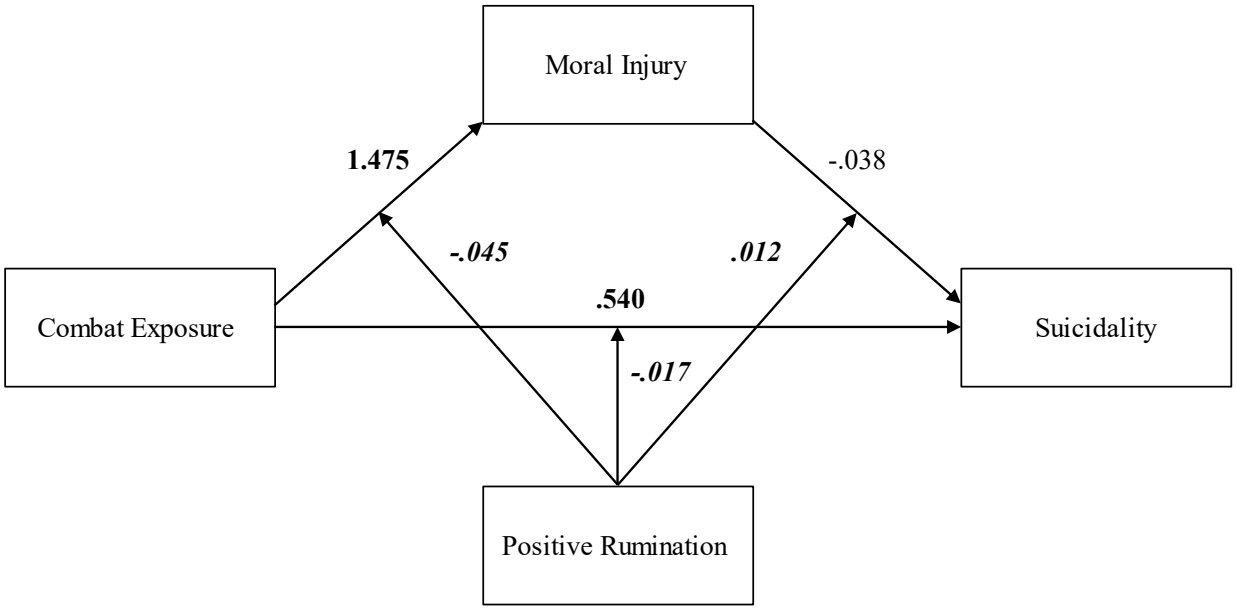
Effects/Predictors	DV	*B*	*SE*	95% CI
1. Direct				
CE (a-path)	MI	**1.475**	**8.226**	**[0.660, 2.290]**
MI (b-path)	Suicidality	-0.038	0.054	[-0.144, 0.067]
CE (c′-path)	Suicidality	**0.540**	**0.119**	**[0.305, 0.776]**
2. Interaction Terms				
CE x PR	MI	**-0.045**	**0.017**	**[-0.078, -0.011]**
MI x PR	Suicidality	**0.012**	**0.002**	**[0.007, 0.016]**
CE x PR	Suicidality	**-0.017**	**0.005**	**[-0.026, -0.007]**
R^2		.529		
F		38.91***		

Note. *N* = 250. DV = Dependent Variable. CE = Combat Exposure. MI = Moral Injury. PR = Positive Rumination. Direct paths represent effects controlling for other variables in the model. Significant effects as determined by 95% bootstrapped confidence intervals that do not contain zero are in bold.

*** $p < 0.001$.

Figure 3

Results of the Moderated Mediation Model Showing Direct Paths and Interactions



Note. Significant effects as determined by 95% bootstrapped confidence intervals are in bold. Interaction terms are italicized. All coefficients represent effects controlling for other variables in the model.

contrast = .02, boot SE = .01, 95% CI [0.001, 0.054]. Thus, the moderated mediation was significant, supporting Hypothesis 3. The indirect effect of combat exposure on suicidality through the mediator moral injury, was conditional on levels of positive rumination, such that higher levels of positive rumination weakened (i.e., buffered) the mediational relationship. The pairwise comparison highlighted evidence for moderation mediation. To better understand this relationship, we return to the conditional indirect effects which were previously examined at low, average, and high levels of the moderator (i.e., positive rumination). The conditional indirect effect of combat exposure on suicidality via moral injury was significant when positive rumination was both low (*B* = 0.12, 95% CI [0.06, 0.18]) and at the mean (*B* = 0.12, 95% CI [0.05, 0.18]). At high levels of positive rumination, this relationship was reduced to the extent that combat exposure no longer had a statistically significant indirect effect on suicidality through moral injury (*B* = 0.06, 95% CI [-0.03, 0.16]). Collectively, results from the moderated mediation model suggest positive rumination buffers military members from experiencing moral injury and subsequent suicidality, with the most protective effects at high levels of positive rumination and perhaps the most important need for those with low positive rumination. Conditional indirect and direct effects at all three levels of positive rumination examined are displayed in Tables 5, 6, and 7.

Table 5

Conditional Effects of Combat Exposure on Suicidality through Moral Injury at Low Levels of Positive Rumination

Effects/Predictors	DV	*B*	*SE*	95% CI
1. Direct				
CE (a-path)	MI	**.774**	**.182**	**[0.416, 1.132]**
MI (b-path)	Suicidality	**.149**	**.023**	**[0.104, 0.195]**
CE (c′-path)	Suicidality	**.277**	**.053**	**[0.173, 0.381]**
2. Indirect	Suicidality	**.116**	**.031**	**[0.058, 0.182]**

Note. $N = 250$. Low denotes a Positive Rumination value of 15.74. DV = Dependent Variable. CE = Combat Exposure. MI = Moral Injury. Significant effects as determined by 95% bootstrapped confidence intervals that do not contain zero are in bold.

Table 6

Conditional Effects of Combat Exposure on Suicidality through Moral Injury at Average Levels of Positive Rumination

Effects/Predictors	DV	*B*	*SE*	95% CI
1. Direct				
CE (a-path)	MI	**.492**	**.133**	**[0.229, 0.755]**
MI (b-path)	Suicidality	**.225**	**.018**	**[0.190, 0.260]**
CE (c′-path)	Suicidality	**.171**	**.039**	**[0.095, 0.247]**
2. Indirect	Suicidality	**.111**	**.033**	**[0.047, 0.177]**

Note. N = 250. Average denotes a Positive Rumination value of 22.08. DV = Dependent Variable. CE = Combat Exposure. MI = Moral Injury. Significant effects as determined by 95% bootstrapped confidence intervals that do not contain zero are in bold.

Table 7

Conditional Effects of Combat Exposure on Suicidality through Moral Injury at High Levels of Positive Rumination

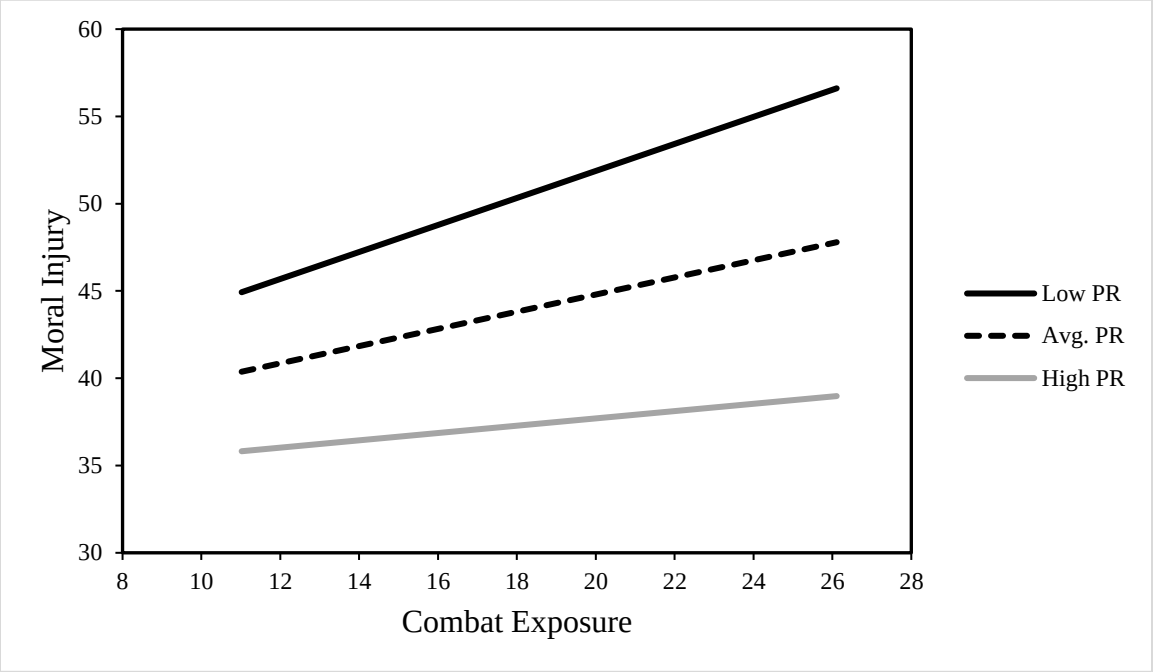
Effects/Predictors	DV	*B*	*SE*	95% CI
1. Direct				
CE (a-path)	MI	.209	.161	[-0.108, 0.526]
MI (b-path)	Suicidality	**.301**	**.023**	**[0.255, 0.346]**
CE (c′-path)	Suicidality	.065	.045	[-0.024, 0.154]
2. Indirect	Suicidality	.063	.048	[-0.030, 0.160]

Note. *N* = 250. High denotes a Positive Rumination value of 28.42. DV = Dependent Variable. CE = Combat Exposure. MI = Moral Injury. Significant effects as determined by 95% bootstrapped confidence intervals that do not contain zero are in bold.

In support of Hypothesis 4a, the positive relationship between combat exposure and moral injury (a-path) was significantly moderated and buffered by positive rumination (*B* = -.04, 95% CI [-0.08, -0.01]). Further investigation using a simple slopes analysis revealed that the conditional effect of combat exposure on moral injury was greatest when positive rumination was low (*B* = 0.77, 95% CI [0.42, 1.13]), and this relationship decreased for those with average levels of positive rumination (*B* = 0.49, 95% CI [0.23, 0.75]). Among those with high positive rumination, the relationship was further weakened, such that the effect of combat exposure on moral injury was no longer statistically significant (*B* = 0.21, 95% CI [-0.11, 0.53]). Thus, higher levels of positive rumination buffered and reduced the combat-moral injury relationship. This moderation is visually depicted in Figure 4.

Figure 4

Moderation Effect of Positive Rumination on Combat Exposure and Moral Injury

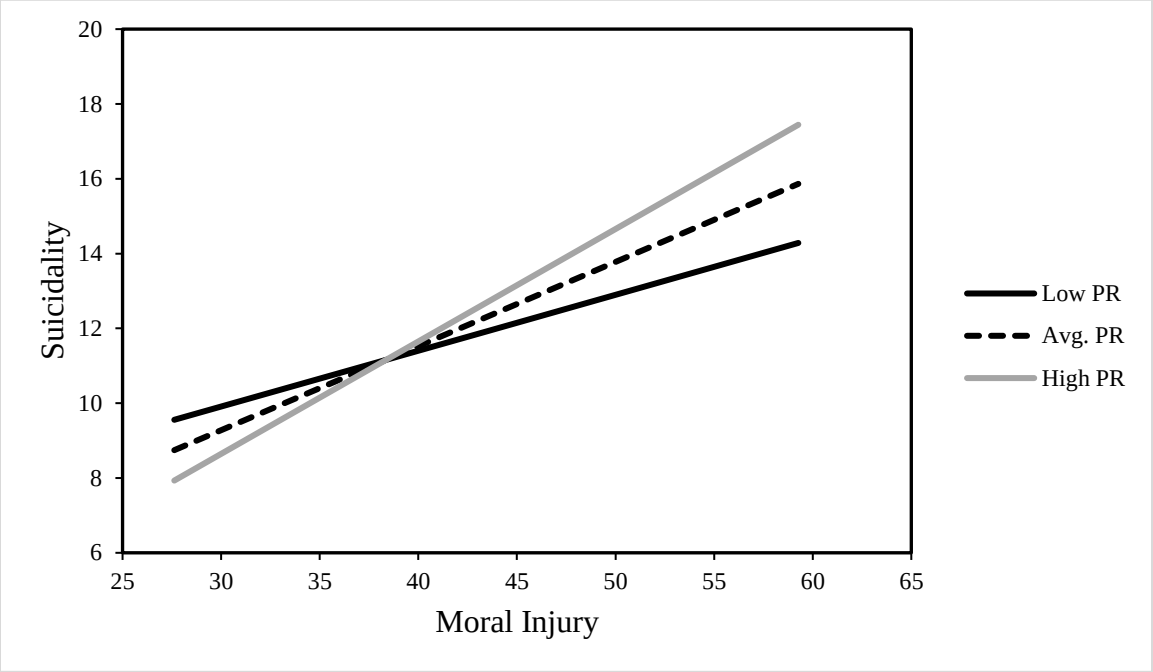


Note. PR = Positive rumination. “Low” denotes 1 standard deviation below the mean (15.74). “Avg.” denotes the average or mean (22.08). “High” denotes 1 standard deviation above the mean (28.42).

The positive relationship between moral injury and suicidality (b-path) was also significantly moderated by positive rumination (*B* = 0.01, 95% CI [0.01, 0.02]). Contrary to Hypothesis 4b, however, the moderation was synergistic. Specifically, at low levels of positive rumination, the conditional effect of moral injury on suicidality was weakest (*B* = 0.15, 95% CI [0.10, 0.19]). This relationship was stronger at average levels of positive rumination (*B* = 0.23, 95% CI [0.19, 0.26]), and the strongest at high levels of positive rumination (*B* = 0.30, 95% CI [0.26, 0.35]). Thus, higher levels of positive rumination enhanced the moral injury-suicidality relationship, showing that those with greater moral injury experienced more suicidality when frequently ruminating on positive affect. While this finding contrasts with Hypothesis 4b, it is important to note that at low levels of moral injury, positive rumination did exhibit buffering effects against suicidality and provided partial support for the hypothesis. Of note, it should also be recognized that the moral injury-suicidality relationship remained positive across all levels of positive rumination, suggesting important implications remain for moral injury's effects on suicidality. This moderation is visually depicted in Figure 5.

Figure 5

Moderation Effect of Positive Rumination on Moral Injury and Suicidality

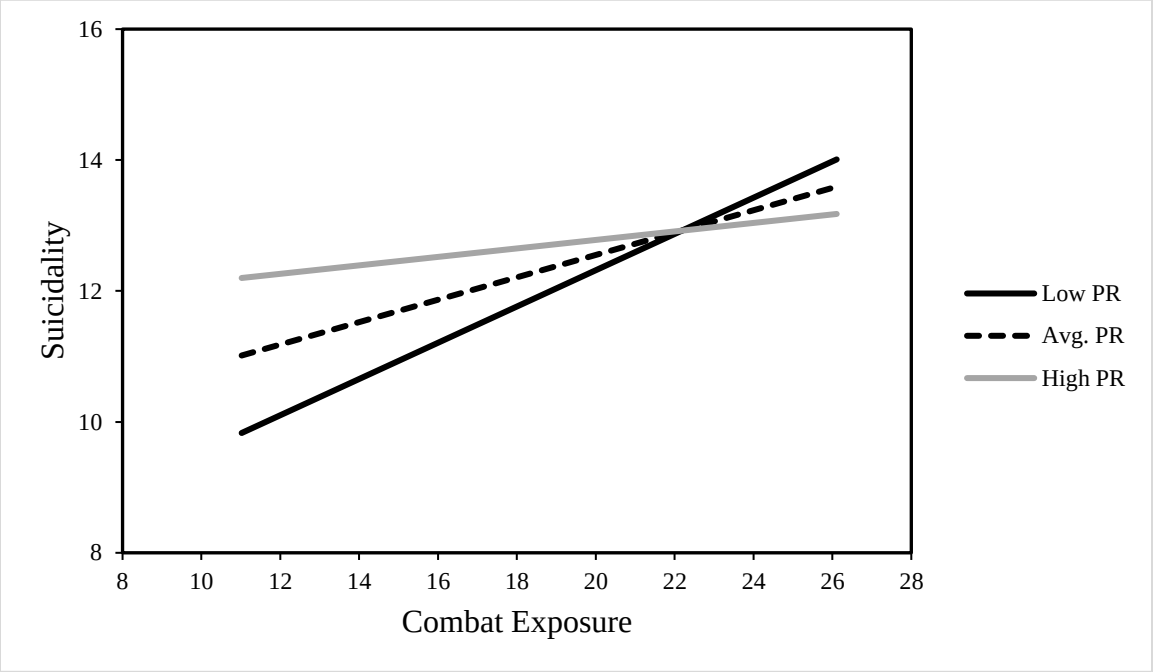


Note. PR = Positive rumination. "Low" denotes 1 standard deviation below the mean (15.74). "Avg." denotes the average or mean (22.08). "High" denotes 1 standard deviation above the mean (28.42).

The positive relationship between combat exposure and suicidality (c′-path) was significantly moderated and buffered by positive rumination (*B* = -0.02, 95% CI [-0.03, -0.01]). At low levels of positive rumination, the conditional effect of combat exposure on suicidality was greatest (*B* = 0.28, 95% CI [0.17, 0.38]). This relationship was reduced at average levels of positive rumination (*B* = 0.17, 95% CI [0.10, 0.25]). At high levels of positive rumination, the relationship was reduced to the extent that combat exposure no longer had a statistically significant effect on suicidality (*B* = 0.06, 95% CI [-0.02, 0.15]). Results suggest increased levels of positive rumination buffered and reduced the relationship between combat exposure and suicidality, providing support for Hypothesis 4c. This moderation is visually depicted in Figure 6.

Figure 6

Moderation Effect of Positive Rumination on Combat Exposure and Suicidality



Note. PR = Positive rumination. “Low” denotes 1 standard deviation below the mean (15.74). “Avg.” denotes the average or mean (22.08). “High” denotes 1 standard deviation above the mean (28.42).

CHAPTER IV

DISCUSSION

Causes for suicidality among combat veterans has been a concern in recent years. Namely, empirical support for the relationship between combat experiences and suicidality has been gaining traction as veterans saw the end of the wars in Iraq and Afghanistan. However, the variability in combat exposure (e.g., different branches, being wounded vs. witnessing civilian deaths), combined with the severity of suicidality has provided inconsistent results in military psychology literature (Reger et al., 2018). This unpredictable relationship has required additional attention from mediating and moderating mechanisms. The present study applied a framework consistent with mediation models to examine whether combat exposure was associated with suicidality, and whether this relationship was better explained through a third variable, moral injury. Additionally, the researcher applied a moderated mediation model to investigate whether the mediation model was conditional on the protective effects of how often one ruminates on positive affect (i.e., positive rumination). In doing so, this was the first study to examine how the relationships between combat, moral injury, and suicidality may be impacted based on levels of positive rumination among current and former U.S. military members who had experienced at least one combat deployment.

Combat Exposure and Suicidality. The initial aim of the study was to examine the association between combat exposure and suicidality among military members who have experienced combat. members of the military. Previous research has found significant associations between experiences during war and both suicidal attempts and suicidal ideation (Bryan et al., 2015; Kelley, Bravo, Hamrick, et al., 2019; LeardMann et al., 2021; Maguen et al., 2012). Results from the present study are consistent with this literature, as combat exposure was

positively associated with suicidality, regardless of how long one has served in the military or time since their last deployment. The interpersonal-psychological theory of suicide (IPTS) suggests military members engage in suicidal thoughts and behaviors when three key factors are present: a thwarted belongingness, perceived burdensomeness, and acquired capability (Joiner, 2005; Van Orden et al., 2010). While the present study did not address thwarted belongingness or perceived burdensomeness, results provide partial support for the acquired capability of suicide and the IPTS. More specifically, enduring critical warzone experiences can be challenging and painful, such as being wounded or wounding others. Other experiences may enervate military members through feelings of senselessness, such as seeing women or children injured or killed but not being able to help them. Collectively, consistent exposure to these events can habituate and desensitize servicemembers to death and subsequently lower their fear of dying (Bryan et al., 2010). This acquired sense of being able to overcome the fear and pain associated with death ultimately places the servicemember or veteran at an elevated risk of suicidality.

Moral Injury as a Mediator. Experiences during war are complex and unique, often involving split-second decisions in morally ambiguous situations. When these potentially morally injurious experiences, violate one's personal morals or values and are unable to be rectified, service members are often left suffering with distress, shame, guilt, and anger, among others. This constellation of symptoms is known as moral injury, a unique form of trauma that is consistently associated with suicidality (Ames et al., 2019; Nichter et al., 2020). Thus, the second aim of the study was to examine whether moral injury mediated the association between combat exposure and suicidality.

Contrary to Hypothesis 2, however, moral injury did not mediate the combat-suicidality relationship in the model that excluded positive rumination. While unexpected, these results are consistent with Battles et al. (2018) who did not find moral injury to mediate warzone experiences and suicidality among a similar sample of $N = 244$ combat servicemembers and veterans. Further, these findings did not provide support for the present conceptualization of the fluid vulnerability theory which suggests suicidality exists due to risk factors that are both long term (combat exposure) as well as ones which are short term and potentially mediating (moral injury; Rudd, 2006). If these veterans were diagnosed with PTSD, a diagnosis often comorbid with moral injury (see Jinkerson, 2016), they would have been entitled to VA benefits and services aimed at reducing or alleviating psychopathologies. Second, measurement instruments may also have affected these findings. Participants were given the full EMIS scale, encompassing both self- and other-directed moral injury. Perhaps endorsement of moral injury symptoms could have resulted from non-combat sources of moral violations, such as MST or institutional betrayal, which are common causes for moral injury and suicidality among military populations (Frankfurt et al., 2018; Lopes et al., 2023; Maguen et al., 2023). Additionally, had combat experiences been measured as pMIEs rather than more general experiences during war, relationships between combat and moral injury may have been more defined, which was the case in previous research (Battles et al., 2018; Kelley, Bravo, Hamrick, et al., 2019).

An alternative explanation for this finding considers the fact that once one's time since last deployment was removed as a variable in the mediation model, moral injury mediated the relationship of combat exposure and suicidality. When controlled for, the relationship between moral injury with suicidality, and the overall mediation model were no longer statistically significant, suggesting time since one's deployment is contributing substantial and potentially

beneficial effects upon these relationships. Perhaps the passage of time since the potentially traumatic experiences of combat deployments are more crucial for posttraumatic growth than anticipated. This is consistent with literature that suggests mental health symptoms, such as PTSD and psychological distress, may be elevated several months post-deployment, but ultimately subside in the long-term (Bliese et al., 2007; Rona et al., 2016). As it pertains to the present study, over the course of time, returning veterans have an increased chance to confront, move past, or make meaning of their experiences in a way that might mitigate the onset of morally injurious symptoms and suicidality. There is growing recognition that the constellation of symptoms in moral injury require novel treatments beyond those addressing PTSD symptoms (Jordan et al., 2017). Many of these treatments require substantial time to properly address the moral, spiritual, and/or psychological needs of the servicemembers (see Kelley et al., 2024 for a review). Thus, in order to achieve posttraumatic growth, time since the potential traumatic experiences (i.e., combat) is an inherent necessity in the healing process. Aside from posttraumatic growth, research examining temporal functioning in the aftermath of traumatic experiences, including combat deployments, may also suggest many military members are simply highly resilient over time. According to Bonanno (2005) and Sampson et al. (2015), most military members are actually resistant to experiencing declines in mental health, even years after traumatic events occur. However, those that do experience poor mental health symptoms following combat are more likely to be resilient and adapt to the trauma over time with improvements in mental health, rather than experiencing the delayed onset or chronic expression of negative symptomologies. Considering the negative correlation of time since a servicemember's last deployment with moral injury symptoms and suicidality in the present study further supports the notion that military members are resilient by trade, trained to perform

in the most extreme situations and environments, and able to adapt to adversity in the years following trauma. Lastly, the process to receive VA benefits can be time consuming. Decisions regarding whether or not a veteran will receive benefits can range from almost six months for an initial decision to more than two years for a decision on an appeal (Department of Veterans Affairs, 2023, 2024). Therefore, health-seeking veterans may be initially held back in receiving the care and benefits needed to address the mental health symptoms associated with war, with the reductions in symptoms occurring following a substantial waiting period. While time may in fact heal hidden wounds, future studies may still benefit from examining time since last deployment in the context of combat and moral injury for deeper insights in suicide prevention.

Of note and consistent with Battles et al. (2018), significant direct paths between combat exposure and suicidality remained in the non-significant mediation model with moral injury, signifying specific aspects of combat continue to uniquely contribute to suicidality among servicemembers. Interestingly, moral injury also remained significantly and positively associated with suicidality. This finding supports previous research showing positive relationships between moral injury (Kelley et al., 2021) and moral injury symptoms (e.g., guilt and shame; Bryan et al., 2013; Frankfurt et al., 2017) with suicidal ideation among military members. Given both combat and moral injury persisted as significant predictors of increased suicidality, the pathways in which these two variables impact suicide may simply operate independently of one another, or through a mechanism or mechanisms different from those in the present model. It could be, too, other important variables have not been accounted for. Specifically, other risk factors consistent with the fluid vulnerability theory may contribute to veteran suicidality along both chronic (e.g., childhood trauma) and acute (e.g., marital complications, PTSD reexperiencing symptoms) domains.

Positive Rumination Moderates. Positive rumination is a distinct emotion-regulation response style that involves reflecting on positive affect states in a manner that is perceived as beneficial to the individual (Feldman et al., 2008). Findings from the moderated mediation analysis provided evidence that positive rumination moderated the indirect effects of combat exposure on suicidality through moral injury, as well as all three direct relationships of the model.

While there was no evidence of mediation in the simple mediation model, combat exposure did indirectly effect suicidality when positive rumination was included in the model. That is, this mediation model was conditional on the military member's frequency of ruminating on positive affect. Increased exposure to combat indirectly led to increases in suicidal thoughts and behaviors by increasing moral injury symptoms, but only when positive rumination was at or below normal levels. Specifically, combat exposed military members with average and below average levels of positive rumination, were likely to endorse moral injury symptoms and subsequent suicidality. Those who do not ruminate frequently in their daily lives may either not be experiencing enough positive affect, or they are experiencing positive emotions, but regulating them in such a way that they are not enjoyed or reflected on. Not surprisingly, research with trauma victims shows that often time, anhedonia symptoms are likely to occur following trauma-exposure (Vinograd et al., 2022). Experiencing transgressions, injury, or death during war may make it difficult for servicemembers to enjoy positive emotions and the positive aspects that life has to offer once they return home. Either way, personal experiences of positive affect for military members in the present study were not sufficient to overcome prior trauma and prevent mechanisms from contributing to future negative symptomologies. These findings suggest the protective effects from positive rumination may be most beneficial for individuals

who fail to ruminate on positive affective states on a frequent basis. Further, they are consistent with Li et al., (2017) who found that positive rumination had the greatest impact on poor mental health during times in which positive experiences were low. According to the broaden and build theory (Fredrickson, 1998, 2004), the lack of actual or perceived positive affect may be inhibiting military members' ability to build enduring resources (e.g., meaning making to influence purpose in life; resilience following adversity) which promote upward spirals of posttraumatic growth. In turn, military members may be left with nothing but unpleasant experiences that provoke negative mental health symptoms. Reconsideration of the fluid vulnerability theory (Rudd, 2006) may suggest this lack of protective emotion-regulation may be permitting combat exposure and moral injury symptoms to work together as chronic and acute risk factors to influence suicidality. As the trauma sits dormant with no positive moods to counter the negative ones, strong bouts of guilt or shame, as is common with moral injury, may be sufficient to trigger one's decision in taking their own life.

In stark contrast, those military members who more frequently reflected on their positive emotions and mood states were unlikely to perceive their combat experiences as moral injurious with subsequent suicidal thoughts or behaviors. That is, positive rumination ultimately buffered the combat-moral injury-suicidality relationship, providing support that focusing one's thoughts and energy on the positive aspects of life may protect military members from experiencing moral injury and suicidality. These findings are consistent with prior research suggesting savoring, which encompasses positive rumination strategies, may counter negative affect and depressive symptoms, both critical components of moral injury and suicidality (Hurley & Kwon, 2013). The protective influences displayed in the moderated mediation model were primarily due to the buffering effect of positive rumination on the combat exposure and moral injury relationship,

rather than the moderation of the moral injury and suicidality path which was ultimately synergistic. It could be that engaging in positive rumination is a compensatory behavior for military members. That is, in the aftermath of trauma incurred during combat, more resilient military members may use these enhancing strategies to cope with reintegration back into non-combat environments, ultimately promoting post-traumatic growth. Results further support this idea in which positive rumination buffered the direct effects of combat exposure on both moral injury and suicidality. Additionally, combat exposure was unexpectedly associated with greater positive rumination. Further inquiries showed similar research in which individuals with prior trauma exposure endorsed higher levels of positive rumination than those with no exposure (Wozniak, 2020). Collectively these suggest promising support for positive rumination as a protective factor following exposure to war. The broaden and build theory would posit that reflecting on positive emotions in the wake of combat may broaden the individual's thoughts and awareness, allowing them to explore the intricacies of events that have unfolded in novel way and positive ways. Some may use the knowledge and experienced gained as a means of resilience, overcoming the adversities of war in order to deploy again in the future with normal functioning (Matthews, 2008). Others may confront the potentially traumatic experiences, making meaning from these events and further encourage posttraumatic growth (Larner & Blow, 2011; Spero, 2016). Lastly, military members may also build social support, seeing these events as an opportunity to create lasting relationships (e.g., comradery) or strengthening previous ones (e.g., family bonds). While the specific mechanisms that were built according to the theory were not examined in this study, or whether the emotion-regulation strategy of positive rumination was itself the resource built, those fortunate enough to experience high levels of positive rumination did exhibit the capacity to minimize moral injury and promote survival. Collectively,

these findings suggest that high levels of positive rumination may serve as a protective factor for military members exposed to potentially traumatic experiences in combat, which are associated with moral injury and suicidality. There is promising potential in guiding veterans with these combat experiences to understand and develop their use of positive rumination strategies in order to reduce the development moral injury and suicidality.

Lastly, and unexpectedly, positive rumination moderated the relationship between moral injury and suicidality synergistically (i.e., enhanced the association). The more military members ruminated on positive affect, the greater the likelihood their moral injury symptoms led to increases in suicidality. This finding contrasts the majority of literature regarding moral injury and suicidality. It could be that increases in positive rumination denote an emotional and motivational shift in the pursuit of suicidality. While the IPTS suggests individuals must acquire the capability to inflict harm on themselves, Snyder (1994) suggests this acquired capability must include the motivation to engage in suicidality. Specifically, prior to engaging in suicidal behavior, it is posited that individuals move from a state of depression and lethargy, to one of high energy and motivation in order to achieve their suicidal goals (Grewal & Porter, 2007; Snyder, 1994, 2000). Others have found similar patterns in departures from distress and increases in energy prior to any suicidal behavior (Joiner Jr. et al., 2004). According to Watson et al. (1988), sadness and lethargy reflect low positive affect, while high positive affect is characterized by high energy and concentration whereby the individual feels active and enthusiastic. Thus, increases in positive affect, and subsequent positive rumination, could be indicative of a transition from the negative symptoms experienced by those with moral injury, to one in which suicidality becomes a reality. Second, it is important to recognize that moral injury continued to significantly and positively influence suicidality regardless of the military

member's utilization of positive rumination strategies. True, the findings are surprising, and the moral injury-suicidality relationship was conditional on and increased with levels of positive rumination. However, these finding could also be indicative of the predominantly deleterious effects of moral injury which continued to influence suicidality in the face of positive affect regulation strategies. For those with low expressions or onsets of moral injurious symptoms, engaging in positive rumination may be beneficial and protective of further mental health complications. However, as symptoms of moral injury strengthen, other treatments or preventative approaches may be needed. Increases. To that end, the negative correlation found between moral injury and positive rumination could suggest that the shame, guilt, anger, and/or other symptoms of moral injury may be preventing the military member from experiencing positive affect, or utilizing strategies aimed at maintaining or increasing positive affect. Therefore, while the relationship between moral injury and suicidality is rather prominent in the literature (see Ames et al., 2019; Bryan et al., 2014; Hamrick et al., 2020; Jinkerson, 2016; Kelley, Bravo, Davies, et al., 2019), protective mechanisms buffering moral injury symptoms and suicidality may warrant further research. That is, positive rumination may not solely buffer and protect those with moral injury from suicidal ideation or self-harm as moral injury symptoms may be especially difficult to target with positive psychological strategies alone. Special importance is placed on the continued understanding and prevention of moral injury before it turns into exacerbated mental health and suicidality outcomes. Ultimately, the findings emphasize that frequent rumination on positive affect may be more beneficial as a protective factor for those exposed to combat, rather than one used to heal the deep-rooted symptoms associated with moral injury.

Limitations and Future Directions

Favorable findings should be interpreted while considering the study limitations. First, cross-sectional data in the present study limit the ability to infer causality. Although suicidality was measured for the past week, there is no way to determine whether suicidal thoughts or behaviors also existed prior to one's combat exposure or moral injury symptoms. Similarly, moral injury may have resulted from other sources of moral violations (e.g., MST, institutional betrayal, etc.) that occurred prior to combat exposure. Longitudinal research is needed to establish the temporal sequence among these variables. Second, self-report measures were utilized and these measures may have introduced biases that could have influenced validity of the present study. Third, according to the DoD (2022), those who enlisted into service disproportionately died by suicide; however, participant rank was not examined in the present study. Future studies should examine current rank (active duty) or rank upon service exit (veterans) to understand the efficacy of positive rumination among specific ranks and to promote research tailored to at-risk sub-populations as prioritized by the White House (2021).

Additional considerations could be addressed in future studies as well. First, more research is needed to understand positive rumination with military populations, especially in experimental and longitudinal studies. For instance, daily studies with positive rumination, which have been shown to be promising for combating mental health symptoms (see Li et al., 2017), may be of value for examining whether positive rumination fluctuates in the short term with military members. Similarly, developing education programs or treatments based on specific positive rumination strategies and examining those effects against control groups may provide support for positive rumination as a complementary approach to current training active-duty programs and veteran treatments. Given that this study was cross sectional, future studies may

also benefit from understanding whether the employment of positive rumination strategies may be more advantageous as a preventative and protective treatment, as an intervention following the onset of mental health symptoms after exposure to combat, or a combination of both. Lastly, consideration of time since a military member deployed last may also be of importance. Future studies examining this factor as a moderating variable may further understand the temporal patterns of military mental health and when best to apply preventative strategies, such as positive rumination education, in a veteran's post-deployment trajectory.

CHAPTER V

CONCLUSIONS

Veterans exhibit suicide rates three-times higher than non-veterans with continuous increases in these rates over the last ten years (DoD, 2022; VA, 2022). Findings contribute to the current literature highlighting the deleterious impact of combat exposure on suicidality, with a unique emphasis on the growing concept of moral injury as a mediator that might better help understand this relationship. Additionally, vital insight was shed into the deleterious effects of combat on military mental health as veterans seek solace following 20 years of war in Iraq and Afghanistan. Fortunately, positive rumination moderated this complex relationship, stressing the importance of tracking and assessing military members' levels of combat exposure, moral injury symptoms, levels of positive rumination, and suicidal thoughts and behaviors on a continued basis. These findings are an important first step in understanding the potential protective and buffering effects of positive rumination on negative health outcomes in the context of war. Ultimately, the novelty of this study has implications for future research and implantation of preemptive measures utilizing positive rumination among active-duty military (both pre- and post-deployment), as well as for veterans who seek help from the VA, in order to mitigate symptoms associated with moral injury and suicidal thoughts and behaviors.

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APPENDICES

APPENDIX A: SCREENING ITEMS

1. Are you 18 or older?
    ( ) Yes
    ( ) No

2. What is your current military status? Please select only one.
    ( ) Active Duty
    ( ) Veteran
    ( ) Reserves
    ( ) National Guard
    ( ) Retired
    ( ) Never served in military

3. Have you ever been deployed?
    ( ) Yes
    ( ) No

4. What is the acronym for the generic term that the military uses for various job fields?
    () RTC or BCT or MTF or SEPS
    () NOB or FOB or ECP or MOB
    () MOS or NEC or RATE or AFSC
    () ASVAB or AIT

5. What is the acronym for the location where the final physicals are taken prior to shipping off for basic training?
    () MEPS or AFEES
    () TAP or CAC
    () NOB or FOB or ECP or MOB
    () KP or DT or ATO

If they are not 18 or older, have never served in the military, or never deployed they are screened out. If they do not answer correctly to question 4 (MOS/NEC/RATE/AFSC) and question 5 (MEPS/AFEES), they are screened out.

"Thank you for your interest in our study. Unfortunately, you did not meet our requirements for the survey and will not be allowed to continue."

APPENDIX B: DEMOGRAPHICS QUESTIONNAIRE

1. How old are you?
    [free response field]

2. What best describes your educational level?
    ( ) Some high school
    ( ) High school graduate / GED / home school certificate
    ( ) Some college
    ( ) Associate's degree
    ( ) Bachelor's degree
    ( ) Master's degree
    ( ) Doctoral degree

3. What is your ethnicity?
    ( ) White
    ( ) Black or African American
    ( ) American Indian or Alaskan Native
    ( ) Asian
    ( ) Native Hawaiian or other Pacific Islanders
    ( ) Hispanic or Latino/Latina
    ( ) Other [free response field]

4. What is your sex assigned at birth?
    ( ) Female
    ( ) Male
    ( ) Intersex
    ( ) Other (please describe) [free response field]
    ( ) Prefer not to say

5. What is your gender identity?
    ( ) Cisgender Female/Woman
    ( ) Cisgender Male/Man
    ( ) Transgender Woman/Trans Feminine
    ( ) Transgender Man/ Trans Masculine
    ( ) Non-Binary/Genderqueer/Gender Fluid
    ( ) Two Spirit
    ( ) Prefer to self-describe [Free response field]
    ( ) Prefer not to say

6. What is your sexual orientation?
    ( ) Lesbian
    ( ) Gay

( ) Bisexual
( ) Queer
( ) Asexual
( ) Pansexual
( ) Straight
( ) Questioning/Unsure
( ) Not Listed Above (please specify) [free response field]
( ) Prefer not to say

7. What is your relationship/marital status? Please check all that apply.
( ) Single, never married
( ) Cohabitating/living with a partner but not married
( ) Married
( ) Separated
( ) Divorced
( ) Widowed

8. What branch(es) of the military did you serve in or are you currently serving in? Please check all that apply.
( ) Army
( ) Navy
( ) Air Force
( ) Marine Corps
( ) Coast Guard
( ) National Guard
( ) Army Reserves
( ) Air Force Reserves
( ) Navy Reserves
( ) Marine Corps Reserves
( ) Other (please specify) [free response field]

9. Are you currently employed… *[Allows multiple answers]*
( ) Full-time
( ) Part-time
( ) Retired
( ) Unemployed
( ) Full-time student

10. How many years were you/have you been in the military?
[free response field]

11. How has being in the military affected your life?
(1) Strong negative effect on my life

(2)
(3)
(4) Neutral effect on my life
(5)
(6)
(7) Strong positive effect on my life

12. In the past week, how much do you agree with the following: I feel well-integrated with my community.
    (1) Disagree
    (2)
    (3)
    (4) Neutral
    (5)
    (6)
    (7) Agree

13. Have you ever been deployed for 90 days or more?
    ( ) Yes
    ( ) No

14. How long was your longest deployment? Please round to the closest month. *[If participants select the following, then they were kicked out of the survey at this point: "Never deployed," "Less than 1 month," "1 month," and "2 months."]*

( ) Never deployed	( ) 11 months
( ) Less than 1 month	( ) 12 months
( ) 1 month	( ) 13 months
( ) 2 months	( ) 14 months
( ) 3 months	( ) 15 months
( ) 4 months	( ) 16 months
( ) 5 months	( ) 17 months
( ) 6 months	( ) 18 months
( ) 7 months	( ) 19 months
( ) 8 months	( ) 20 months
( ) 9 months	( ) 21 months
( ) 10 months	( ) 22 months

15 **if yes to Question 16*, How many deployments (90 days or more) have you taken part in since you joined the military that were in support of:

	0	1	2	3	4	5+
Operation Iraqi Freedom (OIF)						

Operation Enduring Freedom (OEF)						
Humanitarian mission (non-OIF/OEF)						
Operation New Dawn (OND)						
Operation Inherent Resolve						
Operation Freedom's Sentinel						
Other (none listed above). Please specify below [Free Response Field]						

16. How many years has it been since your *last* deployment?

( ) Less than 1 year
( ) 1 year
( ) 2 years
( ) 3 years
( ) 4 years
( ) 5 years
( ) 6 years
( ) 7 years
( ) 8 years
( ) 9 years
( ) 10 years
( ) 11 years
( ) 12 years
( ) 13 years
( ) 14 years
( ) 15 years
( ) 16 years
( ) 17 years
( ) 18 years
( ) 19 years
( ) 20 years
( ) More than 20 years

17a. Do you have a service-connected disability?

( ) Yes
( ) No

17b. What is your Total Combined VA Disability Rating?

( ) 0%
( ) 10%
( ) 20%
( ) 30%
( ) 40%
( ) 50%
( ) 60%
( ) 70%
( ) 80%
( ) 90%
( ) 100%

** displayed only to participants who endorse "Yes" for item 19a ("Do you have a service-connected disability) and for those who are veterans or are retired.*

18. Have you been diagnosed with or treated for Posttraumatic Stress Disorder (PTSD) as a result of combat action or exposure?

( ) Yes
( ) No

19. Please choose “Yes” for this question. * ATTENTION CHECK *
    ( ) Yes
    ( ) No

20. Are you physically injured/wounded or have another physical disability as a result of military service ***where a Purple Heart WAS awarded?***
    ( ) Yes
    ( ) No

21. What state do you live in?
    ( ) Alabama
    ( ) Alaska
    ( ) Arizona
    ( ) Arkansas
    ( ) California
    ( ) Colorado
    ( ) Connecticut
    ( ) Delaware
    ( ) District of Columbia
    ( ) Florida
    ( ) Georgia
    ( ) Hawaii
    ( ) Idaho
    ( ) Illinois
    ( ) Indiana
    ( ) Iowa
    ( ) Kansas
    ( ) Kentucky
    ( ) Louisiana
    ( ) Maine
    ( ) Maryland
    ( ) Massachusetts
    ( ) Michigan
    ( ) Minnesota
    ( ) Mississippi
    ( ) Missouri
    ( ) Montana
    ( ) Nebraska
    ( ) Nevada
    ( ) New Hampshire
    ( ) New Jersey
    ( ) New Mexico
    ( ) New York
    ( ) North Carolina
    ( ) North Dakota
    ( ) Ohio
    ( ) Oklahoma
    ( ) Oregon
    ( ) Pennsylvania
    ( ) Rhode Island
    ( ) South Carolina
    ( ) South Dakota
    ( ) Tennessee
    ( ) Texas
    ( ) Utah
    ( ) Vermont
    ( ) Virginia
    ( ) Washington
    ( ) West Virginia
    ( ) Wisconsin
    ( ) Wyoming
    ( ) Currently living outside the United States

APPENDIX C: SUICIDALITY

Inventory of Depression and Anxiety Symptoms (IDAS) – Suicidality subscale

Instructions:
Below is a list of feelings, sensations, problems, and experiences that people sometimes have. Read each item to determine how well it describes your recent feelings and experiences. Then select the option that best describes how much you have felt or experienced things this way during the **past week**, including today. Use the scale below when answering.

Scale:
1 = Not at all
2 = A little bit
3 = Moderately
4 = Quite a bit
5 = Extremely

Items:

1. I had thoughts of suicide.
2. I hurt myself purposefully.
3. I thought about my own death.
4. I thought about hurting myself.
5. I cut or burned myself on purpose.
6. I thought that the world would be better off without me.

Modifications:
The original IDAS is a 64-item scale that consists of the following subscales: Well-Being, Panic, Suicidality, Lassitude, Insomnia, Social Anxiety, Ill Temper, Traumatic Intrusions, Appetite Loss, Appetite Gain, Dysphoria, and General Depression. The present study used only the suicidality subscale of the IDAS.

The original IDAS asks respondents to consider the past two weeks, including the present day, when responding to items. We have modified these instructions, asking respondents to consider the past week.

APPENDIX D: COMBAT EXPOSURE

Critical Warzone Experiences (CWE) Scale

Instructions:
How often did you experience the following during combat?

Scale:
0 = Never
1 = 1 time
2 = 2-4 times
4 = 5-9 times
5 = 10+ times

Items:

1. Seeing ill/injured women/children who you were unable to help.
2. Had a buddy shot or hit who was near you.
3. Being in threatening situations where you were unable to respond because of rules of engagement.
4. Witnessing violence within local population or between ethnic groups.
5. Being directly responsible for the death of an enemy combatant.
6. Being wounded/injured.
7. Saved the life of a soldier or civilian.

APPENDIX E: MORAL INJURY

Expressions of Moral Injury Scale – Military version (EMIS-M)

Instructions:
Military service can entail doing or witnessing acts that may affect one's emotional well-being, relationships, and later quality of life. When considering your own feelings, beliefs, and behaviors related to things that you did/saw in the military, please indicate how much you personally agree or disagree with each statement thinking of the past week.

Scale:
1 = Strongly disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly agree

Items:

1. I am ashamed of myself because of things that I did/saw during my military service.
2. I feel anger over being betrayed by someone who I had trusted while I was in the military.
3. My military experiences have taught me that it is only a matter of time before people will betray my trust.
4. Because of things that I did/saw in the military, I doubt my ability to make moral decisions.
5. In order to punish myself for things that I did/saw in the military, I often neglect my health and safety.
6. I sometimes enjoy thinking about having revenge on persons who wronged me in the military.
7. I feel guilt about things that happened during my military service that cannot be excused.
8. Because of things that I did/saw in the military, I am no longer worthy of being loved.
9. My military experiences have caused me to seriously doubt the motives of people in authority.
10. The moral failures that I witnessed during my military service have left a bad taste in my mouth.
11. I sometimes feel so bad about things that I did/saw in the military that I hide or withdraw from others.
12. Because of things that I did/saw in the military, I sabotage my best efforts to achieve my goals in life.
13. No matter how much time passes, I resent people who betrayed my trust during my military service.
14. I am an unforgivable person because of things that I did/saw in the military.

15. Things I saw/did in the military have caused me at times to lose faith in the basic goodness of humanity.
16. I sometimes lash out at others because I feel bad about things I did/saw in the military.
17. When I look back on my military service, I feel disgusted by things that other people did.
18. My understanding of right and wrong is much less clear since my experience in the military
19. I feel guilty about the times I didn't know the right thing to do in the military
20. I doubt my ability to make good moral choices since my military experience
21. I often think that life is absurd since my experience in the military
22. After facing conflicting demands from those in authority while in the military, I feel bitter and cynical
23. I'm often angry at God/Life for how many things went wrong when I was in the military
24. Looking back on my military experience, I often wonder if what I did was worth it
25. The world makes much less sense to me since my military experience.

Modifications:

The original EMIS does not ask for a time frame. We included the time frame of one week.

Questions 18-25 were included based on recommendations from Dr. Flemming.

APPENDIX F: POSITIVE RUMINATION

Responses to Positive Affect (RPA) Questionnaire

Instructions:
People think and do many different things when they feel happy. Please read each of the following items and indicate whether you never, sometimes, often, or always think or do each one when you feel happy, excited, or enthused. Please indicate what you generally do, not what you think you should do during the past week.

Scale:
1 = Almost never
2 = Sometimes
3 = Often
4 = Almost always

Items:
1. Think about how happy you feel.
2. Think about how strong you feel.
3. Think about how you feel up to do everything.
4. Notice how you feel full of energy.
5. Savor this moment.
6. Think 'My streak of luck is going to end soon.'
7. Think 'I don't deserve this.'
8. Think about things that could go wrong.
9. Think about things that have not gone well for you.
10. Remind yourself these feelings won't last.
11. Think 'This is too good to be true.'
12. Think about how hard it is to concentrate.
13. Think 'People will think I'm bragging.'
14. Think 'I am achieving everything.'
15. Think 'I am living up to my potential.'
16. Think about how proud you are of yourself.
17. Think 'I am getting everything done.'

VITA

Jeffrey M. Gabelmann

Old Dominion University
Department of Psychology
Norfolk, VA 23529 -0267

Education

M.S. **Old Dominion University**, *Norfolk, VA*
Psychology, 2024 (Expected)
Advisor: Michelle L. Kelley, Ph.D.

B.S. **Old Dominion University**, *Norfolk, VA*
Psychology, 2022
Advisor: Michelle L. Kelley, Ph.D.

Select Publications

Kelley, M. L., Strowger, M., **Gabelmann, J. M.**, Vasic, S., Rivera, I., Fleming, R., & Burgin, E. E., Bravo, A. J., Fleming, W. H., Gaylord, S. A., & Vinci, C. (2024). A review of empirical treatments focused on mind-body and spiritually grounded complementary practices for moral injury among veterans. *Counseling & Values, 69,* 65-91. https://doi.org/10.1163/2161007x-bja10011

Davies, R. L., Kelley, M. L., & **Gabelmann, J. M.** (2024). Unit Support Moderates the Association Between Institutional Betrayal and Military Women's Use of Minimization After Sexual Assault. *Journal of Military Social Work and Behavioral Health Services,* 1–10. https://doi.org/10.1080/28367472.2024.2376079

Kelley, M. L., Strowger, M., & **Gabelmann, J. M.** (in press). The sequential mediating effect of betrayal-based moral injury and drinking to cope on the association between sexual assault and sexual harassment and alcohol consumption in women veterans. *Military Psychology*.

Select Presentations

Gabelmann, J. M., & Vasic, S. (2023, March). *Differences between moral injury & PTSD*. Poster presented at the 2023 Virginia Association for Counselor Education and Supervision (VACES) Student Conference, William & Mary, Williamsburg, VA.

Gabelmann, J. M., Davies, R. L., Bravo, A. J., McGuire, A. P., & Kelley, M. L. (2023, August). *Response to Positive Affect as a moderator of warzone experiences and suicidality*. Poster presented at the 131st annual American Psychological Association (APA) Convention, Washington, DC.