

2017

## Moral Injury and Stress Response Patterns in United States Military Veterans

Emily L. Ferrell

*Bowling Green State University*, emilylf@bgsu.edu

John M. Huyser

*Syracuse University*, jmhuyser@syr.edu

Matthew Dykas

*State University of New York, Oswego*, matt.dykas@oswego.edu

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### Recommended Citation

Ferrell, Emily L.; Huyser, John M.; and Dykas, Matthew (2017) "Moral Injury and Stress Response Patterns in United States Military Veterans," *Modern Psychological Studies*: Vol. 23 : No. 1 , Article 2.

Available at: <https://scholar.utc.edu/mps/vol23/iss1/2>

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### Abstract

During combat, veterans encounter situations that violate their moral principles resulting in moral injury. For example, if a soldier fails to prevent, witnesses, and/or performs acts that oppose their values, their moral integrity may be harmed. The present study's aim was to examine such injuries and their association with stress response patterns in veterans. Participants completed questionnaires as part of a larger study examining PTSD in war veterans. The MIQ was used to assess participants' degree of cognitive dissonance with their actions during war, the IES- R was used to assess responses to traumatic events, and the SRQ was used to measure conscientiousness and ability to accomplish goals. A multiple regression analysis indicated that higher moral injury scores were associated with higher self-reported hyper-aroused responses to traumatic events. Additional moderation analyses indicated that higher self-regulatory skills may be a risk factor for veterans experiencing hyperarousal in response to moral injuries.

*Keywords:* moral injury, military, veterans, Post-Traumatic Stress Disorder (PTSD), war

During combat, veterans may have encountered situations that violated their moral principles. For example, if a soldier failed to prevent, witnessed, and/or performed acts that deeply opposed his/her personal values, the soldier's own moral integrity may have been harmed (Maguen & Litz, 2012). In recent years, the study of these *moral injuries* has grown significantly and new data suggests that they may contribute to behavioral and emotional problems in veterans (Currier et al., 2014; Worthen & Ahern, 2014). For example, recent evidence indicates that individuals who experience moral injuries tend to isolate themselves from other individuals, including family and friends (Litz et al., 2009; Worthen & Ahern, 2014; Taft et al., 2012). It is possible that these behaviors stem at least in part from underlying maladaptive cognitions occurring as a response to experiencing moral injury. Identifying particular response patterns to moral injury could thus lead to a better understanding of individuals suffering from that experience and, potentially, aid in providing better treatment for the individuals' needs.

Our study's principal aim was to add to the growing body of literature on moral injuries by examining links between moral injuries and three of the most common responses to trauma: intrusion, avoidance, and hyperarousal (Sundin, 2002). *Intrusion* refers to re-experiencing memories of the event through unwanted thoughts and memories, repeated unpleasant dreams, flashbacks, and general discontentment when reminded of the event (Cox et al., 2008). *Avoidance* refers to the attempt to prevent thinking about or remembering an event by intentionally eluding all reminders, denying meanings and consequences of the event, exhibiting inhibitory behavior, and counter-phobic activity (Sundin, 2002). *Hyperarousal* refers to physical reactions to reminders of the event such as trouble sleeping, irritable or short-tempered behaviors, trouble concentrating, jumpy, and easily startled mannerisms, and excessively alert behavior in response to non-threatening stimuli (Sundin, 2002 & Cox et al., 2008). We

hypothesized that veterans' who experience moral injuries would report suffering from one or more of three post-traumatic response patterns.

We also hypothesized that in addition to finding a direct link between moral injuries and indicators of post-traumatic stress, veterans' degree of self-regulation would moderate the link. According to Aubrey et al. (1994), self-regulation refers to the ability to develop, implement, and flexibly maintain planned behavior. For example, a person who exhibits high self-regulatory capacities is likely to be conscientious and goal oriented. On the other hand, a person possessing low self-regulation capacity may be impulsive and less likely to have control over their environment. In this study, we expected the link between moral injury and post-traumatic stress responses would be stronger in veterans who exhibit higher self-regulatory capacities because they may be more conscientious of interpersonal injury. On the other hand, we expected that veterans who show fewer self-regulatory abilities may be less aware of their morally injurious experience and thus would be less conscientious to interpersonal injury.

## **Method**

### **Participants**

Our participants ( $n = 37$ ; 22% female; mean age = 40 years) were United States military veterans who had served in the United States Air Force, Army, Navy, Marine Corps, National Guard, and Air Guard. These participants were recruited from a larger study examining links between genetic biomarkers and measures of stress and well-being in United States military veterans.

### **Measures**

**Moral Injury Questionnaire (MIQ; Currier et al., 2013).** We used this 19-item scale to measure participants' amount of exposure to morally injurious experiences during active duty.

Items included statements such as: “I made mistakes in the war zone that led to injury or death” and “I did things in the war that betrayed my personal values.” Items were scored on scale ranging from (1) *never* to (4) *often* and summed to create a moral injury experience self-report score for each participant.

**The Impact of Events – Revised (IES-R; Christianson, 2013).** We used this 22-item scale to assess participants’ subjective response to specific traumatic event. Specifically, it measures the intrusive response patterns (e.g., “Pictures about it popped into my mind),” avoidant response patterns (e.g. “I stayed away from reminders of the event),” and hyperaroused response patterns “(e.g. Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart).” Items for each subset of responses were scored on scale ranging from (0) *not at all* to (4) *extremely* and summed to create intrusive response pattern, avoidant response pattern, and hyperaroused response pattern self-report scores for each participant.

**The Self-Regulation Questionnaire (SRQ; Aubrey et al., 1994).** We used this 63-item scale to assess participant’s self-regulatory skills. Items included statements such as: “I change the way I do things when I see a problem with how things are going.” Items were scored on a scale ranging from (1) *strongly disagree* to (5) *strongly agree* and summed to create a self-regulatory ability score for each participant.

## **Procedure**

Veterans completed an online consent form, a demographic survey, and multiple questionnaires during an online data collection session.

## **Results**

### **Preliminary Analyses**

The means, standard deviations, and ranges for the study variables are presented in Tables 1 and 2. Overall, each of these variables showed sufficient variability.

### **Principal Analyses**

We hypothesized that veterans' moral injuries would be associated with one or more post-traumatic response patterns. To test this hypothesis, we conducted a multiple regression analysis in which we regressed participants' MIQ scores on their intrusive response pattern, avoidant response pattern, and hyperaroused response pattern SRQ subscale scores. As expected, higher MIQ scores were significantly associated with higher self-reported hyperaroused responses to traumatic events ( $b = 1.253, p = 0.027$ ), such that veterans who reported a greater severity of moral injury reported more hyperaroused response patterns. Veterans' MIQ scores were not significantly associated with their intrusive ( $b = -0.386, p = 0.289$ ) or avoidant ( $b = 0.392, p = 0.229$ ) IES-R subscale scores.

To test our second hypothesis that veterans' degree of self-regulation would moderate the link between post-traumatic responses and moral injuries, we conducted a follow-up moderation analysis. In this analysis, we ran our regression analysis and included the interaction term between self-regulation and hyperarousal as a test of moderation. The interaction term was significant, indicating that self-regulation moderated the link between hyperarousal and experiencing moral injury ( $b = 0.006, p = 0.042$ ). A post-hoc inspection of the interaction plot suggested that, as expected, veterans who exhibited higher self-regulatory capacities showed more hyperaroused response patterns if they had been exposed to moral injury. In contrast, veterans that show fewer self-regulatory abilities may be less aware of their morally injurious experience and thus would be less likely to recognize and react to the morally injurious experience.

### Discussion

The principal aim of this study was to identify individual posttraumatic response patterns in relation to moral injury. Results indicated that one common stress pattern, hyperarousal, was associated with moral injury and this link may be especially important to understanding how military personnel cope with situations that may have violated their moral beliefs. The finding that other types of post-traumatic symptoms was not linked to moral injury also distinguishes between common response patterns of individuals with PTSD and individuals who have experienced moral injury. Perhaps intrusive and avoidant response patterns commonly seen in individuals with PTSD were not linked to moral injury because they are helpless, passive response patterns as oppose to hyperarousal which is a an active response pattern. It may be that the hyperaroused response pattern is a defense mechanism for the individual to protect themselves in case they were to experience another situation similar to their morally injurious experience again.

Results also indicated that higher self-regulatory skills increased the risk for experiencing hyperarousal as a response to morally injurious events. This finding supports our proposition that having high self-regulatory skills generates more conscientious behavior, which could be referred to as hyperarousal in some settings. The more self-regulatory behavior an individual exhibits, the more likely it is that they will be aware of their morally injurious experiences. This finding relates to Currier et al.'s (2015) work regarding "making meaning of a stressor." In this case, the findings suggest that higher self-regulatory skills would point to the importance for an individual to make meaning; but, it is not necessarily indicative of one's ability to appropriate meaning. This suggests that if an individual experiences a moral injury and has higher self-regulatory abilities that they would have a greater desire to give meaning to the situation.

However, higher self-regulatory ability does not improve the individual's ability to actually make meaning of the experience, leaving them hyperaroused while attempting to make meaning. Instead, they experience more hyperarousal as a retaliation to their inability to appropriate meaning to the experience. Furthermore, if individuals with higher self-regulatory skills are more aware of their experience it is possible that higher self-regulatory skills are a risk factor for hyperaroused responses to moral injury. If we can identify that higher self-regulatory skills are characteristic of individuals experiencing moral injury then we may be able to screen for these characteristics prior to the individual being exposed to a cognitively dissonant situation.

Although this study provides important insights into moral injury, this study's findings should be considered in terms of the study's limitations. First, the sample size was relatively, which limited the statistical power of our analyses. Different results could have emerged in a large sample size. Second, the data were collected using self-report measures. It is unlikely all of the self-report responses were exact due to the intuitive, honest nature it requires to answer accurately. In particular, a few of the traumatic experiences the participants referred to in the surveys were not related to combat. Finally, the data were correlational and casual claims cannot be made regarding how moral injuries cause post-traumatic symptomatology. Future researchers could conduct longitudinal studies to examine how moral injury might cause common posttraumatic stress response patterns. Such studies would also contribute to a better understanding and treatment for those afflicted by moral injury, as well as whether different types of personality-related factors may moderate the link between moral injury and post-traumatic symptomatology.

### **Acknowledgements**



This research was supported by the National Science Foundation Trauma Research Education for Undergraduates Program at Syracuse University. We thank our mentor Dr. Matthew Dykas who provided expertise and commentary which greatly assisted our ability to conduct and present this research in a professional manner.

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Table 1

*We present descriptive statistics for the core study variables in Table 1. Overall, sufficient variability emerged in these scores indicating that participants were diverse with respect to responses to trauma, morally injurious experiences, and self-regulatory ability.*

<u>Variable</u>	<u>N</u>	<u>Range</u>	<u>Mean</u>	<u>Standard Deviation</u>
Hyperarousal	42	23.00	7.5238	5.96428
Avoidance	41	29.00	11.3659	7.96479
Intrusion	42	31.00	11.2381	8.02377
Moral Injury	38	45.00	30.8421	11.46682
Self-regulation	42	107.00	183.7143	23.50432

Table 2

*We present the multiple regression results table to show the relationship between moral injury and the three post-traumatic response patterns. According to this test, only hyperarousal is significantly associated with people who experienced moral injury.*

<u>Response Pattern</u>	<u>Unstandardized Coefficients</u>		<u>Standardized Coefficients</u>	<u>t</u>	<u>Significance</u>
	<u>B</u>	<u>Standard Error</u>	<u>Beta</u>		
Hyperarousal	1.253	0.542	.681	2.312	0.027
Avoidance	0.392	0.320	0.282	1.226	0.229
Intrusion	-0.386	0.358	-0.284	-1.078	0.289

Dependent Variable: Moral Injury Score