5-2018

The Wounded Warrior: Resilience Factors Minimizing Suicide Risk in Veterans with Posttraumatic Stress Disorder

Christina Hein
chein9@gmail.com

THE WOUNDED WARRIOR: RESILIENCE FACTORS MINIMIZING SUICIDE RISK IN VETERANS WITH POSTTRAUMATIC STRESS DISORDER

by

Christina Lynn Hein

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of the Requirements

For the Degree of Doctor of Philosophy

Major: Psychology

Under the Supervision of Professor David DiLillo

Lincoln, Nebraska

May, 2018

THE WOUNDED WARRIOR: RESILIENCE FACTORS MINIMIZING SUICIDE RISK IN VETERANS WITH POSTTRAUMATIC STRESS DISORDER

Christina L. Hein, Ph.D.

University of Nebraska, 2019

Advisor: David DiLillo

Veterans experience high rates of both posttraumatic stress disorder (PTSD) and suicidal behaviors when compared to the general public. Moreover, PTSD is a significant predictor of suicidal behavior among clinical and non-clinical adult populations. Joiner's Interpersonal-Psychological Theory (IPT) of suicide (Joiner et al., 2005) identifies three etiological factors that greatly increase risk of suicide, with PTSD potentially increasing risk of suicide by exacerbating these three components of IPT. Conversely, prior work has also identified resilience factors that may serve to buffer against the risk of suicide, particularly by counteracting the three components of IPT. These resilience factors fall into primary classes of social support and protective psychological factors. Thus, the current study tests the possibility that resilience factors related to social support (i.e., social connectedness and social engagement) and various psychological factors (i.e., protective psychosocial characteristics and altruism) moderate the relations between PTSD (Wave 1) and suicide (Wave 2) in a nationally representative sample of 565 U.S. military veterans. Consistent with expectations, results showed that PTSD was significantly positively associated with suicidal ideation (SI) for the veterans from a majority of combat eras (i.e., non-combat, Vietnam War, and OEF/OIF/OND veterans), while resiliency was generally negatively associated with SI across eras. Furthermore, the relation between PTSD and SI was moderated by specific resiliency factors for Vietnam War veterans (altruism) and OEF/OIF/OND veterans (social connectedness, perceived ability to cope). The findings from the

present study are relevant to suicide intervention strategies among veterans with trauma symptoms and from distinct combat eras. Specifically, the various resiliency factors that are associated with reduced risk for suicide among veterans of different combat eras may be useful points of intervention for treatment providers seeking to reduce risk for suicidal behaviors among this high-risk population.

ACKNOWLEDGEMENTS

I would like to first thank my committee chair and advisor, Dr. David DiLillo, for his guidance and support for this dissertation and the past four years. His mentorship has been the single greatest influence on my development as a psychologist, and I will always be grateful to him for that. It has been an honor and a privilege to work with Dr. DiLillo, and the following dissertation could not have occurred without him.

I would also like to extend my deepest appreciation to my committee members, Drs. Lisa Kort-Butler, Mario Scalora, and Scott Stoltenberg, as well as Dr. Rebecca Brock for her consultation on statistical analyses utilized in this study. My gratitude goes to Dr. Robert Pietrzak for providing me access to his data and serving as a consultant role on this project. Additionally, I would like to acknowledge the members of the Department of Psychology at the University of Nebraska for their support.

My dissertation and the past four years would not have been possible - or nearly as fun - without the help of my fellow Trauma, Violence, and Abuse lab members, both past and present: Anna Jaffe, Annie Steel, Michelle Haikalis, Molly Franz, Hanna Grandgenett, Shaina Kumar, and Kyle Haws. Your support and encouragement have been nothing short of extraordinary.

Finally, I would like to thank my family and friends for their unwavering belief in my ability to succeed throughout my graduate school career.

TABLE OF CONTENTS

LIST OF MULTIMEDIA OBJECTS

TABLES

FIGURES

CHAPTER 1: INTRODUCTION

Letter From Daniel

Daniel Somers was a veteran of Operation Iraqi Freedom. While in Iraq, he ran more than 400 combat missions as a machine gunner, interviewed countless Iraqis, and interrogated dozens of insurgents and terrorist suspects. Daniel was diagnosed with PTSD and a traumatic brain injury, among other major health problems. On June 10, 2013, Daniel wrote a final letter to his family before taking his life. Daniel was 30 years old. His wife and family have given permission to publish it (abbreviated version below).

I am sorry that it has come to this.

The fact is, for as long as I can remember my motivation for getting up every day has been so that you would not have to bury me. As things have continued to get worse, it has become clear that this alone is not a sufficient reason to carry on. The fact is, I am not getting better, I am not going to get better, and I will most certainly deteriorate further as time goes on…

You will perhaps be sad for a time, but over time you will forget and begin to carry on. Far better that than to inflict my growing misery upon you for years and decades to come, dragging you down with me. It is because I love you that I can not [sic] do this to you. You will come to see that it is a far better thing as one day after another passes during which you do not have to worry about me or even give me a second thought. You will find that your world is better without me in it.

I really have been trying to hang on, for more than a decade now. Each day has been a testament to the extent to which I cared, suffering unspeakable horror as quietly as possible so that you could feel as though I was still here for you. In truth, I was nothing

more than a prop, filling space so that my absence would not be noted. In truth, I have already been absent for a long, long time…

My mind is a wasteland, filled with visions of incredible horror, unceasing depression, and crippling anxiety, even with all of the medications the doctors dare give. Simple things that everyone else takes for granted are nearly impossible for me. I can not [sic] laugh or cry. I can barely leave the house. I derive no pleasure from any activity. Everything simply comes down to passing time until I can sleep again. Now, to sleep forever seems to be the most merciful thing…

Thus, I am left with basically nothing. Too trapped in a war to be at peace, too damaged to be at war. Abandoned by those who would take the easy route, and a liability to those who stick it out—and thus deserve better. So you see, not only am I better off dead, but the world is better without me in it.

This is what brought me to my actual final mission. Not suicide, but a mercy killing. I know how to kill, and I know how to do it so that there is no pain whatsoever. It was quick, and I did not suffer. And above all, now I am free. I feel no more pain. I have no more nightmares or flashbacks or hallucinations. I am no longer constantly depressed or afraid or worried.

I am free…

(Somers, 2013)

Daniel is one of the over 18 million living veterans who served the United States through various forms of military service, including serving active duty, in the National Guard, or in the Reserves (National Center for Veterans Analysis and Statistics, 2016). Unfortunately, suicide

attempts and completions are a significant problem among military personnel: a troubling report released by the U.S. Department of Veterans Affairs (DVA) in 2016 indicated that an average of 22 veterans commit suicide every day (DVA, 2016), a staggering statistic cited by Daniel in his final suicide letter. Historically, until 2007, the suicide rate for military was well below the civilian, demographically-matched suicide rate (Chiarelli, 2010). However, since the initiation of Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (OEF/OIF/OND) in 2001, suicide rates for military personnel and veterans have been increasing and have recently surpassed the rates for society at large (Chiarelli, 2010). Currently, despite making up only 6% of the population, veterans comprise 22% of all completed suicides in the U.S. (DeBeer, Kimbrel, Meyer, Gulliver, & Morissette, 2014), making suicide the second leading cause of death for veterans (after accidents; Corr, 2014; Kang et al., 2015). These figures make clear that suicide, and relatedly, suicidal behaviors, among veterans is an ongoing, and increasing, problem that must be addressed.

Suicidal Behaviors: Definition and Prevalence

Suicide completion is the final (and most severe) act along what can be considered the continuum of suicidal behaviors. Along this continuum lies a range of suicidal behaviors, spanning from thoughts about suicide to completed suicide (Vilhjalmsson, Kristjansdottir, & Sveinbjarnardottir, 1998; see Figure 1.1). The full range of suicidal behaviors encompasses any "nonhabitual act…that the individual, expecting to, or taking the risk to die…initiated and carried out with the purpose of bringing about wanted changes," (De Leo, Burgis, Bertolote, Kerkhof, & Bille-Brahe, 2006). Nonsuicidal self-injury (NSSI), though found to predict concurrent and later suicidal thoughts and behaviors (Whitlock et al., 2012), is not typically considered to be a part of the suicidal continuum due to the difference in *intention for death*;

namely, NSSI behaviors are most often undertaken as a way to regulate or cope with emotional pain, rather than as a means of ending one's life. This intention to end one's life is considered to be a critical and central feature of suicidal behaviors (Whitlock, Minton, Babington, & Ernhout, 2015).

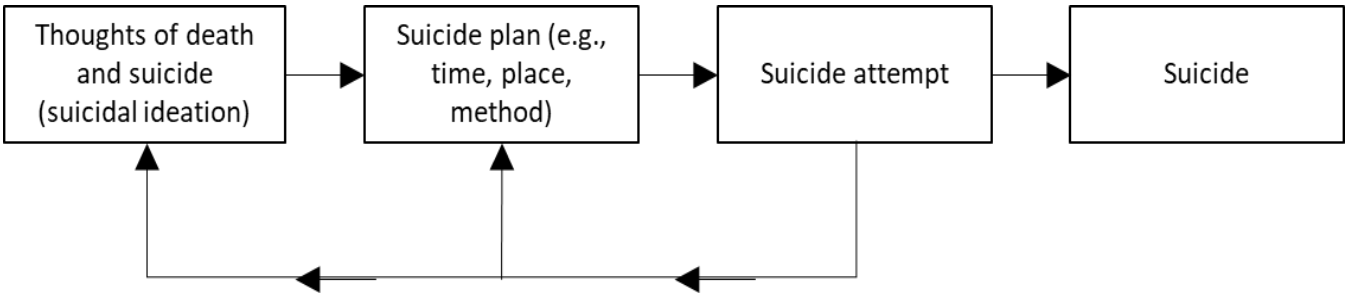

Figure 1.1. The process of suicide.

Along the continuum, thoughts about suicide, termed "suicidal ideation," are considered to be the least severe, and are located early on the pathway to suicide (Arria et al., 2009). Ideation is frequently separated into two components: passive and active. Passive ideation includes such thoughts as avoiding steps necessary to save or maintain life and thoughts of death, but with a general unwillingness to carry out such actions. Active ideation includes serious thoughts that involve contemplating or wishing to commit suicide (Szanto et al., 1996). However, research has shown that the clinical utility of separating ideation into these categories is limited and so passive and active ideation should be considered in concert with each other (Szanto et al., 1996).

Suicidal ideation (SI) typically precedes active suicidal behaviors (Beck, Kovacs, & Weissman, 1979). Approximately 85% of individuals who attempt suicide report having previously engaged in suicidal ideation (CDC.gov, 2015; Center for Behavioral Health, 2014). SI is among the strongest predictors of a future suicide attempt in a broad range of samples

including psychiatric patients, medical students, college students, and veterans (Dyrbye et al., 2008; Garlow et al., 2008; Ilgen et al., 2010; Mann et al., 2008; Smith & Crawford, 1986). Studies have shown that approximately 3.9% of adults in the United States report having had serious thoughts about suicide in the past year (CDC.gov, 2015; Center for Behavioral Health, 2014), indicating that suicidal ideation is a relatively common occurrence among adults. SI is even more common among military personnel, with approximately 6.5% of veterans endorsing suicidal ideation at any given time (Lemaire, Graham, & Debakey, 2011).

Further along the continuum, suicidal planning is considered to be a step on the path leading from ideation to a suicide attempt. Suicide planning includes making conscious and intentional decisions regarding suicide, including identifying the means (e.g., firearm, jumping, motor vehicle accident), the location, and/or the date or time. Although some individuals deny any suicide planning prior to a suicide attempt, the majority of attempters report engaging in some sort of planning prior to the attempt (Simon & Crosby, 2000), with studies identifying associations between the occurrence of *any* suicide planning and more medically lethal suicide attempts (Brown, Henriques, Sosdjan, & Beck, 2004; Power, Cooke, & Brooks, 1985). Additionally, increased suicide planning (e.g., greater levels of planning and/or details) has been related to a greater risk for completed suicide (Coryell & Young, 2005; Harriss, Hawton, & Zahl, 2005; Jacobs et al., 2010).

Following suicidal planning, the next major distinction within suicidal behaviors is suicide attempts. Suicide attempts are significant and dangerous acts, beyond suicidal ideation or planning, that serve as a final step towards suicide. Suicide attempts consist of "self-injurious behavior with a nonfatal outcome for which there is evidence that the person intended at some (nonzero) level to kill himself/herself," (O'Carroll et al., 1996). Current suicide nomenclature

states that suicide attempts include three important qualities: a) the behavior was self-initiated and was potentially injurious; b) there was presence of intent to die; and c) there was a non-fatal outcome (Silverman, Berman, Sanddal, O'Carroll, & Joiner, 2007; Van Orden et al., 2010). Attempted suicide is one of the strongest risk factors for completed suicide in adults. One meta-analysis of individuals who completed suicide found that individuals with a prior suicide attempt were 38 to 40 times more likely to complete suicide than those with no prior suicide attempts (Brown et al., 2005). Numerous prospective studies have identified suicide attempts to be a significant risk factor for eventual completed suicide (e.g., Brown et al., 2005, 2000; Fawcett et al., 1990; Harris & Barraclough, 1997).

The continuum of suicidal behaviors may be viewed as comprising a larger process that moves incrementally toward the ultimate outcome of a completed suicide. Indeed, suicidal ideation most strongly predicts suicide attempts, with suicide attempts, in turn, most strongly predicting completed suicide (Brown, 2013; Kessler et al., 1999; Weissman, Klerman, Markowitz, & Ouellette, 1989). Thus, each of these suicidal behaviors can be characterized as a step in a hierarchy of actions, each one more risky and serious than the last (Beck, 1986; Diekstra, 1993; Smith & Crawford, 1986; Vilhjalmsson et al., 1998). Consistent with the broader literature (e.g., Sveticic & De Leo, 2012), the continuum of suicidal behaviors will be referred to here as "suicidality." Therefore, suicidality captures a large scope of thoughts and behaviors, allowing for the identification of additional points at which clinicians may intervene in an attempt to prevent the completion of suicide in addition to the patently critical phase following a suicide attempt.

Rates of suicide-related behaviors in veterans. As may be expected, the rate of suicide-related behaviors, including suicidal ideation and attempts, is even higher than the rate of

completed suicides; this is the case particularly among veterans. A review of literature indicates that, similar to the pattern seen with completed suicides, current and former service members experience an unexpectedly high rate of suicide attempts and ideation even when compared to civilians (Blow et al., 2012; Kang & Bullman, 2009; Zivin et al., 2007). Specifically, a Veterans Affairs report from the Office of Suicide Prevention found that, after adjusting for differences in gender and age, veterans' risk for suicide-related behaviors (i.e., ideation, attempts) was 22% higher than their civilian counterparts, with male veterans at 19% higher risk and female veterans 25% higher risk than their gender-based civilian counterparts (DVA, 2016). To begin examining these increased suicide risks among veterans, an abundance of literature has aimed to identify demographic and military specific factors that may function to increase risk. Several identified risk factors include combat exposure, active duty versus Reserve/National Guard service, and various mental disorders including depression, PTSD, and substance use (Boehmer, Flanders, McGeehin, Boyle, & Barrett, 2004; Harris & Barraclough, 1997; Kang & Bullman, 2008; Pietrzak et al., 2010a; Thoresen & Mehlum, 2004).

Regarding suicidal ideation, studies of OEF/OIF/OND veterans found that 12.5% of participants had contemplated suicide within the prior two weeks (Pietrzak et al., 2010a), and 40% had considered suicide within the preceding year (IAVA.org, 2016). When examining active suicidal behavior, attempted suicide among veterans is common: 54% of OEF/OIF/OND veterans reported that they knew of a veteran who attempted suicide (IAVA.org, 2016), with estimates that 10 to 20 times more individuals attempt suicide than those who complete it (WHO.org, 2017).

However, it is important to note that although suicide rates among veterans are concerning, suicide attempts—and, to a greater extent, competed suicide—are nevertheless

relatively low base rate events, making them difficult to predict. Prospective studies aiming to identify individuals who go on to attempt or commit suicide have had limited success, with studies "miss[ing] many cases [and] identif[ying] far too many false positive cases to be workable" (Pokorny, 1983; also discussed in Nock et al., 2008). Given their slightly higher prevalence rates, as well as predictive powers for risk of eventual completed suicide, secondary constructs of suicide (e.g., suicidal ideation, suicidal attempts) are frequently utilized as outcome variables in research.

Interpersonal-Psychological Theory of Suicidal Behavior

In part to improve the prediction of those at risk for suicide, as well as to aid in the prevention of suicides, it is critical to understand those etiological factors that may increase risk for suicide and related behaviors. Underscoring the need for accurate prediction is that, beyond the tremendous emotional toll on survivors, suicides and suicide attempts have major economic costs, with an estimated national cost of $58.4 billion for both attempted and completed suicides in the U.S. (Shepard, Gurewich, Lwin, Reed, & Silverman, 2016). In order to explain the etiology of suicidal behavior, multiple theoretical models have been proposed (e.g., Baumeister, 1990; Durkheim, 1897; Rudd, 2006; Shneidman, 1993). In general, these models can be grouped into those that aim to explain the biological, social, and/or psychological factors that contribute to suicide (Barzilay & Apter, 2014). To be of value, a theoretical model of suicide must meet three important criteria: a) it must offer insight into the processes by which contextual and background factors (i.e., physiological, cognitive, social) interact with proximal triggers (i.e., activating events, e.g., divorce, death of a loved one) to predict suicidality; b) it must address the interaction between inter-individual risk factors and intra-individual dynamic systems, and; c) it

must be consistent with empirical risk factors and be able to account for them (Barzilay & Apter, 2014; Prinstein, 2008).

A brief listing of major etiological models of suicidal behavior is contained in Table 1.1. Among the extant conceptual models, the most empirically-validated framework appears to be Thomas Joiner's Interpersonal-Psychological Theory (IPT) of suicide (Joiner, Brown, & Wingate, 2005; Van Orden, Witte, Cukroqicz, Braithwaite, Selby, & Joiner, 2010). IPT, meeting all three of the criteria of a sound theoretical model, takes a broad perspective, examining both an individual's *desire* to die and her or his *ability* to do so. Specifically, this theory posits that an individual will not die by suicide unless two critical interpersonal constructs, perceived burdensomeness and thwarted belongingness, simultaneously coexist within the individual. Together, these constructs constitute what IPT refers to as the "desire for death" (Joiner et al., 2002). In addition to the desire for death, the individual must also have the capability to engage in the suicidal behavior. A graphical depiction of the IPT model is shown in Figure 1.2, with the darkest area within the Venn diagram capturing the relatively small number of individuals who maintain both the desire and the capability for suicide (e.g., those most at risk for attempted or completed suicide). It is important to note that the "capability for suicide" construct is portrayed as smaller than the other two due to the relative infrequency of individuals who demonstrate an elevated capability in concert with the desire for death; however, military personnel demonstrate rates of capability that are higher than those of civilians, as will be discussed later.

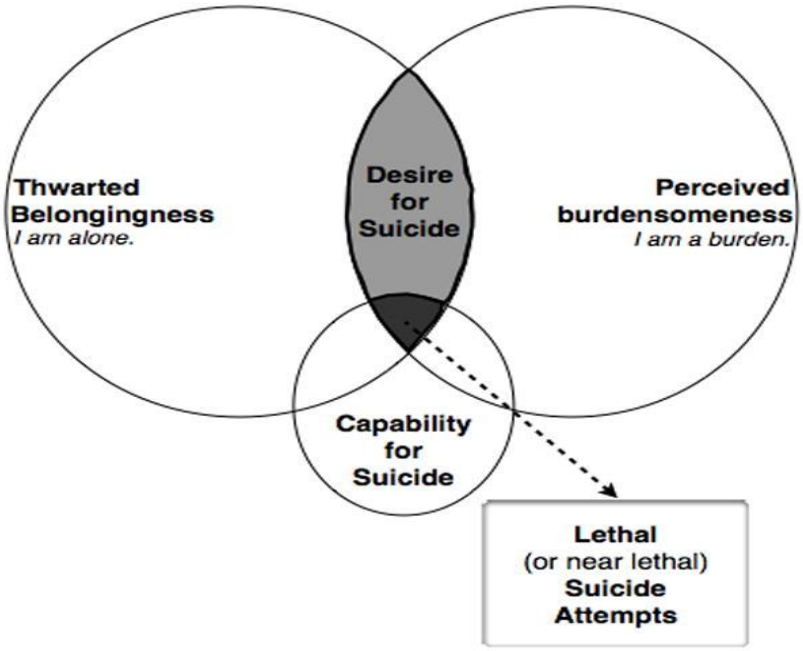

Figure 1.2. Critical assumptions of the Interpersonal-Psychological Theory of suicidal behavior (Van Orden et al., 2010).

According to IPT, a primary factor contributing to suicide risk is that the individual must feel that he or she is a burden on others and/or society (e.g., perceived burdensomeness). This view leads to the idea that "my death is worth more than my life" (Joiner, 2009). An example of perceived burdensomeness can be seen clearly in Daniel's suicide letter presented earlier. Specifically, Daniel describes how his existence will continue to directly result in increased grief in the lives of those around him ("Far better [to commit suicide] than to inflict my growing misery upon you for years and decades to come;" Somers, 2013). He continues by writing that the world is "better off without" him in it and therefore committing suicide is the only and best apparent option (Somers, 2013). Consistent with the construct of perceived burdensomeness, throughout his letter, Daniel reinforces his perception that committing suicide will be liberating to both those around him and to the world in general. As expected within the structure of IPT,

research in this area has indeed identified positive associations between levels of perceived burdensomeness and the presence of both suicidal ideation and behaviors (e.g., De Cantanzaro, 1995; Hill & Pettit, 2014; Joiner et al., 2002), even when controlling for suicide-related covariates (Van Orden, Lynam, Hollar, & Joiner, 2006).

Secondly, IPT posits that the individual must feel that he or she does not belong with other people, an experience labeled "thwarted belongingness." A low sense of belongingness results in a sense of alienation from others with a failure to feel an integral part of a family, circle of friends, and/or other valued groups. Thwarted belongingness also includes having strained relationships with those around the individual. An example of thwarted belongingness may be observed through a television mini-series that recently gained popularity titled "13 Reasons Why" (Golin et al., 2017). Throughout the series, the main character, Hannah, describes numerous and repeated social isolation and active efforts by peers to demoralize and humiliate her. Consistent with literature (e.g., Trout, 1980), Hannah attributes this social disconnect to be the main cause of her final act of suicide.

The direct construct of thwarted belongingness is well-supported in literature as being a significant predictor of suicidal behaviors (e.g., Bryan, 2011; Hill & Pettit, 2014; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Moreover, numerous studies have examined indirect measures of thwarted belongingness, such as social isolation (i.e., disengagement that may result from an individual's attempts at social connection being rebuffed). Studies have found that, of all risk factors for suicidal behavior, indices related to social isolation remain the strongest and most consistent predictor (Joiner, 2009; Van Orden et al., 2010). The role of interpersonal disconnect in predicting suicidality has been established in a broad array of populations, including adolescents, elderly individuals, and military personnel (Joiner, 2009; for a meta-analysis, see

Chu, Saucier, & Hafner, 2010). Various measures of social dysfunction associated with thwarted belongingness, which have been linked to suicidal behavior, include social withdrawal, living alone, losing a spouse, and having few social supports, among others (e.g., Appleby, Cooper, Amos, & Faragher, 1999; Dervic, Brent, & Oquendo, 2008; Fazel, Cartwright, Norman-Nott, & Hawton, 2008; Wyder, Ward, & De Leo, 2009).

As noted, thwarted belongingness, coupled with perceived burdensomeness, constitute a "desire to die" (Van Orden et al., 2010). However, even in the presence of this desire to die, Joiner posits that suicide will not occur unless the individual also has the ability to enact self-harm or to complete the act of suicide. Thus, an individual must have an acquired capability to overcome the fear and pain that is associated with suicide (referred to as the "acquired capability of lethal self-injury"; Joiner et al., 2005). This factor suggests that suicide is in direct conflict with an individual's instinct of self-preservation (Joiner, 2009) and thus requires an increased capacity for self-harm to override the instinct. In his suicide letter, Daniel alludes to the concept of acquired capability, whereby he personifies this ability to override self-preservation: "I know how to kill, and I know how to do it so that there is no pain whatsoever. It was quick, and I did not suffer," (Somers, 2013).

A key theoretical underpinning supporting acquired capability as a contributor to suicidality is Solomon's (1980) opponent-process theory, which posits that repeated exposure to a stimulus results in a weakened original negative response and the strengthening of opposing responses. In the context of suicide, the opponent-process theory suggests that the capability for suicide is acquired through repeated exposure to sub-threshold scenarios such as frequent engagement in nonsuicidal self-injury (Franklin et al., 2010), combat exposure (Bryan, Cukrowicz, West, Campbell, & Morrow, 2010a), or substance intoxication (Brown, Beck, Steer,

& Grisham, 2000). Repeated exposure to fear and sensations of pain results in increased habituation, leading to elevated tolerance for fear and a resultant sense of fearlessness about death, as well as opposing senses of calm and relief (Joiner et al., 2005; Ribeiro & Joiner, 2009). The acquired capability factor is seen as a continuous construct, which is strengthened over time with repeated exposure to relevant experiences. Consequently, actions such as past suicidal behaviors (e.g., non-suicidal self-harm, prior suicide attempts) or perpetrated violence will allow an individual to habituate to the pain and fear of self-injury, thereby making future suicidality more likely (Joiner, 2009; Ribeiro & Joiner, 2009).

Abundant empirical evidence supports the notion of acquired capability as a risk factor for suicidality. A meta-analysis (Yoshimasu, Kiyohara, Kazuhisa, & Ae, 2008) examined a series of articles for suicidal risk factors. Previous suicide attempts or deliberate self-harm was identified as one of the five major domains of risk factors for suicide. In fact, individuals who attempt suicide have an approximately 370-fold increased risk of suicide (Takahashi, 2006; Yoshimasu et al., 2008). Additionally, many studies have found a positive association between past suicidal ideation and other factors tangentially related to acquired capability, including higher pain tolerance (e.g., Franklin, Hessel, & Prinstein, 2011; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006; Orbach, Mikulince, King, Cohen, & Stein, 1997) and more serious future suicidality (Brown et al., 2000; Joiner et al., 2005), thereby lending support to the application of the opponent-process theory to suicidal behaviors through the lens of IPT.

Although each factor in IPT has been found to function independently as a unique risk factor for suicide, the theory posits that the greatest risk for suicide occurs via a three-way interaction between the factors (Joiner, 2009). More specifically, the theory of IPT states that the *desire* to die, which results from perceived burdensomeness and thwarted belongingness,

ultimately leads to suicidal attempts or completions only when the acquired *capability* for suicide is also present (Joiner, 2009; Van Orden et al., 2006). Several studies have examined these theorized interactions in various samples, including undergraduate students, psychotherapy outpatient clients, and community samples of young adults (e.g., Joiner et al., 2009; Van Orden et al., 2008). Each of these studies has found the expected interaction between high perceived burdensomeness and low belongingness, along with capability for self-harm, in predicting increased suicidal ideation or suicide attempts (Joiner et al., 2009; Van Orden et al., 2008).

IPT applied to veterans. Although considerable research supports the IPT model in civilian samples, much less empirical research has evaluated the role or fit of IPT within veteran and military populations. Nevertheless, elements of Joiner's model may be inherently present in military life, indicating that the model may remain a solid lens through which to view veteran suicides. One such example, though not often evaluated, is the construct of perceived burdensomeness manifesting uniquely among veterans. It has been hypothesized that veterans, particularly elderly veterans, often experience a heightened sense of perceived burdensomeness (Castro & Kintzle, 2014). Following military service, veterans may experience physical and psychological health difficulties. Many military personnel fail to adequately address their physical and mental health needs while still operating within the military structure, due to their ability to maintain function at a baseline level, a phenomenon labeled "functioning while suffering" (Adler & Castro, 2013; Castro & Kintzle, 2014). However, upon discharge from the military, physical and psychological injuries may result in significant barriers to occupational and social functioning, causing difficulties in a vast array of civilian life arenas. These employment and social difficulties likely result in a sense of feeling like a burden to their friends, family, and community (Adler & Castro, 2013; Burrell, Adams, Durand, & Castro, 2006; Castro

& Kintzle, 2014). Although rarely studied directly, literature indirectly supports the existence of perceived burdensomeness among veterans.

Furthermore, it is likely that veterans experience a heightened sense of thwarted belongingness. It is well known that military indoctrination builds cohesion within its ranks, emphasizes shared values, and creates an intense "brothers-in-arms" bond. This powerful social connection is inherently lost upon discharge from the military and transition to civilian life. Civilian family and friends may have difficulty understanding the military experiences, and the personal identity of a veteran is challenged upon discharge from the military (Castro & Kintzle, 2014; Selby et al., 2010). In addition, veterans, particularly those who are older, may begin experiencing the deaths of family members and close friends, especially those with combat and military experience; these losses can significantly disrupt the veterans' social support network and sense of belongingness (Castro & Kintzle, 2014; Nicholson, 2009). Thus, thwarted belongingness appears to be a major risk factor for veterans, consistent with expectation within IPT.

Finally, of the three constructs proposed in IPT to be essential for suicidal behaviors, acquired capability may be the most relevant construct for explaining suicide in current and former military personnel (Monteith, Menefee, Pettit, Leopoulos, & Vincent, 2013; Selby et al., 2010). For example, surviving combat experience may lead to a sense of "invincibility," resulting in increased willingness to engage in risky and dangerous behaviors. One study found that greater exposure to violent warfare, the killing of another human, and repeated contact with high levels of human trauma predicted greater risk-taking (e.g., substance abuse, verbal/physical abuse) upon homecoming (Killgore et al., 2008), with risk-taking acting as a construct that is conceptually related to acquired capability. Additionally, depressed and alcohol-abusing military

personnel from Norway who experienced combat were nearly as likely to die by suicide as by a reckless accidental death (Killgore et al., 2008; Thoresen & Mehlum, 2004). Consistent with the construct of acquired capability, suicide risk may also increase following exposure to military-related work and stressors (Ritchie, Keppler, & Rothberg, 2003). Military service, for example, restricts personal freedoms in a community where aggression is often a significant component of the training. The masculine culture of the military further discourages personal compassion (Rozanov & Carli, 2012). Moreover, military service provides ready access to firearms, which are the leading cause of death by suicide (CDC, 2015; Nademin et al., 2008; Rozanov & Carli, 2012). Finally, each completed suicide in the military and/or veteran community may contribute to suicide clustering, which arises when an inordinate number of suicides occur in close temporal and geographic proximity, similar to an "outbreak" (also referred to as contagion or imitation; Gould, Wallenstein, & Davidson, 1989). Suicide clusters are most likely to occur among teenagers and young adults (Gould, Wallenstein, Kleinman, O'Carroll, & Mercy, 1990), or within a closed system such as the military or among veterans (Rozanov & Carli, 2012).

Initial theories attempting to explain the high rates of suicide in the military considered that the potentially traumatic experiences encountered in combat might increase rates of suicide as a result the acquired capability for violence. Specifically, in combat, individuals are more likely to have experienced trauma, engaged in behaviors that contrast with their personal beliefs, and experienced repeated exposure to violence, all of which have been linked to increased risk for suicide (e.g., Bryan et al., 2010a). However, research has yielded mixed results regarding the risk of suicide among combat versus non-combat veterans. Several studies indicate that combat increases suicide risk (e.g., Bruce, 2010; Mitchell, Gallaway, Millikan, & Bell, 2012), with still other studies suggesting that suicide rates among non-combat veterans are as high or even higher

than that observed among combat veterans (Kang et al., 2015; Kang & Bullman, 2009; LeardMann et al., 2013); however, both combat and non-combat veterans consistently demonstrate higher rates of suicide than civilians (e.g., Chiarelli, 2010; Corr, 2014). One hypothesis for the possible decreased risk of suicide among combat veterans posited by some studies is that individuals who have deployed may have internalized the aspect of military culture in which mental toughness is seen not only as a sign of strength but potentially necessary for survival. If those who have deployed subscribe to this notion, they may avoid seeking help from mental health professionals and others and are thus unwilling to disclose internal struggles (Kang et al., 2015; Kang & Bullman, 2009). These conflicting findings indicate that although combat exposure certainly has numerous negative effects on mental health and future suicidal behavior, additional factors above and beyond the role of combat must be considered in understanding the elevated risk of suicide among military personnel as compared to that of civilians.

The majority of veterans have not experienced combat. However, all veterans were prepared for the possibility of deployment as a result of their training. Therefore, aside from combat per se, it is plausible that some experience within the military environment itself, above and beyond that of combat, may increase acquired capability for suicide among current and former service members as compared to their civilian counterparts. Although only a small subsection of service members face combat, the military as a unit is exposed to physical hardship and provocative scenarios through such practices as basic training and training in the use of firearms (Anestis, Bryan, Cornette, & Joiner, 2009). Intense combat training is required and involves increasing familiarity with firearms and other violent weapons and practicing engagement in combat situations (Selby et al., 2010). It has been suggested that such training may also lead to habituation to physical hardship, resulting in a sense of fearlessness towards

both injury and death (Koob & Davis, 1977; Selby et al., 2010), potentially facilitating an acquired capability for suicide. Even without combat, it is possible that service members develop an acquired capability for suicide simply through those shared experiences individuals undergo as a facet of their military service. Studies have shown that acquired capability appears to be relatively stable across time (Monteith et al., 2013; Van Orden et al., 2010); thus, extending these findings to veterans suggests that veterans likely experience elevated acquired capability similar to their active duty counterparts.

Although a number of studies have examined–either directly or indirectly–the role of IPT constructs in predicting suicidality in military, only two studies have directly examined IPT in a more holistic manner (i.e., including all three main constructs) among military personnel. One study (Bryan, Morrow, Anestis, & Joiner, 2010b) compared the history of suicide across a sample of active duty U.S. Air Force personnel, non-military undergraduate students, and a non-military clinical patients. The authors found that, compared to the two non-military samples (undergraduate students and clinical patients), the military sample reported significantly higher levels of perceived burdensomeness and similar levels of thwarted belongingness. Additionally, the military sample demonstrated higher levels of acquired capability than the clinical patients (but did not differ from the undergraduate sample). It is important to note that the authors found that the interaction of perceived burdensomeness and acquired capability significantly predicted suicidal history, but the interaction between all three factors did not, providing partial support for IPT applied to military personnel in this study.

A related study by Nademin et al. (2008) evaluated whether applying IPT to a sample of active duty Air Force personnel would differentiate between those who died by suicide from those who remained alive. Results showed that individuals' scores for the acquired capability

construct alone, as well as a composite score assessing perceived burdensomeness, thwarted belongingness, and acquired capability, reliably differentiated between those who committed suicide and those who did not, with each point increase on the composite score corresponding with 1.27 times greater risk of suicide. This provides preliminary evidence that military personnel who are at increased risk for suicide may be identifiable by their overall severity of IPT symptoms, as well as elevated reported acquired capability. These studies taken together lend support for the implementation of IPT to military and veteran suicides, and allow for the current study to be viewed through the lens of IPT.

PTSD: Diagnosis and Prevalence

The diagnosis of PTSD. Although not explicitly incorporated into Joiner's theory of suicide, PTSD is a robust risk factor for increased suicidality (Cavanagh, Carson, Sharpe, & Lawrie, 2003; Van Orden et al., 2010; Zisook, Downs, Moutier, & Clayton, 2012). PTSD is a psychiatric condition that may develop following exposure to one or more traumatic events (e.g., combat, automobile accident, natural disaster). PTSD was first introduced as a psychiatric diagnosis by the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (*3rd Ed.*; *DSM-III*; American Psychiatric Association, 1980). Prior to the incorporation of PTSD into the *DSM-III*, the diagnosis was still recognized among mental health professionals by other labels; a progression of labels has been used across time to describe this disorder, including "shell shock," "soldier's/irritable heart," "battle fatigue," and "war neurosis," (Sauer & Bhugra, 2001).

Currently, the *DSM-5* (American Psychiatric Association, 2013) describes PTSD as a chronic, impairing disorder that manifests after exposure to actual or threatened death, serious

injury, or sexual violation. The traumatic event must be experienced by the individual in one of four possible ways to be classified as a traumatic event (criterion A). The individual must have:

1. Directly experienced the event;
2. Witnessed the traumatic event in person;
3. Learned that the traumatic event happened to a close friend or family member; or
4. Experienced first-hand repeated or extreme exposure to aversive details of the traumatic event.

Specific diagnostic criteria for PTSD consist of four clusters of symptoms: Intrusion (Criterion B), Avoidance (Criterion C), Negative Alterations in Cognitions or Mood (Criterion D), and Alterations in Arousal and Reactivity (Criterion E). In addition, the symptoms must have lasted at least one month (Criterion F), there must be functionally significant impairment resulting from the symptoms (Criterion G), and the symptoms must be a direct result from PTSD and not comorbid conditions (Criterion H). See Table 1.2 for a list of criteria, a basic definition of each criterion, and sample symptoms.

To receive a diagnosis of PTSD, the individual must meet a certain threshold of symptoms from each cluster rated as "moderate/threshold" or higher (a "2" on the Likert-type scale used for PTSD symptom assessment, scored from 0 [*absent*] to 4 [*extreme/incapacitating*]). The *DSM-5* (American Psychiatric Association, 2013) diagnostic rule requires:

1. Criterion A is met (exposure to actual or threatened death, serious injury, or sexual violence)
2. At least one Criterion B symptom
3. At least one Criterion C symptom

4. At least two Criterion D symptoms
5. At least two Criterion E symptoms
6. Criterion F is met (disturbance has lasted at least one month)
7. Criterion G is met (disturbance causes either clinically significant distress or functional impairment)
8. Criterion H is met (disturbance is not attributable to the physiological effects of a substance or another medical condition).

PTSD prevalence in the military. Approximately 7 to 8% of the general population will suffer from PTSD in their lifetime, with about 8 million adults experiencing PTSD within a given year (e.g., Kessler et al., 1999, Ozer et al., 2003). Although the prevalence of PTSD among the general population is high relative to some other psychiatric disorders, the rate of PTSD among military veterans is even higher. PTSD has emerged as one of the signature "invisible wounds" within military and veteran populations, with many service members forced to contend with PTSD symptoms resulting from their military service. Chronic PTSD among veterans is one of the greatest challenges faced by the Veterans Affairs Health Care System and the larger mental health treatment community. A meta-analysis examining 33 studies evaluating the prevalence of PTSD in those who served in Iraq and Afghanistan found rates of PTSD ranging from 1.4% to 60%, with the authors identifying an overall prevalence rate of 23% (Seal et al., 2009). PTSD rates are similarly high in other combat eras (for a review, see Magruder & Yeager, 2009). This high prevalence rate makes clear that trauma is a substantial issue faced by both current and former service members.

One reason for the varying prevalence rates of PTSD across studies may be differential susceptibility across subgroups. One of the most well-conducted studies of PTSD prevalence

rates, the National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990; Kulka et al., 1988) estimated the current prevalence of PTSD to be 15.2% and 8.5% in Vietnam era males and females, respectively. Those veterans with high levels of war-zone exposure had significantly higher rates, with 35.8% of males and 17.5% of females meeting criteria for current PTSD. Current PTSD was also found to be higher among black veterans (27.9%) than Hispanic (20.6%) or white (13.7%) veterans. Additionally, lifetime rates of PTSD remained high, with 30.9% of males and 26.9% of females meeting criteria for the diagnosis (Kulka et al., 1990; Kulka et al., 1988).

PTSD as a Risk Factor for Suicidality

Despite the difficulty in accurately predicting those who will complete suicide, studies consistently point to PTSD as a significant risk factor for suicidality in both civilian (Tarrier & Gregg, 2004) and in veteran (Fontana & Rosenheck, 1995; Jakupcak et al., 2009, 2011) samples. Numerous studies have explored the association between PTSD and each of the various steps along the continuum of suicide, documenting a positive correlation between PTSD and the full continuum of suicidal behaviors, including suicidal ideation (Jakupcak et al., 2009; Nađ, Marčinko, Vuksan-Æusa, Jakovljević, & Jakovljevic, 2008; Panagioti, Gooding, Taylor, & Tarrier, 2014; Sareen, Houlahan, Cox, & Asmundson, 2005; Wilcox et al., 2010), suicide planning (Ramsawh et al., 2014; Tarrier & Gregg, 2004), and suicide attempts (Khan, Leventhal, Khan, & Brown, 2002; Oquendo et al., 2003; Sareen et al., 2005; Wilcox, Storr, & Breslau, 2009). This association between PTSD and suicidality remains significant even when controlling for sociodemographic variables, lifetime mood disorders, substance use disorders, nonaffective psychosis, antisocial personality disorder, and three or more comorbid psychiatric diagnoses

(Bell & Nye, 2007; Oquendo et al., 2003; Panagioti et al., 2014; Sareen et al., 2005; Tarrier & Gregg, 2004; Wilcox et al., 2010, 2009; Yoshimasu et al., 2008).

In addition to the civilian population, PTSD also consistently predicts completed suicide in combat veterans and military service members (Boscarino, 2006; Bullman & Kang, 1994; Drescher, Rosen, Burling, & Foy, 2003). A recent study found that OEF/OIF/OND veterans with mental disorders, including PTSD, commit suicide at a higher rate than individuals in the general population (standardized mortality ratio: 1.77, CI = 1.01-2.87; Kang & Bullman, 2008). These recent findings in OEF/OIF/OND veterans are built upon prior research showing that Vietnam veterans with PTSD have an elevated risk of suicide relative to both the general population (Freeman, Roca, & Moore, 2000; Hendin & Haas, 1991) and Vietnam veterans without a diagnosis of PTSD (Bullman & Kang, 1994; Farberow, Kang, & Bullman, 1990). Thus, a clear relation exists between PTSD and suicide among adults, a relation that is only strengthened among military personnel.

Comorbidity of depression, substance abuse and PTSD in predicting suicide. A number of seminal studies have identified the elevated comorbidity of a PTSD diagnosis with that of depressive and substance use disorders (e.g., Brady, Killeen, Brewerton, Lucerini, 2000). Major depressive disorder (MDD) is of particular interest given the abundance of literature support indicating that these are the disorders most likely to co-occur with PTSD (Brady et al., 2000). Depressive symptoms are a common and independent sequela of exposure to trauma, and having a previous depressive disorder is a risk factor for the development of PTSD once exposure to a trauma occurs (Brady et al., 2000). A large meta-analysis composed of 57 studies found that 52% of military personnel with diagnosed PTSD also had comorbid MDD (Rytwinski

et al., 2013). Furthermore, a diagnosis of PTSD has been identified as among the strongest predictors for suicide (Nock et al., 2008).

Similarly, substance use disorders are common among those with PTSD), specifically among military personnel, with studies finding comorbidity rates of 63% to 74% for veterans of various combat eras (Kulka et al., 1990; Seal et al. 2011). The comorbidity of PTSD with substance use is complex because while a substance use disorder may often develop as an attempt to self-medicate the painful symptoms of PTSD, withdrawal states exaggerate these symptoms (Brady et al., 2000). Furthermore, substance use disorders and is highly predictive of risk for suicide, particularly among the military (LeardMann et al., 2013). Therefore, given the elevated comorbidity of both depressive and substance use disorders with PTSD among military personnel, it is essential for studies to control for the possible co-occurrence in order to isolate the unique effects of PTSD from those that may be partially attributable to depressive or substance use disorders.

Trauma and PTSD in IPT. Research examining PTSD as a risk factor for suicidality has developed independently from the literature evaluating the IPT model of suicide. However, examination of literature reveals several ways in which the experience of PTSD may be compatible with the IPT model of suicide risk. Consistent with Joiner's theory (2005), the three facets of IPT (thwarted belongingness, perceived burdensomeness, acquired capability) offer a conceptual lens through which to understand the established relations between PTSD and suicidality. In particular, the factors that make up the IPT model may serve as intervening variables that function as mechanisms through which symptoms of PTSD are associated with increased suicidality (Poindexter et al., 2015).

When considering the potential impact of perceived burdensomeness, for example, research has shown that exposure to trauma is linked to increased reports of self-blame (Davis, Lehman, Silver, Wortman, & Ellard, 1996), a construct with clear conceptual links to perceived burdensomeness. Self-blame, in turn, is significantly associated with increased suicide attempts, such as among females with a reported trauma history (Ullman & Najdowski, 2009). Furthermore, it has been theorized that increased feelings of perceived burdensomeness could emerge among combat veterans experiencing high levels of survival guilt (Selby et al., 2010).

Similarly, numerous studies have evaluated the impact of thwarted belongingness on the relation between PTSD and suicide. For example, lower social support (a component of thwarted belongingness) has been linked repeatedly to increased suicidal ideation and suicide attempts among victims of sexual assault (Panagioti et al., 2014; Ullman & Najdowski, 2009). Research has shown that highly symptomatic veterans with PTSD have smaller social networks, less interpersonal contact, and more negative interactions (Flannery, 1990). Directly in line with thwarted belongingness, decreased social support, consistent with symptoms of PTSD, has been found to increase the risk of suicide.

Finally, a number of studies have examined correlations between PTSD and suicidality through acquired capability, in that exposure to trauma may increase risk for suicide. It is possible that individuals with PTSD seek an escape from their suffering resulting from their experienced trauma and chronic trauma symptomology, and thus consider suicide to be an acceptable option (Jagdeo, Cox, Stein, & Sareen, 2009). Moreover, consistent with the construct of acquired capability, potentially traumatic military experiences such as combat training and deployments may cause habituation to fear of painful experiences such as self-harm and suicide (Bryan et al., 2010a). Trauma exposure itself, which is an inherent part of PTSD, may serve to

desensitize individuals to the traumatic experience of suicide and death, consistent with Joiner's theory of acquired capability. As noted earlier, studies have shown that acquired capability appears to be elevated among military personnel (Bryan, Morrow, Anestis, & Joiner, 2010b; Nademin et al., 2008). Although the specific dimensions that increase acquired capability within the military remain unclear, evidence shows that the distressing and potentially traumatic events that are common to the experience of military personnel such as extensive and intensive war-like training situations, combat, and constant exposure to firearms may act as contributors, consistent with the IPT construct of acquired capability.

Although a PTSD diagnosis increases risk for suicide in accordance with Joiner's model, so too do specific PTSD symptoms. One such symptom that serves as a hallmark for PTSD is social disengagement, characterized by a sense of being distant or cut off from others. Impairment in social functioning is considered a major negative outcome that may result from symptoms of PTSD. This social disengagement and impairment in social functioning experienced by many with PTSD are consistent with Joiner's construct of thwarted belongingness. Similarly, another symptom of PTSD that may increase risk of suicide is that of taking more risks or engaging in self-destructive behavior; this self-destructive behavior is consistent with Joiner's construct of acquired capability. Therefore, an individual experiencing particular symptoms of PTSD (e.g., social disengagement, self-destructive behavior), even without a full PTSD diagnosis, may be at increased risk for suicide through the constructs of IPT (e.g., thwarted belongingness, acquired capability), consistent with Joiner's theory.

A study by Bryan (2011) examined associations between the severity of PTSD symptoms, perceived burdensomeness, and thwarted belongingness. The authors found that overall PTSD severity, as well as the severity on each of the three subscales of a *DSM-IV* PTSD

diagnosis, were each positively correlated with total scores for both perceived burdensomeness and thwarted belongingness. These data provide preliminary support for the theory of PTSD resulting in increased risk for suicide in accordance with Joiner's model of IPT.

PTSD symptom clusters in IPT. Until recently, most studies focusing on PTSD and suicidal behavior have examined PTSD at the diagnostic level, utilizing a total severity score created by summing symptoms across clusters. However, recent work has also examined the symptom clusters as independent predictors of SI. These studies demonstrate inconsistent results, with some finding support for an association (e.g., Davis, Witte, Weathers, & Blevins, 2014; Weisenhorn, Frey, van de Venne, & Cerel, 2017), and others failing to do so (e.g., Davis, 2016). However, it is important to note that nearly all studies examining relations between specific symptom clusters and suicidal behaviors have utilized the *DSM-IV* three-factor model of PTSD (i.e., utilizing a combination of avoidance and emotional numbing symptoms).

Furthermore, in recent years, a number of studies have examined the relation between PTSD and suicidal behavior using the IPT framework. However, most of this work is limited by methodological or conceptual issues, including utilizing outcomes variable that combines multiple forms of suicidal behavior (e.g., Bryan & Anestis, 2011), or failure to consider the relationship between individual PTSD clusters and suicidal behavior (e.g., Bryan, Hernandez, Allison, & Clemans, 2013). The potential predictive role of *DSM-5* PTSD symptom clusters are thus theorized as to their impact on suicidality through the lens of IPT.

Intrusive symptoms. Intrusive symptoms of PTSD involve the unwanted re-experiencing of the traumatic event in some way, such as through nightmares, unwanted memories, and intrusive thoughts of the trauma. Research has previously linked intrusive symptoms to suicide, with greater severity of reexperiencing symptoms being associated with higher scores of past-

week suicidal ideation in a sample of Vietnam veterans (Bell & Nye, 2007). When considering the role of intrusive symptoms within the context of IPT, this cluster of symptoms may serve to exacerbate an individual's acquired capability for suicide through the increase in his or her ability to tolerate self-inflicted pain as a result of the repeated unwanted re-experiencing of the traumatic event. Thus, increased intrusive symptoms experienced by those with PTSD might serve to result in increased risk for suicide through the IPT construct of acquired capability for suicide.

Avoidance symptoms. Avoidance symptoms of PTSD involve the conscious and deliberate efforts to avoid physical reminders (e.g., people, places, objects) and nonphysical (e.g., memories, thoughts, feelings) reminders of the traumatic event. To do so, individuals frequently experience emotional and social withdrawal as a result of the intentional restriction of their thoughts and behaviors (e.g., avoidance of certain people or locations; Hofmann, Litz, & Weathers, 2003). Research has demonstrated associations between avoidance symptoms of PTSD and suicide behavior, such that a greater reported avoidance severity was associated with elevated risk for suicidal ideation in a sample of OEF/OIF/OND veterans (Lemaire et al., 2011).

When considering this relationship within the context of IPT, avoidance symptoms likely contribute to an individual's experience of thwarted belongingness (i.e., sense of alienation and isolation), particularly if avoided reminders involve physical reminders such as people or places (Davis, Witte, Weathers, & Blevins, 2014). Therefore, avoidance symptoms experienced within PTSD may result in increased suicide behavior through IPT's construct of thwarted belongingness.

Negative alterations in cognitions and mood. Negative alterations in cognitions and mood is characterized by myriad feelings, from a persistent and distorted sense of blame of self

or others, to markedly diminished interest in activities, to an inability to remember key components of the trauma. Research has found that this symptom cluster has been found to associate with SI (Davis, 2016). Within this symptom cluster, the symptom related to the detachment/estrangement from others emerged as the strongest predictor of SI (Margaret Taylor Davis, 2016). Evidence has shown that elevations in this symptom cluster result in increased risk for SI through both perceived burdensomeness and thwarted belongingness (Davis et al., 2014).

Alterations in arousal and reactivity. This cluster is marked by aggressive, reckless, or self-destructive behavior, disturbances in sleep, and hypervigilance. This symptom cluster has been associated with SI through perceived burdensomeness (Davis, 2016).

As discussed, some researchers have examined the predictive ability of cluster scores for suicidality. However, work examining separate clusters is limited by variation and disagreement about the existence and structure of those clusters. Specifically, the *DSM-5* conceptualization of PTSD is comprised of four distinct symptom clusters. Despite the literature leading to the ultimate adoption of the four-cluster structure (e.g., Friedman, Resick, Bryant, & Brewin, 2011), there is significant controversy surrounding this decision, and a number of studies have since indicated that PTSD might best be characterized differently (e.g., Armour et al., 2014; Pietrzak et al., 2015; Tsai et al., 2012). Even before the release of the *DSM-5* four-cluster structure, various studies found support for a three-symptom cluster structure, used in the *DSM-IV,* while other work proposed two competing 6-factor models as well as a 7-factor model (Armour et al., 2015b; Liu et al., 2014; Tsai et al., 2012). Therefore, there remains significant disagreement regarding the most concise classification of PTSD and, consequently, the utility of symptom cluster scores.

The Role of Resilience

As discussed, PTSD is a well-known risk factor for suicidality. However, because only a small percentage of individuals diagnosed with PTSD ultimately attempt or complete suicide, it is critical to examine the factors that may moderate relations between PTSD and suicide to further understand what protects those who do not attempt or complete suicide. Knowledge of these variables may represent viable targets for intervention to reduce suicide risk among those with PTSD. Such variables are considered resilience factors in that they have the potential to minimize the risk of suicide; these factors contrast with those oft-studied factors that have been found to increase suicide risk, known as risk factors (e.g., depression, hopelessness, suicidal ideation; Brown et al., 2000).

Resiliency has recently become a major focus of the Department of Defense partnered with the National Institute of Mental Health (NIMH), with the recent undertaking of the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS; http://www.armystarrs.org), a large epidemiological-neurobiological study of Army suicides and their psychopathological correlates. Specifically, the overarching goals of the STARRS program were to (a) conduct the largest study of mental health risk and resilience ever conducted among military personnel; (b) evaluate hypotheses about modifiable risk-resilience factors to help target preventive interventions for Army suicides; and (c) expand scientific knowledge of psychosocial and neurobiological risk-resilience factors for suicidal behaviors and their psychopathological correlates. A number of iterations of this study have been implemented within the Army, including the Historical Administrative Data Study (HADS), All Army Study (AAS), New Soldier Study (NSS), Soldier Health Outcomes Study (SHOS-A & B), Pre/Post Deployment Study (PPDS), and the Longitudinal Study (LS; for a summary of these studies, refer to Ursano, Colpe, Heeringa, & Kessler, 2014). However, literature derived from this large study to-date

focus primarily on those risk factors for suicide that are prevalent among this population, including military service and prior psychiatric diagnoses (Kessler et al., 2015), with limited published research exploring resiliency.

Resilience factors decreasing risk of suicide. Consistent with the characteristics of resilience described above, various factors have been found to decrease the likelihood of suicidal behaviors among children, adolescents, survivors of childhood trauma, and older adults (Heisel & Flett, 2008; Johnson, Gooding, Wood, & Tarrier, 2010; Nrugham, Holen, & Sund, 2010; Roy, Carli, & Sarchiapone, 2011; Roy, Sarchiapone, & Carli, 2007). Although only a small subset of this work has specifically examined resilience to suicide among military personnel, this literature as a whole has identified two classes of factors that appear to boost resilience to suicide: social support, and psychological protective factors (Nock et al., 2013).

Social support. The construct of social support (e.g., as provided by family, peers, military unit) has been a major focus of resilience research (Nock et al., 2013), including among current and former military personnel (e.g., King, King, Fairbank, Keane, & Adams, 1998; Pietrzak, Russo, Ling, & Southwick, 2011a). Research on veterans' adjustment has focused primarily on the quantity and quality of available social support (e.g., Keane, Scott, Chavoya, Lamparski, & Fairbank, 1985; Pietrzak et al., 2010b). The role of social support appears to be particularly essential among current and former service members; for example, research on unit cohesion and support shows that the presence of support prior to experiencing stress and trauma decreases their negative effects and prevents the development of psychiatric symptoms including PTSD and substance abuse (Brailey, Vasterling, Proctor, Constans, & Friedman, 2007; Du Preez, Sundin, Wessely, & Fear, 2012).

Social support is one of the most critical functions of an individual's larger social networks, with broader social networks encompassing a number of structural characteristics (Heaney & Israel, 2008). Refer to Table 1.3 for a review of the characteristics and essential functions of social networks. As shown in this table, one critical component of a social network is reciprocity, or the extent to which an individual both *accepts* (e.g., social connectedness) and *provides* (e.g., social engagement) support to those around him or her. Reciprocity has been consistently linked to positive mental health and outcomes (House, Umberson, & Landis, 1988; Israel, 1982). Furthermore, research shows that relationships tend to be more satisfying and stable and overall social support tends to be stronger when reciprocity is present (Buunk, Doosje, Jans, & Hopstaken, 1993; LaGaipa, 1977). Thus, both social connectedness and social engagement have been found to be positively associated with improved social networks.

Table 1.3

Characteristics and Functions of Social Networks (Heaney & Israel, 2008)

	Definition
Structural characteristics	
Reciprocity	**Extent to which resources and support are both given and received in a relationship**
Intensity/strength	Extent to which social relationships offer emotional closeness
Complexity	Extent to which social relationships serve many functions
Formality	Extent to which social relationships exist in the context of organizational or institutional roles
Density	Extent to which network members know and interact with each other
Homogeneity	Extent to which network members are demographically similar
Geographic dispersion	Extent to which network members live in close proximity to focal person
Directionality	Extent to which members of the dyad share equal power and influence
Functions	
Social capital	Resources characterized by norms of reciprocity and social trust
Social influence	Process by which thoughts and actions are changed by actions of others
Social undermining	Process by which others express negative affect or criticism or hinder one's attainment of goals
Companionship	Sharing leisure or other activities with network members
Social support	**Aid and assistance exchanged through social relationships and interpersonal transactions**

Note. Bolded rows indicate characteristics that are of direct relevance to the present study.

Numerous studies have also documented that the presence of social support is associated with decreased risk of suicide. Pietrzak et al (2010b) found that veterans with greater post-deployment social support had lower rates of suicidal ideation. Another study examined the impact of a suicide prevention program initiated in 1996 within the U.S. Air Force in response to a growing rate of suicides (Knox, Litts, Talcott, Feig, & Caine, 2003). This program primarily sought to strengthen social support. In comparing suicide and other adverse outcomes pre- and post-implementation, the authors found a 33% relative risk reduction for suicide following

implementation. These studies demonstrate the potential impact of social support in buffering against suicide risk in military populations.

The role of social support in decreasing suicide risk may be understood through the lens of IPT. One study aimed to directly examine the association between various interpersonal constructs and thwarted belongingness and perceived burdensomeness (Van Orden, Cukrowicz, Witte, & Joiner, 2012). The authors found that decreased social support and increased loneliness were each associated with elevated levels of thwarted belongingness, increasing risk for suicide. In addition, the authors found that low social worth was associated with increased perceived burdensomeness, thereby increasing suicide risk. As a result, the role of social support in decreasing risk for suicide may be comprehended through the application of IPT to the resilience factor.

Psychological protective variables. A second category of resilience factors is that of various psychological protective factors. A review of literature shows that there has recently been an increase in research on psychological factors that may mitigate negative outcomes. These psychological protective factors fall within the broader realm of "positive psychology" (Nock et al., 2013) and include such constructs as "stoicism, character strength, life satisfaction, positive moods, self-esteem, autonomy, hope (optimism), zest, gratitude, capacity to love (ability to form reciprocated relationships), and a sense of meaning and purpose" (Nock et al., 2013, p. 11). Numerous studies have identified the protective effects of such constructs (e.g., Davidson, Wingate, Slish, & Rasmussen, 2010; Seligman & Csikszentmihalyi, 2000; Wingate et al., 2006). Specifically, studies examining the impact of psychological protective factors on the risk for suicide have identified a number of positive psychological variables that appear to reduce suicide risk. Such variables include feeling a sense of control, optimism, purpose in life, hope, self-

efficacy, coping strategies, and positive acceptance of change, among others (Heisel & Flett, 2004; Hirsch, Conner, & Duberstein, 2007; Meadows, Kaslow, Thompson, & Jurkovik, 2005; Pietrzak et al., 2010b, 2011).

One specific type of psychological protective factor that appears to play a significant protective role in risk for suicide, as well as the development of psychiatric disorders following adversity, is that of an individual's perceived ability to cope with adverse events and situations. Studies have shown that this perceived ability mitigates risk of suicidal behavior associated with childhood trauma in samples of abstinent substance dependent patients and male prisoners (Roy et al., 2011) and is associated with a decreased likelihood of suicide contemplation among OEF/OIF/OND veterans (Pietrzak et al., 2010b).

A second category of psychological protective factors consists of altruistic behaviors, defined as behaviors that benefit others at a personal cost to the individual engaging in the behavior (Kerr, Godfrey-Smith, & Feldman, 2004). Examples of altruistic behaviors include listening to others' concerns, helping others with their daily activities, and volunteering, and have been tied to greater well-being, health, and longevity, and improved mental health (Post, 2005). Midlarsky (1991) proposed five reasons that altruistic behavior may be beneficial: (a) enhanced social integration; (b) distraction from the agent's own problems; (c) enhanced meaningfulness; (d) increased perception of self-efficacy and competence; and (e) improved mood or more physically active lifestyle.

Literature shows that increasing engagement in prosocial and altruistic activities, including volunteering, can decrease negative psychiatric outcomes such as depression and anxiety (Layous, Chancellor, & Lyubomirsky, 2014; Layous, Chancellor, Lyubomirsky, Wang, & Doraiswamy, 2011). One study assessing the role of altruistic behaviors in relation to mental

health found that in a sample of 1019 church members, altruistic social interest behaviors (e.g., providing help to others) was a stronger predictor of better reported mental health than receiving help, even when controlling for age, gender, stressful life events, income, general health, and positive and negative religious coping (Schwartz, Meisenhelder, Ma, & Reed, 2003). Additional studies have found that retirees older than age 65 who volunteered showed significantly higher life satisfaction and will to live, and had decreased levels of depression, anxiety, and somatization (Hunter & Linn, 1981).

Various protective psychological factors such as hope and gratitude can strengthen social networks and are associated with lower levels of both thwarted belongingness and perceived burdensomeness (Davidson, Wingate, Rasmussen, & Slish, 2009; Kashdan, Uswatte, & Julian, 2006; Kleiman, Adams, Kashdan, & Riskind, 2013). The protective factor of perceived ability to cope is closely aligned with increased confidence in an ability to cope, which decreases risk for suicide (Roy et al., 2011). It is possible that confidence in coping might buffer against perceived burdensomeness due to feeling capable and thus less reliant on others. Similarly, the psychological protective factor of altruism has been tied to increased social support and diminished risk for suicide, with the hypothesized pathway through decreases in both perceived burdensomeness and thwarted belongingness (Oyama et al., 2008; Van Orden & Conwell, 2011). Given the understanding that thwarted belongingness and perceived burdensomeness increases risk of suicide, we recognize the roles of protective psychological characteristics in general, and perceived ability to cope and altruism specifically, in diminishing risk of suicide through these constructs of IPT.

Resilience factors moderating relations between PTSD and suicide risk. As noted, there is significant research support for the notion that PTSD increases risk for suicidality. A

separate realm of literature has identified the role of social support and protective psychological constructs in decreasing the risk for suicide and suicidal thoughts and behaviors. As detailed below, theory and prior empirical findings suggest that these same resiliency constructs may serve to mitigate the negative effects of PTSD on suicide risk among those with a high degree of social support and/or certain psychological factors.

Although social support and protective psychological factors have been found to lower suicide risk independent of PTSD status, they may also serve to decrease suicide risk by diminishing the negative impacts of PTSD highlighted by IPT. Specifically, as discussed above, social support appears to decrease thwarted belongingness and perceived burdensomeness, those very facets of IPT that are exacerbated by the experience of trauma and presence of PTSD symptoms. Social support, for example, may buffer the isolating impact of PTSD by mitigating the impact of trauma on an individuals' sense of thwarted belongingness and perceived burdensomeness. Someone who receives substantial, high-quality social support is likely to have a degree of interpersonal connectedness that can serve as a counterbalance to a sense of social isolation and thwarted belongingness associated with PTSD, thus decreasing suicide risk.

Similarly, protective psychological factors may buffer against the negative emotionality components of PTSD such as self-blame and survivor guilt, also serving to decrease the impact of thwarted belongingness and perceived burdensomeness that may follow trauma exposure. Although the role of protective psychological factors in moderating the impact of PTSD on SI has not been tested empirically, theory and prior work suggests that protective psychological factors may buffer against the impact of trauma on suicide by reversing the effects of PTSD on suicide risk through the various IPT facets. For example, PTSD is known to engender significant feelings of self-blame (potentially resulting in perceived burdensomeness: Koss, Figueredo, &

Prince, 2002; Ullman, 1997). It is possible that a sense of ability to cope or having a life purpose (e.g., feeling like there is a reason for the trauma and a reason to keep moving forward with life) serve to buffer against the sense of perceived burdensomeness resulting from trauma, thereby decreasing risk for suicide. Additionally, an individual who engages in help-giving (i.e., altruistic behaviors), is likely to experience less of a sense of perceived burdensomeness on those around him, ultimately decreasing risk for suicide.

Combat Era

Despite the extensive literature documenting differences in suicide risk between veterans and their civilian counterparts, veterans are not a homogenous population. One important way in which they differ may be the combat era in which they served. Indeed, each combat era has unique characteristics that reflect the military culture during its time. These characteristics in turn shape the experiences of the service members, such as psychiatric disorders and negative life outcomes, during their time of service and following discharge from the military. The effects of the combat era likely impact all service members, but especially those who experienced combat firsthand.

Vietnam War. The Vietnam War took place from 1964 to 1975, with nearly 9.2 million Americans serving during the Vietnam era. This combat era was unique in a number of ways. First, the conflict itself was highly controversial regarding the use of U.S. forces to prevent the spread of Communism in a country unrelated to the U.S., with both sides of dissent within the U.S. strongly distrusting the other. This controversy, coupled with it being the first televised war showing the immediacy and violence of combat, resulted in extraordinarily negative public reception faced by many veterans upon their return home. Importantly, the Vietnam War was the last war that utilized a highly-controversial draft before transitioning to an all-volunteer military.

As a result of the draft, a large percentage of men entered the services possessing higher education, resulting in many service members becoming aware of and questioning the conditions in which they served. Finally, the Vietnam War utilized a form of combat called guerilla war, in which enemy combatants and battle lines were no longer well-defined and clear, resulting in soldiers feeling incapable of letting their guards down or feeling safe for the duration of their deployment and beyond (Emanuel et al., 2012).

For Vietnam veterans, this era of service caused great physical, emotional, and existential trauma. Among a vast array of issues, Vietnam era veterans experience extremely high rates of alcohol and substance abuse during and after military service, (McFall, Mackay, & Donovan, 1992; Virgo, Price, Spitznagel, & Ji, 1999), high rates of PTSD arising from the guerilla warfare-type combat (Bremner, Southwick, Darnell, & Charney, 1996; Laufer, Frey-Wouters, & Gallops, 1985; McFall et al., 1992), and high rates of homelessness, with up to 50% of homeless male veterans having served in the Vietnam era (Rosenheck, Gallup, & Leda, 1991).

Persian Gulf War. The Persian Gulf War began with the invasion of Kuwait by Iraq in 1990, resulting in a coalition of forces led by the U.S. that quickly liberated Kuwait before exiting in June of 1991. Approximately 650,000 service members served in the Persian Gulf War (i.e., Operation Desert Shield and Desert Storm; DVA, 2014). A major defining experience of this combat era was service members' exposure to significant environmental toxins, biological weapons, and endemic disease in the Gulf region (Emanuel et al., 2012); as a result, Gulf War veterans report high rates of medically-unexplained physical health issues such as memory loss and fibromyalgia symptoms (frequently referred to as "Gulf War Syndrome"), infectious diseases, respiratory problems, and amyotrophic lateral sclerosis (ALS; Emanuel et al., 2012; DVA, 2014).

Interestingly, longitudinal studies of Persian Gulf War veterans identify low prevalence rates of substance use disorders with approximately 14-15% reporting alcohol abuse and 2-3% reporting drug abuse (Shipherd, Stafford, & Tanner, 2005). Studies show about 16-19% of Persian Gulf War veterans reported problems with anxiety, depression, and PTSD within the first year of return from war zone duty (Sutker, Davis, Uddo, & Ditta, 1995), with 15% reporting PTSD, 8% reporting major depression, and 7% reporting an adjustment reaction about five years after return (Joseph, 1997).

OEF/OIF/OND. On September 11, 2001, attacks organized by the terrorist organization Al Qaeda took place in the United States. In October 2001, the U.S. led an invasion of Afghanistan where Al Qaeda was based, thus beginning the Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (OEF/OIF/OND) conflicts, which continue to this day. Since October 2001, over two million veterans have served in this conflict, with more than 800,000 having been deployed more than once. This most recent combat era is the first to require service members to serve multiple deployments with repeated prolonged exposure to combat-related stress. For the first time in combat, improvised explosive devices (IEDs) have emerged as a prominent and devastating component of warfare, accounting for 60% of combat casualties, both killed and wounded (Wilson, 2007).

Research documents that these most recent wars pose substantial mental health challenges to service members and health care systems (Erbes, Westermeyer, Engdahl, & Johnsen, 2007; Hoge et al., 2004; Hoge, Auchterlonie, & Milliken, 2006; Rosenheck & Fontana, 2007). As a result of the frequent, long-term deployments, coupled with extensive exposure to combat trauma, PTSD has emerged as an invisible wound of OEF/OIF/OND veterans, with estimates ranging from 4-45% of the sample (Tanielian & Jaycox, 2008). A vast number of

OEF/OIF/OND veterans also experience ongoing symptoms resulting from traumatic brain injuries (TBIs), with estimates of nearly half of veterans screening positive for a TBI (Morissette et al., 2011). Finally, OEF/OIF/OND veterans report high rates of unemployment and suicides (Khaylis, Polusny, Erbes, Gewirtz, & Rath, 2011; Martin, Ghahramanlou-Holloway, Lou, & Tucciarone, 2009).

Clearly, although veterans as a whole share many features, there are significant distinctions to be made between combat eras, including the types of warfare combatants endured, location-specific types of risks faced (e.g., sand storms, IEDs), and the overall political climate of the U.S. at the time. These significant and meaningful differences experienced by those deployed in various combat eras suggest the possibility that associations between PTSD, suicide and the potential moderating factors may differ according to combat era. Moreover, veterans from different combat eras differ in their time since active duty service. Those in the Vietnam era are, on average, further removed temporally from their time in service than those in the Persian Gulf War, who in turn are more removed from those in the OEF/OIF/OND era. It is well-established that PTSD typically abates over time (Bonanno, 2004); thus, we might expect weaker associations between PTSD and SI among veterans who served in earlier eras. Thus, it is critical to keep in mind the potential differential effects that various combat eras may have on psychiatric disorders.

Summary and Proposed Model

PTSD and suicidality among current and former military service members is a critical social issue in need of further understanding. Military personnel and veterans experience high rates of both PTSD and suicidal behaviors when compared to the general public. Although suicide is a complex phenomenon that is determined by many factors, research consistently

shows that PTSD is an important risk factor for the commission of suicide. Joiner's IPT (Joiner et al., 2005) model of suicide, which has received significant empirical support, posits three conditions that must exist for suicide to occur: an individual must feel (a) a sense of perceived burdensomeness and (b) thwarted belongingness (considered the "desire" for death), as well as overcome human self-preservation to be (c) capable of committing suicide. PTSD and its associated symptoms may increase risk of suicide by exacerbating the three components of IPT. Prior work has also identified factors that may promote resilience to the risk of suicide by attenuating linkages between PTSD and SI. These factors include social support and protective psychological factors. The current study examines these factors as potential moderators of the known relations between PTSD and suicidal behaviors. Specifically, the present study controls for comorbid disorders (i.e., MDD, alcohol use disorder, drug use disorder) in order to examine the unique effects of PTSD beyond that which is attributable to the common/core symptoms associated with those disorders Moreover, given the noted evidence of significant and meaningful differences between cohorts of various combat eras, the proposed models will be examined by combat era. Refer to Table 1.3 for the proposed model with predicted paths present.

Aim 1: Examine the direction and strength of the direct associations between PTSD and suicidality (Path A).

Hypothesis 1: Across models, there will be a positive correlation between PTSD and suicidality, such that increased PTSD severity will be associated with increased risk for suicidality.

Aim 2: Examine the direction and strength of the direct associations between resiliency and suicidality (Path B).

Hypothesis 2: Across models, there will be a negative correlation between resilience factors and PTSD severity, such that increased scores on the various resiliency factors will be associated with decreased suicidality.

Aim 3: Examine the resiliency factors as possible moderators of the relation between PTSD and suicidality (Path C). Each moderated model will be examined by primary combat era of service (i.e., Vietnam War, Persian Gulf War, OEF/OIF/OND, or non-combat).

Hypothesis 3: Across models, resiliency factors will moderate the hypothesized relation between PTSD and SI, such that increased resiliency factors will weaken the hypothesized relation between PTSD and suicidality.

Aim 4: Compare all models by combat era.

Aim 4 will be exploratory in nature with the goal of better understanding the role that combat era plays on the previously-discussed relationships. Given the exploratory nature, no specific hypotheses are proposed.

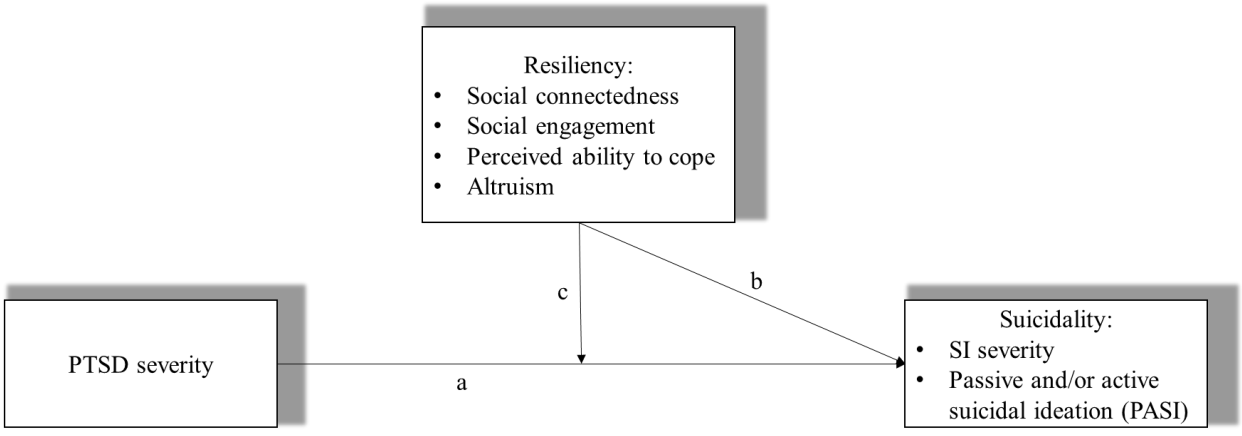

Figure 1.3. Proposed moderation model with predicted paths apparent.

CHAPTER 2: METHOD

Participants and Recruitment

Data for the proposed study came from the National Health and Resilience in Veterans Study (NHRVS), a longitudinal nationally-representative survey of 1,484 United States military veterans. The initial sample (Wave 1) was recruited and completed a baseline survey in 2013. Participants in the follow-up sample (Wave 2) were 713 (48%) veterans from Wave 1 who responded to study requests between September and October of 2016. Refer to Figure 2.1 below for a summary of the flow of NHRVS participant recruitment.

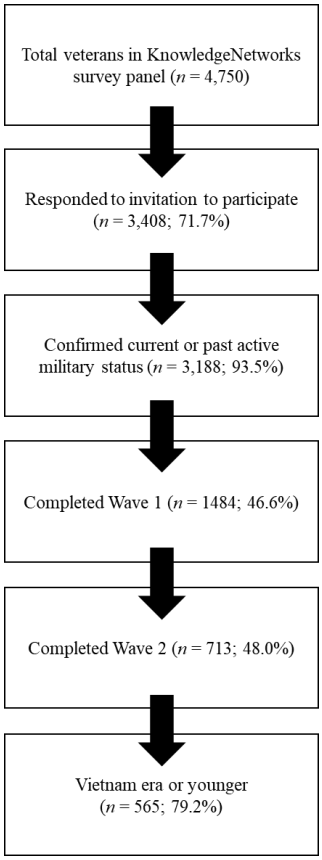

Figure 2.1. NHRVS participant flow chart.

Participants in the larger study were drawn from a research panel of more than 80,000 households maintained by GfK Knowledge Networks, Inc., a survey research firm that owns KnowledgePanels. KnowledgePanels is a probability-based, online non-volunteer access survey panel of a nationally-representative sample of U.S. adults. Panel members are recruited through national random samples using a sampling procedure that allows access to households with listed and unlisted phone numbers; telephone, non-telephone, and cell phone-only households; and households with and without Internet access, allowing for coverage of approximately 98% of U.S. households. Potential participants are recruited almost entirely by posted mail. If selected, households without Internet access are provided both Internet and/or computers if necessary. To be eligible for the NHRVS, participants had to self-identify as veterans of the U.S. Armed Forces, Military Reserves, or National Guard during their initial entry to the panel. All participants for the larger NHRVS study provided informed consent, and approval for the study was given by the Human Subjects Subcommittee of the VA Connecticut Healthcare System and the VA Office of Research and Development. The VA National Center for PTSD funded the NHRVS and has ownership of all data.

Participants for the proposed study was drawn from those who completed both waves, which totaled 713 veterans of the U.S. Armed Forces. Furthermore, only those individuals who reported their military service as spanning the Vietnam War era or more recently (e.g., Persian Gulf War, OEF/OIF/OND) or did not report having any combat experience were included in the present study, resulting in a final sample size of 525 veterans. Participants were primarily male (*n* = 499, 88.3%) and non-Hispanic White (*n* = 454, weighted = 80.4%), with a mean age of 59.3 years (range: 23 - 90). Other reported races/ethnicities included Black/African-American (*n* =43,

7.6%), Hispanic/Latino American (*n* = 40, 7.1%), or other ethnic groups (*n* = 28, 5.0%). Participants were primarily married (*n* = 416, 73.6%) or divorced (*n* = 89, 15.8%) with most participants reporting having some college education or higher (*n* = 478, 84.6%).

Regarding military service, participants reported an average of 7.6 years of military service (range: 0 to 41). Participants were primarily in the Army (*n* = 237, 42.2%), Navy (*n* = 134, 23.8%), or Air Force (*n* = 123, 21.9%). Most veterans reported having enlisted in the military (*n* = 490, 87.0%), although some participants reported having been drafted (*n* = 73, 13.0%). Approximately 42% of the sample (*n* = 236) reported having served in an active combat or war zone during their military service. Of the 231 veterans who reported a combat history, participants indicated serving in the Vietnam War (*n* = 145, 62.0%), the Persian Gulf War (*n* = 35, 6.2%), or OEF/OIF/OND (*n* = 34, 6.0%). In general, participants reported the military had a moderate positive effect on their lives (*M* = 2.02, *SD* = 1.37; range: 1-7; 1 = *strong positive effect*, 7 = *strong negative effect*). Demographic descriptives and military statistics may be found in Table 2.1.

Table 2.1

Descriptive Demographic and Military Statistics for Wave 2 Participants

	N (565)	Percent
Gender identity		
Male	499	88.3
Female	66	11.7
Race/ethnicity		
White, non-Hispanic	454	80.4
Black, non-Hispanic	43	7.6
Other, non-Hispanic	13	2.3
Hispanic	40	7.1
2+ races, non-Hispanic	15	2.7
Age		
18-24 years	1	0.2
25-34 years	29	5.1
35-44 years	42	7.4
45-54 years	84	14.9
55-64 years	167	29.6
65-74 years	232	41.1
75+ years	10	1.8
Current relationship status		
Married/living with partner	416	73.6
Divorced/separated	89	15.8
Never married	44	7.8
Widowed	16	2.8
Employment status		
Working	236	41.8
Retired	222	39.3
Not working	107	18.9
Education		
Less than high school	4	0.7
High school	83	14.7
Some college	252	44.6
Bachelor’s degree or higher	226	40.0

	N (565)	Percent
Branch of military		
Army	237	42.2
Air Force	123	21.9
Marine Corps	37	6.6
Navy	134	23.8
Draft status		
Drafted	73	13.0
Enlisted	490	87.0
Combat history		
No	328	58.2
Yes	236	41.8
Conflicts served (n = 231)		
Vietnam War	145	62.0
Persian Gulf War	35	6.2
OEF/OIF/OND[a]	34	6.0
Other	17	3.1

Notes. [a]Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn

Measures

Posttraumatic stress disorder. PTSD was examined in the current study utilizing the Posttraumatic Stress Disorder Checklist (PCL-5; Blevins, Weathers, Davis, Witte, & Domino, 2015). The PCL-5 is a 20-item DSM-5-referenced self-report measure used to assess current and/or lifetime symptoms of PTSD. Specifically, it assesses the four *DSM-5* symptom clusters. The PCL-5 was adapted from the original PCL (Weathers, Litz, Herman, Huska, & Keane, 1993). Participants rate each of the items on a five-point Likert-type scale that ranges from 1 (*not at all*) to 5 (*extremely*). A higher total score indicates more severe symptoms related to PTSD. Three composite scores may be obtained from the PCL-5:

1. A total symptom severity score (range: 0 – 80), obtained by summing participants' responses for each item; higher total scores indicate higher levels of subjective distress;
2. DSM-5 symptom cluster severity scores, obtained by summing the items for each cluster; higher cluster score indicates higher level of subjective distress for that cluster; and
3. Provisional PTSD diagnosis. This provisional diagnosis is obtained by a total severity score of 33 or higher.

The present study utilized both total severity score and each of the four symptom severity scores as predictor variables. The PCL-5 has strong psychometric properties. Studies have shown the PCL-5 to be extremely reliable across a wide range of populations including veterans, with an internal consistency score of .96 (Bovin et al., 2015). Cronbach's alpha for the 20 PCL-5 items in the current sample is .96. The PCL has shown a test-retest reliability in Vietnam veterans of between .83 and .96 in a variety of samples (Bovin et al., 2015).

Resilience factors. As described above, resilience variables examined through literature revealed two distinct areas of focus: social support, and psychological protective factors. The present study examines four types of resilience variables, two in each area of focus: social connectedness and social engagement (social support) and perceived ability to cope and altruism (protective psychological factors).

Social connectedness. Social connectedness is a construct encompassing the interpersonal integration reported by an individual. Specifically, this is the degree of support the individual reports *receiving* or *has available* to him or her. This measure consists of five items drawn from the larger 19-item Medical Outcomes Study Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991). The full 19-item MOS-SSS is comprised of items assessing five dimensions of social support: (a) emotional support (the expression of positive affect, empathetic understanding); (b) informational support (the offering of advice, information, or guidance); (c) tangible support (the provision of material aid or behavioral assistance); (d) positive social interaction (the availability of other persons to do fun things with you); and (e) affectionate support (involving expressions of love and affection; Sherbourne & Stewart, 1991). The present study used a modified MOS-SSS-5 that included one item from each of the five domains. Specifically, the five items respondents were asked to report how often they have experienced were: "someone you can confide in or talk to about your problems" (emotional support), "someone to turn to for suggestions about how to deal with a personal problem" (informational support), "someone to help you with daily chores if you were sick" (tangible support), "someone to get together with for relaxation" (positive social interaction), and "someone to love and make you feel wanted" (affectionate support). The items are rated from 1 (*none of the time*) to 5 (*all of the time*), with a higher overall score indicating greater social connectedness. The total score for

this measure was utilized in the current study. The full-length MOS-SSS has excellent internal consistency with a Cronbach's alpha coefficient of .97 (Sherbourne & Stewart, 1991). Cronbach's alpha in the present study for the 5-item short version is .90, indicating good internal consistency.

Social engagement. The social engagement construct reflects the degree and/or frequency with which participants engage in interpersonal connections outside of the home. Specifically, this is the degree of support the individual reports *providing* to individuals, as opposed to social connectedness which reflects the support *received* from others. Social engagement in the present study was made up of participants' responses to the number of days per week they report typically visiting family, and the number of days per week they typically visit friends (each item scored from 0-7 days per week), with participants' responses to each item summed to create an overall social engagement score ranging from 0 to 14. A higher total score indicates greater social engagement. Pearson's correlation between these items was .371 ($p < .001$), indicating a weak, though significant, linear relationship.

Perceived ability to cope. This construct reflects an individual's perceived ability to thrive despite adversity and is made up of the participant's total score on the Connor-Davidson Resilience Scale-10 (CD-RISC-10; Campbell-Sills & Stein, 2007). The CD-RISC-10 is a 10-item self-report measure of resilience, adapted from a larger 25-item scale (Connor & Davidson, 2003) that assesses an individual's perceived ability to cope with adversity. The items of the CD-RISC-10 load onto constructs labeled "hardiness" and "persistence," and have been found to maintain construct validity with the broader measure (Campbell-Sills & Stein, 2007). Participants report how much they agree with the following 10 statements: "I am able to adapt when changes occur," "I can deal with whatever comes my way," "I try to see the humorous side

of things when faced with problems," "Having to cope with stress can make me stronger," "I tend to bounce back after illness, injury, or other hardships," "I believe I can achieve my goals, even if there are obstacles," "Under pressure, I stay focused and think clearly," "I am not easily discouraged by failure," "I think of myself as a strong person when dealing with life's challenges and difficulties," and "I am able to handle unpleasant or painful feelings like sadness, fear, and anger." All items are rated on a scale from 0 (*not true at all*) to 4 (*true nearly all the time*). The sum of all items of the CD-RISC-10 was utilized in the present study, with a higher total score indicating a greater sense of resilience and ability to cope with adversity. The CD-RISC-10 has been found to have an internal consistency score of .85, indicating good reliability (Campbell-Sills & Stein, 2007). Cronbach's alpha in the current study was .93, indicating high internal reliability.

Altruism. This construct reflects a participant's reported extent of concern for the wellbeing of others. It includes two items assessing the participant's frequency of engagement in helping others with instrumental activities of daily living, and frequency of engaging in volunteer activities, each scored on a weekly basis (i.e., each item scored from 0-7 days per week). Participants' responses to each item were summed to create an overall altruism score, ranging from 0 to 14, with a higher total score indicating a greater engagement in altruistic behavior. Pearson's correlation between these items was .172 ($p < .001$).

Demographics and psychiatric comorbidity control variables. Participants were asked to report their age, gender, ethnicity, and military background. Consistent with literature, the following demographic variables were controlled for in the current study: gender, race/ethnicity, and income level. In order to control for core/common symptoms of frequent comorbid disorders, current or lifetime depression, history of suicidal ideation, and history of an alcohol or

drug use disorder were also controlled for in the present study. Lifetime depression and current and lifetime alcohol and drug abuse/dependence were assessed through modules from the Mini-International Neuropsychiatric Interview (MINI; *DSM-IV/ICD-10* version; Sheehan et al., 1998). The Patient Health Questionnaire-4 (PHQ-4; Kroenke, Spitzer, Williams, & Lowe, 2009) was used to assess current depression, while history of suicidal ideation was assessed using question 9 from the PHQ-9 (Kroenke, Spitzer, & Williams, 2001). In order to control for the potentially confounding factor of passage of time, age was also included as a covariate in the present study.

Suicidality. Two questions assessing current suicidal ideation were utilized: one item assessed passive suicidal ideation, and the other assessed active ideation. Both questions used a Likert-type scale ranging from 0 (*not at all*) to 4 (*nearly every day*). To assess passive ideation, participants were asked, "Over the last 2 weeks, how often have you been bothered by thoughts that you would be better off dead?" For active ideation, participants responded to the item, "Over the last 2 weeks, how often have you been bothered by thoughts of hurting yourself in some way?" The sum of participants' reported suicide attempts was examined; however, low prevalence rates (i.e., $n = 7$) prohibited its use in further analyses.

Consistent with literature, the two items assessing suicidal ideation (i.e., active and passive) were utilized in concert. First, these two items were summed to create a suicidal ideation severity score (range: 0-8), labeled "SI severity." Second, a categorical variable was created such that participants were coded as having either: no suicidal ideation (= 0), *either* passive *or* active ideation (= 1), or having *both* passive *and* active ideation (= 2). This second variable is labelled "Passive and/or active SI" (PASI). Spearman's correlation between these items was .895 ($p < .001$). Despite this statistical concordance, these variables reflect

conceptually different components of SI and therefore may yield different results when testing primary study hypotheses; as a result, both variables were retained.

Data Analytic Plan

Preliminary analyses were conducted in order to determine whether the data met the basic assumptions of SEM. Descriptive analyses, including sample characteristics and bivariate correlations, were examined for all study variables, and ANOVAs were conducted to identify potential control variables. In order to promote generalizability of results to the entire population of U.S. veterans, post-stratification weights based on geographic and demographic distributions (i.e., gender, age, race/ethnicity, education, census region, and metropolitan area) of U.S. veterans from concurrent U.S. Census data (October 2010; Census Bureau, 2010) were applied. These post-stratification weights were included in the master dataset and used upon the recommendation of the Principal Investigator of the original National Health and Resilience in Veterans Study (Pietrzak, personal communication, December 21, 2016).

The overall aim of the present study was to examine associations between a) total PTSD symptom severity (Aim 1, Hypothesis 1) and b) each of the four resiliency variables (Aim 2, Hypothesis 2) with suicidality, as well as the potentially moderating role of resiliency when each of the four resiliency variables were entered simultaneously (Aim 3, Hypothesis 3). All models (Hypotheses 1-3) were further assessed by grouping participants into their combat era of service (non-combat, Vietnam War, Persian Gulf War, OEF/OIF/OND; Aim 4).

Hypotheses 1 and 2 were examined with Pearson product moment correlations utilizing SPSS version 24.0 (IBM Corp, 2017). To test Hypothesis 1, a series of correlations was conducted. In each analysis, PTSD total severity served as one variable, with the suicidality variables (SI severity or PASI) serving as the other. Similarly, to test Hypothesis 2, correlations

utilizing resiliency (social connectedness, social engagement, perceived ability to cope, or altruism) and suicidality were conducted. These correlations allowed for the examination of the direct association between the variables of interest and suicidality.

Hypothesis 3 was examined in M*plus* version 7.0 (Muthén & Muthén, 2017) utilizing structural equation modeling (SEM). Maximum likelihood robust to non-normality (MLR) was utilized to address potential violations of normality assumptions, as well as its preferred approach to address missing data (Enders, 2010) and the estimate of mean, (co)variance, and standard errors robust to non-normality. Due to the robustness of MLR in handling missing data, additional techniques were not necessary to analyze the data (Schafer, 1999). Finally, evaluation of model fit in all cases was accomplished with reference to cutoff guidelines recommended by Kline (2011). Critically, because all models were considered "just-identified" or "saturated" (i.e., model had zero degrees of freedom), MLR did not produce global fit statistics (i.e., Root Mean Square Error of Approximation [RMSEA]); consistent with literature (e.g., Muthén, 2012), local fit statistics (i.e., path coefficients) were examined for fit.

In each of the moderation models, one of the PTSD variables (total or cluster scores) served as the predictor, with the suicidality variables serving as the outcome. In the interest of comprehensiveness, PTSD total symptom severity and cluster scores were examined as predictors in these analyses, and all results are reported in relevant tables. However, to avoid excessive detail and redundancy (all cluster scores are reflected in the PTSD total score), the reporting and discussion of results will focus on total PTSD symptom severity. In these models, each of the resiliency variables, as well as their interactions with PTSD, were entered both independently and simultaneously.

CHAPTER 3: RESULTS

Data Cleaning and Checking

All data were screened for accuracy and completeness. Participants who did and did not complete Wave 2 were compared on age, gender, combat history, education level, and PTSD severity. Those who completed Wave 2 were significantly younger (W2 completers: $M = 59.26$; W1 only: $M = 64.95$; $F = 51.25$, $p < .001$), and more likely to have served in a war zone ($\chi^2[1] = 4.39$, $p = .020$). However, the two groups did not differ on PTSD severity (W2 completers: $M = 8.83$; W1 only: $M = 9.26$; $F = .41$, $p = .521$), race ($\chi^2[4] = 4.20$, $p = .379$), gender ($\chi^2[1] = 1.026$, $p = .311$), or education level ($\chi^2[3] = 7.469$, $p = .058$). Results of the ANOVAs used to identify potentially confounding variables may be found in Tables 3.1 and 3.2, with study variables differing significantly by income level and military combat era. Specifically, lower income was generally associated with increased PTSD and suicidality severity and decreased levels of resiliency as compared to higher income. Additionally, there was a significant difference of study variables by combat era, with different eras reporting significant differences across PTSD and suicidality severity, and levels of resiliency.

Table 3.1

Associations Between Demographic and Study Variables

	Gender				Race						Income					
	Mean				Mean						Mean					
	Male	Female	F	*p*	White	Black	Hispanic	Other	F	*p*	$0-35k	$35-60k	$60-85k	$85+	F	*p*
PTSD variables																
PTSD severity	8.40	11.52	2.88	.09	8.32	9.30	11.47	11.50	.99	.40	13.28	9.21	6.23	6.84	*7.27*	***.000***
Cluster B severity	1.58	2.39	3.03	.08	1.58	1.97	2.04	2.36	.69	.56	2.53	1.69	1.15	1.42	**3.77**	**.01**
Cluster C severity	.87	1.24	2.18	.14	.87	1.17	.90	1.32	.75	.52	1.53	.97	.59	.63	***7.30***	***.000***
Cluster D severity	2.92	4.00	2.16	.14	2.89	3.40	3.97	3.86	.72	.54	4.89	3.27	1.99	2.25	*7.77*	***.000***
Cluster E severity	3.20	4.22	2.80	.10	3.14	3.50	4.80	3.95	1.75	.16	4.68	3.49	2.62	2.67	***6.10***	***.000***
Resilience variables																
Social connectedness	14.25	13.23	2.40	.12	14.30	13.49	12.80	14.32	1.34	.26	12.02	13.80	15.35	15.10	***13.22***	***.000***
PAC	29.87	29.12	.65	.42	29.91	29.26	27.93	31.29	1.49	.22	28.18	29.42	30.30	30.86	**4.12**	**.007**
Social engagement	3.60	3.41	.23	.63	3.63	3.69	3.25	3.04	.56	.65	3.65	3.18	3.81	3.67	1.11	.345
Altruism	3.20	3.14	.06	.80	3.22	3.56	2.83	2.68	1.77	.15	3.17	3.14	3.28	3.19	.12	.95
Suicidality variables																
Passive SI	1.12	1.14	.13	.72	1.11	1.25	1.23	1.25	1.60	.19	1.25	1.10	1.09	1.06	**4.80**	**.003**
Active SI	1.05	1.11	1.48	.22	1.04	1.14	1.13	1.14	1.84	.14	1.15	1.05	1.02	1.03	**4.62**	**.003**

Notes. PAC = Perceived ability to cope. [a]Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn. Bold is significant at $p <$ .01. Bold and italicized is significant at $p <$ .001.

Table 3.2

Associations Between Military and Study Variables

	Combat history				**Military era**					
	Mean				Mean					
	Yes	No	F	*p*	Persian War	Vietnam War	OEF/OIF /OND[a]	Other	F	*p*
PTSD variables										
PTSD severity	9.44	8.27	.96	.33	10.96	6.78	17.30	12.42	**3.69**	**.007**
Cluster B severity	1.97	1.46	2.83	.09	2.36	1.36	3.97	2.18	*3.20*	*.014*
Cluster C severity	1.01	.84	1.13	.29	1.04	.75	1.82	1.83	*2.73*	*.031*
Cluster D severity	3.15	2.97	.14	.71	3.85	2.08	6.21	4.33	**4.05**	**.004**
Cluster E severity	3.56	3.14	1.13	.29	4.00	2.74	6.25	4.25	**3.74**	**.006**
Resilience variables										
Social connectedness	14.30	13.99	.54	.47	14.20	14.67	12.71	15.73	2.00	.079
Perceived ability to cope	29.87	29.71	.07	.79	29.80	31.02	25.35	29.67	**3.34**	**.006**
Social engagement	3.71	3.47	.89	.34	2.75	3.88	3.94	3.20	1.79	.116
Altruism	3.23	3.16	.19	.66	2.37	3.49	2.85	3.40	**3.74**	**.003**
Suicidality variables										
Passive SI	1.17	1.09	*4.63*	*.03*	1.29	1.06	1.36	1.40	***4.13***	***.001***
Active SI	1.08	1.05	1.50	.22	1.11	1.01	1.21	1.20	***6.13***	***.000***

Notes. [a]Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn. Bold and italicized is significant at $p < .001$. Bold is significant at $p < .01$. Italicized is significant at $p < .05$

Descriptive Analyses

Current total PTSD severity in the present sample was relatively low, with participants endorsing an average severity score of 8.78 (*SD* = 12.46; range: 0-80). A total of 24 (4.2%) individuals exceeded the threshold of score of 33 or higher on the PCL-5 and thus met the criteria for a likely diagnosis of current PTSD. Total PTSD cluster severity scores were also low (Cluster B: *M* = 1.68, *SD* = 3.13, range: 0-20; Cluster C: *M* = .91, *SD* = 1.67, range: 0-8; Cluster D: *M* = 3.04, *SD* = 4.90, range: 0-24; Cluster E: *M* = 3.32, *SD* = 4.08, range: 0-24). Similarly, suicidality in the present sample was infrequent and severity was relatively low. Specifically, 30 (5.6%) of individuals endorsed current passive suicidal ideation, with an average severity score of .11 (*SD* = .47, range: 0-4). A total of 14 individuals (2.6%) endorsed current active suicidal ideation, with a mean severity of .07 (*SD* = .39, range: 0-4). Of the total sample, 7.0% (*n* = 39) indicated the presence of suicidal ideation occurring within the previous two weeks. Regarding resilience, participants endorsed the presence of social connectedness (*M* = 14.13, *SD* = 5.04, range: 0-20), social engagement (*M* = 3.58, *SD* = 2.93, range: 0-14), perceived ability to cope (*M* = 29.79, *SD* = 7.04, range: 0-40), and altruism (*M* = 3.19, *SD* = 1.89, range: 0-12). Descriptive statistics of study variables may be found in Table 3.3.

All study variables were correlated with each other to identify potential issues with collinearity. Correlations among PTSD total and cluster scores were strong and ranged from .68 to .93, indicating collinearity issues, and further supporting the use of PTSD total severity rather than cluster scores, as an independent predictor. Correlations among suicidality variables ranged from .08 to .77. Finally, correlations among resiliency variables ranged widely; social connectedness ranged from .12 to .45, social engagement ranged from .19 to .27, perceived ability to cope ranged from .19 to .45, and altruism ranged from .12 to .27, and thus reflect distinct constructs. These correlations, though significant at $p < .05$, are weak and do not reflect

issues with collinearity. All bivariate correlations of study variables may be found in Table 3.4. The same bivariate correlations separated by combat era of service may be found in Tables 3.5 and 3.6.

Finally, a series of chi-square tests of independence were conducted to examine the relation between potentially-confounding diagnoses of MDD, alcohol use disorder, and drug use disorder with PTSD and suicidality. It was found that MDD was statistically significantly related to PTSD dx (X^2[1, N = 561] = 8.40, p = .009), active SI (X^2[1, N = 562] = 4.76, p = .042), and passive SI (X^2[1, N = 559] = 9.90, p = .006), such that the presence of MDD was associated with increased likelihood for the presence of PTSD and both active and passive SI. Both alcohol use disorder and drug use disorder were statistically associated with passive SI (alcohol use disorder: X^2[1, N = 561] = 4.69, p = .040; drug use disorder: X^2[1, N = 562] = 4.66, p = .050), such that the presence of either was associated with increased likelihood for the presence of passive SI. However, neither alcohol use disorder nor drug use disorder were associated with a PTSD diagnosis (alcohol use disorder: X^2[1, N = 558] = 2.72, p = .136; drug use disorder: X^2[1, N = 561] = 1.31, p = .259) or active SI (alcohol use disorder: X^2[1, N = 563] = 2.97, p = .125; drug use disorder: X^2[1, N = 562] = 4.38, p = .066). These results lend support for including both MDD and alcohol and drug use disorder as covariates in the present study.

Table 3.3

Severity of Study Variables

	Range	*M (SD)*	*n* (%)
Suicidality			
Passive ideation	0-4	.11 (.47)	30 (5.6)
Active Ideation	0-4	.07 (.39)	14 (2.6)
Any ideation	0 / 1	--	39 (7.0)
Attempt (Y/N)	0 / 1	--	25 (4.4)
Current PTSD			
Total	0-76	8.78 (12.46)	24 (4.2)
Cluster B	0-20	1.68 (3.13)	--
Cluster C	0-8	.91 (1.67)	--
Cluster D	0-24	3.04 (4.90)	--
Cluster E	0-24	3.32 (4.08)	--
Resilience			
Social connectedness	0-20	14.13 (5.04)	--
Perceived ability to cope	0-40	29.79 (7.04)	--
Social engagement	0-14	3.58 (2.93)	--
Altruism	0-12	3.19 (1.89)	--

Table 3.4

Bivariate Correlations of Full Sample for Observed Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Current PCL severity	--												
2. Cluster B sum	***.89***	--											
3. Cluster C sum	***.85***	***.79***	--										
4. Cluster D sum	***.94***	***.76***	***.75***	--									
5. Cluster E sum	***.92***	***.73***	***.70***	***.81***	--								
6. Social connectedness	***-.39***	***-.21***	***-.29***	***-.43***	***-.42***	--							
7. Social engagement	***-.17***	-.09	**-.12**	***-.20***	***-.17***	***.23***	--						
8. Perceived ability to cope	***-.50***	***-.42***	***-.38***	***-.53***	***-.48***	***.43***	***.17***	--					
9. Altruism	-.08	-.05	-.06	-.09	-.08	**.11**	***.25***	***.17***	--				
10. SI severity	***.40***	***.30***	***.30***	***.41***	***.43***	***-.23***	-.06	***-.30***	**-.10**	--			
11. PASI	***.38***	***.28***	***.30***	***.38***	***.42***	***-.23***	-.08	***-.31***	-.10	***-.90***	--		
12. Passive SI	***.40***	***.29***	***.29***	***.41***	***.41***	***-.24***	**-.09**	***-.31***	**-.11**	***.96***	***.89***	--	
13. Active SI	***.34***	***.26***	***.26***	***.33***	***.39***	***-.19***	-.02	***-.24***	-.06	***.92***	***.77***	***.77***	--
14. Suicide attempts	.09	**.10**	***.13***	**.10**	.02	-.01	-.03	.02	-.03	.04	.04	.08	-.02

Note: Bold, italicized correlations are significant at $p < .01$. Bold correlations are significant at $p < .05$

Primary Analyses

Aim 1. The purpose of this aim was to examine the associations between PTSD total severity and both SI outcome variables. It was hypothesized that PTSD would be positively associated with SI, such that an increase in PTSD would be associated with greater levels of SI. As shown in Tables 3.5 and 3.6, PTSD was significantly positively correlated with both SI severity and PASI for non-combat (r[250] = .226, p < .001; r[252] = .216, p < .001), Vietnam War (r[117] = .363, p < .001; r[117] = .363, p < .001), and OEF/OIF/OND (r[30] = .646, p < .001*;* r[30] = .633, p < .001) veterans, as expected. Because commonly-occurring psychiatric disorders (i.e., MDD, substance use disorders) were controlled for in the present study, this study accounts for the unique effects of PTSD above and beyond those that may be accountable to these comorbid disorders. Contrary to expectations, PTSD was not significantly correlated with either SI severity or PASI for Persian Gulf War veterans (r[26] = .274, p = .175; r[26] = .206, p = .314). Thus, Hypothesis 1 is supported for non-combat, Vietnam War, and OEF/OIF/OND veterans, but is not supported for Persian Gulf War veterans.

Aim 2. The purpose of this aim was to examine the associations between each of the resiliency factors and both SI outcome variables. It was hypothesized that for all eras, each resiliency factor would be negatively associated with SI, such that an increase in the resiliency score would be associated with lower levels of SI. The results of Aim 2 can also be found in Tables 3.5 and 3.6. These results show that, for non-combat veterans, the following resiliency variables were found to be negatively correlated with both SI severity and PASI: social connectedness (r[325] = -.196, p < .001; r[327] = -.195, p < .001), perceived ability to cope (r[325] = -.220, p < .001; r[326] = -.212, p < .001), and altruism (r[325] = -.133, p = .016; r[327] = -.139, p = .012). For Vietnam War veterans, only perceived ability to cope was negatively

correlated with SI severity and PASI (r[144] = -.325, p < .001; r[145] = -.338, p < .001). For OEF/OIF/OND veterans, the following resiliency variables were negatively associated with both SI severity and PASI: social connectedness (r[34] = -.423, p = 013; r[34] = -.459, p = .006) and perceived ability to cope (r[34] = -.543, p = .001; r[34] = -.459, p = .006). Conversely, for Persian Gulf War veterans, only altruism was significantly correlated with suicide, and the correlation was positive for both SI severity and PASI (r[35] = .351, p = .038; r[35] = .383, p = .023). As a result, Hypothesis 2 is partially supported, with numerous but not all resiliency variables showing the expected negative correlations with both SI severity and PASI.

Table 3.5

Bivariate Correlations of Study Variables for Non-combat and Persian Gulf War Veterans

	1.	2.	3.	4.	5.	6.	7.
1. Current PCL severity	--	-.15	-.33	***-.62***	-.09	.27	.21
2. Social connectedness	***-.37***	--	.32	***.46***	.12	-.33	-.31
3. Social engagement	**-.14**	***.20***	--	.25	.32	-.10	.06
4. Perceived ability to cope	***-.39***	***.35***	.10	--	.03	-.20	-.27
5. Altruism	-.03	**.11**	***.27***	***.22***	--	**.35**	**.38**
6. SI severity	***.23***	***-.20***	-.04	***-.22***	**-.13**	--	***.88***
7. PASI	***.22***	***-.20***	-.07	***-.21***	**-.14**	***.89***	--

Note: Correlations for non-combat veterans are presented below the diagonal and correlations for Persian Gulf War veterans are presented above the diagonal. ***Bold and italics*** indicates correlation is significant at p < .01. **Bold** indicates correlation is significant at p < .05.

Table 3.6

Bivariate Correlations of Study Variables for Vietnam War and OEF/OIFOND Veterans

	1.	2.	3.	4.	5.	6.	7.
1. Current PCL severity	--	***-.59***	***-.37***	***-.74***	-.28	***.65***	***.63***
2. Social connectedness	***-.38***	--	***.52***	***.64***	.09	***-.54***	***-.50***
3. Social engagement	-.07	***.25***	--	***.39***	**.40**	-.30	-.28
4. Perceived ability to cope	***-.46***	***.49***	***.25***	--	.14	***-.54***	**-.50**
5. Altruism	-.04	.10	.11	.02	--	-.23	-.18
6. SI severity	***.36***	-.10	-.06	***-.33***	.03	--	***.89***
7. PASI	***.36***	-.12	-.05	***-.34***	.04	***1.00***	--

Note: Correlations for Vietnam War veterans are presented below the diagonal and correlations for OEF/OIF/OND veterans are presented above the diagonal. ***Bold and italics*** indicates correlation is significant at $p < .01$. **Bold** indicates correlation is significant at $p < .05$.

Aim 3. The purpose of this aim was to examine the potential role of resiliency factors in moderating relations between PTSD and both SI outcome variables by examining the interaction variables within each model. It was hypothesized that in all models, when controlling for PTSD and relevant moderators, each resiliency factor would moderate the relation between PTSD and SI, such that the presence of resilience would weaken (i.e., reduce the strength) the PTSD/SI relationship. The results of Aim 3 when utilizing SI severity as the outcome variable are presented in Tables 3.7 and 3.8 and Figures 3.1 to 3.20. The results when utilizing PASI as the outcome variable are presented in Tables 3.9 and 3.10, and Figures 3.21 to 3.40. A visual summary of the results of both outcome variables is presented in Tables 3.11 and 3.12. The results of the secondary models assessing the predictive role of each PTSD symptom cluster may be found in Tables 3.13 to 3.14. Finally, the R^2 values of each of the models may be found in Table 3.15.

Non-combat veterans. For non-combat veterans, when examining the model in which all moderators were entered simultaneously, no resiliency variables were found to moderate the relation between either PTSD/SI severity or PTSD/PASI. Furthermore, when examining the models with single independent moderators, social connectedness alone significantly negatively moderated the known relation between PTSD and SI severity (β = -.434, SE = .117, p = .036). No other variables significantly moderated PTSD/SI severity or PTSD/PASI for the non-combat group.

Vietnam War era veterans. For Vietnam War veterans, when examining the model in which all moderators were entered simultaneously, altruism was found to negatively moderate the relationship between PTSD and both SI severity (β = -.198, *SE* = .078, *p* = .033) and PASI (β = -.218, *SE* = .077, *p* = .026). When examining the models with single independent moderators, perceived ability to cope negatively moderated the relation between PTSD and both SI severity (β = -.467, *SE* = .231, *p* = .036) and PASI (β = -.218, *SE* = .077, *p* < .001), while altruism also negatively moderated the relation between PTSD/SI severity only (β = -.753, *SE* = .325, *p* = .040). No other variables significantly moderated PTSD/SI severity or PTSD/PASI for the Vietnam War era veterans.

Persian Gulf War era veterans. For Persian Gulf War veterans, when examining the model in which all moderators were entered simultaneously, altruism significantly positively moderated the relation between PTSD and both SI severity (β = .607, *SE* = .346, *p* < .001) and PASI (β = .013, *SE* = .158, *p* = .030), while perceived ability to cope additionally positively moderated the relation between PTSD and SI severity only (β = 1.310, *SE* = .277, *p* = .013). When examining the models with single independent moderators, the relation between PTSD and SI severity was independently positively moderated by both perceived ability to cope (β = 1.017, *SE* = .302, *p* = .025) and altruism (β = 1.364, *SE* = .276, *p* < .001); furthermore, the relation between PTSD and PASI was independently negatively moderated by both social connectedness (β = -1.849, *SE* = .766, *p* < .001) and perceived ability to cope (β = -.516, *SE* = .286, *p* = .007). No other variables significantly moderated PTSD/SI severity or PTSD/PASI for the Persian Gulf War era veterans.

OEF/OIF/OND era veterans. For OEF/OIF/OND veterans, when examining the model in which all moderators were entered simultaneously, perceived ability to cope significantly

negatively moderated the relation between PTSD and both SI severity (β = -.560, *SE* = .238, *p* = .019) and PASI (β = -.530, *SE* = .236, *p* = .019), while social connectedness additionally negatively moderated the relation between PTSD and SI severity only (β = -.678, *SE* = .164, *p* < .001). When examining the models with single independent moderators, social engagement negatively moderated the relation between both PTSD/SI severity (β = -.471, *SE* = .170, *p* < .001) and PTSD/PASI (β = -.372, *SE* = .142, *p* < .001) while social connectedness also independently negatively moderated PTSD/PASI (β = -.441, *SE* = .209, *p* = .014). No other variables significantly moderated PTSD/SI severity or PTSD/PASI for the OEF/OIF/OND era veterans.

Summary of findings related to Hypothesis 3. Hypothesis 3 is partially supported. The predicted moderation by resilience factors of associations between PTSD and SI severity is apparent for Vietnam War (altruism) and OEF/OIF/OND (social connectedness, perceived ability to cope) veterans with SI severity as the outcome variable while holding constant all four moderators entered simultaneously. Furthermore, the predicted moderation by resilience factors of associations between PTSD and PASI is apparent for Vietnam War (altruism) and OEF/OIF/OND (perceived ability to cope) veterans, while holding constant all four moderators. The predicted moderation relation between resiliency and both SI outcome variables is significant for Persian Gulf War veterans (perceived ability to cope, altruism), although in the opposite direction than hypothesized.

As can be seen in Tables 3.11 and 3.12, when each resiliency variable was entered independently as a moderator, a pattern emerges: for the PTSD-SI severity relation, social connectedness is a significant moderator for non-combat veterans, perceived ability to cope and altruism for both Vietnam War and Persian Gulf War era veterans, and social engagement for

OEF/OIF/OND veterans. For the PTSD/PASI relation, perceived ability to cope is a significant moderator for Vietnam War era veterans, social connectedness and perceived ability to cope for Persian Gulf War era veterans, and social connectedness and social engagement for OEF/OIF/OND veterans.

Table 3.11

Correlations Between PTSD Severity and Other Variables by Combat Era With SI Severity Outcome Variable

	All mods	SC	PAC	SE	altruism
Non-combat					
PTSD	--	*	--	--	--
Moderator(s)	--	--	--	--	--
Interaction(s)	--	*	--	--	--
Vietnam War					
PTSD	--	--	*	*	--
Moderator(s)	* (altruism)	--	--	--	--
Interaction(s)	* (altruism)	--	*	--	*
Persian Gulf					
PTSD	*	--	--	--	*
Moderator(s)	* (PAC)	--	--	--	--
Interaction(s)	* (PAC, altruism)	--	*	--	*
OEF/OIF					
PTSD	*	*	*	*	--
Moderator(s)	--	--	--	--	--
Interaction(s)	* (SC, PAC)	--	--	*	--

Notes: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement.
*$p < .05$.

Table 3.12

Correlations Between PTSD Severity and Other Variables by Combat Era With PASI Outcome Variable

	All mods	SC	PAC	SE	altruism
Non-combat					
PTSD	--	--	--	*	--
Moderator(s)	--	--	--	--	--
Interaction(s)	--	--	--	--	--
Vietnam War					
PTSD	--	--	*	--	--
Moderator(s)	* (altruism)	--	--	--	--
Interaction(s)	* (altruism)	--	*	--	--
Persian Gulf					
PTSD	--	*	*	*	--
Moderator(s)	--	--	--	--	--
Interaction(s)	* (altruism)	*	*	--	--
OEF/OIF					
PTSD	*	*	--	*	*
Moderator(s)	--	--	*	--	--
Interaction(s)	* (PAC)	--	--	*	--

Notes: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement. *$p < .05$.

CHAPTER 4: DISCUSSION

PTSD is a serious and prevalent psychological disorder among veterans that leads with relative frequency to suicidal thoughts and behaviors; however, little is known about the role that personal resilience may play in mitigating this relationship. The present study evaluated the potential role of resilience factors in attenuating the impact of PTSD severity on suicidal outcomes. Specifically, models were run to determine whether the resiliency factors of social support (i.e., social connectedness, social engagement) and protective psychosocial factors (i.e., perceived ability to cope, altruism) would moderate the expected positive associations between trauma symptomology and suicidality. These analyses were run with data from a large sample of veterans with differing primary combat service eras (i.e., non-combat, Vietnam War, Persian Gulf War, and OEF/OIF/OND).

Overall, findings indicated that PTSD and most types of resilience (social connectedness, perceived ability to cope, and altruism) were significantly related to both SI severity and PASI, although the specific patterns differed by combat era. As expected, the presence of certain resilience factors moderated, for veterans from some but not all combat eras, relations between PTSD and suicidality. Specifically, when all four resiliency factors were considered simultaneously, altruism alone negatively moderated the relation between PTSD and suicidality for Vietnam War veterans, while social connectedness and perceived ability to cope served as negative moderators for OEF/OIF/OND veterans. In each of these cases, as the resilience factors increased, the strength of the relation between PTSD and suicide decreased as expected. The pattern of results was in the opposite direction of anticipated results for Persian Gulf War veterans, such that the strength of associations between PTSD and SI severity increased as levels of perceived ability to cope and altruism increased in that group.

Although results differed somewhat in models where resilience factors were entered individually, those models in which all four types of resiliency were examined simultaneously allow for the control of any shared variance among the resilience factors. This discussion will therefore focus on those more stringent tests of the study hypotheses. These findings will be interpreted in the context of existing theory and research related to PTSD and suicide. Finally, limitations of the current study will be discussed, as will directions for future research, and potential clinical implications.

Descriptive Findings

PTSD. One significant and unexpected finding is the limited degree of self-reported PTSD symptoms reported in the sample. Within the sample as a whole, few participants met for a current PTSD diagnosis, with participants reporting very minimal current PTSD severity. The severity of PTSD remained unexpectedly low even when more closely examining current PTSD symptom severity across eras. Importantly, although severity of PTSD is low in the present study, the prevalence of PTSD diagnosis across combat eras was on the lower end of prevalence estimates obtained reported in Magruder and Yeager (2009). When considering possible reasons for discrepancies between the current and past studies of PTSD severity, it is important to recognize that studies utilize substantially different recruitment methods, samples, and measures of PTSD. For example, the current study employed the relatively recent PCL-5 (Blevins et al., 2015) to assess PTSD and its symptoms, whereas the majority of prior studies used an older version of the PCL linked to the *DSM-IV* (Weathers, Litz, Huska, & Keane, 1999) or even *DSM-III* (Weathers et al., 1993), as well as other measures of PTSD (e.g., Mississippi Scale [Keane, Caddell, & Taylor, 1988]). Because few studies have utilized the PCL-5, no standard cut score has been established. However, a study examining a sub-sample of 140 veterans identified

preliminary valid diagnostic cutoff scores on the PCL-5 ranging from 31-33, concluding that these scores were optimal for diagnosing PTSD (Bovin et al., 2015); thus, the cutoff of 33 utilized in the present sample represents the most stringent of this range and therefore may have artificially limited diagnosis. The use of the PCL-5, in contrast with the measures predominantly used in PTSD research to-date makes it difficult to compare the rates of PTSD obtained in the present study with those from prior studies.

The limited combat/warfare endorsed by the individuals in the present study might also help account for the relatively low prevalence and severity of PTSD found here. Studies have shown that increased combat experiences are associated with increased prevalence and severity of a PTSD diagnosis (Hiley-Young, Blake, Abueg, Rozynko, & Gusman, 1995; Keane et al., 1989; Pietrzak, Whealin, Stotzer, Goldstein, & Southwick, 2011b). The low rates of deployment and combat endorsed by the current sample may additionally serve to diminish the severity of PTSD endorsed by the present sample.

A final potential explanation for the limited PTSD may be an inadvertent result of the manner in which participants were recruited. Although the present participants were drawn from a large national sample collected through random selection, it is possible that the sample is not as representative as hoped due to common issues with voluntary study participation (e.g., self-selection bias, low response rates). Furthermore, the veterans in the present sample were individuals who had previously enrolled in an online database, which may indicate easy access to a computer and internet access. They were initially recruited through postal mail; as a result, individuals who move frequently, have unstable housing, or are homeless—many of whom experience increased symptomology (Benda, 2005; Pavao, Alvarez, Baumrind, Induni, & Kimerling, 2007; Schnurr, Lunney, Bovin, & Marx, 2009)— were likely undersampled in the

present study. Compared to a treatment-seeking sample (typically found to report higher levels of symptomology than non-treatment-seeking veterans; Boscarino, Hoffman, Pitcavage, & Urosevich, 2015), it is possible and indeed likely that the overall symptom severity found in a non-treatment-seeking sample would be lower.

Suicidality. The frequency of reported suicidal ideation across combat eras is relatively consistent with frequencies obtained in prior studies (e.g., Knoke, Smith, Gray, Kaiser, & Hawksworth, 2000; Kramer, Lindy, Green, Grace, & Leonard, 1994). Overall, however, participants reported minimal current passive and active SI severity, as well as limited history of suicide attempts. Several reasons may account for this low severity. First, suicidal ideation was assessed with two Likert-type self-report questions. This approach contrasts with many studies that utilize more elaborate and in-depth measures of suicidality such as the Modified Scale for Suicidal Ideation (Miller, Norman, Bishop, & Dow, 1986) or the Scale for Suicide Ideation (Beck, Kovacs, & Weissman, 1979). These measures may provide a more robust assessment of suicidal ideation than was utilized in the present study. In addition, similar to the issue raised regarding the limited PTSD severity, it is possible that the recruitment methods used here oversampled those high-functioning individuals (e.g., those with computer/wireless internet access, stable housing, non-treatment-seeking), resulting in a sample of veterans with lower suicidal symptomology than obtained in other studies. In sum, the present sample appears to be a more highly-functioning community individuals with significantly lower levels of symptomology compared to samples described in other studies; the low severity in the present study may be attributable to the measures used, sample characteristics, or manner of recruitment of the present study.

Primary Analyses

Hypothesis 1: Direct associations between PTSD and SI. As noted above, PTSD was generally positively related to both SI severity and PASI. A closer examination of these findings revealed that PTSD was significantly positively associated with both SI severity and PASI for non-combat, Vietnam War, and OEF/OIF/OND veterans such that as PTSD severity increased, so did suicidality. Conversely, PTSD was not significantly associated with SI for Persian Gulf War veterans. Prior literature has shown that PTSD increases risk for suicidality across combat eras (Guerra, Calhoun, & Mid-Atlantic Mental Illness Research, Education and Clinical Center Workgroup, 2011; Hendin & Haas, 1991; Kramer et al., 1994; Pietrzak et al., 2011b; Rozanov & Carli, 2012). Although the present results generally align with this larger body of literature, the expected association between PTSD and suicidality among Persian Gulf War veterans was not found. A closer examination of this sub-group shows that of the 23 Persian Gulf War veterans in the present sample, only 4 reported the presence of *any* suicidal ideation. Limited research has examined this sub-population (due, in part, to the short duration of the war and the minimal number of service members directly involved in the conflict), thereby making comparisons to literature difficult. However, prior work identifies a link between PTSD and suicidality among Persian Gulf War veterans (Bell, Amoroso, Wegman, & Senier, 2001). Thus, given the limited presence of SI symptoms found here, and as identified by prior literature, any conclusions regarding the relation between PTSD and SI severity within Persian Gulf War veterans must be interpreted with caution.

Hypothesis 2: Associations between resiliency and SI. As hypothesized, increased resiliency factors in general were associated with decreased suicidal ideation. This pattern of results differed by combat era, with social connectedness, perceived ability to cope, and altruism associated with lower SI. Contrary to expectation, altruism was associated with elevated SI for

Persian Gulf War veterans only. Unexpectedly, social engagement was not associated with SI for any combat eras.

Of the four types of resiliency, perceived ability to cope was the most consistently related to suicidality, with significant negative association with SI for all eras other than Persian Gulf War. Studies examining the possible protective role of personal resources have found that such characteristics as personality hardiness, personal strength, and perceived ability to cope with adversity are associated with positive outcomes among veterans, including protection against a later PTSD diagnosis, substance misuse, depression and suicide, and resulting in substantial posttraumatic growth following a trauma (Green, Beckham, Youssef, & Elbogen, 2014; Maguen, Vogt, King, King, & Litz, 2006; Pietrzak et al., 2010a; Rainey, Petrey, Reynolds, Agtarap, & Warren, 2014). It has been hypothesized that a perceived ability to cope allows individuals to thrive in the face of adversity as a result of the individual's positive perception of his or her ability to successfully adapt to disruptions caused by internal and external stressors (Connor & Davidson, 2003; Nrugham et al., 2010). It is possible that a perceived ability to cope may result in an individual feeling more confident in her or his internal strength, which may serve as a buffer of the damaging effects of feeling like a burden (i.e., perceived burdensomeness) on risk for suicide. As a result, perceived ability to cope may, in turn, be associated with decreased risk for suicidal ideation.

As hypothesized, a second type of resilience, social connectedness, was significantly negatively related to SI for non-combat and OEF/OIF/OND veterans, although not for Vietnam War or Persian Gulf War veterans. This is in partial support of literature that has identified the protective role of social connectedness (i.e., social support given to an individual) in other military samples, including Vietnam War combat, non-combat, OEF/OIF/OND, and Persian Gulf

War combat veterans (Keane, Scott, Chavoya, Lamparski, & Fairbank, 1985b; Tsai et al., 2012; Wolfe, Proctor, Davis, Borgos, & Friedman, 1998). Social connectedness has been hypothesized to be associated with decreased risk for suicidality through its positive impact on thwarted belongingness (Jahn, Cukrowicz, Linton, & Prabhu, 2011; Van Orden et al., 2012; You, Van Orden, & Conner, 2011). Specifically, social connectedness bolsters an individual's support network, thereby decreasing an individual's sense of thwarted belongingness. The lack of associations between social connectedness and SI for either Persian Gulf War or Vietnam War veterans is inconsistent with past studies (Adams et al., 2017; King et al., 1998) and may be in part due to the manner in which social connectedness was measured in the present study. Here, social connectedness was assessed with five items selected from a previously-established measure (i.e., MOS-SSS); the validity of this abbreviated scale as a measure of social connectedness has not been evaluated. Additionally, the overall limited suicidality in the present sample may have hindered the detection of associations with other variables, including social connectedness.

Greater altruism was associated with decreased SI for non-combat veterans, but not for Vietnam War or OEF/OIF/OND veterans. Unexpectedly, altruism was positively related to SI for Persian Gulf War veterans. Although altruism has long been associated with greater health, well-being, and longevity (Post, 2005), it has not often been examined in relation to its protective role against suicidal behaviors. However, literature supports the notion that engaging in altruistic behaviors likely boosts the production of the "Happiness Trifecta" (i.e., dopamine, serotonin, and oxytocin; Ritvo, 2014). The presence of these hormones is associated with buffering the effects of depression and decrease risk for suicide (e.g., Golden et al., 1991; Jokinen et al., 2012; Padurariu et al., 2016; Pitchot, Hansenne, & Ansseau, 2001; Suda et al., 2009). Therefore, it may

be that greater reported altruistic behaviors are negatively associated with suicidality by virtue of their potential to decrease negative psychiatric symptoms related to lowered levels of the Happiness Trifecta.

In contrast to expectations, the direction of the relation between altruism and SI was reversed for Persian Gulf War veterans such that greater levels of altruism were associated with *increased* risk of suicidal ideation. As described above, the unusual and unexpected association for Persian Gulf War veterans may be attributable to the very low level and frequency of suicidal ideation among this sub-sample. Although it is possible that there is a damaging effect of altruism for Persian Gulf War veterans, this seems unlikely considering findings drawn from prior literature, and may be the result of the small number of these participants who reported any SI. Additionally, there was no significant relation between altruism and SI for Vietnam War and OEF/OIFOND veterans. The absence of this expected relation among Vietnam War and OEF/OIF/OND veterans may be due in part to the limited definition of altruism in the present study. Altruism, here, was measured in response to two items regarding the number of days per week of engagement in volunteer activities and assisting others in instrumental activities of daily living. However, literature shows that altruism encompasses a broader range of selfless acts (e.g., "opening a door, helping a stranger change a tire, donating money or time, and giving advice…"; Ritvo, 2014). Thus, it is possible that the measure of altruism in the present study did not fully capture the elements that serve to buffer against SI. In sum, the anticipated relation between altruism and SI was found for non-combat veterans; the unexpected findings for the other combat eras may be attributable to the low levels of reported suicidality and the measure of altruism utilized in the present study.

Contrary to expectations, social engagement did not predict suicidality for any of the era sub-samples. This result may be explained by a number of factors. First, the construct was measured by two items (i.e., number of days per week individuals report visiting family and friends) that are not drawn from validated measure. Furthermore, the overall limited suicidality in the present sample again may have hindered these relationships from being detected. Therefore, it is possible that the predicted relations between social engagement and resiliency could simply not be captured by the measures selected or the limited levels of suicidality severity present in the current sample.

Additionally, few studies have examined the construct termed "social engagement," which shares characteristics with but differs substantially from social support. Social support reflects the social connections an individual *receives* or *has available* (e.g., having people to confide in or to help with daily chores), while social engagement mirrors the connections individuals *give* to those around them (e.g., how often an individual visits friends or family). To date, much of the existing research has focused on the impact of receiving support, with the effects of giving support largely having been neglected (Momtaz, Ibrahim, & Hamid, 2014). Specifically, studies have found that providing social support to others has significant protective implications (Krause & Shaw, 2000; Momtaz et al., 2014). However, given the limited measurement of social engagement utilized in the present study, and its distinction from the more often studied social support, conclusions regarding the lack of association with SI found in the present study must be drawn with caution.

Hypothesis 3: Moderating effect of resiliency on PTSD and SI. Aim 3 was the ultimate focus of the present study. As noted above, there was evidence for a protective effect of resiliency on the relation between PTSD and suicidal ideation, even when considering the

potential impact of various sociodemographic characteristics. Consistent with predictions, certain resiliency factors moderated the relation between PTSD and SI severity. Specifically, altruism served as a moderator for Vietnam War veterans, while both social connectedness and perceived ability to cope served as a moderator for OEF/OIF/OND veterans. As hypothesized, each of these resiliency factors negatively moderated the relation between PTSD and SI, such that increased resiliency weakened associations between PTSD and SI. For Persian Gulf War veterans, however, perceived ability to cope and altruism both *positively* moderated the relation between PTSD and suicide, such that increased levels of these factors resulted in strengthened relation between PTSD and SI.

The finding that altruism moderated associations between PTSD severity and SI among Vietnam veterans may be understood in the context of Joiner's IPT model of suicide. As described, PTSD has been linked to elevated levels of perceived burdensomeness and thwarted belongingness (Davis et al., 1996; Poindexter et al., 2015), resulting in increased risk for suicidality (Joiner, 2009; Poindexter et al., 2015; Ullman & Najdowski, 2009). Thus, it is possible that engaging in volunteer activities (i.e., increasing altruism) protects against the negative effects of PTSD by both decreasing an individual's sense of burdensomeness (through the provision of support for others) while simultaneously increasing their sense of belongingness (through the resultant interaction with others), ultimately reducing suicide risk. Support for this possibility comes from a study demonstrating that efforts to increase the engagement of elderly Japanese adults in volunteer activities resulted in significantly lower suicide rates compared to control regions (Oyama et al., 2008); it has been hypothesized that this decrease in suicide risk among the elderly Japanese participants may be through decreases in perceived burdensomeness and thwarted belongingness felt by those individuals (Van Orden & Conwell, 2011).

The risk for PTSD-related suicidality was buffered for OEF/OIF/OND veterans with greater levels of social connectedness. Again, this relationship may be understood through the lens of Joiner's construct of thwarted belongingness, with increases in thwarted belongingness resulting in elevated risk for suicide. PTSD, and specifically emotional numbing symptoms, have been associated with greater interpersonal difficulties and elevated thwarted belongingness (Ruscio, Weathers, King, & King, 2002; Selby et al., 2010), increasing risk for suicide. As a result, it is possible that high levels of social connectedness, measured through reports of having multiple individuals available to confide in or turn to for help, mitigates the potentially isolating effects of PTSD by reducing an individual's sense of thwarted belongingness, thereby ultimately decreasing suicide risk.

Finally, for those with elevated perceived ability to cope, an increased PTSD severity was less likely to lead to suicidality, consistent with hypothesis. As discussed, PTSD has been found to result in elevated levels of perceived burdensomeness (Davis et al., 1996; Poindexter et al., 2015). It is possible that an individual who feels capable of coping with adversity (that is, someone who is capable of engaging in emotion- and problem-focused strategies to deal with adversity) feels like less of a burden to those around them, thereby decreasing suicide risk. Although no known studies appear to have specifically examined the moderating role of perceived ability to cope on the relation between PTSD and suicide, a related study found that distress tolerance (a construct with some similarity to perceived ability to cope) was found to moderate the relation between PTSD and suicidality in a sample of firefighters (Bartlett et al., 2018). Thus, the protective role of perceived ability to cope among veterans with PTSD may be understood as buffering the negative effects of PTSD on perceived burdensomeness, ultimately decreasing an individual's risk for suicide.

Despite these results, which were consistent with predictions, several findings were contrary to expectations. Specifically, the direction of moderation was reversed for Persian Gulf War veterans when examining SI severity, such that greater perceived ability to cope and reported altruism each increased risk for suicide among individuals with PTSD. As described above, this unusual association may be attributable to the low levels of both PTSD and SI severity and must be interpreted with caution. Although it is possible that there is an impeding effect of resilience on the severity of suicidal ideation within Persian Gulf War veterans, this seems unlikely considering (a) the reverse direction of the moderation is inconsistent with prior work, (b) the reverse direction of this moderation is in direct contrast with that obtained for all other models in the present study. Secondly, none of the types of resiliency measured here moderated relations between PTSD and suicidality for non-combat veterans. As described above, this may be attributable to the heterogeneity of this sub-sample, as well as the limited range of both PTSD and suicidality.

Thirdly, despite literature showing that social support has emerged as one of the prominent protective factors against suicide (Kleiman & Liu, 2013), only one aspect of social support served a protective role across all eras (i.e., social connectedness among OEF/OIF/OND veterans). It was unexpected that social connectedness and social engagement did not more consistently serve a protective role across combat eras. Because the present study separated these two aspects of social support into social connectedness and social engagement, it is possible that social connectedness (more similar to social support examined in prior literature) may play a significant role in some combat eras, as found in the present study, while social engagement does not.

In sum, the current study identifies resilience factors, primarily protective psychosocial in nature, that appears to moderate the known relation between PTSD and suicidality for non-combat, Vietnam War, and OEF/OIF/OND veterans. Furthermore, no resiliency factors moderated the relation among non-combat veterans. These findings are consistent in part with limited prior literature, although additional research must be conducted to further examine the results of the present study.

Limitations

The results of this study must be interpreted in light of a number of methodological limitations. First, all variables were assessed via self-report, a single mode of assessment. Future studies would benefit from the use of more comprehensive and multi-method assessments, such as self-report measures accompanied by clinical interviews and record reviews. Secondly, although the longitudinal nature of this study was a strength, it is important to note that this data were comprised of two data points. Literature emphasizes that additional time points allow for more accurate longitudinal and causal inferences and that moderation analyses are improved with three or more time points (Fitzmaurice, Davidian, Verbeke, & Molenberghs, 2009). As a result, it is recommended that future studies expand their timepoints to better encapsulate the longitudinal effect of the factors of interest.

Another limitation is that the current sample is made up of predominantly middle-aged individuals from the Vietnam War era. Although the age of the current sample is representative of the veteran population as a whole (Pew Research Center, 2011), the majority of these individuals are temporally far removed from their military service and thus any combat they may have experienced. PTSD symptoms are negatively related to age, such that veterans older than 50 years report significantly decreased levels of PTSD (Magruder et al., 2004). At the same time,

younger adults (e.g., less than 25 years) are at higher risk for suicidal behaviors (Kessler et al., 1999). The present sample demonstrates similar symptomology distribution with older veterans reporting less suicidal ideation (5.5% vs. 18.8%) and fewer having a PTSD diagnosis (3.4% vs. 12.5%). The older mean age of the current sample may have diminished the likelihood of finding the expected effects. Additionally, the older mean age was associated with an uneven distribution of participants to combat eras: specifically, an under-recruitment of veterans from the most recent eras, namely the Persian Gulf War and OEF/OIF/OND conflicts. It is recommended that future studies oversample veterans from distinct combat eras in order to increase relevant sample sizes and more effectively evaluate the effect of combat and combat era on the relations identified in the present study. In order to investigate a more clinical sample, it is recommended that future studies might include treatment-seeking veterans, which, though restricting generalizability, may produce a more robust examination of PTSD and suicidality. Furthermore, two of the four sub-samples in the present study (i.e., Persian Gulf War, OEF/OIF/OND) were comprised of very small sample sizes (i.e., $n < 40$). It is possible that with a larger sample size in these sub-eras smaller effect sizes could be detected. Therefore, to address this limitation, it is recommended that future studies oversample from distinct combat eras to create a more robust sub-sample.

Relatedly, the present study examined models according to veterans' most recent combat era of service. However, it was not possible to examine or control for service across multiple eras, which would have permitted an examination of the unique or cumulative impacts of each era. The limited deployment experience of the current sample is not consistent with many reports (e.g., Pew Research Center, 2011), which indicate that OEF/OIF/OND servicemembers experience more frequent and longer-duration deployments than prior eras; however, the

majority of the present sample served in the Vietnam War era, an era characterized by low deployment rates (approximately 11% of personnel on active duty were deployed to South Vietnam and experienced combat; "Vietnam War Statistics," 1997). Thus, the results must be interpreted with caution. Future studies might elicit participation from combat veterans, with an emphasis on their reported era of service.

A final limitation is related to the measurement of resiliency factors. Specifically, for social support and protective psychosocial factors, very brief measures were used to assess these constructs. Although the items within each measure show adequate internal consistency, the validity of these measures in capturing complex constructs is unknown. Thus, it is recommended that future studies utilize full versions of well-validated measures to further develop the strength of the intended constructs and more fully explore the role of these resilience constructs on the relation between PTSD and suicide.

Future Research Directions

In addition to future research that might address the methodological issues described above, there are a number of additional research questions that could be examined through future work in this area. For example, the present study did not examine the role or impact of trauma type (e.g., combat vs. civilian, interpersonal vs. non-interpersonal) on suicidality. Literature suggests that trauma type is differentially related to history of suicidal ideation or attempts in civilian samples (Tarrier & Gregg, 2004). This knowledge suggests the need for a closer examination of the impact of different types of trauma, as well as the specific impact of combat era upon those who report combat-related PTSD.

The examination of resilience factors in the present study was limited to social support, protective psychosocial factors, social engagement, and altruism, which were well supported in

literature (e.g., Pietrzak & Cook, 2013). However, it is possible that other resilience factors may also serve to mitigate the associations between PTSD and suicidality. For example, many studies have evaluated the possible protective role of cognitions (e.g., cognitive appraisal, trauma-related cognitions) religiosity, and perceived sense of control (McLean et al., 2017; Nrugham et al., 2010; Sisask et al., 2010; Spaccarelli & Kim, 1995) following trauma exposure. These factors could also be examined as potential moderators against suicidality for individuals struggling with symptoms of PTSD and should be incorporated into future research.

Finally, future work is needed to test the suppositions made here that components of Joiner's IPT model are important mechanisms through which PTSD impacts suicide risk. In particular, it is critical to consider factors such as perceived burdensomeness and thwarted belongingness (Joiner, 2009; Van Orden et al., 2010). Thus, future studies may seek to incorporate measures of IPT such as the Interpersonal Needs Questionnaire (assessing thwarted belongingness and perceived burdensomeness; Van Orden et al., 2012) and the Acquired Capability for Suicide Scale (assessing acquired capability; Bender, Gordon, & Joiner, 2007), in conjunction with more robust measures of the current constructs, to better evaluate more complex models.

Clinical Implications

The current findings have implications for suicide intervention strategies among veterans with trauma symptoms and from distinct combat eras who may be at risk for suicidality. Specifically, the different resiliency factors identified here as moderators of suicide risk may be useful points of intervention for treatment providers working with veterans. For example, social connectedness is one such point of intervention, particularly for OEF/OIF/OND veterans. Given the current finding that engagement in social behaviors decreases risk for suicide, it is

recommended that treatment providers incorporate strategies to help veterans enhance social connectedness and increase positive interactions with family, organizations, and community throughout treatments. Specific interventions designed to enhance the ability of an individual to both solicit and utilize social support appear to be efficacious in a number of populations (for a review of social support interventions, refer to Hogan, Linden, & Najarian, 2002). These interventions differ in their modality, and may be used independently or concurrently with other treatments, individually or within groups, and thus are adaptable across settings as a means to increase social skills or the network size. In addition, evidence based interventions for PTSD, such as Cognitive-Behavioral Conjoint Therapy for PTSD (Monson et al., 2012), may be used for dyadic-level intervention that both targets the individual's symptomology and improves the marital and other social relationships (Sippel, Pietrzak, Charney, Mayes, & Southwick, 2015). Finally, beyond the realm of formal psychological intervention, it is possible to enhance social support by encouraging veterans to become involved in community organizations such as the Veterans of Foreign Wars (VFW), a nonprofit service organization dedicated to supporting veterans and their families.

Altruism is another potential point of intervention; volunteering has been found to have expansive positive outcomes, including enhancing trust in others and increasing social and political participation. If, as this study indicates, a strong sense of concern for and willingness to help others mitigates against the risk for suicide among those with PTSD, particularly for Vietnam veterans, interventions that encourage individuals to engage in these types of activities might be beneficial. Volunteering and overall civic engagement is higher among veterans aged 50-69 than among other groups (Adler, Goggin, & Bush, 2005); this knowledge may be used by providers to both enhance any volunteer work veterans may engage in, or to encourage those not

already engaged to join peers in volunteer activities. Recently, various organizations have developed with the aim of providing structured volunteer activities for veterans who wish to serve other veterans; examples include such organizations as the Veterans of Foreign Wars (VFW), Disabled American Veterans (DAV), The American Legion, and the Veteran-to-Veteran Volunteer Program.

Treatment providers may also wish to encourage veteran engagement in activities that promote the community and help others, in conjunction with structured clinical treatment. The goal of increasing altruistic behaviors may be addressed through the formal utilization of behavioral activation (BA). Behavioral activation is an effective psychotherapy for treating depression (Dimidjian et al., 2006) with increasing support for its use as a treatment for PTSD (Jakupcak et al., 2006; Jakupcak, Wagner, Paulson, Varra, & McFall, 2010; Wagner, Zatzick, Ghesquiere, & Jurkovich, 2007). The aims of BA are to identify and enact activities that are reinforcing to the individual and result in mood improvement, thereby producing both internal and environmental reinforcement. Because avoidance and withdrawal are common maintaining features of PTSD, the principles of BA appear to be useful conceptual means through which to address significant symptoms of the disorder. Specifically, BA may be used to increase engagement in activities that improve mood, which could therefore by used to counteract the correlates of PTSD that lead to SI. Altruistic behaviors are therefore strong candidates that fit appropriately into the confines of behavioral activation. Examples of informal volunteer activities that may be incorporated into BA include serving meals through Meals on Wheels, offering services to local animal shelters, and assisting at a library. Similarly, veterans may be encouraged to incorporate altruistic behaviors on a more regular, and informal, basis, such as through raking leaves for a neighbor or picking up trash around a neighborhood; consistent with

BA, such prosocial behaviors have been found to enhance the production of dopamine (Grimm, Spring, & Dietz, 2007), which has in turn been associated with improved outcomes including better health, decreased levels of psychiatric symptoms such as depression and suicidality, and lower mortality rates (Brown et al., 2000; Dunlop & Nemeroff, 2007; Grimm et al., 2007; Oyama et al., 2008).

One final point of intervention suggested by the present findings is an individual's perceived ability to cope, particularly among OEF/OIF/OND veterans. Given that an increase in this type of resiliency appears to decrease risk for suicide following trauma (Roy et al., 2011), treatment providers may wish to incorporate aspects that enhance this perception. One way this may be done is through the implementation of Cognitive Processing Therapy (CPT; Resick, Monson, & Chard, 2016), a "gold-standard" manualized therapy for PTSD. Specifically, CPT provides psychoeducation regarding important skills such as the practice and utilization of coping skills and strategies (McCarthy & Petrakis, 2011). Importantly, research has shown that individuals with a greater degree of coping flexibility and awareness of an array of coping strategies demonstrate increased perceived ability to cope (Bonanno, Pat-Horenczyk, & Noll, 2011). Thus, the incorporation of existing coping skills into CPT may serve to increase an individual's perceived ability to cope with adverse life events, while simultaneously addressing the individual's trauma symptoms. Additionally, clinicians may also informally integrate skills-building into existing ongoing treatment in order to enhance this resiliency within the structure of any other interventions. Such possible skills on which to focus may include encouraging veterans to set and accomplish small goals and recognize successes, and urging veterans to perceive challenges as opportunities for mastery as opposed to imminent failures. In addition, consistent

with that of CPT, it is possible for coping skills to be incorporated into other treatment protocols in order to enhance this type of resiliency.

One related implication of the present study is the need for treatment providers of veterans to consider the potential impact that the client's particular era of service may have on their symptomology. The present study both confirms and extends prior findings supporting the unique differences that exist among combat eras. The present study reinforces prior findings implicating that veterans are not a homogenous group and must be considered in the context of the culture of their era of service. Specifically, the current findings show that patterns of resilience differ across combat eras, with the differences reflecting the culture of era. Importantly, many suicide prevention programs developed for and implemented among veterans fail to adapt to the effects of combat era differences; as a result, it is recommended that programs highlight both clinical perceptions of era of combat service, as well as assist participants in assessing these effects within themselves.

Finally, findings from this study do not indicate that incorporating other types of resilience, such as social connectedness or social engagement, is contraindicated; it is possible that some veterans may find related activities to be rewarding and may boost their overall mood and promote resiliency in a way that is not captured in the present study. Thus, consistent with literature supporting the necessity of personalizing treatment to the patient (Cuijpers et al., 2012; March, 2009), it is recommended that treatment providers assess the individual's preferences and tendencies regarding trends towards protective factors, and incorporate those nuances into treatment to most effectively enhance the client's natural strengths.

Conclusions

Ongoing symptoms of PTSD following a trauma frequently precede the occurrence of suicidal thoughts and behaviors, particularly among U.S. military service members and veterans. However, protective factors that may serve to mitigate risk for suicide have become important areas of focus in research literature. The present study used a longitudinal design to investigate the role of different types of resiliency (social connectedness, social engagement, perceived ability to cope, and altruism; Wave 1) on suicide risk (Wave 2) for individuals with PTSD symptoms. However, there is increasing evidence that veterans as a sample are not homogenous; thus, the present study aimed to examine these relations across combat era of service (non-combat, Vietnam War, Persian Gulf War, OEF/OIF/OND) to obtain a more comprehensive understanding of the nuances of these relations. Though not all study hypotheses were fully supported, the study both confirmed prior literature, as well as yielded several novel findings. Specifically, PTSD was positively associated with suicidality, while social connectedness, perceived ability to cope, and altruism were all negatively associated. Furthermore, altruism served a protective role against suicide for Vietnam War veterans with PTSD, while social connectedness and perceived ability to cope each served the same role for OEF/OIF/OND veterans. Together, these findings provide support for the need to incorporate the enhancement of various types of resiliency into treatment provided to veterans; additionally, these findings lend research support for the further examination of resiliency through the Army STARRS. Finally, it is essential that the veteran's era of service be considered when deciding upon potential avenues of intervention.

REFERENCES

Adams, R. E., Urosevich, T. G., Hoffman, S. N., Kirchner, L., Hyacinthe, J. C., Figley, C. R., … Boscarino, J. A. (2017). Social support, help-seeking, and mental health outcomes among veterans in non-VA facilities: Results from the Veterans' Health Study. *Military Behavioral Health, 5*, 393-403.

Adler, A. B., & Castro, C. A. (2013). An occupational mental health model for the military. *Military Behavioral Health, 1*, 41–45.

Adler, R. P., Goggin, J., & Bush, G. W. (2005). What do we mean by "civic engagement"? *Journal of Transformative Education, 3,* 236–253.

American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders: DSM-III*. (Author, Ed.) (3rd ed.). Washington, DC.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. Washington, D. C.: American Psychiatric Association.

Anestis, M. D., Bryan, C. J., Cornette, M. M., & Joiner, T. E. (2009). Understanding suicidal behavior in the military: An evaluation of Joiner's Interpersonal-Psychological Theory of Suicidal Behavior in two case studies of active duty post-deployers. *Journal of Mental Health Counseling, 31*.

Appleby, L., Cooper, J., Amos, T., & Faragher, B. (1999). Psychological autopsy study of suicides by people aged under 35. *The British Journal of Psychiatry: The Journal of Mental Science, 175*, 168–174.

Armour, C., Tsai, J., Durham, T. A., Charak, R., Biehn, T. L., Elhai, J. D., & Pietrzak, R. H. (2015a). Dimensional structure of DSM-5 posttraumatic stress symptoms: Support for a

hybrid anhedonia and externalizing behaviors model. *Journal of Psychiatric Research*, 1–8.

Armour, C., Tsai, J., Durham, T. A., Charak, R., Biehn, T. L., Elhai, J. D., & Pietrzak, R. H. (2015b). Dimensional structure of DSM-5 posttraumatic stress symptoms: Support for a hybrid anhedonia and externalizing behaviors model. *Journal of Psychiatric Research*, *61*, 106–113.

Arria, A. M., O'Grady, K. E., Caldeira, K. M., Vincent, K. B., Wilcox, H. C., & Wish, E. D. (2009). Suicide ideation among college students: A multivariate analysis. *Archives of Suicide Research : Official Journal of the International Academy for Suicide Research*, *13*, 230–246.

Bartlett, B. A., Jardin, C., Martin, C., Tran, J. K., Buser, S., Anestis, M. D., & Vujanovic, A. A. (2018). Posttraumatic stress and suicidality among firefighters: The moderating role of distress tolerance. *Cognitive Therapy and Research*, 1–14.

Barzilay, S., & Apter, A. (2014). Psychological models of suicide. *Archives of Suicide Research*, *18*, 295–312.

Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review*, *97*(1), 90–113.

Beck, A. (1986). Hopelessness as a predictor of eventual suicide. *Annals of the New York Academy of Sciences*, *487*(Psychobiology), 90–96.

Beck, A. T., Kovacs, M., & Weissman, A. (1979a). Assessment of Suicidal Ideation: The scale for suicide ideation. *Journal of Consulting and Clinical Psychology*, *47*, 343–352.

Beck, A. T., Kovacs, M., & Weissman, A. (1979b). Assessment of Suicidal Ideation: The scale for suicide ideation. *Journal of Consulting and Clinical Psychology*, *47*, 343–352.

Bell, N. S., Amoroso, P. J., Wegman, D. H., & Senier, L. (2001). Proposed explanations for excess injury among veterans of the Persian Gulf War and a call for greater attention from

policymakers and researchers. *Injury Prevention, 7,* 4-9.

Bell, J. B., & Nye, E. C. (2007). Specific symptoms predict suicidal ideation in Vietnam combat veterans with chronic post-traumatic stress disorder. *Military Medicine, 172*, 1144–1147.

Benda, B. B. (2005). gender differences in predictors of suicidal thoughts and attempts among homeless veterans that abuse substances. *Suicide and Life-Threatening Behavior*, *35*, 106–116.

Bender, T. W., Gordon, K. H., & Joiner, T. E. (2007). *Impulsivity and suicidality: A test of the mediating role of painful experiences.* Unpublished manuscript.

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, *28*, 489–498.

Blow, F. C., Bohnert, A. S. B., Ilgen, M. A., Ignacio, R., McCarthy, J. F., Valenstein, M. M., & Knox, K. L. (2012). Suicide mortality among patients treated by the Veterans Health Administration from 2000 to 2007. *American Journal of Public Health*, *102 Suppl 1*(S1), S98-104.

Boehmer, T. K. C., Flanders, W. D., McGeehin, M. A., Boyle, C., & Barrett, D. H. (2004). Postservice mortality in Vietnam veterans. *Archives of Internal Medicine, 164*, 1908–1916.

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist*, *59*, 20–28.

Bonanno, G. A., Pat-Horenczyk, R., & Noll, J. (2011). Coping flexibility and trauma: The Perceived Ability to Cope with Trauma (PACT) Scale. *Psychological Trauma: Theory, Research, Practice, and Policy*, *3*, 117–129.

Boscarino, J. A. (2006). Posttraumatic stress disorder and mortality among U.S. Army veterans

30 years after military service. *Annals of Epidemiology*, *16*, 248–256.

Boscarino, J. A., Hoffman, S. N., Pitcavage, J. M., & Urosevich, T. G. (2015). Mental health disorders and treatment seeking among veterans in non-VA facilities: Results and implications from the Veterans' Health Study. *Military Behavioral Health*, *3*, 244–254.

Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2015). Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in veterans. *Psychological Assessment*, 1–14.

Brailey, K., Vasterling, J. J., Proctor, S. P., Constans, J. I., & Friedman, M. J. (2007). PTSD symptoms, life events, and unit cohesion in U.S. soldiers: Baseline findings from the neurocognition deployment health study. *Journal of Traumatic Stress*, *20*, 495–503.

Bremner, J. D., Southwick, S. M., Darnell, A., & Charney, D. S. (1996). Chronic PTSD in Vietnam combat veterans: Course of illness and substance abuse. *The American Journal of Psychiatry*, *153*, 369–375.

Brent, D. A., & Mann, J. J. (2005). Family genetic studies, suicide, and suicidal behavior. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics*, *133C*, 13–24.

Brown, G. K., Beck, A. T., Steer, R. A., & Grisham, J. R. (2000). Risk factors for suicide in psychiatric outpatients: A 20-year prospective study. *Journal of Consulting and Clinical Psychology*, *68*, 371–377.

Brown, G. K., Henriques, G. R., Sosdjan, D., & Beck, A. T. (2004). Suicide intent and accurate expectations of lethality: Predictors of medical lethality of suicide attempts. *Journal of Consulting and Clinical Psychology*, *72*, 1170–1174.

Brown, G. K., Ten Have, T., Henriques, G. R., Xie, S. X., Hollander, J. E., & Beck, A. T. (2005). Cognitive therapy for the prevention of suicide attempts. *The Journal of the American Mediical Association*, *294*, 563.

Brown, K. (2013). The connection between post-traumatic stress disorder and suicide behavior: what links post-traumatic stress disorder to suicide?

Brown, K. L. (2013). *The connection between post-traumatic stress disorder and suicide behavior: What links post-traumatic stress disorder to suicide?* University of Toledo.

Bruce, M. L. (2010). Suicide risk and prevention in veteran populations. *Annals of the New York Academy of Sciences*, *1208*, 98–103.

Bryan, C., & Anestis, M. (2011). Reexperiencing symptoms and the Interpersonal-Psychological Theory of Suicidal Behavior among deployed service members evaluated for traumatic brain injury. *Journal of Clinical Psychology*, *67*, 856–865.

Bryan, C. J. (2011). The clinical utility of a brief measure of perceived burdensomeness and thwarted belongingness for the detection of suicidal military personnel. *Journal of Clinical Psychology*, *67*, 981–992.

Bryan, C. J., Cukrowicz, K. C., West, C. L., Campbell, F., & Morrow, C. E. (2010). Combat experience and the acquired capability for suicide. *Journal of Clinical Psychology*, *66*, 1044–1056.

Bryan, C. J., Hernandez, A. M., Allison, S., & Clemans, T. (2013). Combat exposure and suicide risk in two samples of military personnel. *Journal of Clinical Psychology*, *69*, 64–77.

Bryan, C. J., Morrow, C. E., Anestis, M. D., & Joiner, T. E. (2010). A preliminary test of the Interpersonal-Psychological Theory of Suicidal Behavior in a military sample. *Personality and Individual Differences*, *48*, 347–350.

Bullman, T. A., & Kang, H. K. (1994). Posttraumatic stress disorder and the risk of traumatic deaths among Vietnam veterans. *Journal of Nervous and Mental Disease, 182*, 604–610.

Burrell, L. M., Adams, G. A., Durand, D. B., & Castro, C. A. (2006). The impact of military lifestyle demands on well-being, Army, and family outcomes. *Armed Forces & Society, 33,* 43–58.

Buunk, B. P., Doosje, B. J., Jans, L. G. J. M., & Hopstaken, L. E. M. (1993). Perceived reciprocity, social support, and stress at work: The role of exchange and communal orientation. *Journal of Personality and Social PSychology, 65*, 801–811.

Campbell-Sills, L., & Stein, M. B. (2007). Psychometric analysis and refinement of the Connor–Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Traumatic Stress, 20,* 1019–1028.

Castro, C. A., & Kintzle, S. (2014). Suicides in the military: The post-modern combat veteran and the Hemingway effect. *Current Psychiatry Reports, 16,* 460.

Cavanagh, J. T. O., Carson, A. J., Sharpe, M., & Lawrie, S. M. (2003). Psychological autopsy studies of suicide: A systematic review. *Psychological Medicine, 33,* 395–405.

CDC.gov. (2015). Suicide Facts at a Glance. Retrieved May 11, 2017, from https://www.cdc.gov/violenceprevention/pdf/suicide-datasheet-a.pdf

Census Bureau. (2010). American Community Survey Reports. Retrieved from http://factfinder2.census.gov

Center for Behavioral Health. (2014). Results from the 2013 national survey on drug use and health: Mental health findings. Retrieved May 11, 2017, from https://www.samhsa.gov/data/sites/default/files/NSDUHmhfr2013/NSDUHmhfr2013.pdf

Center for Disease Control. (2015). Details of Leading Causes of Death. Retrieved May 6, 2017,

from https://webappa.cdc.gov/cgi-bin/broker.exe?_service=v8prod&_server=aspv-wisq-1.cdc.gov&_port=5098&_sessionid=fQcbfjqxO52&_program=wisqars.dd_details10.sas&_service=&type=S&prtfmt=STANDARD&age1=15&age2=24&agegp=15-24&deaths=5491&_debug=0&lcdfmt=lcd1age&eth

Chiarelli, P. W. (2010). *Army Health Promotion Risk Reduction Suicide Prevention*. DIANE Publishing.

Chu, P. S., Saucier, D. A., & Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *Journal of Social and Clinical Psychology*, *29*, 624–645.

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, *18*, 76–82.

Corr, W. P. (2014). Suicides and suicide attempts among active component members of the U.S. Armed Forces, 2010-2012: Methods of self-harm vary by major geographic region of assignment. *Medical Surveillance Monthly Report*, *21*, 2–6.

Coryell, W., & Young, E. A. (2005). Clinical predictors of suicide in primary major depressive disorder. *The Journal of Clinical Psychiatry*, *66*, 412–417.

Cuijpers, P., Reynolds, C. F., Donker, T., Li, J., Andersson, G., & Beekman, A. (2012). Personalized treatment of adult depression: Medication, psychotherapy, or both? A systematic review. *Depression and Anxiety*, *0*, 1–10.

Davidson, C. L., Wingate, L. R., Rasmussen, K. A., & Slish, M. L. (2009). Hope as a predictor of interpersonal suicide risk. *Suicide and Life-Threatening Behavior*, *39*, 499–507.

Davidson, C. L., Wingate, L. R., Slish, M. L., & Rasmussen, K. A. (2010). The great black hope: Hope and its relation to suicide risk among African Americans. *Suicide and Life-*

Threatening Behavior, *40*, 170–180.

Davis, C. G., Lehman, D. R., Silver, R. C., Wortman, C. B., & Ellard, J. H. (1996). Self-blame following a traumatic event: The role of perceived avoidability. *Personality and Social Psychology Bulletin*, *22*, 557–567.

Davis, M. T. (2016). *DSM-5 PTSD and passive suicidal ideation: An application of the Interpersonal- Psychological Theory of Suicide*. Auburn University.

Davis, M. T., Witte, T. K., Weathers, F. W., & Blevins, C. A. (2014). The role of posttraumatic stress disorder symptom clusters in the prediction of passive suicidal ideation. *Psychological Trauma: Theory, Research, Practice, and Policy*, *6*(S1), S82–S91.

De Cantanzaro, D. (1995). Reproductive status, family interactions, and suicidal ideation: Surveys of the general public and high-risk groups. *Ethology and Sociobiology*, *16*, 385–394.

De Leo, D., Burgis, S., Bertolote, J. M., Kerkhof, A. J., & Bille-Brahe, U. (2006). Definitions of suicidal behavior lessons learned from the WHO/EURO Multicentre Study. *Definitions of Suicidal Behavior Crisis*, *27*, 4–15.

DeBeer, B. B., Kimbrel, N. A., Meyer, E. C., Gulliver, S. B., & Morissette, S. B. (2014). Combined PTSD and depressive symptoms interact with post-deployment social support to predict suicidal ideation in Operation Enduring Freedom and Operation Iraqi Freedom veterans. *Psychiatry Research*, *216*, 357–362.

Department of Veterans Affairs. (2014). Gulf War Veterans. Retrieved March 20, 2018, from https://www.benefits.va.gov/persona/veteran-gulfwar.asp

Department of Veterans Affairs. (2016a). *Suicide among veterans and other Americans 2001-2014*.

Department of Veterans Affairs. (2016b). VA Suicide Prevention Program: Facts about Veteran Suicide. Retrieved August 6, 2017, from https://www.va.gov/opa/publications/factsheets/Suicide_Prevention_FactSheet_New_VA_Stats_070616_1400.pdf

Dervic, K., Brent, D. A., & Oquendo, M. A. (2008). Completed suicide in childhood. *The Psychiatric Cinics of North America*, *31*, 271–291.

Diekstra, R. F. W. (1993). The epidemiology of suicide and parasuicide. *Acta Psychiatrica Scandinavica*, *87*(S371), 9–20.

Dimidjian, S., Hollon, S. D., Dobson, K. S., Schmaling, K. B., Kohlenberg, R. J., Addis, M. E., … Jacobson, N. S. (2006). Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. *Journal of Consulting and Clinical Psychology*, *74*, 658–670.

Drescher, K. D., Rosen, C. S., Burling, T. A., & Foy, D. W. (2003). Causes of death among male veterans who received residential treatment for PTSD. *Journal of Traumatic Stress*, *16*, 535–543.

Du Preez, J., Sundin, J., Wessely, S., & Fear, N. T. (2012). Unit cohesion and mental health in the UK armed forces. *Occupational Medicine*, *62*, 47–53.

Dunlop, B. W., & Nemeroff, C. B. (2007). The Role of Dopamine in the Pathophysiology of Depression. *Archives of General Psychiatry*, *64*, 327–337.

Durkheim, E. (1897). *Suicide*. New York: The Free Press.

Dyrbye, L. N., Thomas, M. R., Stanford Massie, F., Power, D. V, Eacker, A., Harper, W., … Shanafelt, T. D. (2008). Burnout and suicidal ideation among U.S. medical students. *Annals of Internal Medicine*, *149*, 334–341.

Emanuel, L. L., Hauser, J. M., Bailey, F. A., Ferris, F. D., von Gunten, C. F., & Von Roenn, J. (2012). *The Experiences of Veterans from Different War Eras*. Chicago, IL.

Enders, C. K. (2010). *Applied Missing Data Analysis*. (T. D. Little, Ed.). NY, NY: The Guilford Press. Retrieved from http://hsta559s12.pbworks.com/w/file/fetch/52112520/enders.applied

Erbes, C., Westermeyer, J., Engdahl, B., & Johnsen, E. (2007). Post-traumatic stress disorder and service utilization in a sample of service members from Iraq and Afghanistan. *Military Medicine*, *172*, 359–363.

Farberow, N. L., Kang, H. K., & Bullman, T. A. (1990). Combat experience and postservice psychosocial status as predictors of suicide in Vietnam veterans. *The Journal of Nervous and Mental Disease*, *178*, 32–37.

Fawcett, J., Scheftner, W. A., Fogg, L., Clark, D. C., Young, M. A., Hedeker, D., & Gibbons, R. (1990). Time-related predictors of suicide in major affective disorder. *American Journal of Psychiatry*, *147*, 1189–1194.

Fazel, S., Cartwright, J., Norman-Nott, A., & Hawton, K. (2008). Suicide in prisoners: A systematic review of risk factors. *The Journal of Clinical Psychiatry*, *69*, 1721–1731.

Fitzmaurice, G., Davidian, M., Verbeke, G., & Molenberghs, G. (2009). *Longitudinal Data Analysis*. Boca Raton, FL: Chapman & Hall/CRC.

Flannery, R. B. (1990). Social support and psychological trauma: A methodological review. *Journal of Traumatic Stress*, *3*, 593–611.

Fontana, A., & Rosenheck, R. (1995). Attempted suicide among Vietnam veterans: A model of etiology in a community sample. *The American Journal of Psychiatry*, *152*, 102–109.

Franklin, J. C., Hessel, E. T., Aaron, R. V, Arthur, M. S., Heilbron, N., & Prinstein, M. J. (2010). The functions of nonsuicidal self-injury: Support for cognitive-affective regulation and

opponent processes from a novel psychophysiological paradigm. *Journal of Abnormal Psychology*, *119*, 850–862.

Franklin, J., Hessel, E. T., & Prinstein, M. J. (2011). Clarifying the role of pain tolerance in suicidal capability. *Psychiatry Research*, *189*, 362–367.

Freeman, T. W., Roca, V., & Moore, W. M. (2000). A comparison of chronic combat-related posttraumatic stress disorder (PTSD) patients with and without a history of suicide attempt. *The Journal of Nervous and Mental Disease*, *188*, 460–463.

Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety*, *28*, 750–769.

Garlow, S. J., Rosenberg, J., Moore, J. D., Haas, A. P., Koestner, B., Hendin, H., & Nemeroff, C. B. (2008). Depression, desperation, and suicidal ideation in college students: Results from the American Foundation for Suicide prevention college screening project at Emory University. *Depression and Anxiety*, *25*, 482–488.

Golden, R. N., Gilmore, J. H., Corrigan, M. H., Ekstrom, R. D., Knight, B. T., & Garbutt, J. C. (1991). Serotonin, suicide, and aggression: Clinical studies. *The Journal of Clinical Psychiatry*, *52 Suppl*, 61–69.

Golin, S., Laiblin, K., McCarthy, T., Teefey, M., Wettels, J. G., & Yorkey, B. (2017). *13 Reasons Why*.

Gould, M. S., Wallenstein, S., & Davidson, L. (1989). Suicide clusters: A critical review. *Suicide and Life-Threatening Behavior*, *19*, 17–29.

Gould, M. S., Wallenstein, S., Kleinman, M. H., O'Carroll, P. W., & Mercy, J. (1990). Suicide clusters: An examination of age-specific effects. *American Journal of Public Health, 8021*, 211–212.

Green, K. T., Beckham, J. C., Youssef, N., & Elbogen, E. B. (2014). Alcohol misuse and psychological resilience among U.S. Iraq and Afghanistan era veteran military personnel. *Addictive Behavior*, *39*, 406–413.

Grimm, R., Spring, K., & Dietz, N. (2007). *The health benefits of volunteering: A review of recent research*. Washington, DC.

Guerra, V. S., Calhoun, P. S., & Mid-Atlantic Mental Illness Research, Education and Clinical Center Workgroup. (2011). Examining the relation between posttraumatic stress disorder and suicidal ideation in an OEF/OIF veteran sample. *Journal of Anxiety Disorders, 25*, 12–18.

Harris, E. C., & Barraclough, B. (1997). Suicide as an outcome for mental disorders. A meta-analysis. *The British Journal of Psychiatry*, *170*, 205–228.

Harriss, L., Hawton, K., & Zahl, D. (2005). Value of measuring suicidal intent in the assessment of people attending hospital following self-poisoning or self-injury. *The British Journal of Psychiatry*, *186*, 60–66.

Heaney, C. A., & Israel, B. A. (2008). Social Networks and Social Support. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Social Networks and Social Support* (4th ed., pp. 189–210). San Francisco, CA: Jossey-Bass.

Heisel, M. J., & Flett, G. L. (2004). Purpose in life, satisfaction with life, and suicide ideation in a clinical sample. *Journal of Psychopathology and Behavioral Assessment*, *26*, 127–135.

Heisel, M. J., & Flett, G. L. (2008). Psychological resilience to suicide ideation among older adults. *Clinical Gerontologist, 31*, 51–70.

Hendin, H., & Haas, A. P. (1991). Suicide and guilt as manifestations of PTSD in Vietnam combat veterans. *American Journal of Psychiatry, 148,* 586–591.

Hiley-Young, B., Blake, D. D., Abueg, F. R., Rozynko, V., & Gusman, F. D. (1995). Warzone violence in Vietnam: An examination of premilitary, military, and postmilitary factors in PTSD in-patients. *Journal of Traumatic Stress*, *8*, 125–141.

Hill, R. M., & Pettit, J. W. (2014). Perceived burdensomeness and suicide-related behaviors in clinical samples: Current evidence and future directions. *Journal of Clinical Psychology*, *70*, 631–643.

Hirsch, J. K., Conner, K. R., & Duberstein, P. R. (2007). Optimism and suicide ideation among young adult college students. *Archives of Suicide Research*, *11*, 177–185.

Hofmann, S. G., Litz, B. T., & Weathers, F. W. (2003). Social anxiety, depression, and PTSD in Vietnam veterans. *Anxiety Disorders*, *17*, 573–582.

Hogan, B. E., Linden, W., & Najarian, B. (2002). Social support interventions: Do they work? *Clinical Psychology Review*, *22*, 381–440.

Hoge, C. W., Auchterlonie, J. L., & Milliken, C. S. (2006). Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *Journal of the American Medical Association*, *295*, 1023–1032.

Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., & Koffman, R. L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *New England Journal of Medicine*, *351*, 13–22.

House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and processes of social support. *Annual Review of Sociology*, *14*, 293–318.

Hunter, K. I., & Linn, M. W. (1981). Psychosocial differences between elderly volunteers and non-volunteers. *The International Journal of Aging and Human Development*, *12*, 205–213.

IAVA.org. (2016). 7th Annual IAVA Member Survey.

IBM Corp. (2017). *IBM SPSS Statistics for Windows, Version 24.0.* Armonk, NY: IBM Corp.

Ilgen, M. A., Bohnert, A. S. B., Ignacio, R. V, McCarthy, J. F., Valenstein, M. M., Kim, H. M., & Blow, F. C. (2010). Psychiatric diagnoses and risk of suicide in veterans. *Archives of General Psychiatry*, *67*, 1152–1158.

Israel, B. A. (1982). Social networks and health status: Linking theory, research, and practice. *Patient Counselling and Health Education*, *4*, 65–79.

Jacobs, D. G., Baldessarini, R. J., Conwell, Y., Fawcett, J. A., Horton, L., Meltzer, H., … Simon, R. I. (2010). *Practice guideline for the assessment and treatment of patients with suicidal behaviors*.

Jagdeo, A., Cox, B. J., Stein, M. B., & Sareen, J. (2009). Negative attitudes toward help seeking for mental illness in 2 population—based surveys from the United States and Canada. *The Canadian Journal of Psychiatry*, *54*, 757–766.

Jahn, D. R., Cukrowicz, K. C., Linton, K., & Prabhu, F. (2011). The mediating effect of perceived burdensomeness on the relation between depressive symptoms and suicide ideation in a community sample of older adults. *Aging & Mental Health*, *15*, 214–220.

Jakupcak, M., Cook, J., Imel, Z., Fontana, A., Rosenheck, R., & McFall, M. (2009). Posttraumatic stress disorder as a risk factor for suicidal ideation in Iraq and Afghanistan war veterans. *Journal of Traumatic Stress*, *22*, 303–306.

Jakupcak, M., Hoerster, K. D., Varra, A., Vannoy, S., Felker, B., & Hunt, S. (2011). Hopelessness and suicidal ideation in Iraq and Afghanistan War veterans reporting subthreshold and threshold posttraumatic stress disorder. *The Journal of Nervous and Mental Disease*, *199*, 272–275.

Jakupcak, M., Roberts, L. J., Martell, C., Mulick, P., Michael, S., Reed, R., … McFall, M.

(2006). A pilot study of behavioral activation for veterans with posttraumatic stress disorder. *Journal of Traumatic Stress, 19,* 387–391.

Jakupcak, M., Wagner, A., Paulson, A., Varra, A., & McFall, M. (2010). Behavioral activation as a primary care-based treatment for PTSD and depression among returning veterans. *Journal of Traumatic Stress*, *23,* 491–495.

Johnson, J., Gooding, P. A., Wood, A. M., & Tarrier, N. (2010). Resilience as positive coping appraisals: Testing the schematic appraisals model of suicide (SAMS). *Behaviour Research and Therapy*, *48,* 179–186.

Joiner, T. E. (2009). *The Interpersonal-Psychological Theory of Suicidal Behavior: Current empirical status*. *Psychological Science Agenda*.

Joiner, T. E., Brown, J. S., & Wingate, L. R. (2005). The psychology and neurobiology of suicidal behavior. *Annual Review of Psychology*, *56,* 287–314.

Joiner, T. E., Pettit, J. W., Walker, R. L., Voelz, Z. R., Cruz, J., Rudd, M. D., & Lester, D. (2002). Perceived burdensomeness and suicidality: Two studies on the suicide notes of those attempting and those completing suicide. *Journal of Social and Clinical Psychology, 21,* 531–545.

Joiner, T. E., Van Orden, K. A., Witte, T. K., Selby, E. A., Ribeiro, J. D., Lewis, R., & Rudd, M. D. (2009). Main predictions of the Interpersonal-Psychological Theory of Suicidal Behavior: Empirical tests in two samples of young adults. *Journal of Abnormal Psychology*, *118,* 634–646.

Jokinen, J., Chatzittofis, A., Hellström, C., Nordström, P., Uvnäs-Moberg, K., & Asberg, M. (2012). Low CSF oxytocin reflects high intent in suicide attempters. *Psychoneuroendocrinology*, *37*, 482–490.

Joseph, S. C. (1997). A comprehensive clinical evaluation of 20,000 Persian Gulf War veterans. *Military Medicine*, *162*, 149–155.

Kang, H. K., & Bullman, T. A. (2008). Risk of suicide among US veterans after returning from the Iraq or Afghanistan war zones. *The Journal of the American Medical Association*, *300*, 652–653.

Kang, H. K., & Bullman, T. A. (2009). Is there an epidemic of suicides among current and former U.S. military personnel? *Annals of Epidemiology*, *19*, 757–760.

Kang, H. K., Bullman, T. A., Macfarlane, G. J., & Gray, G. C. (2002). Mortality among US and UK veterans of the Persian Gulf War: A review. *Occupational and Environmental Medicine*, *59*, 794–799.

Kang, H. K., Bullman, T. A., Smolenski, D. J., Skopp, N. A., Gahm, G. A., & Reger, M. A. (2015). Suicide risk among 1.3 million veterans who were on active duty during the Iraq and Afghanistan wars. *Annals of Epidemiology*, *25*, 96–100.

Kashdan, T. B., Uswatte, G., & Julian, T. (2006). Gratitude and hedonic and eudaimonic well-being in Vietnam war veterans. *Behaviour Research and Therapy*, *44*, 177–199.

Keane, T. M., Caddell, J. M., & Taylor, K. L. (1988). Mississippi Scale for combat-related posttraumatic stress disorder: Three studies in reliability and validity. *Journal of Consulting and Clinical Psychology*, *56*, 85–90.

Keane, T. M., Fairbank, J. A., Caddell, J. M., Zimering, R. T., Taylor, K. L., & Mora, C. A. (1989). Clinical evaluation of a measure to assess combat exposure. *Psychological Assessment*, *1*, 53–55.

Keane, T. M., Scott, W. O., Chavoya, G. A., Lamparski, D. M., & Fairbank, J. A. (1985a). Social support in Vietnam veterans with posttraumatic stress disorder: A comparative analysis.

Journal of Consulting and Clinical Psychology, *53*, 95–102.

Keane, T. M., Scott, W. O., Chavoya, G. A., Lamparski, D. M., & Fairbank, J. A. (1985b). Social support in Vietnam veterans with posttraumatic stress disorder: A comparative analysis. *Journal of Consulting and Clinical Psychology*, *53*, 95–102.

Kerr, B., Godfrey-Smith, P., & Feldman, M. W. (2004). What is altruism? *Trends in Ecology and Evolution*, *19*, 135–140.

Kessler, R. C., Borges, G., & Walters, E. E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry*, *56*, 617–626.

Khan, A., Leventhal, R. M., Khan, S., & Brown, W. A. (2002). Suicide risk in patients with anxiety disorders: A meta-analysis of the FDA database. *Journal of Affective Disorders*, *68*, 183–190.

Khaylis, A., Polusny, M. A., Erbes, C. R., Gewirtz, A., & Rath, M. (2011). Posttraumatic stress, family adjustment, and treatment preferences among National Guard soldiers deployed to OEF/OIF. *Military Medicine*, *176*, 126–131.

Killgore, W. D. S., Cotting, D. I., Thomas, J. L., Cox, A. L., McGurk, D., Vo, A. H., … Hoge, C. W. (2008). Post-combat invincibility: Violent combat experiences are associated with increased risk-taking propensity following deployment. *Journal of Psychiatric Research*, *42*, 1112–1121.

King, L. A., King, D. W., Fairbank, J. A., Keane, T. M., & Adams, G. A. (1998). Resilience-recovery factors in post-traumatic stress disorder among female and male Vietnam veterans: Hardiness, postwar social support, and additional stressful life events. *Journal of Personality and Social Psychology*, *74*, 420–434.

Kleiman, E. M., Adams, L. M., Kashdan, T. B., & Riskind, J. H. (2013). Gratitude and grit indirectly reduce risk of suicidal ideations by enhancing meaning in life: Evidence for a mediated moderation model. *Journal of Research in Personality, 47*, 539–546.

Kleiman, E. M., & Liu, R. T. (2013). Social support as a protective factor in suicide: Findings from two nationally representative samples. *Journal of Affective Disorders, 150*, 540–545.

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. (T. D. Little, Ed.) (3rd ed.). NY, NY: Guilford Press.

Knoke, J. D., Smith, T. C., Gray, G. C., Kaiser, K. S., & Hawksworth, A. W. (2000). Factor analysis of self-reported symptoms: Does it identify Gulf War Syndrome? *American Journal of Epidemiology, 152*, 379–388.

Knox, K. L., Litts, D. A., Talcott, G. W., Feig, J. C., & Caine, E. D. (2003). Risk of suicide and related adverse outcomes after exposure to a suicide prevention programme in the US Air Force: Cohort study. *British Medical Journal, 327*, 1376.

Koob, P. B., & Davis, S. F. (1977). Fear of death in military officers and their wives. *Psychological Reports, 40*, 261–262.

Koss, M. P., Figueredo, A. J., & Prince, R. J. (2002). Cognitive mediation of rape's mental, physical, and social health in tests of four models in cross-sectional data. *Journal of Consulting and Clinical Psychology, 70*, 926–941.

Kramer, T. L., Lindy, J. D., Green, B. L., Grace, M. C., & Leonard, A. C. (1994a). The comorbidity of post-traumatic stress disorder and suicidality in Vietnam veterans. *Suicide and Life-Threatening Behavior, 24*, 58–67.

Kramer, T. L., Lindy, J. D., Green, B. L., Grace, M. C., & Leonard, A. C. (1994b). The comorbidity of post-traumatic stress disorder and suicidality in Vietnam veterans. *Suicide*

and Life-Threatening Behavior, *24*, 58–67.

Krause, N., & Shaw, B. A. (2000). Giving social support to others, socioeconomic status, and changes in self-esteem in late life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *55*, S323–S333.

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*, 606–613.

Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Lowe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics*, *50*, 613–621.

Kulka, R. A., Schlenger, W. E., Fairbank, J. A., Hough, R. L., Jordan, B. K., Marmar, C. R., & Weiss, D. S. (1988). *Contractual Report of Findings from the National Vietnam Veterans' Readjustment Study: Volumes 1-4. Research Triangle Institute*. North Carolina.

Kulka, R. A., Schlenger, W. E., Fairbank, J. A., Hough, R. L., Jordan, B. K., Marmar, C. R., & Weiss, D. S. (1990). *Trauma and the Vietnam War Generation: Report of findings From the National Vietnam Veterans Readjustment Study.* Brunner/Mazel.

LaGaipa, J. J. (1977). Interpersonal attraction and social exchange. In *Theory and Practice in Interpersonal Attraction* (pp. 129–164). San Diego, CA: Academic Press.

Laufer, R. S., Frey-Wouters, E., & Gallops, M. S. (1985). Traumatic Stressors in the Vietnam War and Posttraumatic Stress Disorder. In C. R. Figley (Ed.), *Trauma and Its Wake: The Study and Treatment of Post-Traumatic Stress Disorder* (pp. 73–89). Bristol, PA: Brunner/Mazel.

Layous, K., Chancellor, J., & Lyubomirsky, S. (2014). Positive activities as protective factors against mental health conditions. *Journal of Abnormal Psychology*, *123*, 3–12.

Layous, K., Chancellor, J., Lyubomirsky, S., Wang, L., & Doraiswamy, P. M. (2011). Delivering

happiness: Translating positive psychology intervention research for treating major and minor depressive disorders. *The Journal of Alternative and Complementary Medicine, 17,* 1–9.

LeardMann, C. A., Powell, T. M., Smith, T. C., Bell, M. R., Smith, B., Boyko, E. J., … Hoge, C. W. (2013). Risk factors associated with suicide in current and former US military personnel. *The Journal of the American Mediical Association, 310,* 496–506.

Lemaire, C. M., Graham, D. P., & Debakey, M. E. (2011). Factors associated with suicidal ideation in OEF/OIF veterans. *Public Health Resources, 130,* 231–238.

Liu, P., Wang, L., Cao, C., Wang, R., Zhang, J., Zhang, B., … Elhai, J. D. (2014). The underlying dimensions of DSM-5 posttraumatic stress disorder symptoms in an epidemiological sample of Chinese earthquake survivors. *Journal of Anxiety Disorders, 28,* 345–351.

Magruder, K. M., Frueh, B. C., Knapp, R. G., Johnson, M. R., Vaughan, J. A., Carson, T. C., … Hebert2, R. (2004). PTSD symptoms, demographic characteristics, and functional status among veterans treated in VA primary care clinics. *Journal of Traumatic Stress, 17,* 293–301.

Magruder, K. M., & Yeager, D. E. (2009). The prevalence of PTSD across war eras and the effect of deployment on PTSD: A systematic review and meta-analysis. *Psychiatric Annals, 39*(8), 778–788.

Maguen, S., Vogt, D. S., King, L. A., King, D. W., & Litz, B. T. (2006). Posttraumatic growth among Gulf War I veterans: The predictive role of deployment related experiences and background characteristics. *Journal of Loss and Trauma, 11,* 373–388.

Mann, J. J., Ellis, S. P., Waternaux, C. M., Liu, X., Oquendo, M. A., Malone, K. M., … Currier,

D. (2008). Classification trees distinguish suicide attempters in major psychiatric disorders: A model of clinical decision making. *The Journal of Clinical Psychiatry*, *69*, 23–31.

March, J. S. (2009). The future of psychotherapy for mentally ill children and adolescents. *Journal of Child Psychology and Psychiatry*, *50*, 170–179.

Martin, J., Ghahramanlou-Holloway, M., Lou, K., & Tucciarone, P. (2009). A comparative review of U.S. military and civilian suicide behavior: Implications for OEF/OIF suicide prevention efforts. *Journal of Mental Health Counseling*, *31*, 101–118.

McCarthy, E., & Petrakis, I. (2011). Case report on the use of Cognitive Processing Therapy-Cognitive, enhanced to address heavy alcohol use. *Journal of Traumatic Stress*, *24*, 474–478.

McFall, M. E., Mackay, P. W., & Donovan, D. M. (1992). Combat-related posttraumatic stress disorder and severity of substance abuse in Vietnam veterans. *Journal of Studies on Alcohol*, *53*, 357–363.

McLean, C. P., Zang, Y., Zandberg, L., Bryan, C. J., Gay, N., Yarvis, J. S., & Foa, E. B. (2017). Predictors of suicidal ideation among active duty military personnel with posttraumatic stress disorder. *Journal of Affective Disorders*, *208*, 392–398.

Meadows, L. A., Kaslow, N. J., Thompson, M. P., & Jurkovik, G. J. (2005). Protective factors against suicide attempt risk among African American women experiencing intimate partner violence. *American Journal of Community Psychology*, *36*, 109–121.

Midlarsky, E. (1991). Helping as Coping. In M. S. Clark (Ed.), *Review of Personality and Social Psychology, Vol. 12. Prosocial Behavior* (pp. 238–264). Thousand Oaks, CA: Sage Publications, Inc.

Miller, I. W., Norman, W. H., Bishop, S. B., & Dow, M. G. (1986). The Modified Scale for

Suicidal Ideation: Reliability and validity. *Journal of Consulting and Clinical Psychology*, *54*, 724–725.

Mitchell, M. M., Gallaway, M. S., Millikan, A. M., & Bell, M. (2012). Interaction of combat exposure and unit cohesion in predicting suicide-related ideation among post-deployment soldiers. *Suicide and Life-Threatening Behavior*, *42*, 486–494.

Momtaz, Y. A., Ibrahim, R., & Hamid, T. A. (2014). The impact of giving support to others on older adults' perceived health status. *Psychogeriatrics*, *14*, 31–37.

Monson, C. M., Fredman, S. J., Macdonald, A., Pukay-Martin, N. D., Resick, P. A., & Schnurr, P. P. (2012). Effect of Cognitive-Behavioral Couple Therapy for PTSD. *Journal of American Medical Association*, *308*, 700–709.

Monteith, L. L., Menefee, D. S., Pettit, J. W., Leopoulos, W. L., & Vincent, J. P. (2013). Examining the Interpersonal–Psychological Theory of Suicide in an inpatient veteran sample. *Suicide and Life-Threatening Behavior*, *43*, 418–428.

Morissette, S. B., Woodward, M., Kimbrel, N. A., Meyer, E. C., Kruse, M. I., Dolan, S., & Gulliver, S. B. (2011). Deployment-related TBI, persistent postconcussive symptoms, PTSD, and depression in OEF/OIF veterans. *Rehabilitation Psychology*, *56*, 340–350.

Muthén, L. K. (2012). Just-identified model. Retrieved March 20, 2018, from http://www.statmodel.com/discussion/messages/11/3699.html?1359397739

Muthén, L. K., & Muthén, B. O. (2017). *Mplus User's Guide* (Eighth Edi). Los Angeles: Muthen & Muthen.

Nađ, S., Marčinko, D., Vuksan-Æusa, B., Jakovljević, M., & Jakovljevic, G. (2008). Spiritual well-being, intrinsic religiosity, and suicidal behavior in predominantly Catholic Croatian war veterans with chronic posttraumatic stress disorder. *The Journal of Nervous and Mental*

Disease, 196, 79–83.

Nademin, E., Jobes, D. A., Pflanz, S. E., Jacoby, A. M., Ghahramanlou-Holloway, M., Campise, R., … Johnson, L. (2008). An investigation of interpersonal-psychological variables in Air Force suicides: A controlled-comparison study. *Archives of Suicide Research*, *12*, 309–326.

National Center for Veterans Analysis and Statistics. (2016). *Profile of Veterans 2014: Data from the American Community Survey*. Retrieved from http://www.va.gov/vetdata/docs/SpecialReports/Profile_of_Veterans_2009_FINAL.pdf

Nicholson, N. R. (2009). Social isolation in older adults: An evolutionary concept analysis. *Journal of Advanced Nursing*, *65*, 1342–1352.

Nock, M., Joiner, T., Gordon, K., Lloyd-Richardson, E., & Prinstein, M. (2006). Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry Research*, *144*, 65–72.

Nock, M. K., Borges, G., Bromet, E. J., Cha, C. B., Kessler, R. C., & Lee, S. (2008). Suicide and suicidal behavior. *Epidemiologic Reviews*, *30*, 133–154.

Nock, M. K., Deming, C. A., Fullerton, C. S., Gilman, S. E., Goldenberg, M., Kessler, R. C., … Ursano, R. J. (2013). Suicide among soldiers: A review of psychosocial risk and protective factors. *Psychiatry, 76*, 97–125.

Nrugham, L., Holen, A., & Sund, A. M. (2010). Associations between attempted suicide, violent life events, depressive symptoms, and resilience in adolescents. *The Journal of Nervous and Mental Disease, 198*, 131–136.

O'Carroll, P. W., Berman, A. L., Maris, Ronald, W., Moscicki, E. K., Tanney, B. L., & Silverman, M. M. (1996). Beyond the Tower of Babel: A nomenclature for suicidology. *Suicide and Life-Threatening Behavior*, *26*, 237–252.

O'Connor, R. C. (2011). The Integrated Motivational-Volitional model of suicidal behavior. *Crisis*, *32*, 295–298.

Oquendo, M. A., Friend, J. M., Halberstam, B., Beth Brodsky, B. S., Burke, A. K., Grunebaum, M. F., … Mann, J. J. (2003). Association of comorbid posttraumatic stress disorder and major depression with greater risk for suicidal behavior. *American Journal of Psychiatry*, *160*, 580–582.

Orbach, I., Mikulince, M., King, R., Cohen, D., & Stein, D. (1997). Thresholds and tolerance of physical pain in suicidal and nonsuicidal adolescents. *Journal of Consulting and Clinical Psychology*, *65*, 646–652.

Oyama, H., Sakashita, T., Ono, Y., Goto, M., Fujita, M., & Koida, J. (2008). Effects of community-based intervention using depression screening on elderly suicide risk: A meta-analysis of the evidence from Japan. *Community Mental Health Journal*, *44*, 311–320.

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, *129*, 52–73.

Padurariu, M., Prepelita, R., Ciobica, A., Dobrin, R., Timofte, D., Stefanescu, C., & Chirita, R. (2016). Concept of suicide: Neurophysiological/Genetic theories and possible oxytocin relevance. *Neurophysiology*, *48*, 312–321.

Panagioti, M., Gooding, P. A., Taylor, P. J., & Tarrier, N. (2014). Perceived social support buffers the impact of PTSD symptoms on suicidal behavior: Implications into suicide resilience research. *Comprehensive Psychiatry*, *55*, 104–112.

Pavao, J., Alvarez, J., Baumrind, N., Induni, M., & Kimerling, R. (2007). Intimate partner violence and housing instability. *American Journal of Preventive Medicine*, *32*, 143–146.

Pew Research Center. (2011). Chapter 6: A Profile of the Modern Military. Retrieved March 8,

2018, from http://www.pewsocialtrends.org/2011/10/05/chapter-6-a-profile-of-the-modern-military/

Pietrzak, R. H., & Cook, J. M. (2013). Psychological resilience in older U.S. veterans: Results from the National Health and Resilience in Veterans Study. *Depression and Anxiety*, *30*, 432–443.

Pietrzak, R. H., Goldstein, M. B., Malley, J. C., Rivers, A. J., Johnson, D. C., & Southwick, S. M. (2010). Risk and protective factors associated with suicidal ideation in veterans of Operations Enduring Freedom and Iraqi Freedom. *Journal of Affective Disorders*, *123*, 102–107.

Pietrzak, R. H., Johnson, D. C., Goldstein, M. B., Malley, J. C., Rivers, A. J., Morgan, C. A., & Southwick, S. M. (2010). Psychosocial buffers of traumatic stress, depressive symptoms, and psychosocial difficulties in veterans of Operations Enduring Freedom and Iraqi Freedom: The role of resilience, unit support, and postdeployment social support. *Journal of Affective Disorders*, *120*, 188–192.

Pietrzak, R. H., Russo, A. R., Ling, Q., & Southwick, S. M. (2011). Suicidal ideation in treatment-seeking veterans of Operations Enduring Freedom and Iraqi Freedom: The role of coping strategies, resilience, and social support. *Journal of Psychiatric Research*, *45*, 720–726.

Pietrzak, R. H., Tsai, J., Armour, C., Mota, N., Harpaz-Rotem, I., & Southwick, S. M. (2015). Functional significance of a novel 7-factor model of DSM-5 PTSD symptoms: Results from the National Health and Resilience in Veterans Study. *Journal of Affective Disorders*, *174*, 522–526.

Pietrzak, R. H., Whealin, J. M., Stotzer, R. L., Goldstein, M. B., & Southwick, S. M. (n.d.). An

examination of the relation between combat experiences and combat-related posttraumatic stress disorder in a sample of Connecticut OEF/OIF Veterans. *Journal of Psychiatric Research*, *45*, 1579–1584.

Pitchot, W., Hansenne, M., & Ansseau, M. (2001). Role of dopamine in non-depressed patients with a history of suicide attempts. *European Psychiatry*, *16*, 424–427.

Poindexter, E. K., Mitchell, S. M., Jahn, D. R., Smith, P. N., Hirsch, J. K., & Cukrowicz, K. C. (2015). PTSD symptoms and suicide ideation: Testing the conditional indirect effects of thwarted interpersonal needs and using substances to cope. *Personality and Individual Differences*, *77*, 167–172.

Pokorny, A. D. (1983). Prediction of suicide in psychiatric patients. *Archives of General Psychiatry*, *40*, 249–257.

Post, S. G. (2005). Altruism, happiness, and health: It's good to be good. *International Journal of Behavioral Medicine*, *12*, 66–77.

Power, K. G., Cooke, D. J., & Brooks, D. N. (1985). Life stress, medical lethality, and suicidal intent. *The British Journal of Psychiatry*, *147*, 655–659.

Prinstein, M. J. (2008). Introduction to the special section on suicide and nonsuicidal self-injury: A review of unique challenges and important directions for self-injury science. *Journal of Consulting and Clinical Psychology*, *76*, 1–8.

Rainey, E. E., Petrey, L. B., Reynolds, M., Agtarap, S., & Warren, A. M. (2014). Psychological factors predicting outcome after traumatic injury: The role of resilience. *The American Journal of Surgery*, 1–7.

Ramsawh, H. J., Fullerton, C. S., Herberman Mash, H. B., Hin Ng, T. H., Kessler, R. C., Mash, H., … Ursano, R. J. (2014). Risk for suicidal behaviors associated with PTSD, depression,

and their comorbidity in the U.S. Army. *Journal of Affective Disorders, 161*, 116–122.

Resick, P. A., Monson, C. M., & Chard, K. M. (2016). *Cognitive Processing Therapy for PTSD: A Comprehensive Manual*. New York, NY: Guilford Press.

Ribeiro, J. D., & Joiner, T. E. (2009). The Interpersonal-Psychological Theory of Suicidal Behavior: Current status and future directions. *Journal of Clinical Psychology*, *65*, 1291–1299.

Ritchie, E. C., Keppler, W. C., & Rothberg, J. M. (2003). Suicidal admissions in the United States military. *Military Medicine*, *168*, 177–184.

Ritvo, E. (2014, April 24). The Neuroscience of Giving. *Psychology Today*. Retrieved from https://www.psychologytoday.com/us/blog/vitality/201404/the-neuroscience-giving

Rosenheck, R. A., & Fontana, A. F. (2007). Recent trends in VA treatment of post-traumatic stress disorder and other mental disorders. *Health Affairs, 26*, 1720–1727.

Rosenheck, R., Gallup, P., & Leda, C. A. (1991). Vietnam era and Vietnam combat veterans among the homeless. *American Journal of Public Health, 81*, 643–646.

Roy, A., Carli, V., & Sarchiapone, M. (2011). Resilience mitigates the suicide risk associated with childhood trauma. *Journal of Affective Disorders*, *133*, 591–594.

Roy, A., Sarchiapone, M., & Carli, V. (2007). Low resilience in suicide attempters. *Archives of Suicide Research, 11*, 265–269.

Rozanov, V., & Carli, V. (2012). Suicide among war veterans. *International Journal of Environmental Research and Public Health, 9*, 2504–2519.

Rudd, M. D. (2006). Fluid Vulnerability Theory: A cognitive approach to understanding the process of acute and chronic suicide risk. In *Cognition and Suicide: Theory, Research, and Therapy.* (pp. 355–368). Washington: American Psychological Association.

Ruscio, A. M., Weathers, F. W., King, L. A., & King, D. W. (2002). Male war-zone veterans' perceived relationships with their children: The importance of emotional numbing. *Journal of Traumatic Stress, 15*, 351–357.

Sareen, J., Houlahan, T., Cox, B. J., & Asmundson, G. J. G. (2005). Anxiety disorders associated with suicidal ideation and suicide attempts in the National Comorbidity Survey. *Journal of Nervous and Mental Disease, 193*, 450–454.

Sauer, J., & Bhugra, D. (2001). Drug treatments in post-traumatic stress disorder. *International Review of Psychiatry, 13*, 189–193.

Schafer, J. L. (1999). Multiple imputation: A primer. *Statistical Methods in Medical Research, 8*, 3–15.

Schnurr, P. P., Lunney, C. A., Bovin, M. J., & Marx, B. P. (2009). Posttraumatic stress disorder and quality of life: Extension of findings to veterans of the wars in Iraq and Afghanistan. *Clinical Psychology Review, 29*, 727–735.

Schotte, D. E., & Clum, G. A. (1987). Problem-solving skills in suicidal psychiatric patients. *Journal of Consulting and Clinical Psychology, 55*, 49–54.

Schwartz, C., Meisenhelder, J. B., Ma, Y., & Reed, G. (2003). Altruistic social interest behaviors are associated with better mental health. *Psychosomatic Medicine, 65*, 778–785.

Seal, K. H., Metzler, T. J., Gima, K. S., Bertenthal, D., Maguen, S., & Marmar, C. R. (2009). Trends and risk factors for mental health diagnoses among Iraq and Afghanistan veterans using Department of Veterans Affairs Health Care, 2002-2008. *Research and Practice, 99*, 1651–1658.

Selby, E. A., Anestis, M. D., Bender, T. W., Ribeiro, J. D., Nock, M. K., Rudd, M. D., … Joiner, T. E. (2010). Overcoming the fear of lethal injury: Evaluating suicidal behavior in the

military through the lens of the Interpersonal- Psychological Theory of Suicide. *Clinical Psychology Review, 30,* 298–307.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5–14.

Sheehan, D. V, Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., … Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, *59*(Supplement 20), 22–33.

Shepard, D. S., Gurewich, D., Lwin, A. K., Reed, G. A., & Silverman, M. M. (2016). Suicide and suicidal attempts in the United States: Costs and policy implications. *Suicide and Life-Threatening Behavior*, *46*, 352–362.

Sherbourne, C. D., & Stewart, A. L. (1991). The MOS Social Support Survey. *Social Science and Medicine*, *32*, 705–714.

Shipherd, J. C., Stafford, J., & Tanner, L. R. (2005). Predicting alcohol and drug abuse in Persian Gulf War veterans: What role do PTSD symptoms play? *Addictive Behaviors*, *30*, 595–599.

Shneidman, E. S. (1993). Commentary: Suicide as psychache. *The Journal of Nervous and Mental Disease*, *181*, 145–147.

Silverman, M. M., Berman, A. L., Sanddal, N. D., O'Carroll, P. W., & Joiner, Jr., T. E. (2007). Rebuilding the Tower of Babel: A revised nomenclature for the study of suicide and suicidal behaviors part 1: Background, rationale, and methodology. *Suicide and Life-Threatening Behavior*, *37*, 248–263.

Simon, T. R., & Crosby, A. E. (2000). Suicide planning among high school students who report attempting suicide. *Suicide and Life-Threatening Behavior*, *30*, 213–221.

Sippel, L. M., Pietrzak, R. H., Charney, D. S., Mayes, L. C., & Southwick, S. M. (2015). How does social support enhance resilience in the trauma-exposed individual? *Ecology and Society*, *20*, 10–19.

Sisask, M., Värnik, A., Kolves, K., Bertolote, J. M., Bolhari, J., Botega, N. J., … Wasserman, D. (2010). Is religiosity a protective factor against attempted suicide: A cross-cultural case study. *Archives of Suicide Research*, *14*, 44–55.

Smith, K., & Crawford, S. (1986). Suicidal behavior among "normal" high school students. *Suicide and Life-Threatening Behavior*, *16*, 313–325.

Solomon, R. L. (1980). The opponent-process theory of acquired motivation: The costs of pleasure and the benefits of pain. *American Psychologist*, *35*, 691–712.

Somers, D. (2013). "I Am Sorry That It Has Come to This": A soldier's last words. Retrieved August 7, 2017, from http://gawker.com/i-am-sorry-that-it-has-come-to-this-a-soldiers-last-534538357

Spaccarelli, S., & Kim, S. (1995). Resilience criteria and factors associated with resilience in sexually abused girls. *Child Abuse & Neglect*, *19*, 1171–1182.

Suda, A., Kawanishi, C., Kishida, I., Sato, R., Yamada, T., Nakagawa, M., … Hirayasu, Y. (2009). Dopamine D2 receptor gene polymorphisms are associated with suicide attempt in the Japanese population. *Neuropsychobiology*, *59*, 130–134.

Sutker, P. B., Davis, J. M., Uddo, M., & Ditta, S. R. (1995). War zone stress, personal resources, and PTSD in Persian Gulf War returnees. *Journal of Abnormal Psychology*, *104*, 444–452.

Sveticic, J., & De Leo, D. (2012). The hypothesis of a continuum in suicidality: A discussion on its validity and practical implications. *Mental Illness*, *4*, e15.

Szanto, K., Reynolds, C. F., Frank, E., Stack, J., Fasiczka, A. L., Miller, M., … Kupfer, D. J.

(1996). Suicide in elderly depressed patients: Is active vs. passive suicidal ideation a clinically valid distinction? *The American Journal of Geriatric Psychiatry, 4*, 197–207.

Takahashi, Y. (2006). Risk Factors of Suicide (article in Japanese). *Suicide Risk*, 44–61.

Tanielian, T., & Jaycox, L. H. (2008). *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery*.

Tarrier, N., & Gregg, L. (2004). Suicide risk in civilian PTSD patients: Predictors of suicidal ideation, planning, and attempts. *Social Psychiatry and Psychiatric Epidemiology*, *39*, 655–661.

Thoresen, S., & Mehlum, L. (2004). Risk factors for fatal accidents and suicides in peacekeepers: Is there an overlap? *Military Medicine*, *169*, 988–993.

Trout, D. L. (1980). The role of social isolation in suicide. *Suicide and Life-Threatening Behavior; Spring*, *10*, 10–23.

Tsai, J., Harpaz-Rotem, I., Pietrzak, R. H., & Southwick, S. M. (2012). The role of coping, resilience, and social support in mediating the relation between PTSD and social functioning in veterans returning from Iraq and Afghanistan. *Psychiatry*, *75*, 135–149.

Ullman, S. E. (1997). Attributions, world assumptions, and recovery from sexual assault. *Journal of Child Sexual Abuse*, *6*, 1–19.

Ullman, S. E., & Najdowski, C. J. (2009). Correlates of serious suicidal ideation and attempts in female adult sexual assault survivors. *Suicide and Life-Threatening Behavior*, *39*, 47–57.

Van Orden, K. A., & Conwell, Y. (2011). Suicides in late life. *Current Psychiatry Reports*, *13*, 234–241.

Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner, T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric

properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, *24*, 197–215.

Van Orden, K. A., Lynam, M. E., Hollar, D., & Joiner, T. E. (2006). Perceived burdensomeness as an indicator of suicidal symptoms. *Cognitive Therapy and Research*, *30*, 457–467.

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The Interpersonal Theory of Suicide. *Psychological Review*, *117*, 575–600.

Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2008). Suicidal desire and the capability for suicide: Tests of the Interpersonal– Psychological Theory of Suicidal Behavior among adults. *Journal of Consulting and Clinical Psychology*, *76*, 72–83.

Vietnam War Statistics. (1997). Retrieved March 8, 2018, from http://history-world.org/vietnam_war_statistics.htm

Vilhjalmsson, R., Kristjansdottir, G., & Sveinbjarnardottir, E. (1998). Factors associated with suicide ideation in adults. *Social Psychiatry and Psychiatric Epidemiology*, *33*, 97–103.

Virgo, K. S., Price, R. K., Spitznagel, E. L., & Ji, T. H. C. (1999). Substance abuse as a predictor of VA medical care utilization among Vietnam veterans. *The Journal of Behavioral Health Services & Research*, *26*, 126–139.

Wagner, A. W., Zatzick, D. F., Ghesquiere, A., & Jurkovich, G. J. (2007). Behavioral activation as an early intervention for posttraumatic stress disorder and depression among physically injured trauma survivors. *Cognitive and Behavioral Practice*, *14*, 341–349.

Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993). The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility. In *Annual Convention of the International Society for Traumatic Stress Studies*. San Antonio, TX.

Weathers, F. W., Litz, B. T., Huska, J. A., & Keane, T. M. (1999). The Posttraumatic Stress

Disorder Checklist for DSM-IV (PCL-IV). Retrieved from interview available from the National Center for PTSD at www.ptsd.va.gov

Weissman, M. M., Klerman, G. L., Markowitz, J. S., & Ouellette, R. (1989). Suicidal ideation and suicide attempts in panic disorder and attacks. *New England Journal of Medicine*, *321*, 1209–1214.

Whitlock, J., Minton, R., Babington, P., & Ernhout, C. (2015). *The relationship between non-suicidal self-injury and suicide: Is NSSI a suicide attempt?* Ithaca, NY.

Whitlock, J., Muehlenkamp, J., Eckenrode, J., Purington, A., Abrams, G. B., Barreira, P., & Kress, V. (2012). Nonsuicidal self-injury as a gateway to suicide in young adults. *Journal of Adolescent Health*, 1–7.

WHO.org. (2017). World Health Organization: Suicide data. Retrieved April 22, 2017, from http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/

Wilcox, H. C., Arria, A. M., Caldeira, K. M., Vincent, K. B., Pinchevsky, G. M., & O'Grady, K. E. (2010). Prevalence and predictors of persistent suicide ideation, plans, and attempts during college. *Journal of Affective Disorders*, *127*, 287–294.

Wilcox, H. C., Storr, C. L., & Breslau, N. (2009). Posttraumatic stress disorder and suicide attempts in a community sample of urban American young adults. *Archives of General Psychiatry*, *66*, 305.

Williams, J. M. G. (1997). *Cry of Pain: Understanding Suicide and Self-Harm*. London, UK: Penguin Group.

Wilson, C. (2007). *Improvised Explosive Devices (IEDs) in Iraq and Afghanistan: Effects and countermeasures*. Retrieved from http://www.dtic.mil/docs/citations/ADA475029

Wingate, L. R., Burns, A. B., Gordon, K. H., Perez, M., Walker, R. L., Williams, F. M., &

Joiner, T. E. (2006). Suicide and positive cognitions: Positive psychology applied to the understanding and treatment of suicidal behavior. In *Cognition and Suicide: Theory, research, and therapy.* (pp. 261–283). Washington, DC: American Psychological Association.

Wolfe, J., Proctor, S. P., Davis, J. D., Borgos, M. S., & Friedman, M. J. (1998). Health symptoms reported by Persian Gulf War veterans two years after return. *American Journal of Industrial Medicine, 33,* 104–113.

Wyder, M., Ward, P., & De Leo, D. (2009). Separation as a suicide risk factor. *Journal of Affective Disorders*, *116*, 208–213.

Yoshimasu, K., Kiyohara, C., Kazuhisa, A., & Ae, M. (2008). Suicidal risk factors and completed suicide: Meta-analyses based on psychological autopsy studies. *Environmental Health and Preventive Medicine*, *13*, 243–256.

You, S., Van Orden, K. A., & Conner, K. R. (2011). Social connections and suicidal thoughts and behavior. *Psychology of Addictive Behaviors*, *25*, 180–184.

Zisook, S., Downs, N., Moutier, C., & Clayton, P. (2012). College students and suicide risk: Prevention and the role of academic psychiatry. *Academic Psychiatry*, *36*, 1–6.

Zivin, K., Kim, H. M., McCarthy, J. F., Austin, K. L., Hoggatt, K. J., Walters, H., & Valenstein, M. (2007). Suicide mortality among individuals receiving treatment for depression in the veterans affairs health system: AssociationssS with patient and treatment setting characteristics. *American Journal of Public Health*, *97*, 2193–2198.

Table 1.1

Psychological Theories of Suicidal Behavior

Author	Main assumptions
Baumeister, 1990	To limit pain, the person aims to limit self-awareness and emotion. This results in irrationality and disinhibition, causing the individual to search for a means to escape.
Brent & Mann, 2005	Familial and genetic vulnerabilities to impulsive aggression increases risk of suicidal behavior.
Durkheim, 1897	Extra-social causes such as individual psychological constitution and physical environment influence suicide rates.
Joiner et al., 2005	Feelings of social non-belongingness and burdensomeness lead to a desire for death, but suicide won't occur unless the capability for suicide is realized.
O'Connor, 2011	Suicide results from a complex interplay of background, motivational, and volitional (i.e., behavioral enaction) factors.
Rudd, 2006	Risk is determined by baseline and acute factors, and predicts the severity and duration of suicidal crises.
Schotte & Clum, 1987	Deficits in interpersonal problem-solving skills increases risk of suicidal behavior as a reaction to stress.
Shneidman, 1993	Suicide occurs when psychological hurt and anguish is deemed to be unbearable.
Williams, 1997	Feelings of defeat, no escape, and no rescue in stressful situations results in suicidal behavior.

Table 1.2

DSM-5 PTSD Symptom Clusters (American Psychiatric Association, 2013)

Symptom Cluster	Definition	Sample Symptoms
Intrusion (Criterion B)	Difficulty preventing memories of trauma from surfacing	Nightmares, unwanted memories, flashbacks
Avoidance (Criterion C)	Evasion of reminders/stimuli that might stir up memories of the trauma	Avoidance of thoughts/feelings, or external reminders (e.g., people, places)
Negative Alterations in Cognition and Mood (Criterion D)	Changes in mood or mental state which began or worsened following the trauma	Distorted blame, exaggerated negative beliefs about oneself/the world
Alterations in Arousal and Reactivity (Criterion E)	Changes in arousal and reactivity related to the trauma	Irritability, reckless behavior, exaggerated startle response
Symptom Duration (Criterion F)	Persistence of symptoms for more than one month	Symptoms have lasted at least one month
Functional Significance (Criterion G)	Significant distress or functional impairment (e.g., social, occupational) resulting from the trauma	Impact of symptoms on relationships or ability to work
Exclusion (Criterion H)	Symptoms are not due to medication, substance use, or other diagnosis	Symptoms cannot be attributed to any other source

Table 3.7

Unstandardized Parameter Estimates With SI Severity Outcome Variable

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	*S.E.*	Est.	S.E.	Est.	S.E.	Est.	S.E.
Non-combat											
	SI severity ON										
	PTSD severity	.044	.026	.032	.015*	.046	.025	.011	.007	.011	.009
	Social connectedness	.007	.007	.007	.009	---	---	---	---	---	---
	PAC	-.002	.006	---	---	.003	.007	---	---	---	---
	Social engagement	-.019	.010	---	---	---	---	-.010	.009	---	---
	Altruism	-.018	.014	---	---	---	---	---	---	-.022	.013
	PTSD*social connectedness	-.001	.001	-.002	.001*	---	---	---	---	---	---
	PTSD*PAC	-.001	.001	---	---	-.001	.001	---	---	---	---
	PTSD*social engagement	.002	.002	---	---	---	---	.000	.001	---	---
	PTSD*altruism	.000	.002	---	---	---	---	---	---	.000	.002
Vietnam War											
	SI severity ON										
	PTSD severity	.000	.015	.020	.017	.027	.010**	.025	.011*	-.008	.010
	Social connectedness	.007	.007	.003	.005	---	---	---	---	---	---
	PAC	-.005	.006	---	---	-.006	.004	---	---	---	---
	Social engagement	.000	.010	---	---	---	---	.015	.009	---	---
	Altruism	-.033	.015*	---	---	---	---	---	---	-.035	.015*
	PTSD*social connectedness	.000	.001	.000	.001	---	---	---	---	---	---
	PTSD*PAC	-.001	.000	---	---	-.001	.000*	---	---	---	---
	PTSD*social engagement	.000	.002	---	---	---	---	-.003	.002	---	---
	PTSD*altruism	.007	.003*	---	---	---	---	---	---	.007	.003*

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	*S.E.*	Est.	S.E.	Est.	S.E.	Est.	S.E.
Persian Gulf											
	SI severity ON										
	PTSD severity	-.097	.030**	1.335	.787	-.024	.021	.023	.019	-.045	.017*
	Social connectedness	-.050	.039	-.165	.223	---	---	---	---	---	---
	PAC	-.031	.014*	---	---	-.035	.025	---	---	---	---
	Social engagement	.006	.027	---	---	---	---	-.115	.068	---	---
	Altruism	-.074	.088	---	---	---	---	---	---	-.077	.123
	PTSD*social connectedness	.001	.002	-.752	.276	---	---	---	---	---	---
	PTSD*PAC	.002	.001*	---	---	.003	.001*	---	---	---	---
	PTSD*social engagement	-.007	.004	---	---	---	---	.004	.006	---	---
	PTSD*altruism	.033	.005**	---	---	---	---	---	---	.034	.007**
OEF/OIF/ OND											
	SI severity ON										
	PTSD severity	.083	.016**	.785	.321*	.036	.019*	.040	.005**	.021	.011
	Social connectedness	.031	.017	-.075	.153	---	---	---	---	---	---
	PAC	.034	.020	---	---	-.048	.032	---	---	---	---
	Social engagement	-.054	.032	---	---	---	---	.001	.014	---	---
	Altruism	.125	.065	---	---	---	---	---	---	-.059	.075
	PTSD*social connectedness	-.003	.001**	-.272	.212	---	---	---	---	---	---
	PTSD*PAC	-.001	.000*	---	---	-.001	.274	---	---	---	---
	PTSD*social engagement	.002	.002	---	---	---	---	-.005	.001**	---	---
	PTSD*altruism	-.004	.003	---	---	---	---	---	---	.004	.004

Note: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement. *significant at $p < .05$. **significant at $p < .01$

Table 3.8

Standardized Parameter Estimates With SI Severity Outcome Variable

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	*S.E.*	Est.	S.E.	Est.	S.E.	Est.	S.E.
Non-combat											
	SI severity ON										
	PTSD severity	.813	.374	**.588**	**.218**	.846	.353	.195	.105	.210	.133
	Social connectedness	.058	.069	.060	.081	---	---	---	---	---	---
	PAC	-.018	.065	---	---	.031	.082	---	---	---	---
	Social engagement	-.095	.048	---	---	---	---	-.053	.046	---	---
	Altruism	-.062	.050	---	---	---	---	---	---	-.145	.106
	PTSD*social connectedness	-.319	.193	**-.434**	**.117**	---	---	---	---	---	---
	PTSD*PAC	-.452	.324	---	---	-.698	.303	---	---	---	---
	PTSD*social engagement	.141	.128	---	---	---	---	-.015	.093	---	---
	PTSD*altruism	.000	.152	---	---	---	---	---	---	-.010	.124
Vietnam War											
	SI severity ON										
	PTSD severity	-.002	.429	.020	.017	**.768**	**.252**	**.714**	**.241**	-.236	.267
	Social connectedness	.113	.099	.003	.005	---	---	---	---	---	---
	PAC	-.112	.122	---	---	-.132	.090	---	---	---	---
	Social engagement	-.002	.074	---	---	---	---	.113	.063	---	---
	Altruism	**-.198**	**.078**	---	---	---	---	---	---	-.216	.078
	PTSD*social connectedness	.083	.274	.000	.001	---	---	---	---	---	---
	PTSD*PAC	-.358	.257	---	---	**-.467**	**.231**	---	---	---	---
	PTSD*social engagement	-.027	.197	---	---	---	---	-.322	.212	---	---
	PTSD*altruism	**.737**	**.305**	---	---	---	---	---	---	**-.753**	**.325**

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	*S.E.*	Est.	S.E.	Est.	S.E.	Est.	S.E.
Persian Gulf											
	Si severity ON										
	PTSD severity	**-1.644**	**.868**	.078	.061	-.408	.359	.385	.247	**-.769**	**.404**
	Social connectedness	-.222	.190	-.031	.038	---	---	---	---	---	---
	PAC	**-.252**	**.161**	---	---	-.290	.230	---	---	---	---
	Social engagement	.015	.066	---	---	---	---	-.282	.166	---	---
	Altruism	-.075	.093	---	---	---	---	---	---	-.080	.132
	PTSD*social connectedness	.285	.559	-.003	.003	---	---	---	---	---	---
	PTSD*PAC	**.607**	**.346**	---	---	**1.017**	**.302**	---	---	---	---
	PTSD*social engagement	-.136	.112	---	---	---	---	.084	.127	---	---
	PTSD*altruism	**1.310**	**.277**	---	---	---	---	---	---	**1.364**	**.276**
OEF/OIF/ OND											
	SI severity ON										
	PTSD severity	**2.32**	**.400**	**.039**	**.010**	**.740**	**.444**	**1.116**	**.133**	.432	.285
	Social connectedness	.217	.119	-.015	.032	---	---	---	---	---	---
	PAC	.340	.208	---	---	-.353	.206	---	---	---	---
	Social engagement	-.288	.173	---	---	---	---	.007	.075	---	---
	Altruism	.297	.172	---	---	---	---	---	---	-.102	.113
	PTSD*social connectedness	**-.678**	**.164**	-.002	.001	---	---	---	---	---	---
	PTSD*PAC	**-.560**	**.238**	---	---	-.271	.267	---	---	---	---
	PTSD*social engagement	.230	.206	---	---	---	---	**-.471**	**.170**	---	---
	PTSD*altruism	-.301	.225	---	---	---	---	---	---	.220	.206

Note: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement. **Bold** indicates unstandardized estimate was significant at $p < .05$ and may therefore be interpreted.

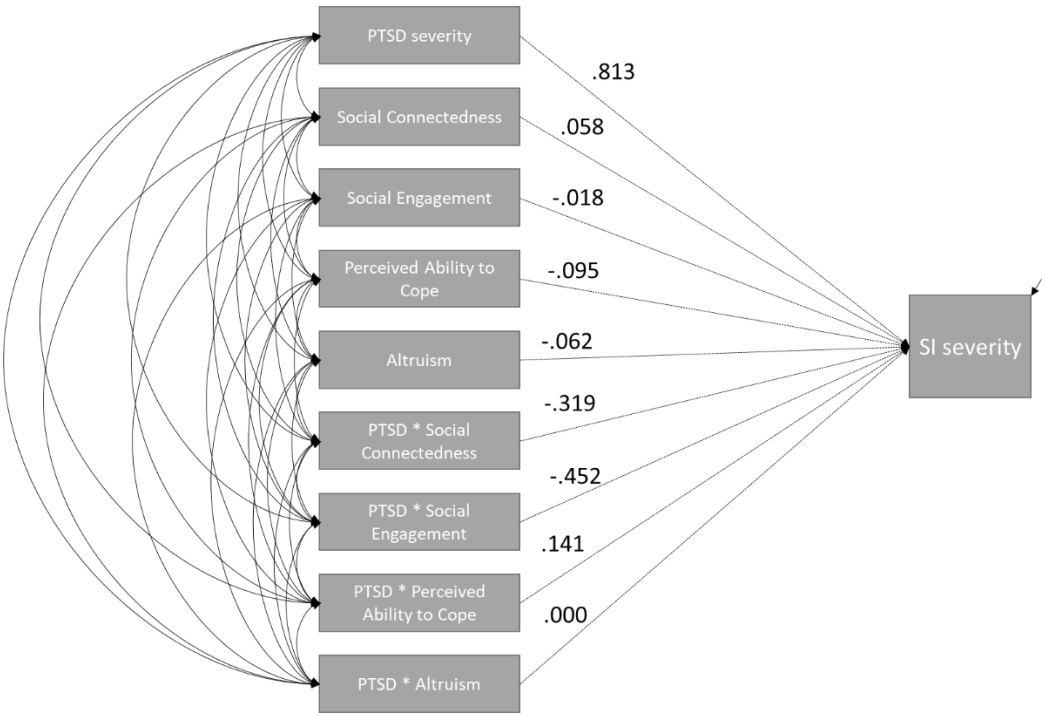

Figure 3.1. Standardized parameter estimates of non-combat veterans on SI severity.

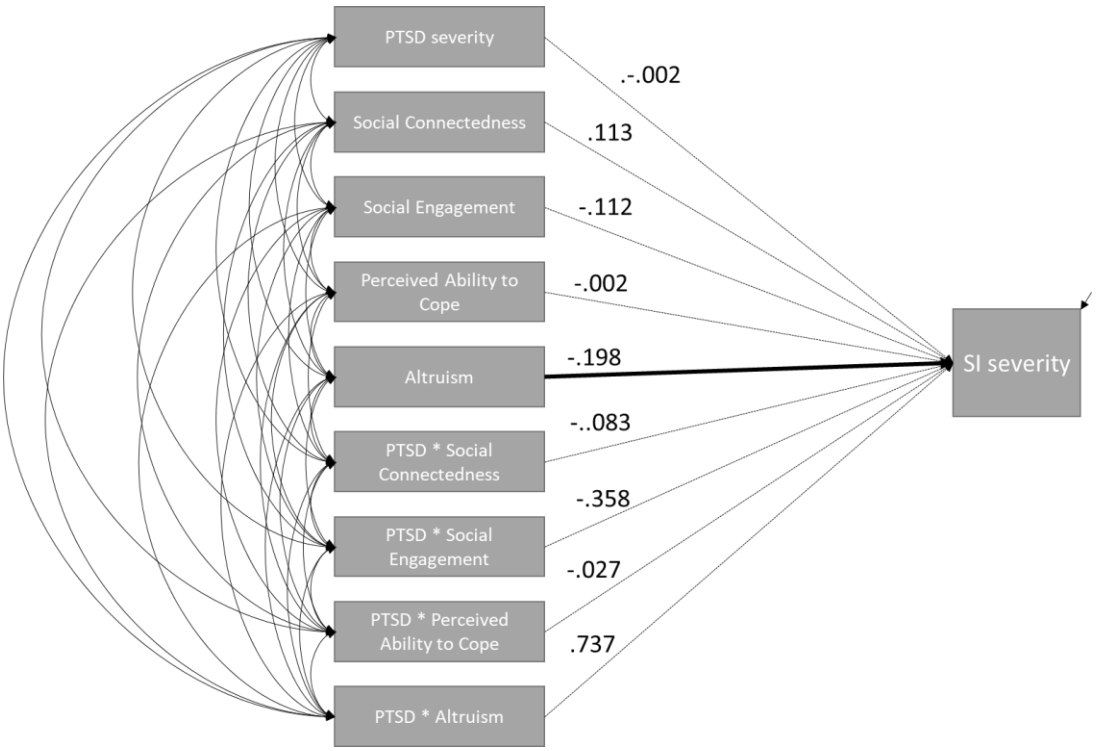

Figure 3.2. Standardized parameter estimates of Vietnam War veterans on SI severity.

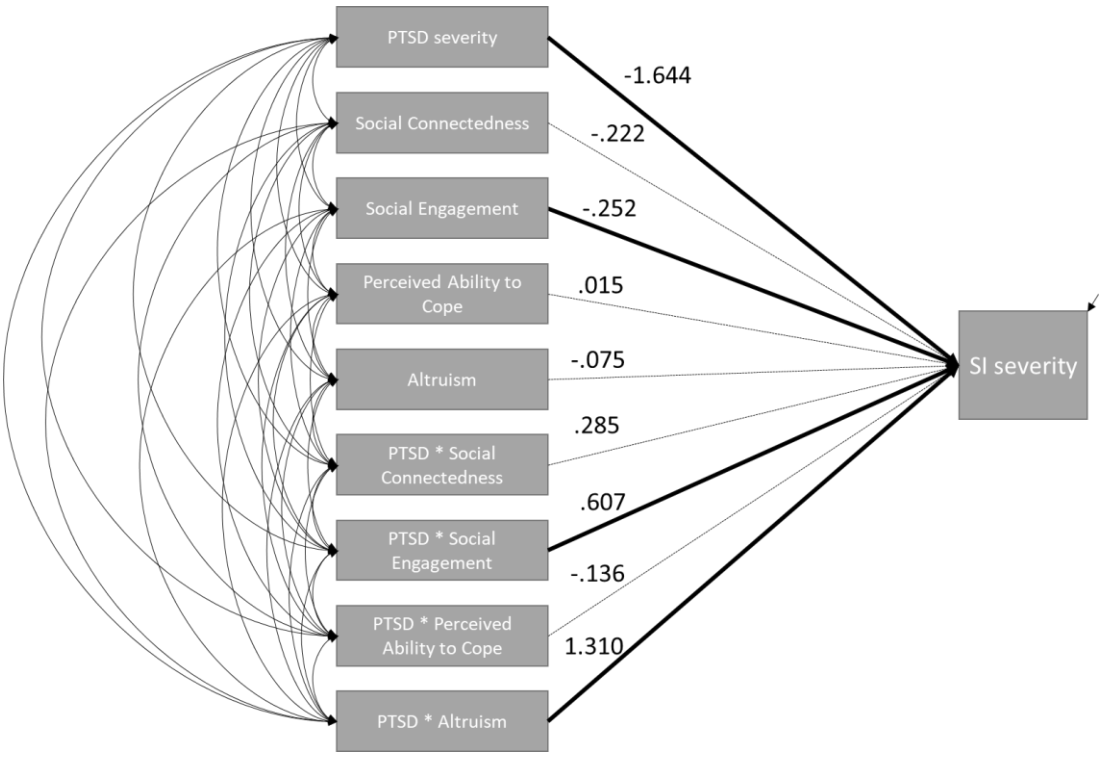

Figure 3.3. Standardized parameter estimates of Persian Gulf War veterans on SI severity.

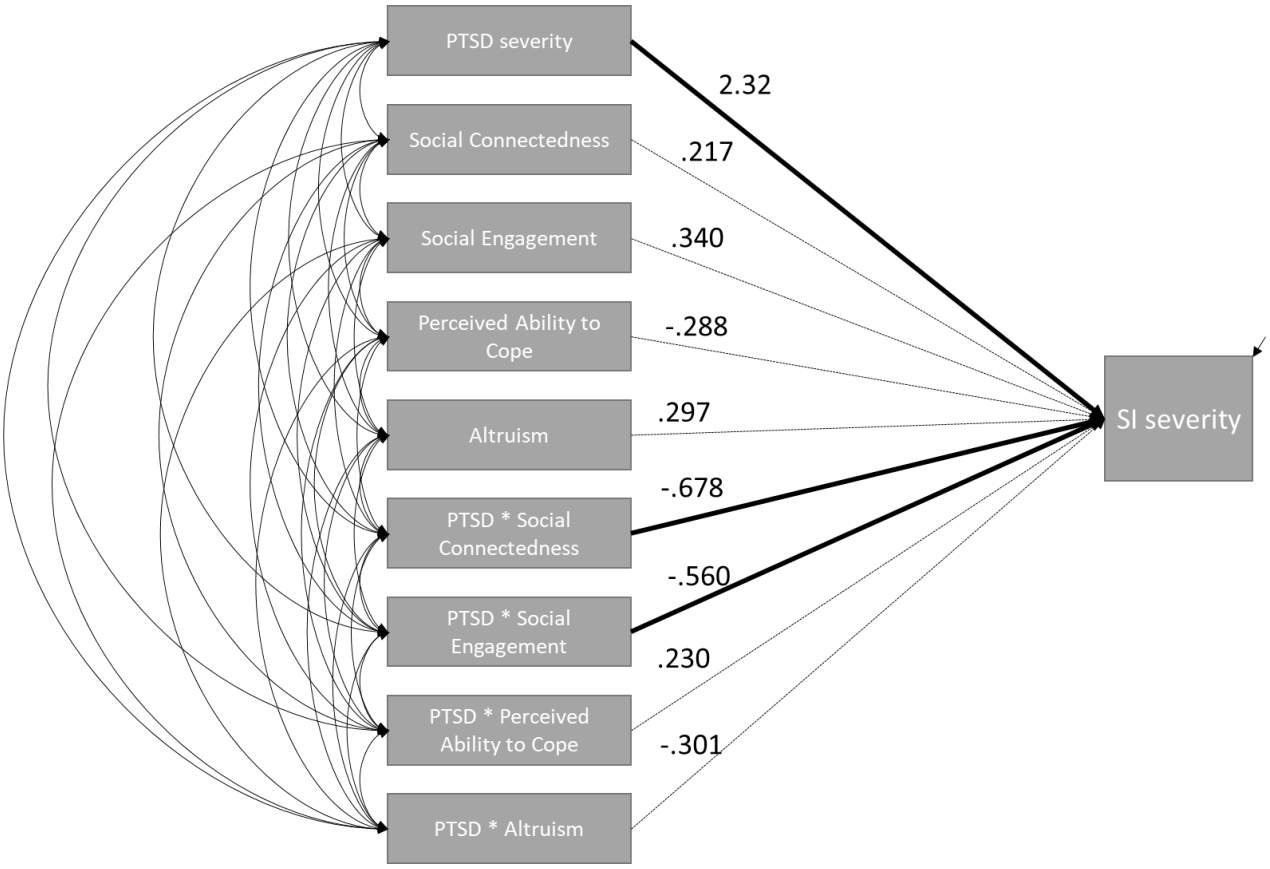

Figure 3.4. Standardized parameter estimates of OEF/OIF/OND veterans on SI severity.

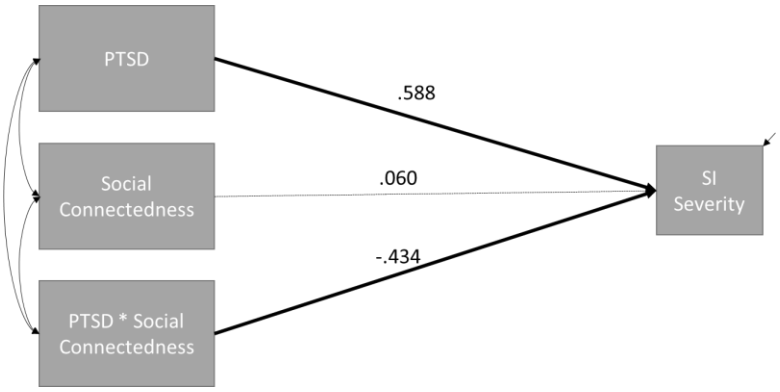

Figure 3.5. Standardized parameter estimates of non-combat veterans on SI severity with social connectedness.

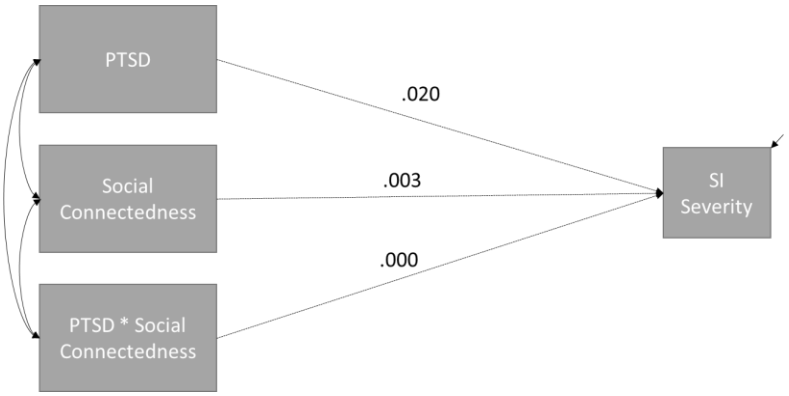

Figure 3.6. Standardized parameter estimates of Vietnam War veterans on SI severity With social connectedness.

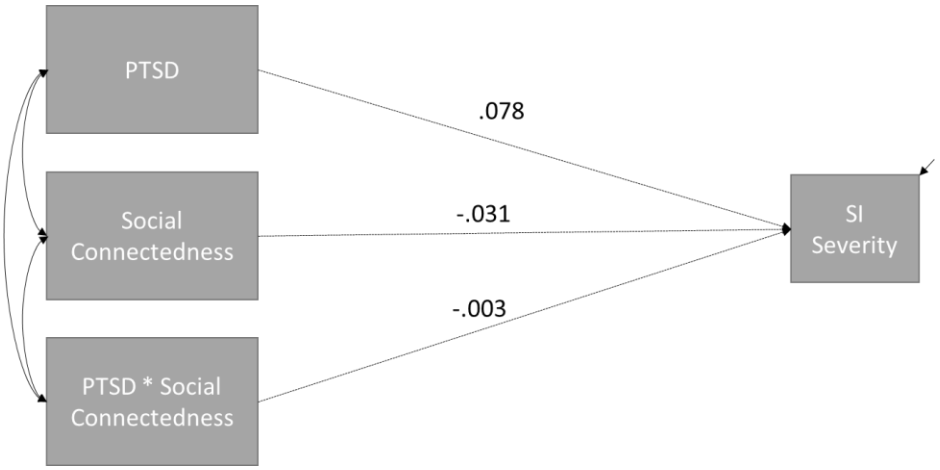

Figure 3.7. Standardized parameter estimates of Persian Gulf War veterans on SI severity with social connectedness.

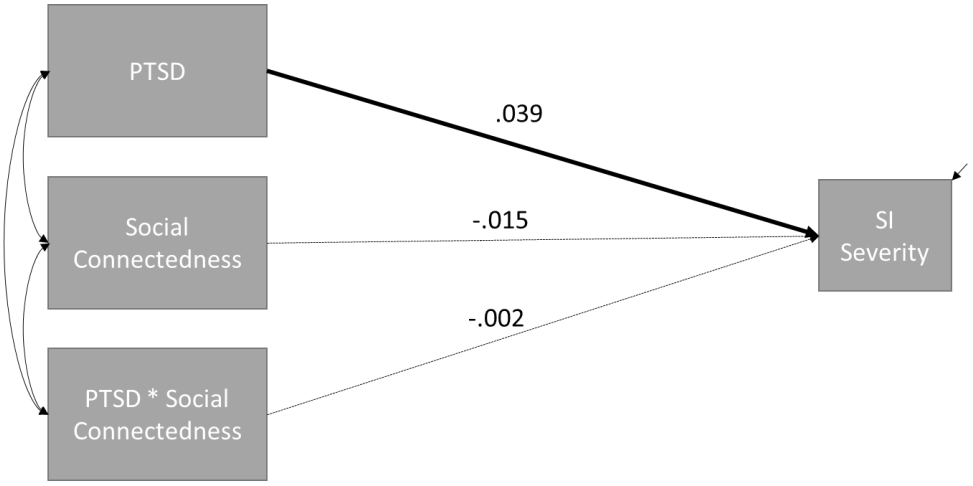

Figure 3.8. Standardized parameter estimates of OEF/OIF/OND veterans on SI severity with social connectedness.

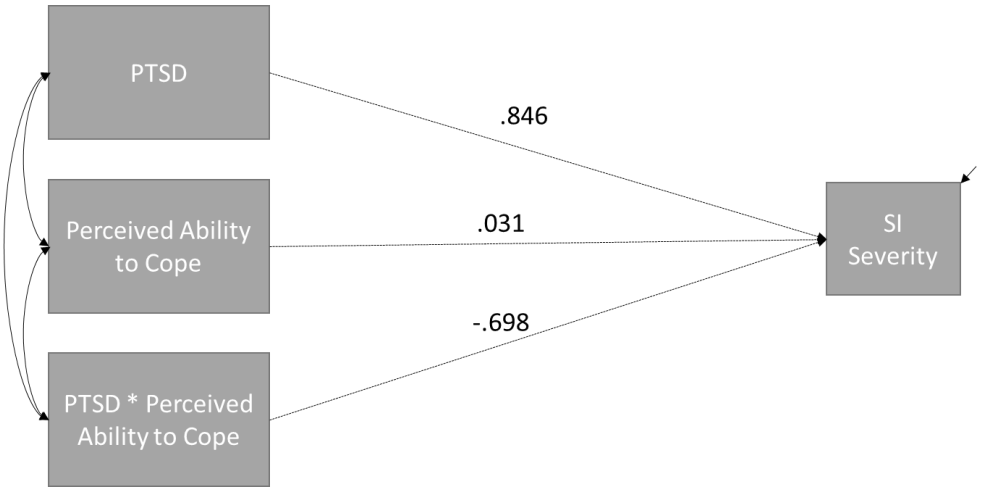

Figure 3.9. Standardized parameter estimates of non-combat veterans on SI severity with perceived ability to cope.

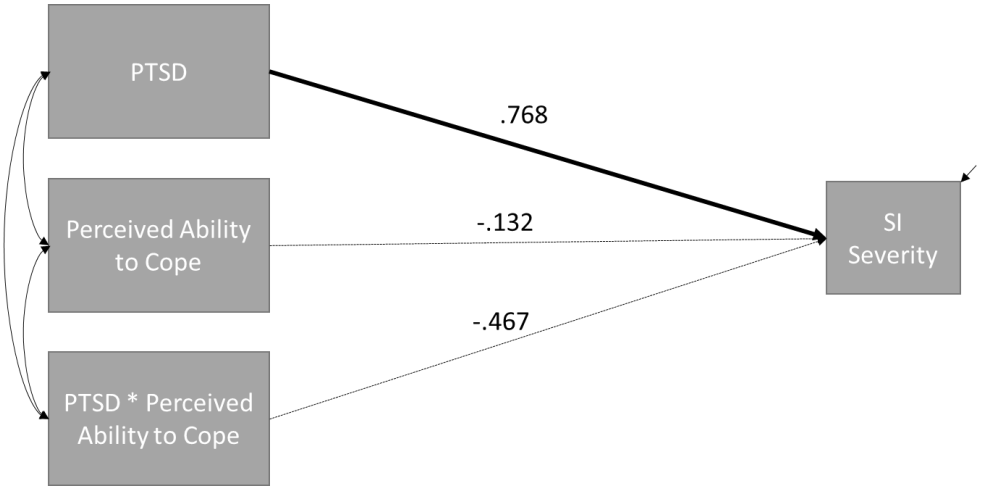

Figure 3.10. Standardized parameter estimates of Vietnam War veterans on SI severity with perceived ability to cope**.**

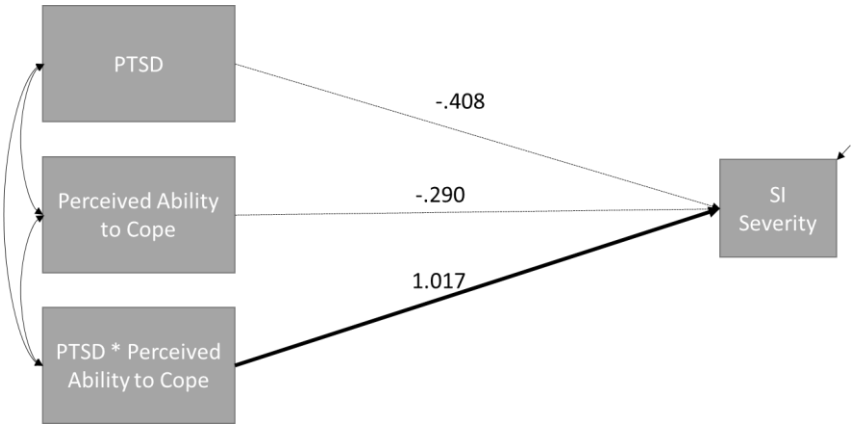

Figure 3.11. Standardized parameter estimates of Persian Gulf War veterans on SI severity with perceived ability to cope**.**

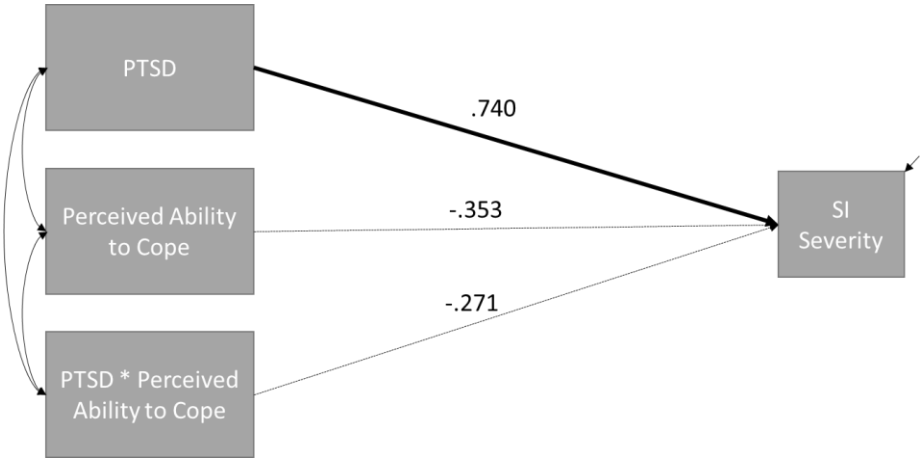

Figure 3.12. Standardized parameter estimates of OEF/OIF/OND veterans on SI severity with perceived ability to cope.

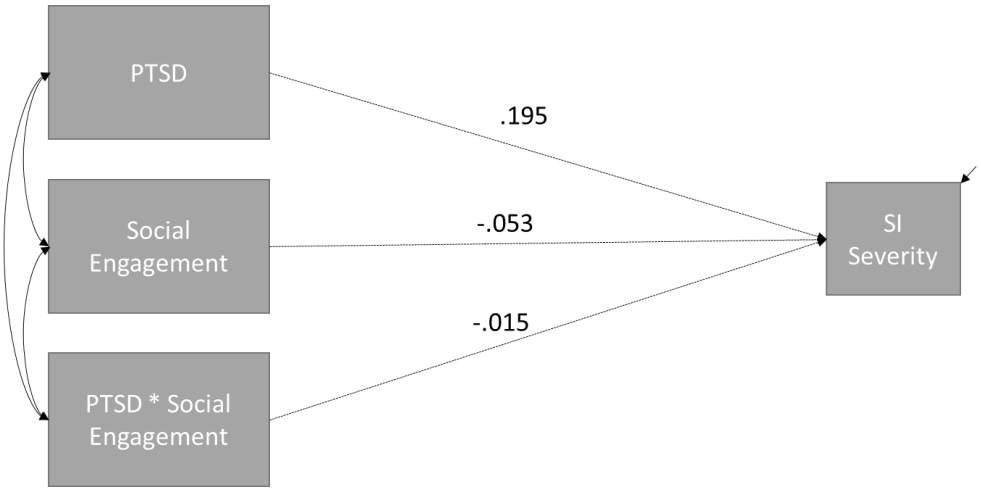

Figure 3.13. Standardized parameter estimates of non-combat veterans on SI severity with social engagement**.**

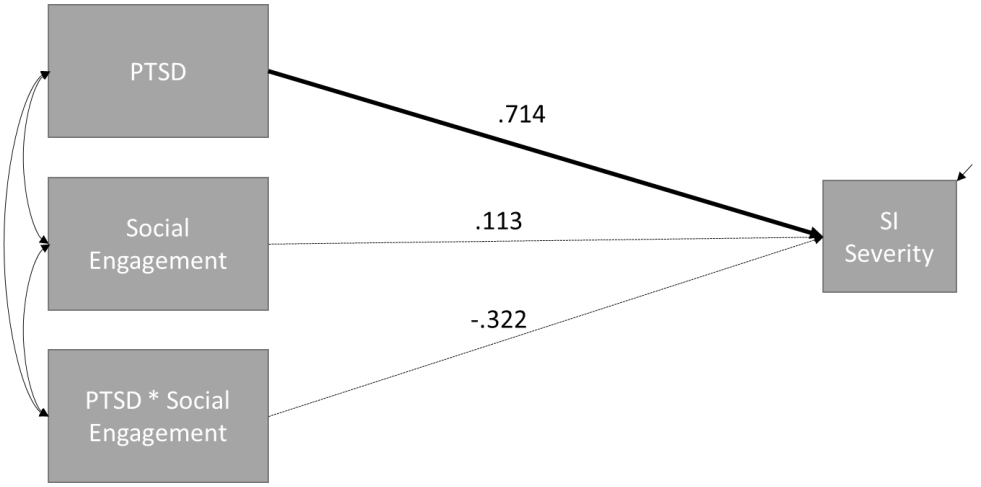

Figure 3.14. Standardized parameter estimates of Vietnam War veterans on SI severity with social engagement**.**

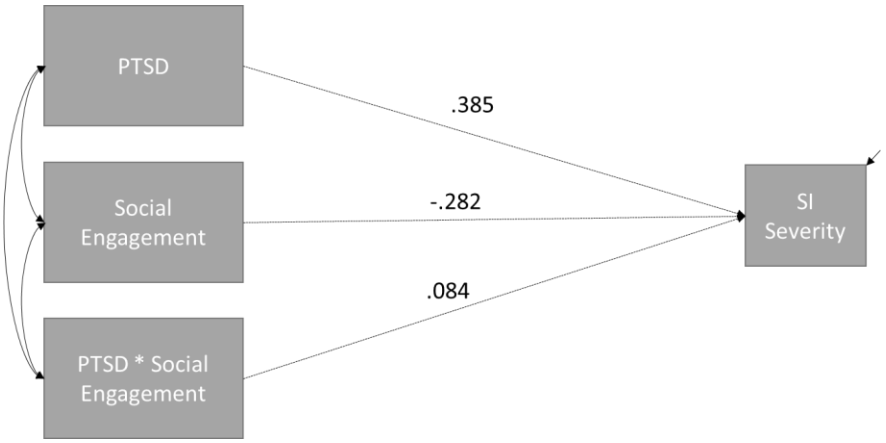

Figure 3.15. Standardized parameter estimates of Persian Gulf War veterans on SI severity with social engagement.

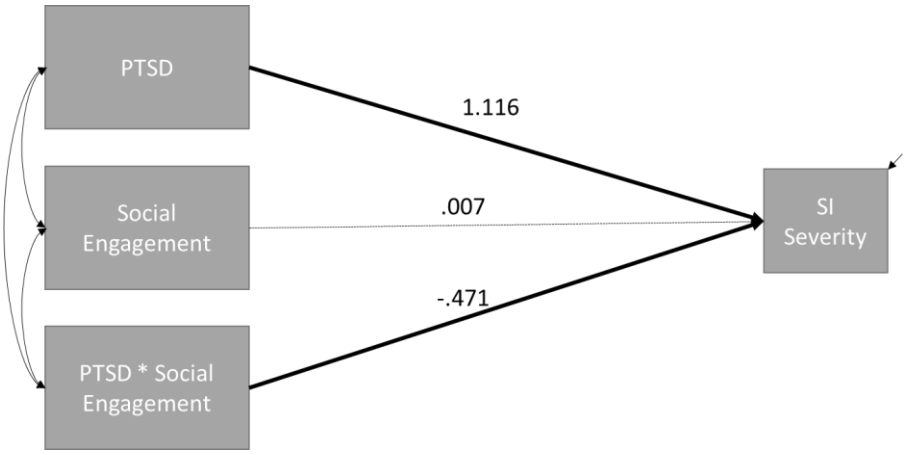

Figure 3.16. Standardized parameter estimates of OEF/OIF/OND veterans on SI severity with social engagement.

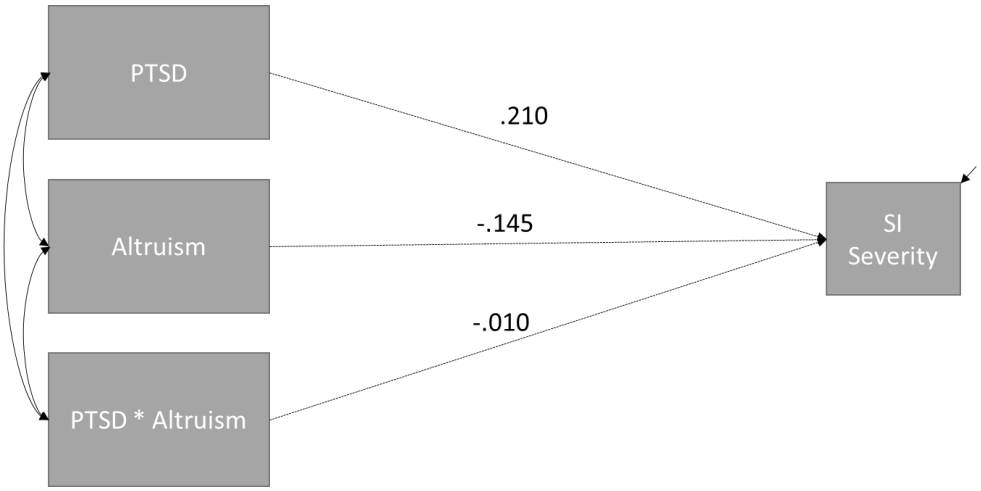

Figure 3.17. Standardized parameter estimates of non-combat veterans on SI severity with altruism.

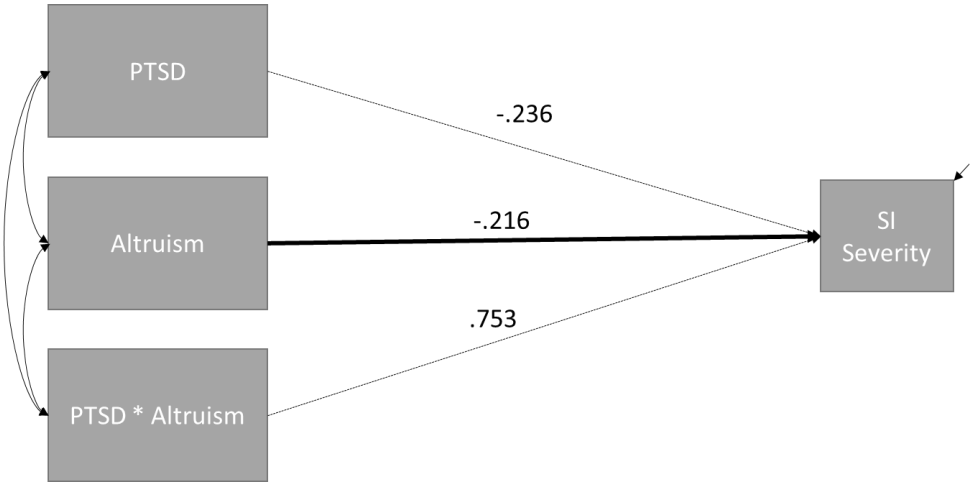

Figure 3.18. Standardized parameter estimates of Vietnam War veterans on SI severity with altruism.

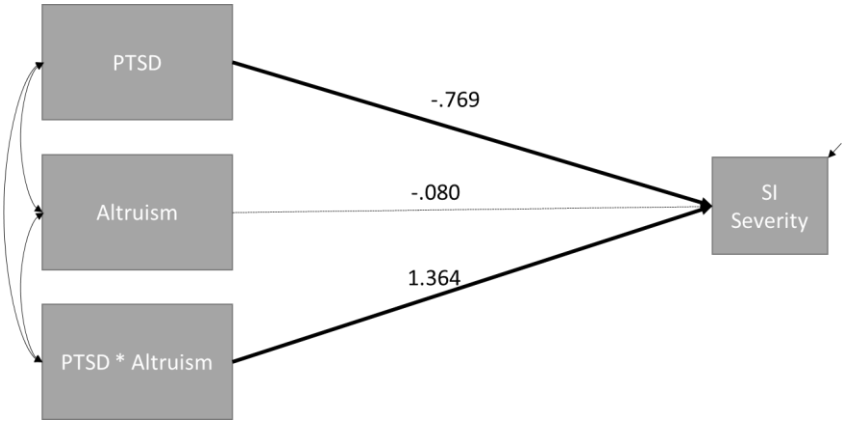

*Figure 3.19. St*andardized parameter estimates of Persian Gulf War veterans on SI severity with altruism**.**

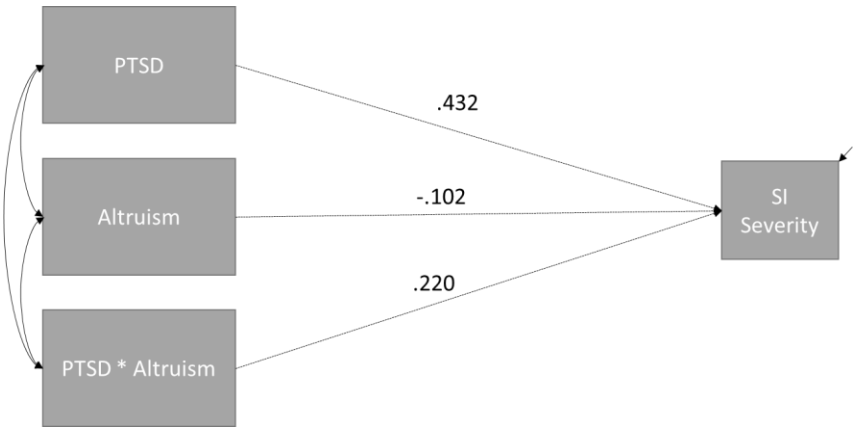

Figure 3.20. Standardized parameter estimates of OEF/OIF/OND veterans on SI severity with altruism**.**

Table 3.9

Unstandardized Parameter Estimates With PASI Outcome Variable

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Non-combat											
	PASI ON										
	PTSD severity	.025	.013	.008	.005	.003	.007	.006	.003*	.006	.004
	Social connectedness	.007	.006	-.001	.004	---	---	---	---	---	---
	PAC	-.001	.005	---	---	-.006	.003	---	---	---	---
	Social engagement	-.014	.008	---	---	---	---	-.003	.005	---	---
	Altruism	-.022	.013	---	---	---	---	---	---	-.005	.007
	PTSD*social connectedness	-.001	.001	.000	.000	---	---	---	---	---	---
	PTSD*PAC	.000	.000	---	---	.000	.000	---	---	---	---
	PTSD*social engagement	.001	.001	---	---	---	---	.000	.001	---	---
	PTSD*altruism	.001	.002	---	---	---	---	---	---	.000	.001
Vietnam War											
	PASI ON										
	PTSD severity	.001	.015	.013	.010	.025	.005**	.015	.008	.007	.006
	Social connectedness	.006	.006	-.004	.005	---	---	---	---	---	---
	PAC	-.007	.006	---	---	-.001	.003	---	---	---	---
	Social engagement	.005	.009	---	---	---	---	.010	.008	---	---
	Altruism	-.036	.015*	---	---	---	---	---	---	.006	.007
	PTSD*social connectedness	.000	.001	.000	.001	---	---	---	---	---	---
	PTSD*PAC	-.001	.000	---	---	-.001	.000**	---	---	---	---
	PTSD*social engagement	.000	.002	---	---	---	---	-.002	.002	---	---
	PTSD*altruism	.007	.003*	---	---	---	---	---	---	.000	.002

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Persian Gulf											
	PASI ON										
	PTSD severity	-.046	.031	.040	.011**	.013	.006*	.009	.004*	.012	.010
	Social connectedness	-.055	.041	-.001	.008	---	---	---	---	---	---
	PAC	-.023	.013	---	---	-.011	.008	---	---	---	---
	Social engagement	-.009	.027	---	---	---	---	-.015	.021	---	---
	Altruism	.007	.084	---	---	---	---	---	---	-.041	.070
	PTSD*social connectedness	.001	.002	-.002	.001**	---	---	---	---	---	---
	PTSD*PAC	.001	.001	---	---	.000	.000**	---	---	---	---
	PTSD*social engagement	-.001	.003	---	---	---	---	.006	.003	---	---
	PTSD*altruism	.011	.005*	---	---	---	---	---	---	-.001	.003
OEF/OIF/ OND											
	PASI ON										
	PTSD severity	.047	.012**	.020	.005**	.007	.007	.019	.003**	.017	.005**
	Social connectedness	.014	.015	-.009	.016	---	---	---	---	---	---
	PAC	.022	.019	---	---	-.035	.015*	---	---	---	---
	Social engagement	-.050	.031	---	---	---	---	.000	.009	---	---
	Altruism	.085	.061	---	---	---	---	---	---	.038	.045
	PTSD*social connectedness	-.002	.001	-.001	.000*	---	---	---	---	---	---
	PTSD*PAC	-.001	.000**	---	---	.000	.000	---	---	---	---
	PTSD*social engagement	.003	.002	---	---	---	---	-.002	.000**	---	---
	PTSD*altruism	.001	.003	---	---	---	---	---	---	.000	.002

Note: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement. *significant at $p < .05$. **significant at $p < .01$

Table 3.10

Standardized Parameter Estimates With PASI Outcome Variable,

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Non-combat											
	PASI ON										
	PTSD severity	.684	.338	.343	.208	.137	.302	**.255**	**.126**	.252	.146
	Social connectedness	.095	.073	-.017	.079	---	---	---	---	---	---
	PAC	-.010	.079	---	---	-.157	.077	---	---	---	---
	Social engagement	-.104	.057	---	---	---	---	-.037	.056	---	---
	Altruism	-.112	.061	---	---	---	---	---	---	-.043	.052
	PTSD*social connectedness	-.349	.199	-.097	.190	---	---	---	---	---	---
	PTSD*PAC	-.322	.292	---	---	.087	.277	---	---	---	---
	PTSD*social engagement	.131	.242	---	---	---	---	.028	.155	---	---
	PTSD*altruism	.057	.207	---	---	---	---	---	---	.032	.160
Vietnam War											
	PASI ON										
	PTSD severity	.028	.418	.573	.426	**1.127**	**.298**	.651	.312	.329	.276
	Social connectedness	.097	.095	-.092	.106	---	---	---	---	---	---
	PAC	-.148	.114	---	---	-.031	.090	---	---	---	---
	Social engagement	.037	.067	---	---	---	---	.120	.094	---	---
	Altruism	**-.218**	**.077**	---	---	---	---	---	---	.056	.062
	PTSD*social connectedness	.049	.267	-.256	.391	---	---	---	---	---	---
	PTSD*PAC	-.363	.259	---	---	**-.905**	**.272**	---	---	---	---
	PTSD*social engagement	-.052	.190	---	---	---	---	-.327	.307	---	---
	PTSD*altruism	**.746**	**.297**	---	---	---	---	---	---	.051	.280

		All mods		SC		PAC		SE		altruism	
		Est.	S.E.	Est	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Persian Gulf											
	Si severity ON										
	PTSD severity	-1.397	.940	**2.208**	**.613**	**.722**	**.370**	**.511**	**.230**	.647	.530
	Social connectedness	-.484	.329	-.012	.142	---	---	---	---	---	---
	PAC	-.339	.225	---	---	-.284	.197	---	---	---	---
	Social engagement	-.041	.118	---	---	---	---	-.119	.163	---	---
	Altruism	.013	.158	---	---	---	---	---	---	-.142	.229
	PTSD*social connectedness	.269	.981	**-1.849**	**.766**	---	---	---	---	---	---
	PTSD*PAC	.621	.498	---	---	**-.516**	**.286**	---	---	---	---
	PTSD*social engagement	-.043	.127	---	---	---	---	.368	.223	---	---
	PTSD*altruism	**.751**	**.354**	---	---	---	---	---	---	-.134	.405
OEF/OIF/ OND											
	SI severity ON										
	PTSD severity	**1.613**	**.405**	**1.047**	**.326**	.353	.395	**1.053**	**.182**	**.916**	**.243**
	Social connectedness	.105	.111	-.103	.180	---	---	---	---	---	---
	PAC	.288	.262	---	---	**-.703**	**.273**	---	---	---	---
	Social engagement	-.295	.179	---	---	---	---	.001	.081	---	---
	Altruism	.221	.168	---	---	---	---	---	---	.158	.188
	PTSD*social connectedness	-.447	.231	-.441	.209	---	---	---	---	---	---
	PTSD*PAC	**-.530**	**.236**	---	---	.028	.208	---	---	---	---
	PTSD*social engagement	.309	.221	---	---	---	---	**-.372**	**.142**	---	---
	PTSD*altruism	.046	.265	---	---	---	---	---	---	-.022	.232

Note: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement. **Bold** indicates unstandardized estimate was significant at $p < .05$ and may therefore be interpreted.

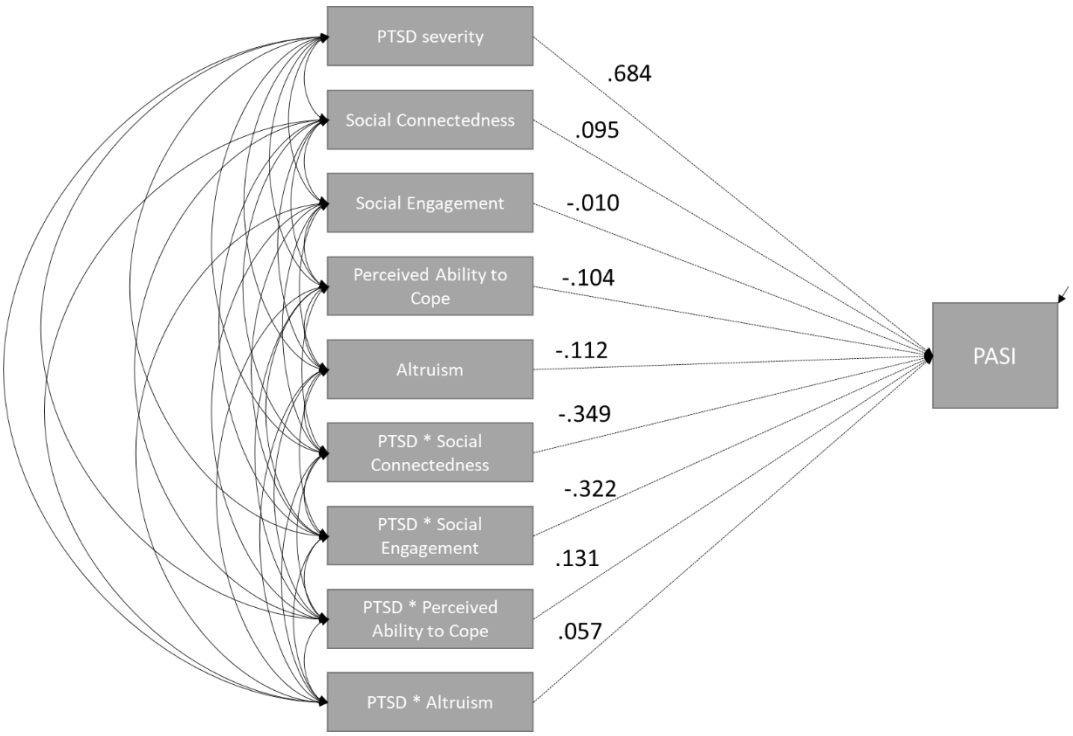

Figure 3.21. Standardized parameter estimates of non-combat veterans on PASI.

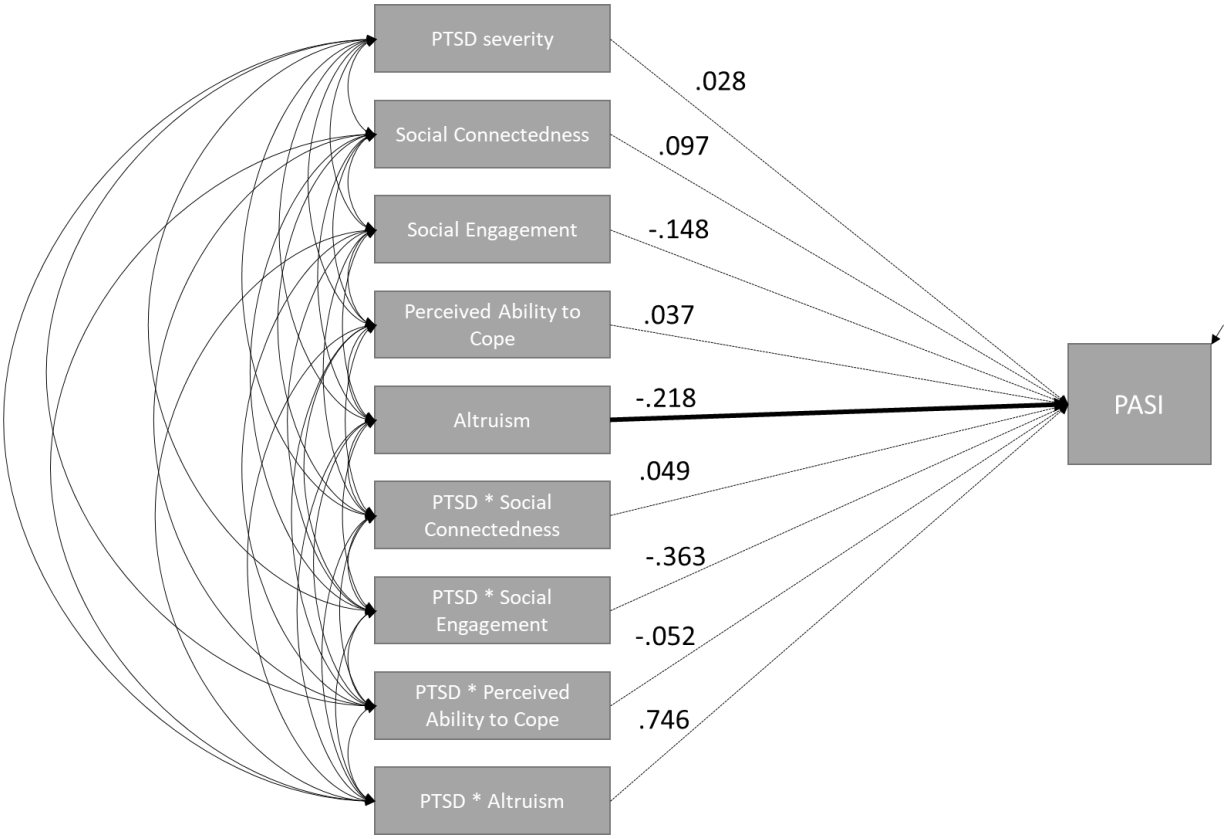

Figure 3.22. Standardized parameter estimates of Vietnam War veterans on PASI.

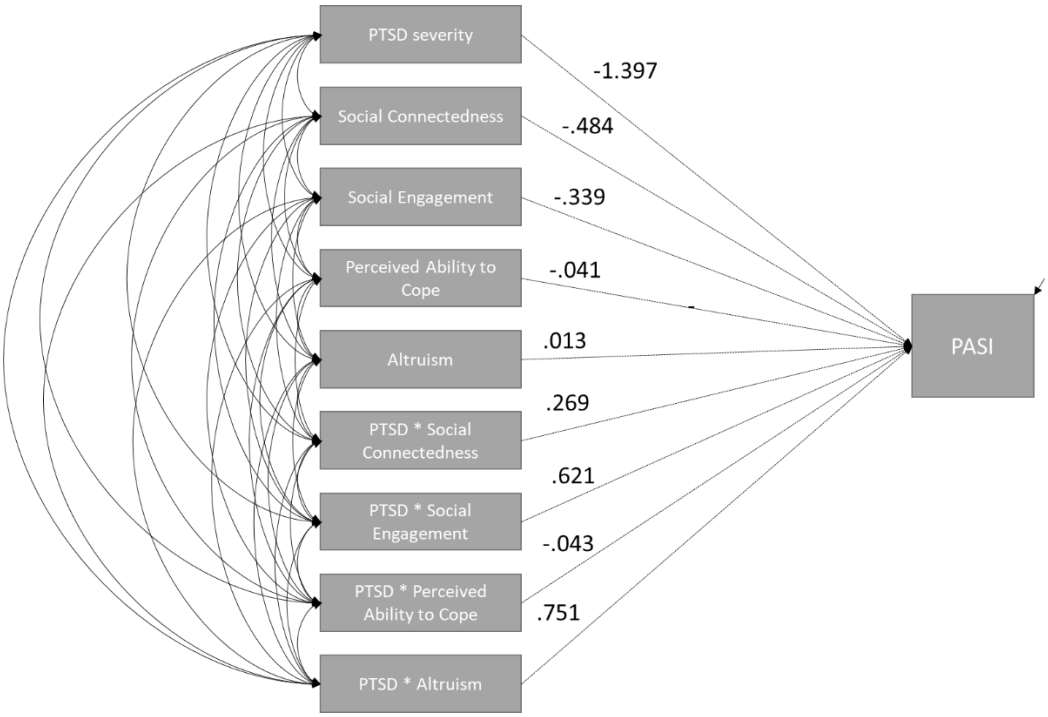

Figure 3.23. Standardized parameter estimates of Persian Gulf War veterans on PASI.

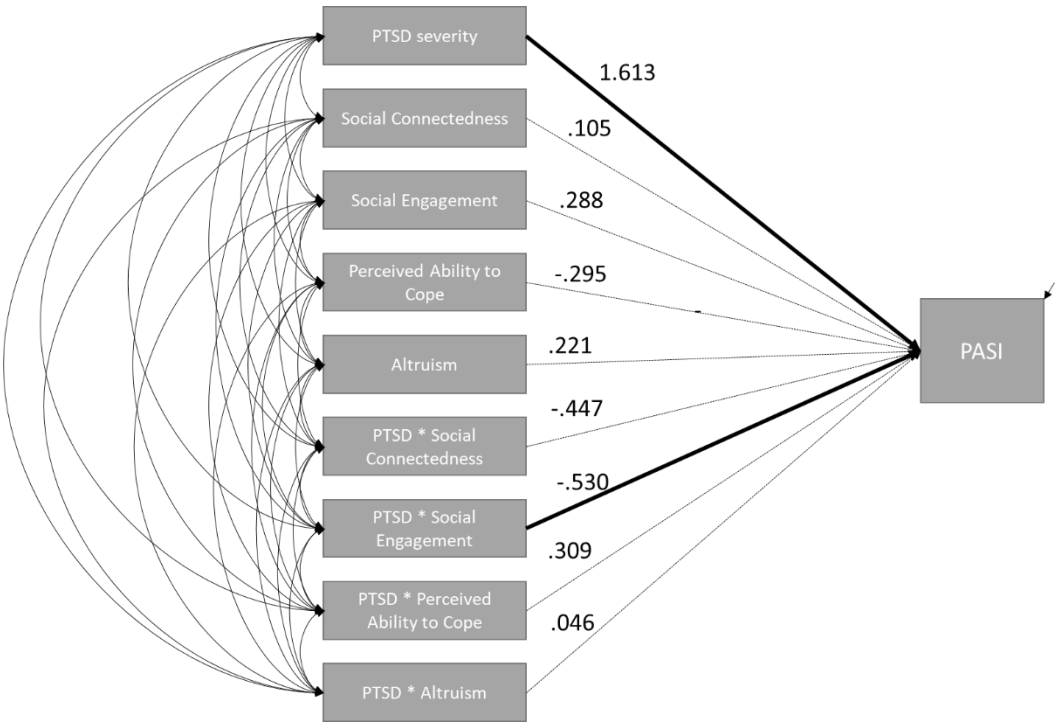

Figure 3.24. Standardized parameter estimates of OEF/OIF/OND veterans on PASI.

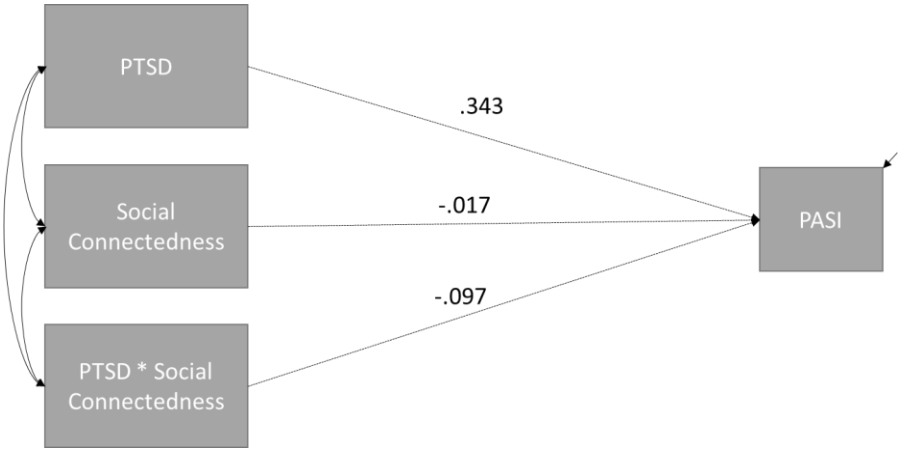

Figure 3.25. Standardized parameter estimates of non-combat veterans on PASI with social connectedness.

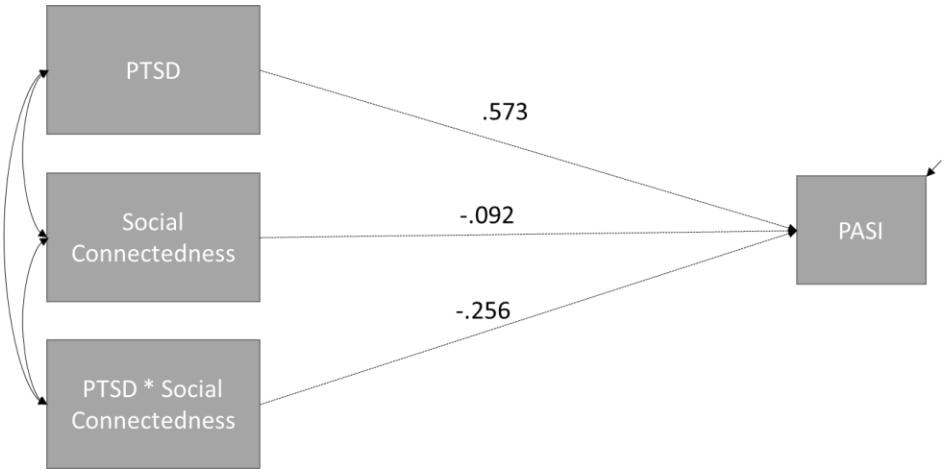

Figure 3.26. Standardized parameter estimates of Vietnam War veterans on PASI with social connectedness.

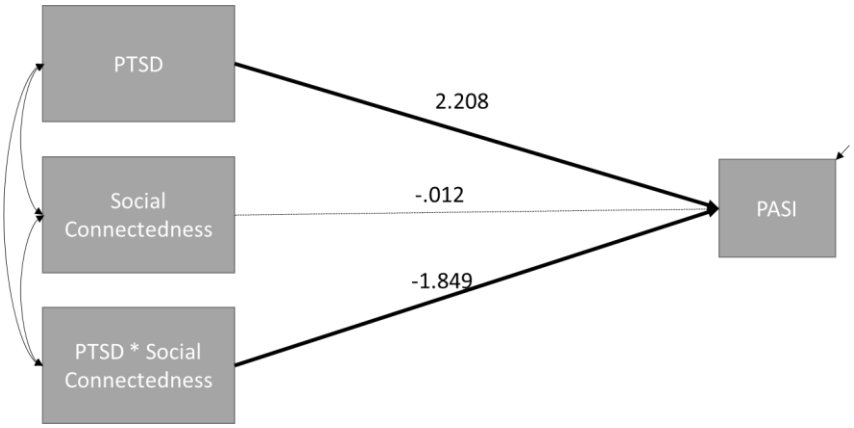

Figure 3.27. Standardized parameter estimates of Persian Gulf veterans on PASI with social connectedness.

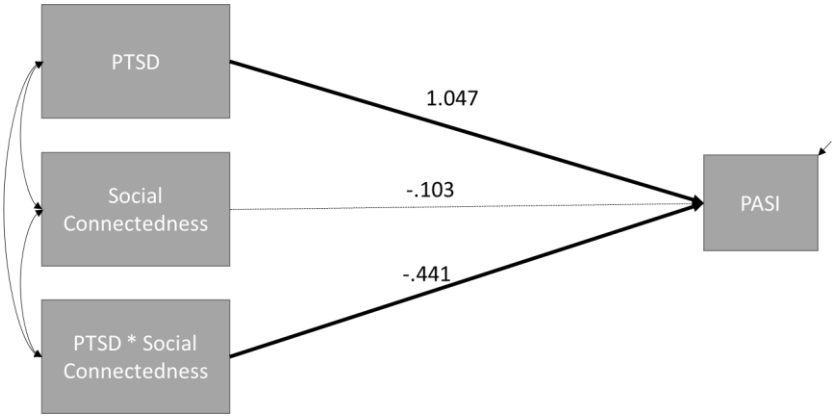

Figure 3.28. Standardized parameter estimates of OEF/OIF/OND veterans on PASI with social connectedness.

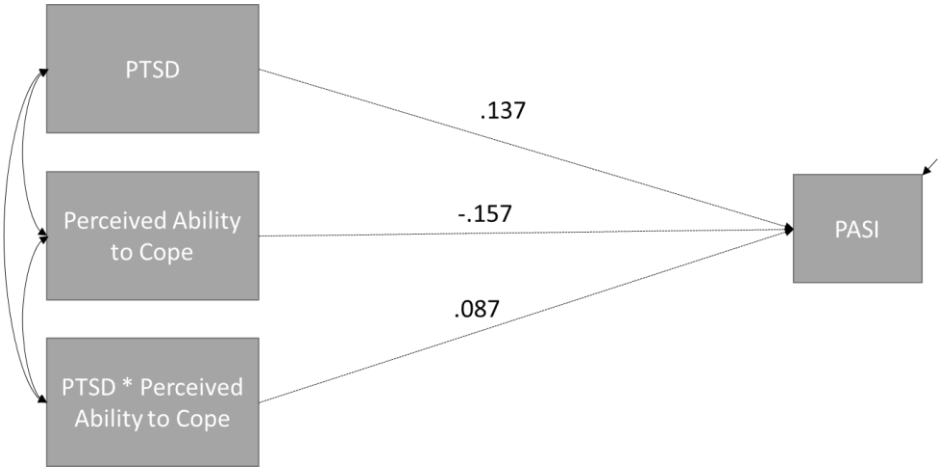

Figure 3.29. Standardized parameter estimates of non-combat veterans on PASI with perceived ability to cope.

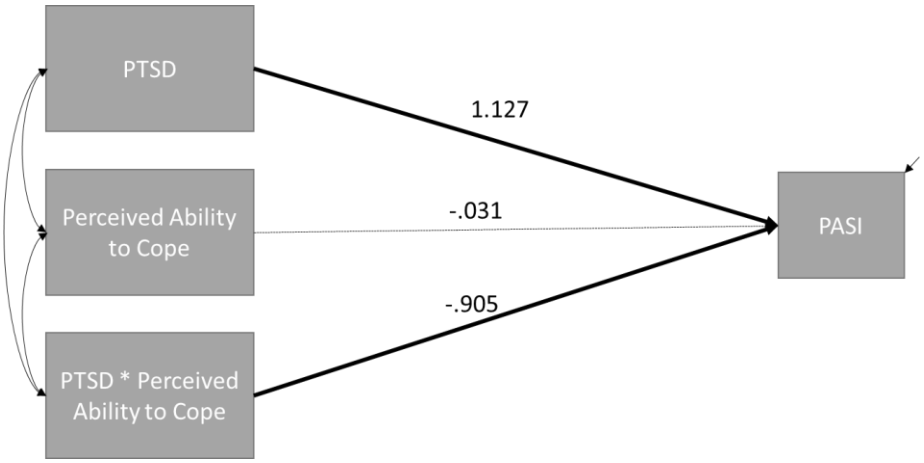

Figure 3.30. Standardized parameter estimates of Vietnam War veterans on PASI with perceived ability to cope**.**

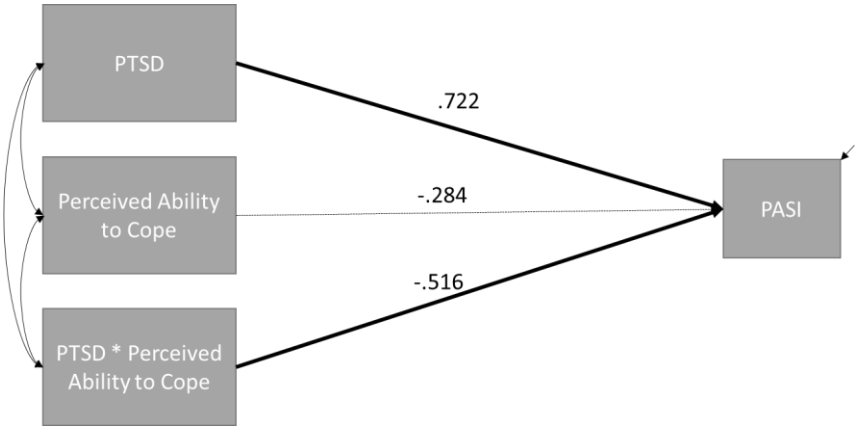

Figure 3.31. Standardized parameter estimates of Persian Gulf War veterans on PASI with perceived ability to cope**.**

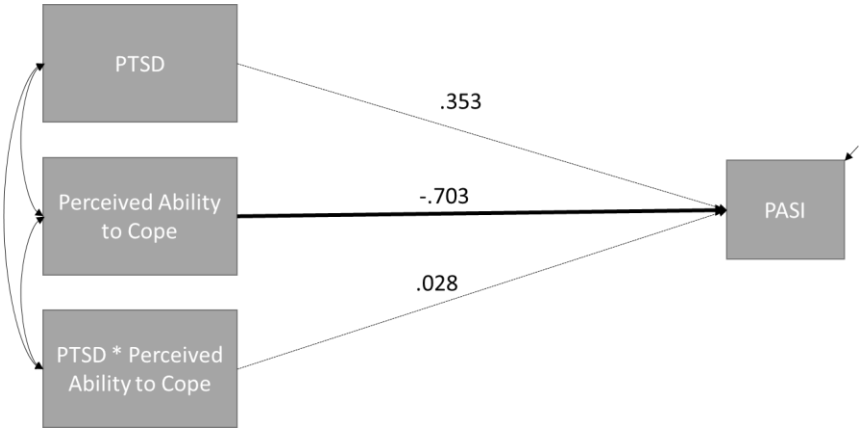

Figure 3.32. Standardized parameter estimates of OEF/OIF/OND veterans on PASI with perceived ability to cope.

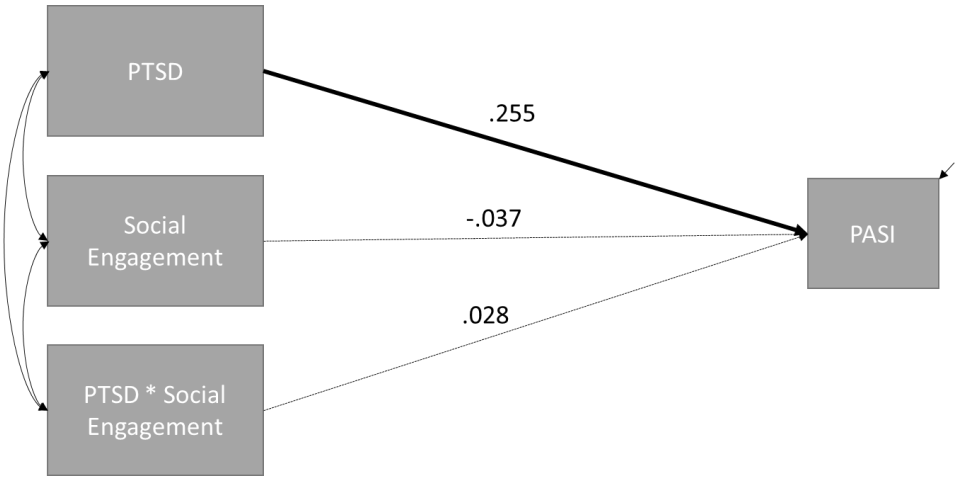

Figure 3.33. Standardized parameter estimates of non-combat veterans on PASI with social engagement.

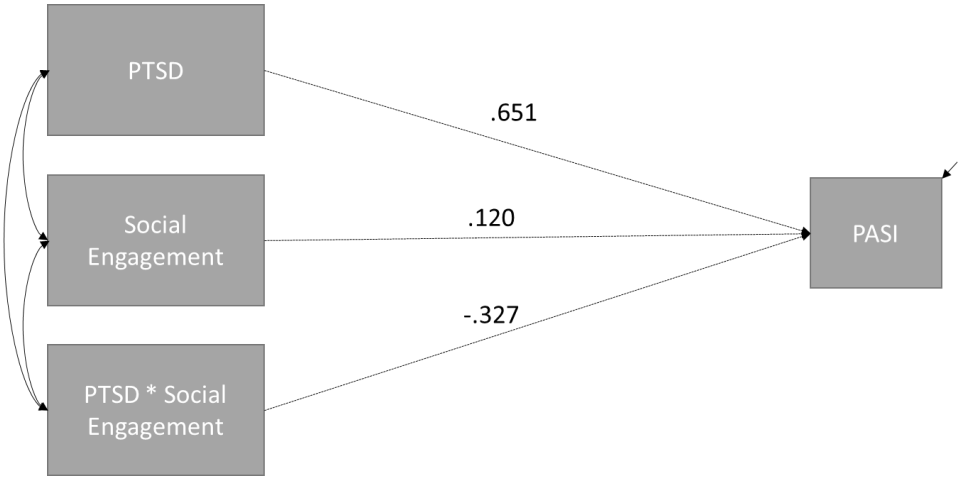

Figure 3.34. Standardized parameter estimates of Vietnam War veterans on PASI with social engagement**.**

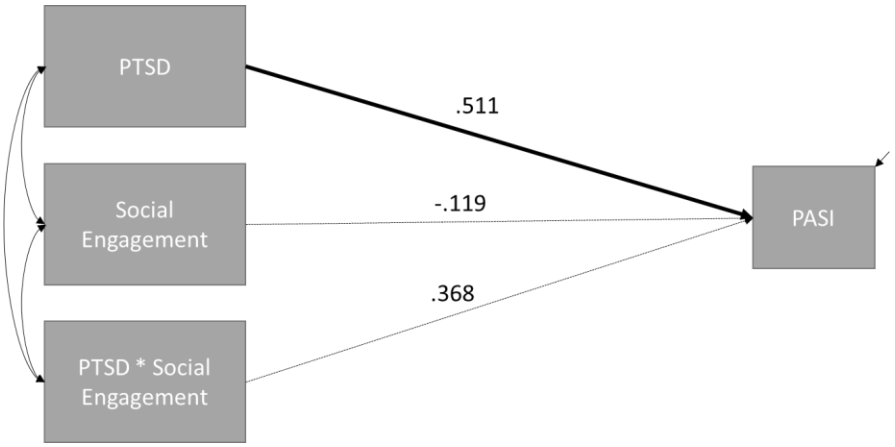

Figure 3.35. Standardized parameter estimates of Persian Gulf War veterans on PASI with social engagement.

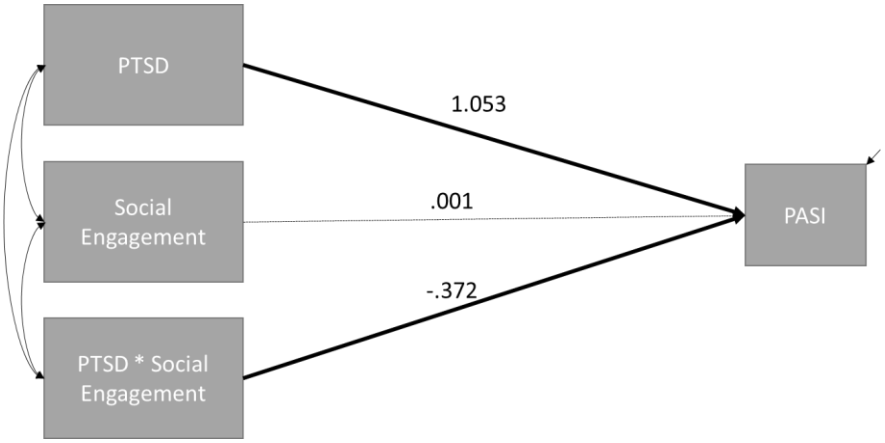

Figure 3.36. Standardized parameter estimates of OEF/OIF/OND veterans on PASI with social engagement.

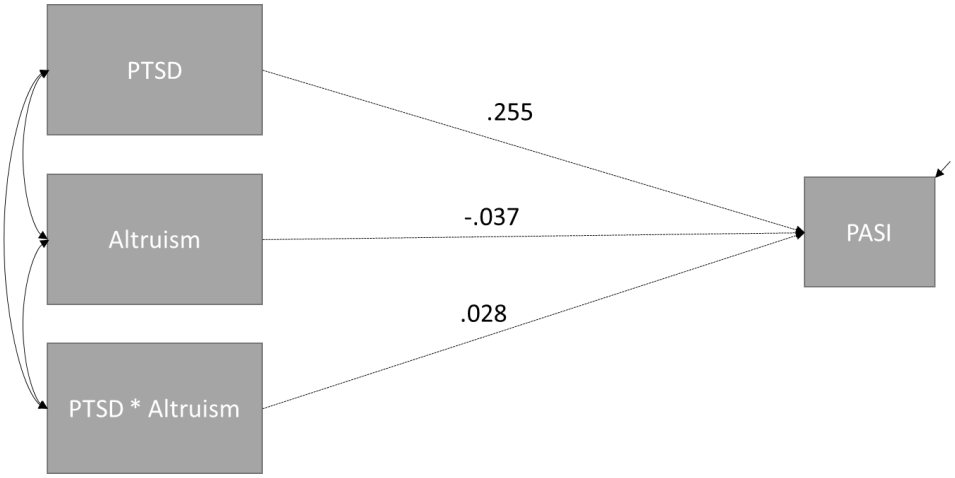

Figure 3.37. Standardized parameter estimates of non-combat veterans on PASI with altruism.

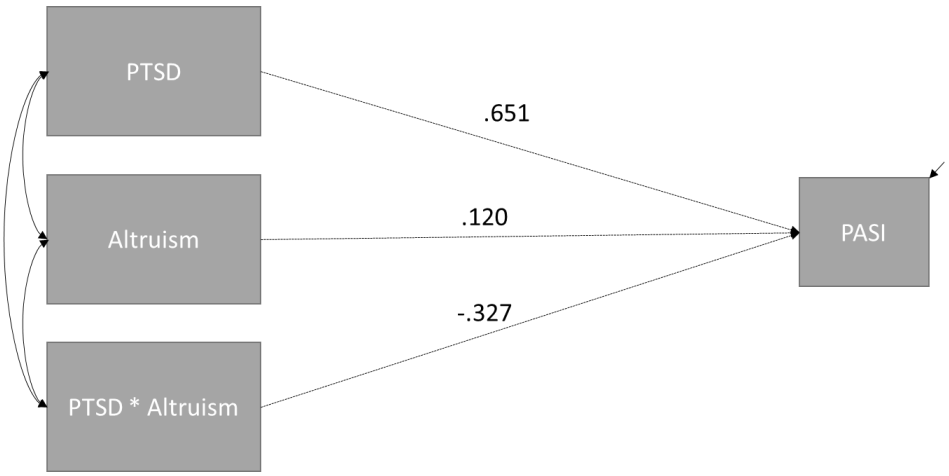

Figure 3.38. Standardized Parameter Estimates of Vietnam War Veterans on PASI with altruism.

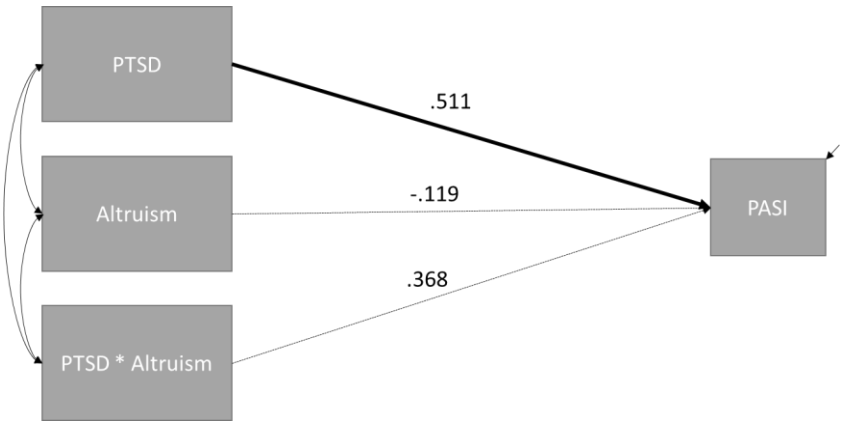

Figure 3.39. Standardized parameter estimates of Persian Gulf War Veterans on PASI with altruism**.**

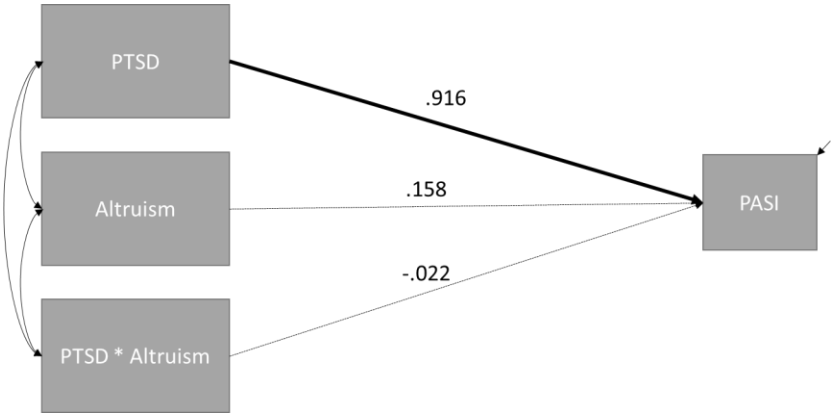

Figure 3.40. Standardized parameter estimates of OEF/OIF/OND veterans on PASI with altruism**.**

Table 3.13

Relationship Between PTSD Symptom Clusters and Other Variables for Non-Combat Veterans in Full Model by Outcome Variable.

		All mods	SC	PAC	SE	altruism
SI severity	Cluster B					
	PTSD	--	--	--	--	--
	Moderator(s)	* (altruism)	--	--	--	*
	Interaction(s)	--	--	--	--	--
	Cluster C					
	PTSD	--	--	--	--	--
	Moderator(s)	--	--	--	--	*
	Interaction(s)	--	--	--	--	--
	Cluster D					
	PTSD	*	*	*	--	--
	Moderator(s)	--	--	--	--	*
	Interaction(s)	--	--	*	--	--
	Cluster E					
	PTSD	--	*	--	--	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (SC)	*	--	--	--
PASI	Cluster B					
	PTSD	--	--	--	--	--
	Moderator(s)	* (altruism)	--	*	--	--
	Interaction(s)	--	--	--	--	--
	Cluster C					
	PTSD	--	--	--	--	--
	Moderator(s)	* (PAC)	--	*	--	--
	Interaction(s)	--	--	--	--	--
	Cluster D					
	PTSD	--	--	--	--	--
	Moderator(s)	* (PAC)	--	*	*	--
	Interaction(s)	--	--	--	--	--
	Cluster E					
	PTSD	--	--	--	*	--
	Moderator(s)	* (PAC)	--	--	--	--
	Interaction(s)	--	--	--	--	--

Notes: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement.
*Relationship between noted variables significant at $p < .05$.

Table 3.14

Relationship Between PTSD Symptom Clusters and Other Variables for Vietnam Veterans in Full Model by Outcome Variable.

		All mods	SC	PAC	SE	altruism
SI severity	Cluster B					
	PTSD	--	--	*	*	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	--	--	*	*	--
	Cluster C					
	PTSD	--	--	*	--	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	--	--	*	--	--
	Cluster D					
	PTSD	--	--	*	*	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	--	--	*	--	--
	Cluster E					
	PTSD	--	--	*	--	--
	Moderator(s)	* (altruism)	--	--	--	*
	Interaction(s)	* (altruism)	--	*	--	*
PASI	Cluster B					
	PTSD	--	*	*	--	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	--	--	*	--	--
	Cluster C					
	PTSD	--	--	*	--	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (PAC)	--	*	--	--
	Cluster D					
	PTSD	*	--	*	--	--
	Moderator(s)	* (PAC)	--	--	--	--
	Interaction(s)	--	--	*	--	--
	Cluster E					
	PTSD	*	--	*	*	--
	Moderator(s)	* (SE)	--	--	*	--
	Interaction(s)	* (PAC)	--	*	*	--

Notes: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement.
*Relationship between noted variables significant at $p < .05$.

Table 3.15

Relationship Between PTSD Symptom Clusters and Other Variables for Persian Gulf War Veterans in Full Model by Outcome Variable.

		All mods	SC	PAC	SE	altruism
SI severity	Cluster B					
	PTSD	*	--	--	--	--
	Moderator(s)	* (SC)	--	*	--	--
	Interaction(s)	* (PAC, SE, altruism)	--	--	--	--
	Cluster C					
	PTSD	--	--	--	--	--
	Moderator(s)	* (SC)	--	--	--	--
	Interaction(s)	--	--	--	--	--
	Cluster D					
	PTSD	--	*	--	--	*
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (PAC, SE, altruism)	--	*	*	*
	Cluster E					
	PTSD	*	--	--	--	*
	Moderator(s)	* (PAC)	--	--	--	--
	Interaction(s)	* (altruism)	--	*	--	*
PASI	Cluster B					
	PTSD	*	*	*	--	--
	Moderator(s)	* (SC)	--	--	--	--
	Interaction(s)	* (SE, altruism)	*	*	--	--
	Cluster C					
	PTSD	--	*	--	--	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (PAC)	*	--	--	--
	Cluster D					
	PTSD	*	*	--	*	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (SC, altruism)	*	--	*	--
	Cluster E					
	PTSD	*	*	*	--	--
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (SC)	*	*	*	--

Notes: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement.
*Relationship between noted variables significant at $p < .05$.

Table 3.16

Relationship Between PTSD Symptom Clusters and Other Variables for OEF/OIF/OND Veterans in Full Model by Outcome Variable.

		All mods	SC	PAC	SE	altruism
SI severity	Cluster B					
	PTSD	*	*	*	*	--
	Moderator(s)	* (altruism)	--	--	--	--
	Interaction(s)	* (SC, PAC)	*	--	*	--
	Cluster C					
	PTSD	*	*	*	*	*
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (SC, PAC)	*	*	*	--
	Cluster D					
	PTSD	*	*	*	*	*
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (SC, PAC)	*	*	*	--
	Cluster E					
	PTSD	*	*	*	*	*
	Moderator(s)	* (SC, PAC, altruism)	*	--	--	--
	Interaction(s)	* (SC)	*	*	*	--
PASI	Cluster B					
	PTSD	*	*	--	*	*
	Moderator(s)	--	--	*	--	--
	Interaction(s)	* (PAC)	*	--	*	--
	Cluster C					
	PTSD	*	*	*	*	*
	Moderator(s)	--	--	--	--	--
	Interaction(s)	* (SC)	*	*	*	--
	Cluster D					
	PTSD	*	*	*	*	
	Moderator(s)	--	--	--	--	
	Interaction(s)	* (SC)	*	*	*	
	Cluster E					
	PTSD	*	*	*	*	*
	Moderator(s)	* (SC)	*	--	--	--
	Interaction(s)	* (SC)	*	*	*	--

Notes: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement.
*Relationship between noted variables significant at $p < .05$.

Table 3.17

R^2 Values by Combat Era and Moderators For SI Severity Outcome Variable.

		None	Vietnam	OEF/OIF/OND	Persian Gulf
SI severity					
	All mods	.150 (.085)	.315 (.151)*	.809 (.081)**	.916 (.069)**
	SC	.145 (.068)*	.178 (.098)	.680 (.122)	.400 (.192)
	PAC	.160 (.087)	.257 (.116)*	.729 (.099)**	.481 (.220)*
	SE	.082 (.039)*	.196 (.093)*	.814 (.079)**	.303 (.171)
	Altruism	.093 (.037)*	.279 (.156)	.308 (.174)	.760 (.169)**
PASI	All mods	.126 (.071)	.330 (.152)*	.718 (.114)**	.712 (.117)**
	SC	.130 (.055)*	.156 (.097)	.653 (.145)**	.609 (.133)**
	PAC	.140 (.052)**	.299 (.151)*	.432 (.173)*	.658 (.107)**
	SE	.125 (.053)*	.147 (.103)	.432 (.182)*	.631 (.169)**
	Altruism	.125 (.053)*	.130 (.091)	.322 (.215)	.449 (.163)**
	All mods	.126 (.071)	.330 (.152)*	.718 (.114)**	.712 (.117)**

Note: SC = social connectedness, PAC = Perceived ability to cope, SE = social engagement.
*significant at $p < .05$. **significant at $p < .01$