SUICIDE RESILIENCE AMONG OPERATION ENDURING FREEDOM AND OPERATION IRAQI FREEDOM VETERANS: SENSE OF COHERENCE AS A MODERATOR OF THE RELATIONSHIP BETWEEN TRAUMATIC EXPERIENCES AND SUICIDALITY

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Dissertation

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ABSTRACT

With approximately 6,000 U.S. veteran deaths by suicide annually, the examination of protective factors against suicidality among returning veterans has received growing attention (DVA, 2010, January). This study examined the influence of one potential protective factor, a sense of coherence (SOC) as defined by Antonovsky (1979), on the relationship between combat distress and suicidality among Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans. Data from 157 OEF/OIF combat veterans were collected in the primary care waiting area at a VA Medical Center. The average age in the sample was 35.67 (SD = 5.0) and was comprised of predominately White, single, and employed male veterans. Findings from correlation analyses found negative associations between SOC and suicidality, SOC and combat distress; as well as a positive association between combat distress and suicidality. No support for the associations between suicidality and time since active duty service, combat exposure and combat distress, or pre-deployment history of traumatic experiences and combat distress were found.

Support was found for the primary hypothesis that predicted SOC would moderate the relationship between combat distress and suicidality. The interaction between SOC and combat distress was a significant predictor of suicidality above and beyond the significant contribution of combat distress and SOC alone. Simple slope analyses indicated that among OEF/OIF veterans with a high SOC, combat distress and suicidality are unrelated suggesting that SOC acts as a buffer. However, among OEF/OIF
veterans with a low SOC, the positive relationship between combat distress and suicidality is stronger.

This study has several important implications based on the findings stated above. First, it is important for researchers and clinicians to address the phenomenological experience of combat rather than exclusive reliance on mental health symptom inventories in the examination of suicidal risk. Second, the findings provide support that SOC has a mechanistic function in the construct of psychological resilience and may act as a protective factor against suicidality among OEF/OIF veterans who served in a combat-zone. Lastly, the use of theoretical frameworks in conducting resilience research is an important implication for future research examining psychological resilience among OEF/OIF veterans.
ACKNOWLEDGEMENTS

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More that 1.6 million United States troops have been deployed to Afghanistan and Iraq since the beginning of the wars in 2001 (Tanielian & Jaycox, 2008). Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) have changed the economic, social, and cultural climate in the U.S., as troops and their families have been greatly impacted. Soldiers’ experiences in OEF/OIF have been considerably different than those previously reported in Vietnam and the Gulf (Tanielian & Jaycox, 2008). Despite lower casualty rates among OEF/OIF troops as compared to previous wars, the nature of deployment and combat exposure have negatively affected today’s troops (Hoge et al., 2004; Scioli, Otis, & Keane, 2010; Seal, Bertenthal, Miner, Sen, & Marmar, 2007). OEF/OIF soldiers have been exposed to longer deployment periods, increased number of deployments, limited time in-between deployments, and intense combat experiences including the threat of improvised explosive devices (IEDs; Spollen & Labbate, 2008; Tanielian & Jaycox, 2008). The current climate of war has resulted in devastating psychological effects on returning soldiers and has increased concerns about the mental health of OEF/OIF veterans. A recent study by the RAND Corporation estimated that out of the 1.6 million previously deployed troops, 300,000 suffer from...
Posttraumatic Stress Disorder (PTSD) or Major Depressive Disorder (MDD; Tanielian & Jaycox, 2008). Moreover, Hoge et al. (2004) surveyed a sample of deployed Marine and Army troops from both Iraq and Afghanistan and found that 25.2% met the criteria for a mental disorder. Therefore, not only have OEF/OIF troops in the United States armed forces been exposed to intensified deployment conditions and dangerous combat situations, but also roughly one-fourth of U.S. soldiers deployed to Iraq and Afghanistan suffer negative psychological consequences. Exacerbating the mental welfare concerns for OEF/OIF veterans is the increasing prevalence of suicidality.

Over the last decade, suicide has become an epidemic concern among veterans. In a presentation at the 2\textsuperscript{nd} Annual Department of Defense/ Veteran’s Affairs Suicide Prevention Conference, VA Secretary Erik Shinseki stated that out of the 30,000 annual deaths by suicide in the United States, 20% are veterans (U.S. Department of Veterans Affairs, 2010, January). Thus, roughly 6,000 veterans die by suicide every year in the U.S., approximating to 18 deaths per day. Previous rates of veteran suicide from the Vietnam and Gulf Wars have been found to be no different from the U.S. general population (Kang & Bullman, 2010). However, for the first time in history the rate of suicide among veterans is speculated to be above that of the general population (Kaplan, Huguet, McFarland, & Newsome, 2007). For example, in a twelve-year longitudinal study, Kaplan, Huguet, McFarland, and Newsome (2007) found that veterans were twice as likely to die by suicide as compared to those in the general population. Increased rates of suicide among veterans and the high prevalence of mental disorders linked to combat exposure have created a resurgence of research efforts and suicide prevention programs to address these concerns (Tanielian & Jaycox, 2008).
Suicide prevention efforts are a high priority within the U.S. Department of Veterans Affairs (DVA; Shekelle, Bagley & Munjas, 2009). Currently, a variety of preventative measures against suicide are implemented within the DVA, including increased research, hotlines, education and prevention programs, peer support, mandatory training programs, and outreach efforts. There are two research centers that focus on suicide prevention, the Veterans Integrated Service Network (VISN) 2 Center of Excellence in Canandaigua, New York and the VISN 19 Mental Illness Research Education and Clinical Center in Denver, Colorado (Posey, 2009). All branches within the United States armed forces provide mandatory suicide prevention training programs (James & Kowalski, 1996; Jones et al., 2001; Kennedy, Cook, Poole, Brunson, & Jones, 2005; Knox, Litts, Talcott, Feig, & Caine, 2003; McDaniel, Rock, & Grigg, 1990). These programs typically involve educating veterans on the risk factors and warning signs of suicide, crisis intervention support and emergency contact resources, access to mental health services, fostering cohesion among units, and life skills training.

In addition to the aforementioned programs that target active military troops, suicide prevention efforts have been created within the DVA. These efforts include providing access to mental healthcare workers, hotlines, education on risk factors, and online resources to veterans. In collaboration with the National Suicide Prevention Lifeline and the Substance Abuse and Mental Health Services Administration (SAMHSA), the DVA founded the Veterans Crisis Line (formerly the Veterans Suicide Prevention Hotline). This is a free 24/7 service available to veterans by calling 1-800-273-TALK and dialing “1” to access the veteran hotline. An online resource for veterans and their families to chat with trained DVA counselors, called Veterans Chat, is also
available (U.S. Department of Veterans Affairs, 2010). At each VA Medical Center, a suicide prevention coordinator is available to address the needs of veterans who are suicidal and to coordinate appropriate care (Posey, 2009). Moreover, the DVA has various brochures available online which include information to help veterans identify risk, warning signs, and external resources.

Suicide prevention programs often focus on informing veterans of potential risk factors to help increase self- and other-awareness of suicide risk and the identification of high-risk veterans by mental health professionals in order to prevent future suicidal behavior (Mann et al., 2005). The National Violent Death Reporting System, organized by the Center for Disease Control (CDC), identified the following suicide risk factors for veterans: presence of a depressive disorder, lack of mental health treatment, substance use, interpersonal relationship problems, physical health problems, and suicidal ideation (Sundararaman, Panangala, & Lister, 2008). Despite the knowledge of suicide risk factors in veterans, which mirror risk factors of the general population, limited attention has been given toward fostering protective factors against suicide through the promotion of resilience (American Association of Suicidology [AAS], 2009). Psychological resilience has been defined as an individual’s ability to adjust to adverse life experiences (Rutter, 1987). Currently, the Army is undergoing a large-scale study of psychological resilience and suicide prevention, known as the Army Study to Assess Risk and Resilience in Service members (ARMY STARRS), in an effort to reduce military suicide and promote mental wellness. Beginning in 2009 and running through 2014, the program’s main objective is to promote mental health and reduce the risk of suicide. To date, no data have yet been reported for this project as related to resilience. Similarly, Pietrzak, Johnson,
Goldstein, Malley, and Southwick (2009a) examined the relationship between protective factors and Posttraumatic Stress Disorder and depression. They found that psychological resilience and social support help to reduce the severity of mental illness in veterans of OIF and OEF. Due to the high incidence rate of suicide and mental illness among veterans, it is imperative for both researchers and clinicians to understand potential protective factors against suicide that contribute to veterans’ psychological resilience in an effort to further prevent the rate of suicide among veterans from increasing.

Psychological resilience has been identified as an important construct in understanding how individuals successfully cope with adversity (Rutter, 1985). The concept of resilience has been widely studied, especially with an application to children and adolescents (Arbona & Coleman, 2008; Rutter, 1985); however, a universal definition of resilience is lacking as researchers and clinicians often conceptualize resilience differently (Almedom & Glandon, 2007). At the most basic level, resilience represents positive psychological adjustment to adverse situations (Rutter, 1987). Resilience has been defined as “the ability to bounce back from a negative experience, or even significant adversity, through flexible adaptation to the ever-changing demands of life” (Yehuda & Flory, 2007, p. 436). It reflects individual differences in response to external stressors and operates as a protective factor (Rutter, 1985). Thus, an individual with high psychological resilience is hypothesized to have adequate and effective coping skills to combat stress, as compared to someone with low resilience who may be vulnerable to negative external stressors. The construct of resilience can be applied to Aaron Antonovsky’s Salutogenic Model of Health (Antonovsky, 1979; 1987). Antonovsky’s model posits that despite negative experiences and stressful life events,
some individuals can successfully adjust to challenges due to individual responses that vary on a continuum of what he called health and dis-ease. According to Antonovsky, when individuals are confronted with stressors their response is dependent upon a global orientation known as a sense of coherence, which influences either positive psychological adjustment (health) or a negative reaction (dis-ease). A sense of coherence is theorized to be the foundation of health that provides individuals with an understanding of stressors, the confidence to manage it, and the motivation to face adversity because life is viewed as meaningful (Antonovsky, 1979).

Based on Antonovsky’s theory behind sense of coherence, this orientation to life appears to fit within the larger construct of resilience as both reflect the promotion of individual strengths to facilitate well-being and adaptive psychological functioning. Sense of coherence involves the positive adjustment to life stressors similarly to the general construct of resilience; however, it also offers a theoretically and empirically-driven concept that explains potential mechanistic factors involved in how an individual successfully overcomes adversity. For the purpose of the current study, sense of coherence is theorized to be a mechanism of psychological resilience.

This chapter presents an introduction to suicide rates among veterans, the prevalence of veteran mental health concerns, and the relationship between trauma and suicide. A brief foreword to Antonovsky’s Salutogenic Model of Health (Antonovsky, 1979; 1987) is presented and the rationale of salutogenics as the theoretical framework for the present study is stated. This chapter concludes with a statement of the problem, the purpose of this research study, and the proposed research question.
The Epidemic of Suicide

Suicide has been considered a significant public health concern that has plagued humanity for centuries. Dating back to 1897, Durkheim defined suicide as “all cases of death resulting directly or indirectly from a positive or negative act of the victim himself which he knows will produce this result” (Shneidman, 1985, pp. 14-15). In 1933, suicide in the United States became a nationally acknowledged problem when Louis Dublin, an insurance worker and statistician, published *To Be or Not to Be* that documented suicide in America and the need for preventative efforts (Berman & Lindahl, 2001). However, national efforts to increase the study and understanding of suicide were not immediately organized. Regionally, suicide prevention efforts were first established in the 1950s, such as the Los Angeles Suicide Prevention Center (LASPC) that was funded by the National Institute of Mental Health (NIMH). Over the next ten years, leaders Edwin Shneidman and Norman Farberow at the LASPC increased recognition of suicide as a significant concern and emphasized the importance of research and prevention. As a result, in 1966 NIMH founded the Center for the Studies in Suicide Prevention and the awareness of suicide became a national concern. Over the next few decades, numerous groups were founded to promote understanding, research, and prevention of suicide, including the American Association of Suicidology founded in 1968 by Edwin Shneidman (AAS, 2010), the American Foundation for Suicide Prevention (AFSP) in 1987 (AFSP, 2010), and the Suicide Prevention Resource Center (SPRC) in 2002 (SPRC, 2009). Moreover, in 1999 the United States government acknowledged suicide as a significant public concern when then Surgeon General David Satcher announced his “Call To Action To Prevent Suicide” (U.S. Public Health Services, 1999). As a result of this national proposal,
suicide gained increased recognition as a leading cause of death that could potentially be prevented. Yet, suicide rates in the United States indicate that the problem of suicide is an enduring, arduous malady.

The most recent suicide statistics from 2010 indicate that the annual suicide rate in the United States is 12.4 per 100,000, totaling 38,364 deaths by suicide (AAS, 2012). Every 13.7 minutes someone in the United States commits suicide, equating to 105.1 daily suicides. As the 10th leading cause of death in the United States, suicide is a national epidemic. In considering the effect of suicide on American society, one must consider an inclusive definition of suicidality. Inconsistencies in the nomenclature of suicide have resulted in limited acceptance of a collective language (Silverman, 2006). Thus, suicidality, for the purpose of this study, is comprehensively defined as suicidal thoughts, suicidal ideation, suicidal behaviors, suicide plans, suicide attempts, and death by suicide. The National Survey on Drug Use and Health, a report by the Substance Abuse and Mental Health Services Administration (SAMHSA), revealed that in 2011, 8.5 million adults experienced suicidal ideation; 2.4 million had a suicide plan; and 1.1 million adults attempted suicide (SAMHSA, 2012). Moreover, it is estimated that for every completed suicide, there are at least 25 attempted suicides (AAS, 2012). Suicidality in the United States is a haunting and strikingly prominent occurrence among the American public, especially for those who are identified as being at risk.

Extensive research on suicide has identified various risk factors, including demographic characteristics such as White, male, elderly aged; and other mitigating factors such as psychological disturbance, history of suicidality, family history of suicidality, and history of abuse (AAS, 2009; Leenaars, 1999; Schwartz & Rogers, 2004).
Men are at higher suicide risk as compared to females, with males committing suicide at a rate of 3.7 times that of women, despite the fact that women attempt suicide more often than men (AAS, 2012). This figure reflects lethality of means used, with men using firearms far more frequently than women who largely attempt suicide by overdose or self-inflicted wounds. Age is also a significant risk factor associated with suicide, generally indicating elderly populations commit suicide at a rate higher than younger populations. However, suicide remains one of the leading causes of death in younger populations. For those between the ages of 15-24, it is the third leading cause of death (AAS, 2012). Additionally, the presence of a mental disorder significantly increases the risk of suicidality. Psychological autopsy studies estimate that 9 out of 10 individuals who die by suicide had a psychiatric disorder (Joiner, Brown, & Wingate, 2005).

Since 1990, suicide rates in the United States have historically been categorized as relatively stable; however, a slight rate increases have been observed in the last decade. Most recently, a rate increase from 2009 to 2010 was observed (AAS, 2012). Rates tend to fluctuate when the United States encounters a national hardship, including increased rates when the economic climate is unstable and decreased rates when the country is at war. Over the past decade, the United States has been in the Afghanistan and Iraqi wars, in addition to what some economists have called a recession. With the presence of both wars and economic downturn, an observed rate of suicide has increased, thus making suicide among the American public a significant concern. Specific to the current study, increased suicide rates among veterans of OEF/OIF have been observed and may be reflective of the negative effects of war on America’s troops (Kang & Bullman, 2008).
Suicide Among Veterans

The U.S. VHA has prioritized veteran suicide as a national concern, calling for action to better understand veteran suicide and increase preventive care (McCarthy et al., 2009). In 2009, a report from the Department of Veterans Affairs, Office of Inspector General estimated that 6,400 veterans die by suicide annually (U.S. Department of Veterans Affairs, 2009, September). Of these estimated 6,400 completed suicides, roughly 1,600-1,800 of these individuals received services at the VHA prior to their death. Thus a large number of veterans, nearly 75%, who commit suicide, are not utilizing VHA services. Despite the knowledge of the annual rate of veteran suicide, it remains unclear as to whether suicide rates among veterans are different from that of the general population. Numerous studies have compared the rate of veteran suicide with the general population; however, conflicting data has resulted in a lack of consensus. The conflicting data related to the rate of veteran suicide compared to the general population may be explained by different sample characteristics of veterans across studies, lack of uniform data collection methods (i.e., medical record review, death records, VHA reports), or unclear documentation related to the cause of death as there is no current system that accurately tracks veteran deaths by suicide.

Suicide rates among veterans have been classified as higher than that of the general population (Kaplan et al., 2007; McCarthy et al., 2009). Kaplan et al. (2007) found that veterans were twice as likely to die by suicide as compared to the general U.S. population, regardless of their association with the Veterans Health Administration. Hence, veterans who have sought treatment and veterans who have not, show no difference in their relative risk for suicidality. Their status as a veteran alone places them
at a higher risk for suicide, as compared to the general population. McCarthy et al. (2009) similarly found veterans to be at six-times greater risk for suicide. Moreover, they examined sex separately and found that when comparing the U.S. general population of men to male veterans, veterans have a significantly higher risk for suicide and similar results were observed for female veterans compared to women in the general population. On the other hand, some studies have shown that veterans do not have significantly different risk associated with suicidality as compared to non-veterans (Miller et al., 2009; Sundararaman et al., 2008). For example, Miller et al. (2009) found veteran status did not have an effect on the risk of death by suicide for males. Rather, veteran males and men from the U.S. general population showed no difference in their risk of suicide, both groups being equally at risk. In spite of inconsistent comparisons of veteran suicide rates to those of the general U.S. population, suicide among veterans remains a significant concern as a large number of service men and women annually die by suicide.

Though rate comparisons may be unclear, research has found that some of the risk factors between that of the general population and veterans are more similar than not. Numerous studies have identified veteran risk factors of suicidal death (Brenner et al., 2008; Desai, Rosenheck, & Desai, 2008; Kang & Bullman, 2010; Kang & Bullman, 2008; Lambert & Fowler, 1997; Pietrzak et al., 2010; Posey, 2009) that are similar to those found in the general population (AAS, 2009). Sex has been found to be a significant correlate of suicidal behavior, with male veterans completing suicide at a higher rate than female veterans (Lambert & Fowler, 1997). Among veterans, White individuals are at higher risk of suicide as compared to African Americans (Desai et al., 2008). This may be related to the overall increased risk among White persons as
compared to other races or perhaps related to the disproportionate representation of races within the military culture. Similar to the general population, older veterans exhibit higher risk of death by suicide than do younger male veterans (Lambert & Fowler, 1997) and this may be explained by increased health concerns among this population. However, with the growing number of young veterans returning from OEF and OIF, attention should be given to this population in light of other factors that aggravate risk. Many veterans suffer from psychiatric conditions, which in turn may place them at higher risk of suicide, particularly in the presence of a mood disorder, anxiety-related disorder, and/or substance use disorders (Desai et al., 2008; Kang & Bullman, 2008; Lambert & Fowler, 1997; Pietrzak et al., 2010; Sundararaman et al., 2008). This exhaustive list of risk factors, including age, sex, race, and psychological well-being, are common risk factors that are characteristic of the general population. However, veterans also have a unique set of risk factors that are not found among civilians.

The powerful and potentially traumatic effect of combat exposure has a significant impact on veterans psychosocial functioning and suicidal risk (Kang & Bullman, 2010; Sundararaman et al., 2008). Veterans’ level of combat exposure has shown to be negatively related to well-being, often resulting in higher levels of psychological disorders that are associated with suicidal risk. A second unique risk factor of veterans is the availability and familiarity with firearms. Veterans are trained to effectively utilize firearms during combat and have increased availability to weapons (Lambert & Fowler, 1997; Sundararaman et al., 2008). This specialized training and unique knowledge of weaponry may increase veterans’ suicidal risk, as they are familiar with how to efficiently obtain and use firearms. Physical health also contributes to
increased suicidal risk, as veterans are often wounded in combat and suffer longitudinal physical ailments, such as Traumatic Brain Injury (TBI; Lambert & Fowler, 1997). Military personal are exposed to combat experiences that can potentially result in physical injury, most notably TBI (Breshears, Brenner, Harwood, & Gutierrez, 2010), which has been associated with increased psychological maladjustment and suicidal behaviors (Breshears et al., 2010; Sundararaman et al., 2008). Lastly, upon deployment return, veterans frequently have difficulties readjusting to civilian life and report limited social support (Lambert & Fowler, 1997; Pietrzak et al., 2010; Sundararaman et al., 2008). Lack of support and feeling as if one does not belong may increase suicidal risk, as veterans may feel alone in a world in which no one understands them (Brenner et al., 2008). In considering these unique risk factors among the veteran population, the promotion of resilience training prior to and after deployments could serve to increase coping resources and decrease the likelihood of suicidality.

The aforementioned distinctive risk factors for veteran suicide, in combination with general risk factors similar to those of the general population, contribute to the understanding of veteran suicide. Regardless of whether the rate of veteran suicide is higher than the U.S. general population, the risk of suicide among veterans has significant implications for the treatment and care of former U.S. troops. Future research efforts are needed to identify protective factors against veteran suicidality, an area that has received little empirical attention. Though it is important to identify why individuals are at risk for suicide, it is equally important to understand factors that may contribute to psychological resilience against suicide. Promoting resilience in veterans could potentially reduce suicidality through a strength-based approach to mental health treatment. This study
examined one potential factor, sense of coherence, which could aid in the promotion of resilience among veterans.

Mental Health and OEF/OIF Veterans

The aftermath of war on veterans’ psychological well-being has been widely researched and not surprisingly indicates that deployment can negatively impact mental health (Hoge, Auchterlonie, & Milliken, 2006). Early research on the Gulf and Vietnam Wars has provided evidence that deployment and combat exposure can increase the risk of various mental health problems, including posttraumatic stress disorder (PTSD), major depressive disorder (MDD), substance-use disorders, disrupted interpersonal relationships, and aggressive behaviors (Kang, Li, Mahan, Eisen, & Engel, 2009; Maguen et al., 2009; Vogt, Pless, King, & King, 2005). Similar patterns of psychological problems have been found for veterans of OEF/OIF, signifying elevated rates of depression, posttraumatic stress, substance abuse, anger and irritability, adjustment issues, and relational problems (Duma, Reger, Canning, McNeil, & Gahm, 2010; Ferrier-Auerbach, Erbes, Polusny, Rath, & Sponheim, 2010; Hoge et al., 2004; Jakupcak et al., 2007; Maguen et al., 2010; Milliken, Auchterlonie, & Hoge, 2007; Scioli et al., 2010; Seal et al., 2007; Shea, Vujanovic, Mansfield, Sevin, & Liu, 2010; Teten, Schumacher, Bailey, & Kent, 2009; Wojcik, Akhtar, & Hassell, 2009).

Since the start of the wars in Afghanistan and Iraq, researchers and mental health professionals have observed alarming rates of psychological distress among returning war veterans. Hoge, Auchterlonie, and Milliken (2006) estimated that 19.1% of OIF veterans and 11.3% of OEF veterans report significant mental health problems upon deployment return. However, these rates may not include veterans who have not sought services at the
VHA, possibly signifying that the scope of mental health impairment among OEF/OIF veterans has not been adequately assessed. In any case, these wars have negatively impacted the mental health of U.S. service members. Despite the high rate of multiple psychological effects, posttraumatic stress disorder has been the most extensively studied due to the direct consequences of combat exposure associated with the development of trauma related symptoms (Shea et al., 2010).

**Trauma Among Veterans**

The psychological trauma of combat experiences has widely been researched and is most often associated with symptoms of posttraumatic stress disorder. Military personal who report high levels of combat exposure have been found to be at-risk for the development of PTSD (Booth-Kewley, Larson, Highfill-McRoy, Garland, & Gaskin, 2010; Castro, 2009; Phillips, LeardMann, Gumbs, & Smith, 2010; Ramchand et al., 2010; Vasterling et al., 2010). For example, in a sample of 1,569 Marines who served in Afghanistan and Iraq, Booth-Kewley, Larson, Highfill-McRoy, Garland, and Gaskin (2010) found that 17.1% met criteria for PTSD. Likewise, Phillips, LeardMann, Gumbs, and Smith (2010) reported that in their sample of 706 Marines, 10.8% exhibited positive symptoms for PTSD. To determine the prevalence of PTSD among veterans, Ramchand et al. (2010) reviewed 66 studies and found that prevalence rates ranged from 5 - 20%. The authors concluded that 50% of veterans who seek mental health treatment screen positive for PTSD, however, many do not receive formal diagnoses. Among the veterans who screen positive for PTSD but do not receive a formal diagnosis of PTSD, this could be due to a lack of comprehensive and specific screening measures, overlap of PTSD symptoms and co-occurring psychological disorders that may cause false positive
screenings, poor identification of Criterion A traumatic stressors, or lack of follow-up for specialized mental health care services where a comprehensive assessment of PTSD may be conducted. Nevertheless, several studies have reported higher rates of psychological problems associated with traumatic stress than with other psychological consequences (Hoge et al., 2004; Milliken et al., 2007; Seal et al., 2007).

As compared to the general U.S. population, veterans have been found to exhibit higher rates of posttraumatic stress (Seal et al., 2007). In their 2007 study, Seal, Bertenthal, Miner, Sen, and Marmar found that the most common mental health diagnosis in their sample of OEF/OIF veterans was PTSD, accounting for 52% of the diagnoses made. Thus, 13% of the veterans’ in their sample suffered from PTSD, which is considerably higher than the 3.5% prevalence rate among civilians. Similarly, Milliken, Auchterlonie, and Hoge (2007) reported that 11.8% of their sample exhibited significant symptoms of PTSD, which was higher than other reported problems such as depression, aggressiveness, and substance use. Moreover, Hoge et al. (2004) observed that before deployment to either Iraq or Afghanistan, military personal reported higher levels of depression (11.4%) as compared to PTSD (9.4%). However, assessment of post-deployment symptoms indicated that PTSD (18.0% of Army veterans from Iraq; 19.9% of Marine veterans from Iraq) was more frequently endorsed than depression (15.2%; 14.7% respectively).

With over 1.6 million deployed troops since the start of OEF/OIF and many beginning to come back home to the states, the mental health needs of returning veterans are more important now than ever. Although, the high prevalence of PTSD has been
linked to increased concerns over the rates of OEF/OIF veteran suicides, the relationship between trauma and suicidality is ambiguous.

Trauma and Suicidality

Mental health diagnoses in general have been associated with an increased risk of suicidal behavior, with psychological autopsies revealing that 90% of those who commit suicide suffer from a psychological disorder, most often depression, schizophrenia, and substance-use disorders (Joiner, Brown, & Wingate, 2005). Previous literature has extensively studied the relationship between trauma and suicidal behavior, but with a limited scope. Most of the research has examined the relationship between suicidality and PTSD symptoms or a diagnosis of PTSD. However, there is limited understanding of trauma experiences that are not defined by symptoms of PTSD and their association with suicidal concerns. Research suggests that the relationship between trauma exposure and suicide exists in the context of a variety of traumatic events, including combat exposure (Bullman & Kang, 1996; Hendin & Pollinger-Haas, 1991; Nye & Bell, 2007), childhood trauma (Afifi et al., 2008; Brodsky et al., 2001; Sarchiapone et al., 2009; Ystgaard, Hestetun, Loeb, & Mehlum, 2004), and domestic violence (Thompson et al., 1999). Yet, the strength and/or nature of the association between trauma/PTSD and suicidality remains unclear.

In a review of studies focusing on the relationship between PTSD and suicide, Panagioti, Gooding, and Tarrier (2009) concluded that regardless of the type of trauma, there is an apparent association between PTSD and suicidality. The authors did not conduct a meta-analysis, therefore, no effect size is available to help understand the strength of the relationship and the results must be interpreted with caution, as the
authors’ conclusions are tentative. Despite the lack of empirical support for their conclusion that PTSD and suicide are related, the authors stated that the unique contribution of PTSD to suicidality remains unknown. That is, individuals who suffer from PTSD often have high rates of co-morbidity, most frequently depression and substance-use disorders (Knox, 2008). Few studies have examined the potential mediating role of co-morbid diagnoses, thus, it is difficult to tease out the direct relationship between PTSD and suicidality. In one study that did attempt to isolate the role of PTSD, Sareen et al. (2007) controlled for the effect of other mental disorders, and found that PTSD was not significantly associated suicidal ideation \((OR = 1.22, 95\% CI [0.73, 2.05], p = ns)\), but significantly related to suicide attempts \((OR = 2.35, 95\% CI [1.29, 4.29], p < .01)\). Despite this finding, there is a relative dearth of literature examining the unique relationship between PTSD and suicide as most of the research examining this relationship has attempted to determine whether or not the two constructs are associated. The current study will expand the previous literature by examining phenomenological distress associated with combat experiences (as compared to PTSD symptoms or diagnosis) as related to suicidality, while attending to potential covariates and moderating variables.

*Studies of Trauma and Suicidality*

Previous literature examining the relationship between trauma and suicidality has most often compared individuals with PTSD to either individuals with other anxiety disorders (Kotler, Iancu, Efroni, & Amir, 2001; Sareen, Houlanan, Cox, & Asmundson, 2005) or control groups (Amir, Kaplan, & Kotler, 1999; Kotler et al., 2001). For example, Kotler, Iancu, Efroni, and Amir (2001) compared individuals suffering from
PTSD, other anxiety disorders, and a group of control participants and found that the PTSD group had the highest risk of suicidal behaviors ($F = 46.3, p < .01$). Similarly, Sareen, Houlihan, Cox, and Asmundson (2005) found that PTSD was significantly associated with lifetime suicidal ideation ($OR = 2.79, 95\% \text{ CI} [2.02, 3.84], p < .01$) and lifetime suicide attempts ($OR = 2.67, 95\% \text{ CI} [1.82, 3.91], p < .01$), while other anxiety disorders were not. Lastly, Amir, Kaplan, and Kotler (1999) reported that PTSD subjects ($M = 39.97$) scored significantly higher on measures of suicidal risk as compared to individuals with other anxiety disorders ($M = 33.75$) and healthy controls ($M = 30.86$).

Though these studies provide some evidence that PTSD is linked to suicidality, the results should be interpreted with caution due to the limited number of studies that have controlled for the effects of other mental disorders and covariates. Consequently, studies have thus far failed to provide sufficient evidence to further the understanding of the unique role that traumatic stress may have on suicidal thoughts and behaviors. It is important for research to examine the unique contribution of traumatic experiences on suicidality in order to further understand the role of trauma in relation to the existential desire to live despite experiencing adversity.

*Trauma, Suicidality, and Veterans*

In reviewing the extant literature in the veteran population, research has demonstrated that trauma (most often defined by PTSD symptoms or diagnosis) and suicidality are related. For example, Lehmann, McCormick, and McCracken (1995) found that in the VHA, 59% of deaths by suicide are among veterans in mental health treatment, with anxiety disorders accounting for 17.7% of deaths by suicide and PTSD individually accounting for 13.3%. However, it appeared that other mental disorders
accounted for a greater percentage among those who completed suicide, with mood disorders accounting for 39% and substance use disorders accounting for 34%. Moreover, 67% of those with PTSD who committed suicide had a dual diagnosis that was most often either a mood or substance use disorder. These findings suggest that comorbidity may largely influence the relationship between PTSD and suicidal behaviors.

The relationship between PTSD and suicidality has been frequently studied with Vietnam veterans; however, evidence is mixed and only supports a weak to moderate relationship among these variables (Farberow, Kang, & Bullman, 1990; Hendin & Pollinger-Haas, 1991). For example, Kramer, Lindy, Green, Grace, and Leonard (1994) found significant correlations between suicidal ideation and PTSD ($r = .53, p < .001$), as well as previous suicide attempt and PTSD ($r = .33, p < .001$). However, veterans with a dual diagnosis of PTSD and depression reported significantly more suicidal ideation and behaviors as compared to veterans with only one diagnosis ($F = 4.67, p < .05$). This suggests that other factors may be contributing to the variance between PTSD and suicidality, such as co-morbid mental health diagnoses. Similarly, Hendin and Pollinger-Haas (1991) found that 20% of Vietnam veterans diagnosed with PTSD in their sample had made a previous suicide attempt and that 89.5% of suicide attempters compared to 53% of suicide non-attempters had severe symptoms of PTSD ($\chi^2 = 6.79, df = 1, p < .05$). According to the authors, these results provided evidence that PTSD increases veteran risk for suicidal behavior. However, logistical regression analysis indicated that anxiety was not a significant and unique predictor of suicidality among PTSD diagnosed veterans, rather, veterans who endorsed combat guilt (as defined by “guilt about combat actions and guilt about surviving when others died”, Hendin & Pollinger-Haas, 1991, p.
and depressive symptoms had a significantly higher likelihood of attempting suicide. Moreover, Farberow, Kang, and Bullman (1990) compared Vietnam veterans who committed suicide to those who were in a motor vehicle accident. Based on psychological autopsies, the authors concluded that veterans who died by suicide experienced more significant symptoms related to PTSD as compared to those who did not die by suicide ($p < .05$), including perceiving the war as a stressor, decreased interest, increased detachment from others, irritability, and difficulties concentrating. However, many hallmark symptoms of PTSD such as intrusive thoughts, nightmares, and startled response were found not to differ between the groups. One may argue that decreased interest and concentration, in addition to increased isolation and irritability could also be a function of depression. These studies provide further evidence that there remains much unknown about the nature of the relationship between PTSD and suicidality, as other factors including co-morbid diagnoses or the perception of trauma as a stressor without PTSD symptoms may influence this relationship.

To date, minimal research has been conducted to examine the effects of trauma on suicidality among OEF/OIF veterans. Jakupcak et al. (2009) found that OEF/OIF veterans with PTSD were four times more likely to endorse suicidal ideation than veterans without PTSD ($OR = 4.45, p < .01$). Moreover, the risk for suicidal ideation was five times greater in veterans with two or more co-morbid diagnoses as compared to those with only PTSD ($OR = 5.71, p < .01$). Similarly, Pietrzak et al. (2010) found a significant relationship between reported suicidal ideation and a positive PTSD screening among OEF/OIF National Guard veterans based on data from the Veterans Needs Assessment Survey ($F = 53.22, p < .001$). In support of Jakupcak et al. (2009) and
Pietrzak et al. (2010), the most recent study conducted by Guerra and Calhoun (2011) found that suicidal ideation was significantly associated with PTSD ($\chi^2 = 16.73, p < .001$). Results from these studies indicate that the relationship between suicidality and PTSD among OEF/OIF veterans may be a more significant problem as compared to previous war veterans.

As a result of these mixed findings on the relationship between posttraumatic stress and suicidality among veterans, a direct and causal understanding remains unclear. What is clear however is the high prevalence of psychological disorders and alarming rate of suicide among veterans. The VHA has dedicated much attention to address the mental health needs of veterans and the prevention of suicide. Previous efforts have focused primarily on the identification of risk factors and availability of services, yet little research has addressed protective factors against suicidality. Therefore, in order to address the relative dearth of information regarding veteran suicide resilience, the present study examined a theory of resilience called Salutogenics.

Theoretical Foundation and Rationale

The theoretical framework adopted in this study is the Salutogenic Model of Health (SMH; also referred to as salutogenesis) proposed by Aaron Antonovksy in 1979. This model emphasizes individual strengths and the ability to overcome adversity (Antonovksy, 1979). Salutogenesis is a theory of successful coping attributed to a response system that effectively manages daily stressors in order to avoid tension and the state of stress (Antonovksy, 1987). In his work with Israeli men and women, Antonovksy observed that despite hardships and traumatic experiences, some individuals remain physically healthy and functionally well (Antonovksy & Shoham, 1978). Through his
studies, he identified a pattern among healthy individuals that reflected their overall perception of the world. This perception, called a sense of coherence (SOC), is the heart of the Salutogenic Model of Health. Defined by Antonovsky (1979), a sense of coherence is:

A global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one’s internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected. (p. 10)

Thus, according to Antonovsky, individuals remain healthy and successfully manage tension in the environment through their unique way of interpreting the world, or their sense of coherence. The focus of the present study was to determine if sense of coherence provides individuals with the skills to successfully manage traumatic combat experiences, which would subsequently reduce suicidality. In order to further understand this concept, the three components of sense of coherence are presented next.

Comprehensibility

Comprehensibility refers to the perception that one’s internal and external environments are understandable, predictable, and structured (Antonovsky, 1979). As defined by Antonovsky (1987), comprehensibility is:

…the extent to which one perceives the stimuli that confront one, deriving from the internal and external environments, as making cognitive sense, as information that is ordered, consistent, structured, and clear rather than noise-chaotic, disordered, random, accidental, inexplicable. (pp. 16-17).

It reflects the ability to make sense out of environmental experiences and respond accordingly. Individuals are able to acknowledge the various experiences they encounter and believe that their responses to these events are accurately interpreted. There is a clear awareness that their world has direction and events are responded to based on this
knowledge. This does not mean that all experiences are perceived as positive and can be easily understood. Rather, an individual with a strong propensity towards comprehensibility acknowledges that life experiences are both positive and negative, but when perceiving negative experiences, the individual can make sense of events such as the death of a loved one, natural disasters, or failure. Moreover, when experiences are unexpected or unknown, individuals with high comprehensibility maintain the expectation that these new experiences will be understood.

In relation to combat exposure and veterans, individuals with high comprehensibility would make sense of their traumatic experiences during war, acknowledging that their behaviors (e.g., killing, injuring others) are a function of their role as a soldier and a means of survival during harsh, life-threatening conditions. In contrast, veterans with low comprehensibility may have difficulty processing their combat experiences and negatively perceive their behaviors as personal faults. Thus, the theory could suggest that veterans with a high comprehensibility are able to process the experiences in combat, rather than become stuck in the trauma, which may in turn contribute to the development of mental health issues and suicidality.

**Manageability**

The second core component of SOC is manageability, defined as “the extent to which one perceives that resources are at one’s disposal which are adequate to meet the demands posed by stimuli that bombard one” (Antonovsky, 1987, p. 17). Individuals ascertain that the challenges they face in life can be successfully tackled because they have access to means that will result in a solution. Resources are not only those under the control of the individual, but also resources controlled by other trusted individuals or
groups (including friends, family, political leaders, and religious authorities). Therefore, for those high in manageability, challenges are met with a reasonable expectation that a solution will be found. It is important to note the use of the word “reasonable” because manageability implies that individuals can appropriately judge reality and based on this judgment they are aware when resources may not be available. Individuals with high manageability assume that life experiences can be managed accordingly, through personal coping skills or external resources, while at the same time recognizing the limits of their resources. Challenges are not viewed as attempts to victimize the individual or that life is unfair, rather, they are anticipated and conquered. On the other hand, an individual with low manageability may perceive life experiences as intolerable events that cannot be successfully coped with. The challenge drags them down instead of motivating them to work harder towards a favorable outcome.

Thus, despite traumatic exposure to combat related events, a veteran with high manageability may rely on necessary resources to cope with war-time stressors, whether these are personal assets or receiving help from others. Appropriately meeting the needs of their mental health challenges could provide a protective source against suicidality. However, for veterans with low manageability, exposure to combat and traumatic experiences could be seen as insurmountable challenge that has no solution. Therefore, they may be less likely to seek mental health services and believe that things will not change, resulting in higher susceptibility to suicidality.

Meaningfulness

The most influential component of a sense of coherence is the motivation to actively engage in life by molding one’s fate through daily interactions and experiences
Accordingly, in order for individuals to become dynamic participants in their lives, they need to perceive events as having meaning and attend to those meaningful events. Meaningfulness was defined by Antonovsky (1987) as:

The extent to which one feels that life makes sense emotionally, that at least some of the problems and demands posed by living are worth investing energy in, are worthy of commitment and engagement, are challenges that are welcome rather than burdens that one would much rather do without. (p. 18)

By finding meaning in one’s environment, in light of both positive and negative experiences, individuals can effectively manage their perception of events. This critical component of SOC is oriented towards the future in that individuals expect that meaningful experiences will continue to be important as time progresses. Despite present hardships, individuals have the ability to overcome challenges based on their future outlook that experiences will continue to have meaning. Individuals high on meaningfulness are willing to confront challenges by finding significance in negative events. On the other hand, individuals with a low sense of meaning unsuccessfully manage the challenges they face. Among the three components, Antonovsky (1987) stated that meaningfulness is central to an individual’s sense of coherence. Without a strong sense of meaning in one’s life, comprehensibility and manageability are only temporary states in which individuals perceive their relation to the world. Meaningfulness provides individuals with the foundation for a stable and enduring perception of life experiences.

Readjustment back into civilian life has posed many problems for veterans, including difficulties in interpersonal functioning, limited community connection, substance use, and mental health concerns (Sayer et al., 2010). Veterans with limited social interactions and poor community involvement may be prone to low
meaningfulness and the development of psychological distress. But for those veterans who find meaning in life’s challenges, they may view wartime experiences as manageable due to the perception that the future will bring potentially meaningful events. Thus, combat experiences may not dictate a veteran’s outlook on what the future has to offer, which could reduce the impact of wartime stressors. Sense of coherence could potentially differentiate those veterans with mental health issues and suicidality from those without.

Rationale for SOC in the Present Study

The development of an individual’s SOC is contingent upon the combination of the three components. Individuals with strong SOC understand the reality of situations and are able to determine if favorable outcomes are likely given the context of the situation. To successfully cope with challenges, individuals with a strong SOC seek available resources, anticipate both negative and positive outcomes, and construct meaning based on their experience. Challenges are understood to be an inherent part of life and with a strong SOC, individuals are able to make sense of the challenges, find meaning in them, and believe in their internal or external resources to manage stress. A well developed and strong SOC recognizes that the natural process of life brings both accomplishments and failures and in order to achieve established goals, one must put forth effort to obtain needs and wants. Overall, the combination of these components reflects a sense of confidence that challenges met will be resolved.

Sense of coherence is essentially a problem-solving orientation towards stressors in one’s environment. Combat exposure can create a set of life-threatening, traumatic stressors that can impact the psychosocial functioning of veterans. Moreover, suicidality
has been considered a problem-solving behavior, as the late Edwin Shneidman (1985) stated, “...suicide is a conscious act of self-induced annihilation, best understood as a multidimensional malaise in a needful individual who defines an issue for which the suicide is perceived as the best solution” (p. 203). In the mind of a suicidal individual, suicide is often considered the only solution to his or her problem. Thus, if combat stressors are perceived as unbearable, suicide may be considered as the only option for veterans to escape their pain. The ability to cope with wartime stressors may be explained by the strength of veterans’ sense of coherence, as individuals with high sense of coherence are likely to demonstrate psychological resilience in the face of adversity. As a mechanism of resilience, sense of coherence may aid in an individual’s ability to navigate life challenges. Sense of coherence could act as a buffer between traumatic experiences and suicidality. Veterans with a high sense of coherence may find an alternative solution to suicide, through the ability to find meaning in life and their perceived resources to manage stressors.

Statement of the Problem

Previous research has identified the growing concerns related to the mental health of veterans and the relatively high rate of suicide in the veteran population. With an estimated 50% of veterans screening positive for PTSD and nearly 6,000 deaths by suicide annually, it is undeniable that veterans are suffering severe psychological distress (U.S. Department of Veterans Affairs, 2010; Ramchand et al., 2010). To date, much of the research has focused on the identification of suicide risk factors and comparing the rate of veteran psychological disorders and suicide to rates of the U.S. general population. Though this information is useful in understanding the incidence and prevalence of
psychological disturbances and suicide among veterans, it provides limited insight into protective or resilience factors. A few studies have addressed the concept of resilience in respect to mental health problems and suicide among veterans, such as the Army STARRS program. In one study, Pietrzak et al. (2009a) found that fostering psychological resilience among veterans decreased the severity of psychological distress. For example, veterans who endorsed suicidality had lower resilience scores ($M = 60.9$) as compared to veterans who did not endorsed suicidality ($M = 75.5$, $F = 24.46$, $p < .001$). Clearly, more research is needed in this area.

The present study attempted to expand the current literature on resilience among OEF/OIF veterans, specifically focusing on suicide resilience in light of traumatic experiences. Theorized as a mechanism of psychological resilience, sense of coherence was examined in order to determine whether this construct plays a role in an individual’s ability to overcome negative life experiences so to prevent suicidality.

**Research Question**

The purpose of this research was to determine whether sense of coherence contributes to suicide resilience among combat veterans of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Aaron Antonovsky’s Salutogenic Model of Health (1979, 1987) and his hallmark concept of a sense of coherence (SOC) have been hypothesized to reflect resilience and promote positive psychological adjustment to negative life experiences. Based on the extant literature regarding sense of coherence and the need to identify protective factors against suicide among veterans exposed to traumatic combat experiences, the following research question was proposed:
What is the moderating role of resilience, conceptualized as sense of coherence within Antonovsky’s salutogenic model, in explaining the relationship between veterans’ self report of traumatic combat experiences and suicidality?

Summary

This chapter began with an introduction to the psychological concerns and the disquieting rate of veteran suicide. An explanation of suicide rates among veterans, the prevalence of veteran mental health concerns, and the relationship between trauma and suicide was briefly provided. As the theoretical foundation for the present study, a brief foreword to Antonovsky’s Salutogenic Model of Health (Antonovsky, 1979; 1987) was offered, with regard to its applicability to the proposed research question. Lastly, the chapter concluded with a problem statement and the proposed research question. Due to the limited knowledge of veteran resilience, increased research is necessary to understand protective factors against traumatic experiences and suicidality. Therefore, the current study investigated one potential mechanism of resilience, sense of coherence, as a protective factor against suicidality.
CHAPTER II
REVIEW OF THE LITERATURE

In this chapter, a comprehensive review of the extant literature is presented. First, the concept of resilience is discussed, with a specific application to suicidality. Second, the Salutogenic Model of Health and a sense of coherence are introduced followed by the application of a sense of coherence as a measure of resilience under this theoretical framework. Subsequently, the literature on a sense of coherence is reviewed and the limitations of previous research are stated. Lastly, the literature on suicide and combat exposure among the veteran population is reviewed, highlighting the limitations of the research and the importance of increased resilience research. The chapter concludes with the proposed research hypotheses.

Resilience

The concept of resilience is grounded in a strengths-based approach that is reflected in the traditional counseling psychology paradigm and the modern movement of positive psychology, which both emphasize the identification of assets that are used to further promote psychological well-being (Gelso & Fretz, 2001; Lopez & Edwards, 2008). Resilience calls attention to the ways in which individuals successfully manage adversity and can be synonymous with terms such as well-being, wellness, strengths, and psychological adjustment. Though much debate has surrounded the definition of
resilience (Miller, 2003), most definitions connote that resilience is the ability to effectively cope with and overcome adverse circumstances (Rutter, 1985). For example, Garmezy (1991) defined resilience as, “the capacity for recovery and maintained adaptive behavior that may follow initial retreat or incapacity upon initiating a stressful event” (p. 459). This definition is similar to Masten (1994)’s definition “…successful adaptation despite risk and adversity” (p. 3). Moreover, in examining characteristics of resilient children, Milgram and Palti (1993) defined resilience as “…children who cope well considering the environmental stressors and deprivations to which they were exposed during their formative years” (p. 207). Thus, a common theme found among various definitions of resilience is the successful adjustment to unfavorable life experiences, similar to Antonovsky’s definition of SOC.

In addition to difficulty in adopting a common definition of resilience, the nature of what influences resilient behavior is often disputed (Luthar, Cicchetti, & Becker, 2000). Some researchers have argued that resilience is a psychological trait or characteristic (Block & Block, 1980), while others posit a process oriented approach including contextual and developmental influences that fuel resilience (Masten, 1994; Luthar 2006; Rutter 1987). Block and Block (1980) affirmed that ego resilience reflects the strength of an individual’s set of traits, including resourcefulness and flexibility against environmental stressors. As a personality trait, resilience can be viewed as a stable characteristic and general response to negative life events. On the other hand, Masten (1994) strongly argued against the notion of resilience as a personality trait. Masten posited that resilience refers to a dynamic process involving the adjustment to life challenges and should be considered under a developmental perspective. Despite the
difference in conceptualizing how resilience is developed and expressed, many authors view resilience as a protective factor against psychological distress.

The notion that resilience is a protective factor is supported by the hypothesis that resilience acts as a buffer to protect an individual from vulnerability to stress (Rutter, 1985). Rutter discussed that social support has historically been most often identified as the primary buffer to stress. However, he highlighted the importance of individual differences and protective factors. As defined by Rutter, a protective factor “refers to influences that modify, ameliorate, or alter a person’s response to some environmental hazard that predisposed to a maladaptive outcome” (p. 600). Therefore, protective factors may include both individual characteristics and environmental conditions, such as personality style, coping skills, perceived social support, or access to resources (Masten, 1994; Rutter, 1985). It is important that protective factors not be viewed as a means to avoid risk because protective factors are utilized when individuals encounter situations that place them at risk for a negative stress reaction (Rutter, 1987). Protective factors enable individuals to successfully manage and react to stressful life events. Thus, resilience is “protective” due to one’s ability to moderate the stress response in an effort to prevent maladjustment. As such, one may argue that resilience can be conceptualized as a strengths-based construct that may enhance psychological well-being.

Themes in Resilience Research

Since resilience is a broad and often ill-defined concept, confusion can arise in examining research supporting the construct. In order to more efficiently review literature on resilience, empirical studies of resilience can be categorized into three major themes: predictive outcomes, successful adaptation, and trauma recovery (Masten, 1994).
Previous research on resilience according to these themes is highlighted in the following subsections.

*Predictive Outcomes*

The first major theme of resilience research includes studies that examine predictors of good outcomes among individuals that are at high-risk. Early studies of resilience often focused on children and adolescents in an attempt to identify characteristics of resilient children considered to be at high-risk for a certain negative outcome. For example, Milgram and Palti (1993) examined differences in psychosocial characteristics among underprivileged youth. Participants included 52 Israeli boys in grades one through eight who were considered to be disadvantaged because their families were of low socioeconomic status, many of whom were on welfare and a majority with absentee parents due to substance use, mental illness, prostitution, and fathers in jail. These young boys were considered to be at-risk for unhealthy development and future psychosocial problems. Information was collected from teachers and nurses in relation to classroom behaviors, knowledge of and impressions about the students, and concerns associated with abnormal biological development. The children also completed a self-report questionnaire, including information on temperament, reinforcement, attention, and care from significant others.

The authors found that high achieving, resilient children exhibited more academic enhancing abilities (e.g., take initiative, autonomous, attentive, self-confident, and high tolerance frustration) and sought out more social support from adults and peers (e.g., make friends easily, help others, enjoy positive relationships) as compared to low achieving, non-resilient children. Academic enhancing abilities that were stronger in
resilient children as compared to non-resilient children included activeness in taking initiative \( (F = 8.17, p < .01) \), high frustration tolerance \( (F = 8.45, p < .01) \), and higher self-confidence \( (F = 15.91, p < .001) \). Resilient children showed more social support than non-resilient children, for example they made friends more easily \( (F = 15.17, p < .001) \), trusted others \( (F = 11.26, p < .01) \), and sought support from adults \( (F = 34.55, p < .001) \).

One critique of Milgram and Palti (1993) is that the positive consequences of academic success, not resilience, may have influenced the participants’ behaviors. Children who are academically successful may be more likely to have self-confidence, leadership, and stress management skills as a result of doing well. Since the authors did not use a specific measure of resilience, it is unclear whether these findings are related to academic success or resilience. Moreover, teacher ratings may have been impacted by a halo effect, in which children who perform well academically may have been rated more favorably as compared to low academic achievers.

A second example of resilience research addressing predictive outcomes was conducted by Werner and Smith (1992). Werner (1993) summarized the findings of a thirty-two year longitudinal study of at-risk children on the island of Kauai in Hawaii. In 1955, a multidisciplinary research team including pediatricians, psychologists, and social workers began a prospective study of 201 infants who were identified as at-risk due to perinatal stress, poverty, and an unhealthy family environment including discord and parental mental health concerns. Over the next 32 years, the children were assessed at ages one, two, 10, 18, and 32 in regard to their vulnerability to abnormal development due to risk factors and influences of resilience. Werner stated that around one-third \( (n = 72) \) of the at-risk children became well adapted and competent adults. Characteristics of
this group of resilient individuals included active and affectionate temperaments in
infancy, autonomy and good communication skills while toddlers, good social skills and
social involvement during elementary years, positive self-concept and internal locus of
control by young adulthood, and the overall ability to seek support and affection outside
the family in addition to extracurricular activities to maintain social ties.

For example, Werner and Smith (1992) found that boys who were at-risk in
infancy were more likely to engage in successful conflict resolution at age 18 (64.7%) as
compared to boys who were not at-risk in infancy (32.5%; \( p < .01 \)). This same group of
high-risk boys at age 18 was also more likely to utilize personal competence and self-
determination as a source of help (73.9%) as compared to the low-risk group of boys
(59.3%, \( p < .05 \)). Similarly, high-risk females at age 18 exhibited resilience as compared
to the low-risk group of females identified at infancy. The high-risk but resilient females
were found to be more satisfied with themselves (52.9%) as compared to the low-risk
group (31.5%; \( p < .05 \)). It was also found that the high-risk resilient females had
increased career or job success (64.7%) as compared to the low-risk group (32.2%; \( p <
.01 \)). These results suggest that children identified as high-risk during early infancy may
exhibit the ability to overcome negative life events and engage in healthy adaptation in
adulthood. One major limitation of these findings is the comparison between low-risk and
high-risk groups. High-risk adults were separated into resilient, teenage mothers,
delinquents, and those with mental health problems. It would have been useful to
compare the various high-risk groups among each other to differentiate resilient vs. non-
resilient children who were identified as at risk. Findings from Masten (1994) and
Werner (1993) emphasize the importance of at-risk children to seek help and stay active
in the community or their school, which could function as protective factors against unhealthy development.

**Successful Adaptation**

The second theme of resilience research has aimed to understand why individuals under stressful conditions successfully adapt to their negative life experiences. This category includes normal life experiences, such as divorce, loss of a job, death of a loved one, or physical illness. In 2002, Bonanno et al. collected prospective data from 205 individuals who lost their spouse in an attempt to identify factors that predicted grief reactions and depression. Data were collected two to three years prior to the spouses’ death, in addition to follow-up data at six and 18 months after the death of a spouse. Participants completed self-report measures of depression, bereavement, grief, and loss. Five common themes of grief were resilient \( (n = 95) \), chronic grief \( (n = 31) \), common grief \( (n = 22) \), improved mental health during bereavement \( (n = 21) \), and chronic depression \( (n = 16) \). Of the five themes, the most commonly occurring was resilience and the least infrequent was chronic depression. Results indicated that pre-loss variables such as quality of conjugal relationship, coping resources, and worldview differed among the five grief reaction groups. For example, significant \( z \)-score differences indicated that resilient widows reported less dependency on spouse \( (M = -.29; SD = 1.10) \) as compared to the chronic grief group \( (M = .19; SD = .86) \) and the chronic depression group \( (M = .22; SD = .60; F(4, 80) = 2.58, p < .05) \). It was also found that the resilient group reported a more just world belief \( (M = .21; SD = .96) \) as compared to chronic grievers \( (M = .03; SD = .83; F(4, 80) = 3.0, p < .05) \), in addition to a more positive acceptance of death \( (M = .26; SD = .74) \) than the chronic grief group \( (M = -.34; SD = 1.11; F(4, 80) = 3.99, p < .01) \).
Though the loss of a loved one may be very difficult for many, results from Bonanno et al. suggested that positive views of death and the world may increase resilience against loss. Caution must be taken in the interpretation of these results for a few reasons. First, since a majority of the participants were women \((n = 180)\) over the age of 72, the results may not be generalized to understand common grief reactions but rather reactions of elderly women who have lost a spouse. Differences may exist in men and/or a younger sample. Second, the literature suggests that bereavement is a process and not constrained by time limitations. Bonanno et al. examined loss up to 18 months after the death of a spouse, however, grief reactions may be prolonged and future research should focus on more longitudinal data. Third, the hypotheses of the study were based on previous research findings but lacked theoretical considerations related to resilience.

Another example of resilience as successful adaptation to life events was observed in a study conducted by Yi, Smith, and Vitaliano (2005). The authors surveyed a group of 404 female high school athletes and examined whether negative life experiences significantly impacted physical illness. Prior to the athletic season, participants completed various measures assessing stressful life events and coping strategies. The Revised Ways of Coping Checklist (WOCC; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985) was used to assess various coping strategies, including Problem-focused Coping, Seeking Social Support, Minimize Threat, Wishful Thinking, Blame Others, and Avoidance. Additionally, physical illness was monitored throughout the season by tracking the number of absences in practice or games due to sickness. Based on participant responses, the authors examined a subsection of participants who identified high experiences of stressors within the last year \((n = 127)\). A total of 48
participants out of the 127 participant subgroup were identified as resilient based on no reported time lost due to physical illness. Of the remaining 79 participants who indicated lost time due to illness, the top third of participants \((n = 31)\) who reported the highest time lost were identified as non-resilient. Due to incomplete data sets, the final subgroups consisted of 42 resilient athletes who were compared to 28 non-resilient athletes.

Results of a MANOVA indicated that resilient and non-resilient athletes exhibited different patterns of coping \((F_{(6, 63)} = 2.90, p < .05)\). The largest difference in coping styles was Avoidance, with non-resilient athletes exhibiting higher levels of avoidance coping as compared to resilient athletes \((F_{(1, 68)} = 9.11, p < .01)\). Furthermore, the authors divided coping styles into two groups, Adaptive (Problem-focused, Social Support, and Minimize Threat styles) and Maladaptive (Wishful Thinking, Blame Others, and Avoidance styles). It was found that resilient athletes exhibited significantly greater adaptive coping responses as compared to the non-resilient athletes \((F_{(1, 68)} = 4.40, p < .05)\). These findings suggest that when faced with stressful life experiences, resilient individuals are less likely to suffer from physical illness and engage in more healthy coping styles such as focusing on the problem and asking others for help. A major limitation of these findings is the limited theoretical foundation used for defining resilience and the lack of a measure of resilience. Yi et al. conceptualized resilient athletes as those who experienced a high level of stressors and limited physical illness. This conceptualization fails to take into account the psychological well-being of these participants, including cognitive and emotional components of resilience. These results may have been more informative had the authors used a theoretical framework to
conceptualize resilience, a consideration that was addressed in the present study through the use of the Salutogenic Model of Health (Antonovsky, 1987).

Trauma Recovery

Recovery after a traumatic experience is the third theme of resilience research that seeks to identify factors contributing to the healing process of trauma survivors. This theme is different from stressful situations because historically traumatic experiences are considered to be dangerous or life-threatening situations, such as physical or sexual abuse, assault, natural disasters, terrorism, and war. It is estimated that 50-60% of the general population experience a traumatic event, however, individual responses to trauma vary widely and may be explained by variations of resilience (Davis, 2009). Hanson, Kilpatrick, Freedy, and Saunders (1995) surveyed individuals who experienced the 1992 Los Angeles riots and found that a majority of their participants (78.2%) reported three or fewer symptoms of posttraumatic stress. Similarly, Galea et al. (2002) found that after the September 11, 2001 terrorist attacks on the city of New York 40% of Manhattan residents reported no symptoms of posttraumatic stress. Thus, individuals may be capable of positively adapting to traumatic experiences, exhibiting strength and resilience.

For example, Connor, Davidson, and Lee (2003) surveyed a population of violent trauma survivors who were recruited online and completed online measures of resilience, symptoms of traumatic stress, and perceived physical/mental physical health status. Logistic regression analysis revealed that resilience was significantly related to physical health status ($B = -.10, SE = .02, p < .001, OR = .91, 95\% CI [.88, .94]) and mental health status ($B = -.23, SE = .02, p < .001, OR = .80, 95\% CI [.76, .84])$. These findings suggest that resilient individuals endorsed healthier physical and mental health statuses.
Moreover, linear regression analysis showed that resilience, spiritual beliefs, and anger significantly related to PTSD symptom severity (adjusted $R^2 = .29$). Higher resilience was found to be associated with lower PTSD severity ($\beta = -.33$). These results suggested that resilient survivors of violent trauma are more likely to endorse fewer symptoms related to PTSD, indicating that individuals may be capable of successful adaptation to negative life experiences via resilience.

In interpreting these results, the selected sample of only violent trauma survivors must be considered. The findings may not be applicable to all trauma survivors. Moreover, the means of participant recruitment is questionable. Participants were recruited through a private commercial survey company that provides participants with free internet connection and equipment. Since the sample was recruited from this company and participants completed all measures online, the veracity of participant responses may be of concern. It is unknown whether all of the participants experienced a traumatic event as no researcher or clinician was able to verify this information. It is also possible that some participants may be involved in the private company in order to gain free access to the internet and computer hardware.

The three themes of resilience research (predictive outcomes, successful adaptation, and trauma recovery) highlight the ability of many individuals to manage negative life events that range in severity and context. In addition to positive psychological adjustment to adverse circumstances, it is important to understand how individuals may respond to specific suicide related problems since suicide is often associated with environmental stressors and mental health concerns.
Suicide Resilience

Research among suicidologists has identified numerous risk and protective factors to suicide. According to the Suicide Prevention Resource Center (SPRC), risk factors associated with suicide increase the potential towards suicidal behavior (SPRC, 2003). Risk factors may include hopelessness, presence of mental disorder, previous suicide attempt, family history of suicide, lack of support, and limited access to care among others. Protective factors, on the other hand, may reduce the likelihood of suicidality and enhance psychological resilience. Protective factors can include access to and effectiveness of clinical care, familial and community support, limited access to lethal means, religious or cultural beliefs against suicide, and adequate problem-solving and conflict resolution skills. A majority of these protective factors are contextually based, with less attention to individual personality/cognitive characteristics. As a result, minimal research has attempted to examine the impact of psychological aspects of resilience on suicidality.

In addressing the relationship between resilience and suicide, there have been some important contributions, including an emphasis on protective factors against suicidal behaviors by Marsha Linehan and the development of a suicide resilience scale by Osman et al. (2004). For example, Linehan, Goodstein, Nielsen, and Chiles (1983) argued that most of the literature in the field of suicidality had focused on the identification of risk factors associated with suicide, including characteristics of suicidal individuals. In contrast, these authors utilized a cognitive-behavioral perspective of suicidality to assess adaptive belief systems among non-suicidal individuals. Based on their hypothesis that there are certain beliefs about life that may reduce the likelihood of
attempting suicide and that suicidal individuals may perceive these beliefs to be of less importance than non-suicidal individuals, the Reasons for Living Inventory (RFL; Linehan, Goodstein, Nielsen, & Chiles, 1983) was developed. Reasons for living were conceptualized as important protective factors against suicidality due to cognitive schemas and expectations associated with living, in addition to negative beliefs of death. Research has supported the notion that reasons for living may function as protective factors against suicide (Britton et al., 2008; Connell & Meyer, 1991; Jobes & Mann, 1999; Lizardi et al., 2007; Osman et al., 1999). For example, Britton et al. (2008) found that individuals with less severe suicidal ideation reported more reasons for living than those with severe suicidal ideation ($t_{(124)} = 3.53$, $p = .001$).

Similarly, Osman and colleagues developed the Suicide Resilience Inventory-25 (SRI-25; Osman et al., 2004), which is a self-report measure assessing protective mechanisms against suicidality. These authors argued that despite extended research on resilience, little application has been made in respect to suicide. In an attempt to operationalize suicide resilience, Osman et al. defined it as “… the perceived ability, resources, or competence to regulate suicide-related thoughts, feelings, and attitudes” (2004; p. 1351). To date, no published empirical studies were found that have utilized the SRI-25. The lack of empirical research on the SRI-25 may be reflective of suicidology’s focus on risk rather than protective factors against suicide.

In addition to the development of the RFL and the SRI-25, a few recent studies by Everall, Altrows, and Paulson (2006), Roy, Sarchiapone, and Carli (2007), and Johnson, Gooding, Wood, and Tarrier (2010) have examined the relationship between suicide and resilience, a potential start in further understanding protective mechanisms against
suicidality. For example, Roy et al. (2007) surveyed 100 substance dependent participants from an outpatient treatment program, all of whom were currently drug free. Participants engaged in a psychiatric interview to gather demographic information, history of substance use and history of previous suicide attempts. Additionally, the participants completed measures of resilience and childhood trauma. Results of a Mann-Whitney rank sum test indicated that suicide attempters had significantly lower resilience ($n = 41; M = 49.8 \pm SE 2.7$) as compared to non-suicide attempters ($n = 59; M = 62.7 \pm SE 2.3, p < .001$). This indicates that individuals who have no history of suicide attempts may exhibit higher levels of resilience as compared to individuals with a history of suicide attempt. The authors concluded that low resilience might be a risk factor for suicide attempts, indicating that high psychological resilience may be a protective factor. A major critique of this study is the limited information provided about the study’s sample. No demographic information was provided, including age, sex, race/ethnicity, marital status, etc. Since many risk factors associated with suicidality relate to demographics, these variables may have influenced the relationship between resilience and suicide attempts. In addition to understanding the association between resilience and suicide attempts, it is important to understand what factors of resilience may reduce the likelihood of suicidality.

Everall et al. (2006) conducted a qualitative study that investigated resilience among female adolescents who overcame suicidality. Thirteen females aged 17 to 26 years old who previously reported suicidal ideation between the ages of 15 and 24 years engaged in a semi-structured interview, answering questions such as “What did you do to cope with being suicidal?” and “How did you shift from being suicidal to not being
suicidal?” Four themes emerged in a thematic analysis of resilience against suicidality: Social processes, Emotional processes, Cognitive processes, and Purposeful and Goal-Directed action. Social processes included perceived social support of peers and families and the participant’s willingness to seek, ask for, and accept support from others. This highlighted the importance for suicidal individuals to be with people who provide comfort, a sense of belonging, and acceptance. The second theme, emotional processes, included working through feelings of depression and sadness, talking with others about feelings, and journaling. Individuals who experience traumatic events or symptoms of depression may isolate themselves and avoid the pain associated with their experiences. However, results from this study indicate that suicidal individuals may benefit from facing their problems through an exploration of their emotionality.

The third theme from Everall et al. (2006) suggested that cognitive processes, such as refocusing their perspective (i.e., reframing negative beliefs) and the acknowledgement of personal choice and control, helped suicidal individuals overcome their ideations. The final theme indicated that participants were proactive and held themselves responsible for their recovery. For example, this theme could include asserting independence, increased hope and optimism towards the future, and developing a greater sense of purpose and meaning in life. This study provided further support that resilience may not only be reflected in personality, but additionally as an interactive process between the environment and thoughts, feelings, and behaviors. Thus, the nature of life stressors as well as individual beliefs and actions, may influence an individual’s response to stressful life events which may be reflected in sense of coherence as the present study proposed (Antonovsky, 1987).
As Everall et al. (2006) found that suicide resilience may be a combination of factors, a third study of suicide resilience by Johnson et al. (2010) examined the specific cognitive mechanisms that enhance the ability to overcome suicidality. The authors investigated whether positive self-appraisals influenced the development of suicidality after a negative life event. The study was based on the authors’ schematic appraisals model of suicide (SAMS), which purports that when faced with stressful life events, an individual appraises both his/her situation and engages in self-appraisal. SAMS suggests that negative self-appraisals may increase risk of suicidality, while positive self-appraisals act as a protective factor. Seventy-eight university students were recruited for participation and completed a battery of measures, including measures assessing suicide, resilience appraisals, and life experiences. Hierarchical regression analysis revealed that positive appraisals moderated the relationship between life events and suicidality, as positive appraisals contributed unique variance above and beyond life events in the prediction of suicidality ($\Delta R^2 = .194, p < .001$). Additionally, an interaction between positive self-appraisals and life events was found to be significant ($\beta = -.304, p < .001$) indicating the moderating effect of appraisals on life events. This study provided additional support to the findings of Everall et al. (2006), highlighting the importance of cognitive mechanisms that may influence suicidality.

In summary, previous research on suicide and resilience suggest that there may be a relationship between suicidality and the ability to overcome suicidal thoughts. Research indicates that higher psychological resilience may be associated with lower incidence of suicide attempts (Roy, Sarchiapone, & Carli, 2007). Moreover, resilience against suicide has been conceptualized as a protective factor which may decrease the risk of death by
suicide (Osman et al., 2004). Protective factors associated with suicide may include beliefs about living, death, and negative life events (Everall, Altrows, & Paulson, 2006; Linehan et al., 1983), perceived social support and acceptance (Everall et al., 2006), optimism and responsibility to self-recovery (Everall et al., 2006), and the role of positive self-appraisals (Johnson, Gooding, Wood, & Tarrier, 2010). These findings have provided initial support that resilience and suicide may be related. Future research efforts are needed to identify psychological factors that may enhance suicide resilience, such as sense of coherence that is examined in the current study.

Research on protective factors against suicide and the concept of suicide resilience has increased over the last decade. This increased awareness and recent research on suicide resilience could help advance further exploration into individual characteristics of resilient outcomes. Moreover, the identification of additional protective factors that reflect psychological aspects of resilience is necessary to increase suicide prevention efforts, especially among a veteran population in which high rates of suicide and mental health concerns are observed. One such protective factor that may be related to resilience against suicide is sense of coherence. Sense of coherence represents the ability to understand, manage, and find meaning in negative life experiences (Antonovsky, 1987). It has been hypothesized to be a mechanism of resilience and has been extensively studied as related to physical and mental health stressors. However, sense of coherence has been minimally applied to suicidal behavior. The present study sought to examine the role of a sense of coherence in understanding the relationship between traumatic experiences and suicidality. The following section provides an
explanation of a sense of coherence, the main construct in the Salutogenic Model of Health proposed by Aaron Antonovsky (1979).

Sense of Coherence in the Salutogenic Model of Health

In 1979, Aaron Antonovsky proposed a theory of successful coping called the Salutogenic Model of Health (SMH; Antonovsky, 1979). The development of the SMH was grounded in Antonovsky’s study of stress, in which he found that despite extremely negative or traumatic life experiences, some individuals remain healthy. Antonovsky believed that this phenomenon was divergent from the dominant paradigm during that era, the pathogenic orientation (Antonovsky, 1984). He argued that previous research neglected to account for why individuals remain healthy, as opposed to developing a disease. Therefore, he posited that the pathogenic orientation provided a limited scope in understanding the human condition and in response, he developed the SMH. Defined, salutogenic means the ‘origins of health’ and Antonovsky sought to understand human development that may lead to the maintenance of health. Rather than a dichotomous system of labeling an individual as either healthy or unhealthy, Antonovsky developed the salutogenic model based on a continuum.

The Salutogenic Model of Health explains an individual’s location on what Antonovsky referred to as the health ease/dis-ease continuum (See Figure 2.1; Antonovsky, 1979). Instead of exploring why an individual is diseased, Antonovsky sought to learn the variables that influenced an individual’s placement on the continuum of health. The ease/dis-ease continuum reflects an individual’s ability or inability to appropriately manage stressors and tension. The dis-ease end of the continuum reflects a breakdown in which stressors or subjective feelings of pain are perceived as interfering
Figure 2.1. Salutogenic Model of Health, adapted from Antonovsky (1979). GRRs provide a set of meaningful, coherent life experiences which in turn shape sense of coherence. Sources of GRRs can create stressors and stressors may influence the availability of GRRs. A strong SOC will mobilize GRRs and stressors to avoid a state of tension, while a weak SOC may result in the experience of tension. Successful management of tension results in movement towards the health-ease end of the continuum whereas unsuccessful tension management results in the experience of a stress reaction and movement towards the dis-ease end of the continuum.
with daily functioning. Antonovsky argued that it is important to look at what factors within an individual promote health and resilience, so to prevent pain and suffering. Therefore, the salutogenic model of health explores the various elements that influence placement on the health ease/dis-ease continuum and what causes movement throughout or static placement on the continuum.

Placement on the continuum is influenced by numerous factors, including previous life experiences, stressors, and sense of coherence (Antonovsky, 1979). According to Antonovsky, individuals have a unique subjective interpretation of life experiences and stressors they encounter, which is influenced by generalized resistance resources (GRRs). GRRs are facilitative factors such as such as coping styles, ego identity, physical strength, intelligence, access to money and basic needs such as shelter, food and clothing. GRRs influence how individuals experience their world, thus creating a meaningful set of life experiences. They can also enhance effective stressor and tension management. However, if a stressor is perceived as negative, individuals may experience a state of tension. Tension is defined as “the response of the organism to stressors” (Antonovsky, 1979, p. 10) and is managed through GRRs. The availability of GRRs in the environment and the capacity to utilize these resources can have a large impact on the ability to efficiently manage tension. The successful management of tension results in the dissipation of tension and healthy adaptation. When GRRs are not readily available, individuals may be unable to successfully manage tension and the resulting consequence may be movement towards the dis-ease end of the continuum and the subjective state of stress. Stress is defined as “the state of the organism in response to the failure to manage
tension well and to overcome stressors” (Antonovsky, 1979, p. 10). Once under a state of stress, placement on the continuum is further moved toward dis-ease.

Therefore, stressors, tension, and subjective stress play an important role in determining an individual’s location on the health ease/dis-ease continuum. More notably, when an individual is confronted with stressors, the prevention of tension from becoming stress is determined by the strength of an individual’s sense of coherence (SOC; Antonovsky, 1979). A sense of coherence is the most influential aspect of an individuals’ relative placement on the health ease/dis-ease continuum.

*Sense of Coherence Defined*

According to Antonovsky, the foundation for health is a strong sense of coherence (Antonovsky, 1979). SOC theoretically determines where individuals fall on the continuum of health, relative to their experience of stressors and their tension management skills, including availability and utilization of generalized resistance resources. Antonovsky posited that since human beings are constantly faced with stressors in both their internal and external environments, a universal theory to account for an individual’s ability to cope is essential to understanding the core of human nature. Defined, sense of coherence is,

> A global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one’s internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected. (Antonovsky, 1979, p. 10)

Inherent in the definition of SOC is a framework for understanding how individuals view not only their world, but how they see themselves fitting within that world. In the development of this concept, Antonovsky sought to account for variables that influence coping skills across various domains, thus SOC is conceptualized as a
generalized concept. SOC is a global orientation because it accounts for an individual’s perception of all life experiences and responses that are based on the interpretation of these experiences. Antonovsky considered SOC to be pervasive and enduring because it is an essential component of an individual’s personality structure. Across the life span, SOC is shaped and reinforced by life experiences, including both social and cultural influences. These experiences may strengthen or weaken one’s SOC, influencing how individuals interact with their world. Moreover, a SOC enables individuals to appropriately judge the reality of situations, adapt to changes, and to acknowledge and accept that frustration and failure are a part of life. Adaptability, flexibility, and reasonable thinking are fundamental mechanisms that give strength to SOC, thus enabling the resolution of conflicts. These concepts are reflected in the second half of Antonovsky’s definition of SOC, which introduces the three crucial components of comprehensibility, manageability, and meaningfulness.

Comprehensibility is a cognitive component in which individuals perceive that life has order and is predictable, as compared to the perception that life is chaotic and cognitively incomprehensible (Antonovsky, 1984; 1993a). Thus, individuals with high comprehensibility face life challenges with an understanding and expectation that these experiences make sense. The second component, manageability, is a behavioral component whereby individuals effectively utilize resources that are available to them in order to successfully cope with life events (Antonovsky, 1996a). Individuals with high manageability are aware of potential means to cope with stressors, whether they are internal or external resources, and appropriately make use of them. Lastly, meaningfulness is the motivational component of SOC that influences individuals’ desire
to respond to stress (Antonovsky, 1993a). Those with high meaningfulness believe that the future will continue to provide important experiences, thus, motivating them to effectively manage their current state of stress.

In sum, a sense of coherence is a relatively pervasive and enduring orientation towards life experiences. Though it is theorized as a stable construct, Antonovsky acknowledged that SOC may fluctuate over time in response to life situations, such as extreme traumatic events like war or abuse (Antonovsky, 1979). Important in the understanding of SOC is that it acts as a dynamic process that develops throughout the lifespan and may be modified based on experiences. Life experiences are crucial in shaping sense of coherence and individuals are constantly introduced to new challenges. When life experiences are consistent, individuals begin to interpret their world as coherent and predictable. One consequence of viewing all events as predictable is that individuals may place themselves in situations in which they are not capable of managing because they believe in their ability to understand the situation. This may result in a weakened SOC and perceived failure to manage stressors. Antonovsky posited that both predictable and unpredictable experiences are important for the development of a strong SOC. Unpredictable experiences are necessary because they provide an opportunity for both growth and increased confidence through successful adaptation to unforeseen events. Additionally, unsuccessful management of unpredictable events may increase one’s awareness that failure is a natural ingredient in life. An individual with a strong SOC views experiences as predictable and rewarding, yet recognizes that not all experiences are positive and can result in failure or frustration.
In relation to the current study, it was hypothesized that combat veterans with strong a SOC may perceive the dangers of war as manageable and meaningful, thus reducing their risk of suicidality. On the other hand, veterans may be at increased risk of suicidality if combat experiences weaken their SOC because these experiences may be perceived as unmanageable and incomprehensible. Thus, a sense of coherence may modify an individual’s response to combat and decrease susceptibility to suicidal thoughts and behaviors. This may have important implications in the prevention of suicidality through increased resilience building via fostering a strong SOC before and after combat deployments.

Sense of Coherence and Mental Health Concerns

Sense of coherence has been extensively studied and linked to various aspects of physical and mental health, including health status (Larsson & Kallenborg, 1996; Suominen, Helenius, Blomberg, Uutela, & Koskenvuo, 2001); psychological adjustment and well-being (Flannery & Flannery, 1990; Gana, 2001; Jorgensen, Frankowski, & Carey, 1999; Mo & Mak, 2008; Ying & Akutsu, 1997); anxiety (Antonovsky & Sagy, 1986; Ristkari, Sourander, Ronning, & Helenius, 2006); depression (Carstens & Spangenberg, 1997; Ristkari et al., 2006; Skarsater, Langius, Agren, Haagstrom, & Dencker, 2005; Skarsater et al., 2009); drug use (Neuner et al., 2006; Ristkari et al., 2006); mortality and lifestyle (Surtees, Wainwright, & Khaw, 2006; Wainwright et al., 2008); heart disease (Ekman, Fagerberg, & Lundman, 2002; Motzer & Stewart, 1996; Poppius, Tenkanen, Kalimo, & Heinsalmi, 1999); and occupational functioning/burnout (Albertsen, Nielsen, & Borg, 2001; Gilbar, 1998; Soderfeldt, Soderfelt, Ohlson, Theorell, & Jones, 2000). Moreover, research has supported the strong connection between
physical health, mental health, and a sense of coherence (Fok, Chair, & Lopez, 2005; Karlsson, Berglin, & Larsson, 2000; Lutgendorf, Vitaliano, Tripp-Reimer, Harvey, & Lubaroff, 1999; Nygren et al., 2005).

In the following subsections, key studies are presented that have investigated the relationship between sense of coherence and variables associated with mental health concerns. Sense of coherence has been broadly examined in both the physical and mental health domains; however, to include physical health concerns is beyond the scope of this study. The literature presented herein on sense of coherence will largely focus on mental health related variables as they are most relevant to the purpose of the current study.

First, a more general review of mental health factors related to sense of coherence is provided, including psychological adjustment, depression, anxiety, and drug use. These variables were selected because mood, anxiety, and substance use disorders are significant risk factors of suicidality (AAS, 2009) and high rates of these disorders are observed among veterans (Scioli et al., 2010; Tanielian & Jaycox, 2008). Second, a more specific review of the literature on a sense of coherence as applied to trauma, suicide, and within the veteran population is presented.

Psychological Adjustment

As the major determinant of placement on the health ease/dis-ease continuum, sense of coherence is hypothesized to either facilitate or inhibit adjustment to negative life events (Antonovsky, 1987). Antonovsky posited that individuals with strong SOC are more likely to successfully adjust to life challenges as compared to individuals with low SOC. Thus, SOC influences an individual’s ability to manage stressors and successfully cope with adverse circumstances. Research has extensively examined how individuals
adjust to negative life events and the influence of SOC as a coping style and orientation towards stressful experiences.

To examine the relationship between life stress, psychological distress, and SOC, Flannery and Flannery (1990) surveyed 95 adult students in night school at two time periods, once in the beginning of their semester (T1) and a second time six weeks later at the end of the semester (T2). The participants completed the Orientation to Life Questionnaire (OLQ; Antonovsky, 1987), Antonovsky’s original measure of a sense of coherence and measures assessing stress, anxiety, and depression.

Correlation coefficients indicated the following statistically significant relations at \( p < .05 \): SOC was negatively related to life stress \( (r = -.59) \) and reported symptoms of anxiety \( (T1, r = -.76; T2, r = -.69) \) and depression \( (T1, r = -.75; T2, r = -.62) \) at both time 1 and time 2. These results suggest a stronger SOC is related to lower reported levels of stress, anxiety, and depression, which is consistent with Antonovsky’s belief that SOC is linked to psychological adjustment. Multiple regression analyses examined the main effect of life stress and sense of coherence on anxiety and depression. Results revealed that for anxiety, statistically significant main effects were found for life stress \( (F_{(1, 91)} = 9.44, p < .003) \) and sense of coherence \( (F_{(1, 91)} = 29.26, p < .001) \); however no interaction was found. Similarly, analysis of depression scores revealed statistically significant main effects for life stress \( (F_{(1, 91)} = 15.83, p < .001) \) and sense of coherence \( (F_{(1, 91)} = 22.60, p < .001) \), but no interaction. These results suggest that sense of coherence and life stress are related to self-reported anxiety and depression. However, the authors did not report effect sizes and results should be interpreted with caution as the strength of these relationships is unknown. Since there was no interaction between SOC and life stress,
results suggested that SOC may not moderate the relationship between self-reported life stress and degree of anxiety.

In contrast to the results found by Flannery and Flannery (1990), Gana (2001) used structural equation modeling to determine the role of SOC in psychological adjustment and found support for SOC as both a mediator and moderator. One-hundred and ninety-three French adults completed a variety of assessments that measured a sense of coherence, psychological well-being, anxiety, depression, and three measures of adversity (anxiety, worry, and stress). Consistent with previous findings, SOC was negatively correlated with anxiety ($r = -.51, p < .05$), worry ($r = -.53, p < .05$), and stress ($r = -.25, p < .05$). As hypothesized by the author, SOC was found to mediate the relationship between adversity and psychological well-being. The mediation findings were evidenced by: 1. Adversity predicted well-being ($\chi^2_{(27)} = 27.60, p < .05$) and the structural path was statistically significant ($\beta = -.58$); 2. Support of full mediation ($\chi^2_{(40)} = 62.40, p < .05$) was found with acceptable goodness of fit indices (Goodness-of-Fit Index = 0.95 and RMSEA = 0.05), and significant structural paths from adversity to SOC ($\beta = -0.84$) and from SOC to well-being ($\beta = 0.68$); and 3. The partially mediated model did not indicate superior fit (RMSEA = 0.06) as compared to the mediated model (RMSEA = 0.05) and the partially mediated structural path from adversity to well-being was not significant ($\beta = -0.11$). The path from adversity to well-being was found to be significant ($\beta = -0.58$), however, when SOC was accounted for, the effect disappeared ($\beta = -0.11$), which is indicative of SOC as a mediator.

In addition to the support for SOC as a mediator, the author also found that SOC acted as a moderator between adversity and psychological well-being among individuals
with low SOC. The structural path from adversity to well-being among individuals with low SOC was statistically significant ($\beta = -0.48$, $p < 0.05$) but not significant among individuals with high SOC ($\beta = -0.11$, $p > 0.05$). These results suggest that individuals with low SOC are more susceptible to the negative effects of stressful situations as compared to individuals with high SOC who may have the necessary coping skills to manage stressful experiences.

When conceptualizing sense of coherence as a general measure of adjustment, previous research supports the relationship between SOC and psychological adjustment. These findings suggest that a strong sense of coherence is related to positive psychological adjustment to life stressors. What remains unclear is the role of sense of coherence as an intervening variable in the relationship between an independent and dependent variable, as evidenced by inconsistent findings of SOC as a moderator or mediator variable. In an attempt to increase the understanding of a sense of coherence as related to mental health concerns, it has been applied to variables such as anxiety, depression, and substance use.

Anxiety

In 1986, Antonovsky and Sagy examined how SOC may influence adolescents’ ability to respond to stressful situations. These authors were interested in the relationship between sense of coherence and anxiety expressed as both trait anxiety (chronic disposition) and state anxiety (situational response). The authors hypothesized that since SOC is an enduring disposition, individuals with strong SOC would exhibit lower trait anxiety in response to stressful situations. Similarly, the authors hypothesized that a strong SOC would be associated with low state anxiety when the stressor is perceived as
ego threatening; however, no association was predicted between SOC and state anxiety if an acute stress response is perceived as very threatening by a group. A sample of 418 ninth through twelfth grade Israeli students completed a battery of assessments, including a measure of coherence and anxiety. There were two groups of students, 78 of whom were about to be evacuated from their settlements in Sinai, Israel (a state anxiety stressful situation) and 340 who were not (control group).

Correlational analysis indicated a strong, negative relationship between trait anxiety and SOC ($r = -.61$, $p < .001$) so individuals with higher SOC exhibited lower trait anxiety. The relationship remained strong among the adolescents who experienced the evacuation ($r = -.56$, $p < .001$) when the two groups were analyzed separately. Moreover, the authors found that one week before the evacuation a non-significant relationship between sense of coherence and state anxiety was observed ($r = -.06$, $p > .05$). The relationship between state anxiety and sense of coherence in an acute stressful situations perceived to be threatening by a whole group was thus insignificant. However, six weeks after evacuation when adolescents were separated from one another there was a significant relationship between sense of coherence and state anxiety ($r = -.31$, $p < .05$), indicating that increased state anxiety is associated with lower sense of coherence. The correlations between pre and post-evacuation were found to be statistically significantly different from one another ($t_{(34)} = 2.27$, $p < .05$). These findings provided support that when individuals face stressful life events, those with a strong SOC may react with less psychological distress (i.e., anxiety) as compared to those with a weak SOC.

In a similar study, Ristikari, Sourander, Ronning, and Helenius (2006) examined the relationship between sense of coherence and psychological problems. A sample of
2348 Finnish boys aged 18 years who registered for the military completed the Young Adult Self-Report (YASR; Achenbach, 1997) that assesses for psychopathology, including anxiety; in addition to a the thirteen item Orientation to Life Questionnaire (SOC-13) that assesses sense of coherence. Univariate logistical regression revealed that sense of coherence and anxiety scores on the YASR were significantly associated ($OR = 2.7$, $95\% \text{ CI} [2.1, 3.6]$, $p < .001$). Moreover, multivariate analysis indicated that anxiety uniquely predicted a weak sense of coherence above and beyond self-reported YASR scores ($OR = 1.9$, $95\% \text{ CI} [1.3, 2.8]$, $p < .001$). Together, these studies provide evidence that sense of coherence may be significantly associated with anxiety disturbances, with a strong SOC related to lower reported anxiety symptoms. A second psychological construct that has been largely studied in the context of a sense of coherence is depression.

**Depression**

In 1997, Carstens and Spangenberg investigated the relationship between sense of coherence and depression. The authors interviewed 50 adults diagnosed with depression and 50 control participants matched for age, education, and socioeconomic status. A significant difference in depression scores was found between groups ($t_{(98)} = 11.38$, $p < .001$) with the depressed group ($M = 26.1$, $SD = 10.5$) endorsing more depressive symptoms as compared to the comparison group ($M = 7.91$, $SD = 5.8$). Similarly, the depressed group ($M = 100.56$, $SD = 22.98$) had significantly lower scores on sense of coherence ($t_{(98)} = -7.66$, $p < .001$) as compared to the control group ($M = 137.24$, $SD = 24.39$). Moreover, correlations revealed a significant negative association between sense of coherence and depression scores for both the depressed group ($r = -.71$, $p < .001$) and
the control group \((r = -0.66, p < .001)\) which indicates that as depression scores increase, sense of coherence is weaker. Lastly, multiple regression analysis revealed that among the depressed individuals, the meaningfulness subscale of the Sense of Coherence Scale was the only significant predictor of depression scores \((t = -3.13, p < .01, R^2 = .52)\) and no subscale predicted depression scores in the comparison group. These findings indicate that depressed individuals may have a lower sense of coherence as compared to non-depressed individuals. Future research should investigate the causal relationship between depression and sense of coherence, as it may have important implications in fostering a strong sense of coherence among depressed persons.

In a similar study, Skarsater, Langius, Agren, Haggstrom, and Dencker (2005) examined the role of sense of coherence and social support following the first major depressive episode among 24 adult psychiatric inpatients. Participants’ depression, social support, and sense of coherence were rated at the time of admission (T1) as well as at a one-year follow-up (T2). At follow-up participants were either placed in the Recovery group or Non-recovery group based on reported depressive symptoms. Mann-Whitney tests conducted at baseline revealed no significant differences between groups with respect to depression scores, sense of coherence, or social support. Follow-up scores indicated that the recovery group (those with low depression scores) exhibited significantly higher sense of coherence and social support scores as compared to T1 \((p < .05)\). In contrast, the non-recovery group showed no increase in sense of coherence or social support scores. Though sense of coherence scores were similar across all participants during hospitalization, an increase in sense coherence was observed one year later among participants who no longer reported depressive symptoms. These findings
not only support the relationship between sense of coherence and depression, but also support Antonovsky’s (1979) notion that sense of coherence may fluctuate over time in response to various life experiences.

A common response to depressive symptoms is often the increased use of alcohol and drugs, which has been observed among OEF/OIF veterans (Ristkari et al., 2006). Since depression and substance use have been found to be comorbid disorders, sense of coherence may play a similar role among substance users as previously found among depressed individuals. The following section reviews the relationship between sense of coherence and substance use.

Substance Use

In the above referenced study by Ristkari et al. (2006), the authors found additional support that substance use and sense of coherence are related among their sample of 18-year-old Finnish boys. Univariate analysis yielded a significant relationship between sense of coherence and substance use \((OR = 3.2, 95\% CI [2.3, 4.4], p < .001)\). This finding suggests that individuals with a weaker sense of coherence are at increased odds of reporting substance use problems. Additionally, multivariate analyses were conducted and the authors found a unique association of sense of coherence and substance use above and beyond other psychiatric disorders such as anxiety and depression \((OR = 2.6, 95\% CI [1.2, 5.4], p < .05)\). Therefore, when controlling for comorbid psychiatric disorders, the strength of sense of coherence remains a significant contributing factor in the use of psychoactive substances. These results suggest that individuals who suffer from substance use disorders may have a weak sense of coherence, highlighting the influence of sense of coherence on maladaptive behaviors.
Further support for the negative association between sense of coherence and substance use was found by Neuner et al. (2006). These authors hypothesized that unhealthy coping strategies may contribute to excessive alcohol use and there may be a significant negative relationship between sense of coherence and alcohol consumption. In an urban hospital’s Emergency Department, 1833 patients were screened for hazardous alcohol consumption (defined as excessive use of alcohol over the past 12 months) and categorized as either with hazardous alcohol consumption (HAC) or without (NHAC). Patients also provided information regarding their smoking habits, illicit drug use, and demographic information. Results indicated a significant association between sense of coherence and alcohol consumption, smoking, and illicit drug use. Chi Square tests revealed a significant linear decrease in alcohol consumption ($p < .001$), smoking prevalence ($p < .001$), and illicit drug use ($p < .001$) as sense of coherence scores increased. Individuals with the weak sense of coherence were more likely to engage in hazardous alcohol consumption as compared to individuals with strong sense of coherence ($OR = 1.99$, 95% CI [1.43, 2.76]). These results suggest that sense of coherence may serve as a protective factor against substance use, as individuals with strong SOC engaged in significantly fewer substance use behaviors as compared to individuals with weaker SOC.

Previous literature has provided support for the relationship between sense of coherence and psychological variables such as depression, anxiety, and substance use. Sense of coherence has been found to be negatively related to psychological functioning, with higher SOC reflecting higher levels of adaptation. To provide further support for the application of sense of coherence to psychological variables, the present study
investigated sense of coherence as related to traumatic experiences and suicide, as well as within the veteran population.

**Applying SOC to Core Variables within the Current Study**

Previous literature applying sense of coherence to suicide and within a veteran population is limited, but provides some initial support for the purposes of the current study. The relationship between sense of coherence and traumatic experiences has been widely studied, however, results are mixed. The following subsections provide a review of the extant literature examining the relationship between sense of coherence and suicide, sense of coherence and trauma, in addition to the application of SOC within the veteran population.

**Suicide**

In the United States, no empirical studies investigating the relationship between sense of coherence and suicide were found. However, three international studies, one each in Canada, New Zealand, and South Africa will be reviewed. In 1992, Petrie and Brook examined whether the three components of sense of coherence (comprehensibility, manageability, and meaningfulness), depression, hopelessness, and self-esteem predicted future suicide attempts. At a New Zealand inpatient psychiatric unit, 150 participants were assessed via a computerized interview both during their hospital stay and at a six month follow-up utilizing measures of hopelessness, depression, self-esteem, sense of coherence, and suicidal ideation. Correlation coefficients during hospitalization indicated that suicidal ideation was significantly related comprehensibility \((r = -.47, \ p < .01)\), manageability \((r = -.48, \ p < .01)\), and meaningfulness \((r = -.55, \ p < .01)\). Of these variables, meaningfulness was most strongly correlated with suicidal ideation. Regression
analysis revealed that the three SOC variables accounted for a significant amount of unique variance in suicidal ideation above and beyond depression, hopelessness, and self-esteem ($F_{(3, 143)} = 5.60, p < .01, R^2 = .34, \Delta R = .07$). Moreover, SOC meaningfulness was most significantly related to suicidal ideation ($\beta = -.36, t = -3.15, p < .05$). At follow-up, 114 of the original 150 participants completed the same questionnaires. Multiple regression analysis indicated that comprehensibility and manageability were significantly associated with suicidal ideation ($F_{(3, 107)} = 3.01, p < .05, R^2 = .22$) and added unique variance to the model ($\Delta R = .07$).

Within the six month time frame, 16 participants attempted suicide and 3 participants died by suicide. The sample was then divided into two groups, suicide attempt/completion or no suicide attempt. Canonical discriminant function coefficients revealed that comprehensibility ($\lambda = .44$) most strongly contributed to the discrimination between attempts vs. non-attempters, followed by hopelessness ($\lambda = .27$) and meaningfulness ($\lambda = .24$). These authors concluded that a sense of coherence uniquely contributed to the presence of suicidal ideation and can discriminate future suicide attempters from non-attempters. This study may have important implications in the identification of strengths within suicidal individuals and the potential to modify coping strategies to reduce suicidal behaviors. One major limitation in this study was the use of a suicide measure that is not supported in the empirical literature and has limited psychometric soundness. Petrie and Brook assessed suicide with four items rating the frequency of suicidal ideation based on the earlier use of these items in a 1974 article. The reliability and validity of the results from this measure may be of concern due to psychometric limitations. A next step in understanding the influence of a sense of
coherence on suicidality may be to explore various coping strategies, as found in Rothmann and Van Rensburg (2002).

Results from Rothmann and Van Rensburg (2002) provide further international support for the relationship between sense of coherence and suicidal ideation, as well as the role of coping skills. A sample of 287 South African police personnel were surveyed and completed measures that assessed sense of coherence, self-efficacy, locus of control, coping styles, and suicidal ideation. Sense of coherence was measured utilizing the SOC-29 (Antonovsky, 1987) and the Adult Suicide Ideation Questionnaire (AISQ; Reynolds, 1991) assessed current suicidal ideation. Spearman correlation coefficients revealed a significant relationship between sense of coherence and suicidality ($r = -.43$), which indicated that a higher sense of coherence relates to lower suicidality.

Additionally, sense of coherence was negatively correlated with coping styles related to behavioral withdrawal ($r = -.32$) and alcohol-drug use ($r = -.33$). These correlations suggest that individuals with a low sense of coherence may cope by isolating themselves/decreasing behavioral activity or substance use. Based on self-reported suicidality, police personnel were classified into two groups, high suicide ideation or low suicide ideation. Stepwise discriminant analysis indicated that a sense of coherence, problem-focused coping via planning and suppression of competing activities, and medical status discriminated low ($n = 27$) versus high ($n = 255$) suicide ideation among police officers. The combination of these four variables correctly identified 81% of the high suicide police personnel and 89% of the low suicide police personnel. Therefore, non-suicidal individuals may have a higher sense of coherence and be planful problem solvers. The generalizability of the findings is limited due to the exclusive sample of
police officers. Additionally, the use of simple correlational analysis only provides evidence that suicide and sense of coherence are related, but does not allow for the direction of suicidal thoughts or behaviors and sense of coherence to be understood. Further support suggesting the importance of coping strategies in the understanding of sense of coherence and suicidality was found in Edwards and Holden (2001).

Edwards and Holden (2001) examined the relationship between coping strategies, meaning in life, and suicidality. A sample of 298 Canadian undergraduate students completed measures that assessed coping styles, sense of coherence, perceived purpose in life, hopelessness, and suicidality. The authors hypothesized that sense of coherence represents an individual’s overall attitude and meaning in life. Sense of coherence was measured utilizing the SOC-29 (Antonovsky, 1987) and a modified version of the Suicidal Manifestations Questionnaire (Johns & Holden, 1997) was used to assess suicidal ideation, behavior, and attempts. A MANOVA was conducted to examine whether individuals who have a history of suicide attempts were different from individuals without a history of suicide attempts in relation to coping styles, purpose in life, sense of coherence, and hopelessness. Participants were divided into two groups, previous attempters ($n = 22$) and non-attempters ($n = 276$). Significant differences were found between attempters and non-attempters ($\Lambda = .943, F_{(5, 291)} = 3.55, p < .01$). Univariate analyses indicated that attempters and non-attempters differed significantly in relation to emotion-oriented coping ($F_{(1, 295)} = 10.61, p < .01$) and sense of coherence ($F_{(1, 295)} = 8.70, p < .01$). Individuals who previously attempted suicide reported lower sense of coherence ($d = .65$) and higher emotion-oriented coping ($d = .72$) as compared to individuals without a history of suicide attempts. An important limitation in the
generalizability of these results is the unequal size of the comparison groups that may have increased the likelihood of statistical error.

The aforementioned studies provide some initial understanding of the relationship between sense of coherence and suicide, indicating that these two constructs may be negatively related. However, this limited evidence suggests the need to further explore the predictive ability of sense of coherence and its potential role as a mediator or moderator between life experiences and suicidality. Future research should include whether sense of coherence can significantly predict suicidality, influence the nature of the relationship between stressors and suicidality, or act as a buffer between stressors and suicidality.

Additionally, increased research among various populations is necessary to enhance scholarly knowledge related to the association between sense of coherence and suicidality. Since the previous studies were conducted with international participants, the relationship between sense of coherence and suicidality should be examined in the United States to determine whether this association exists or is culturally dependent. Antonovsky (1987) argued that since a sense of coherence is culturally and structurally developed based on an individual’s life experiences and subsequent perceptions, it can be applied to various cultural groups. However, no support for this statement has yet to be identified.

**Veteran Population**

Similar to the relationship between sense of coherence and suicide, these concepts have had limited application to the veteran population. Only one national study was found that examined sense of coherence among veterans. An early study conducted by Coe, Romeis, Tang, and Wolinsky (1990) sought to determine if a sense of coherence is
correlated with veterans’ physical and mental health status. A total of 377 male veterans over the age of 55 who were currently receiving treatment at either a general medicine or outpatient facility for health related problems participated in a clinical interview providing information on their health and demographics. Of the original participants, 277 veterans completed a follow-up telephone interview six months after the initial data collection. During this interview, information about health status, perceptions of mental health, and utilization of health care services (e.g., office visits, hospitalizations) were gathered. A self-report measure of sense of coherence was mailed out to these individuals and 240 were returned. Data analysis included information collected from veterans who completed the initial interview, six-month follow-up telephone interview, and mail questionnaire. Correlational analyses revealed that sense of coherence is positively related to mental health morale \((r = .71, p < .001)\), activities of daily living \((r = .17, p < .01)\), instrumental activities of daily living \((r = .36, p < .001)\), and age \((r = .19, p < .01)\).

These correlations suggest that individuals with a strong sense of coherence are more likely to report more positive views of their mental well-being, a greater engagement in behavioral activities, and are older. This could indicate that a strong sense of coherence is associated with greater psychological and physical well-being. It was also found that sense of coherence is negatively related to perceived physical functioning \((r = -.47, p < .001)\), days taken off for disability \((r = -.35, p < .001)\), days spent in bed \((r = -.31, p < .001)\), and number of physicians visits \((r = -.22, p < .01)\). These results provide further evidence that a strong sense of coherence is associated with fewer physical health problems. Therefore, it appears that among U.S. veterans, sense of coherence is
significantly related to physical and mental health status, most strongly associated with mental health morale.

The multiple health status variables were then regressed on sense of coherence and analysis revealed that at baseline, mental health morale ($\beta = .48$, $p < .001$), nutritional risk ($\beta = -.12$, $p < .05$), and perceived health status ($\beta = .18$, $p < .01$) significantly contributed to the prediction of sense of coherence ($F = 26.82$, $p < .001$, $R^2 = .50$). At follow-up however, mental health morale ($\beta = .54$, $p < .001$) and nutritional risk ($\beta = -.13$, $p < .05$) remained significant predictors, in the addition to sensory health status ($\beta = -.12$, $p < .05$; $F = 28.31$, $p < .001$, $R^2 = .50$). The authors concluded that mental health morale was most strongly associated to and predictive of sense of coherence. This study provided initial information regarding the relationship between sense of coherence and health status in a veteran population; however, the results cannot be generalized to veterans as a whole group since Coe et al. sampled older, male veterans. Research examining sense of coherence within a veteran population should include diverse age groups and both sexes, which represents an aim of the current study.

Moreover, Mehlum (1998) and Giotakos (2003) provided international evidence that a sense of coherence may be related to suicide within a military population. Mehlum (1998) assessed whether suicidal behaviors among Norwegian male military recruits varied depending on their sense of coherence. A total of 663 conscripts in their first week of training completed measures assessing suicidality and sense of coherence. Participants were divided into two groups based on their self-reported history of suicidality, suicide ideators ($n = 144$) and non-ideators ($n = 519$). As compared to the non-ideators, individuals who reported previous suicidality more often grew up with only one parent.
family history of mental concerns ($\chi^2 = 12.1, p < .01$), parental substance use history ($\chi^2 = 8.6, p < .01$), and previous mental health treatment ($\chi^2 = 35.8, p < .01$). In relation to sense of coherence scores, non-ideators on average had SOC scores 9.6 points higher than suicide ideators (95% CI [7.6, 11.9]). Regression analysis indicated that sense of coherence ($\Delta R^2 = .21$), previous suicide ideation ($\Delta R^2 = .06$), and previous suicide attempts ($\Delta R^2 = .017$) together accounted for 28% of the variance in suicidality, however no $F$ statistics were provided. These results indicate that Norwegian military personnel who reported suicidal ideation exhibited weaker sense of coherence as compared to their non-suicidal military counterparts.

Similarly, Giotakos (2003) investigated the strength of a sense of coherence in Greek male recruits as related to the severity of their suicidal ideation and substance use. Participants included 1,098 conscripts who completed questionnaires assessing sense of coherence, lifetime and current suicidal ideation and previous attempts, and self-reported substance use. Limited analyses were run on the sense of coherence data, but the author found significant differences between individuals who reported suicidality as compared to the whole sample of recruits. For example, the average sense of coherence score among all participants was 59.75 ($SD = 10.8$; no range of scores was provided). T-tests were conducted and results indicated that individuals who reported current thoughts that life is not worth living ($M = 52.28, SD = 10.9$) had significantly lower SOC scores as compared to the average SOC scores among the whole sample ($t = -10.1, p < .001$). Similarly, individuals who reported current thoughts about killing themselves ($M = 48.28, SD = 11.3$) had significantly lower scores as compared to the average SOC score among the whole sample ($t = -8.7, p < .001$); as well as individuals who reported a
previous suicide attempt ($M = 51.69, SD = 11.6$) showing significantly lower SOC scores as compared to the whole sample ($t = -3.2, p < .05$). These findings indicate that Greek military recruits exhibited weaker sense of coherence associated with current suicidal ideation and past suicide attempts. Since the analyses compared subgroups of individuals reporting suicidal behaviors to the whole sample, these results should be interpreted with caution because independent groups were not compared. Future research should compare independent groups of veterans who either endorse previous or current suicidality to those veterans without a history of suicidality in order to determine if differences in sense of coherence exist between these groups.

The results from Mehlum (1998) and Giotakos (2003) found corroborating evidence that men in the military may be at higher risk for suicidality due to a weak sense of coherence which reflects the perception that the world is incomprehensible, life is meaningless, and the lack of necessary resources to manage challenges. Despite limited application of sense of coherence to suicide and a military population, initial evidence suggests that suicide and a sense of coherence may be negatively related within a military population. Furthermore, to add context to the current study, the literature examining the relationship of sense of coherence and traumatic experiences is reviewed.

**Traumatic Experiences**

A sense of coherence has largely been applied to the construct of traumatic experiences (Snekkevik, Anke, Stanghelle, & Fugl-Meyer, 2003; van der Hal-van Raalte, van Ijzendoorn, & Bakermans-Kranenburg, 2008) and specifically the diagnosis of PTSD (Dudek & Koniarek, 2000; Schnyder, Moergeli, Klaghofer, & Buddeberg, 2001; Wittmann, Moergeli, Martin-Soelch, Znoj, & Schnyder, 2008). The following section
provides a review of some key findings, both in support of and unsupportive of the relationship between sense of coherence and traumatic experiences.

A majority of the studies that have investigated sense of coherence and trauma have found support that the constructs are negatively related. For example, Dudek and Koniarek (2000) hypothesized that among firefighters in Poland, sense of coherence would be negatively correlated with posttraumatic stress disorder (PTSD) symptoms. Among the 464 participants, 83% (n = 385) reported experiencing at least one traumatic event. Correlation coefficients indicate a negative relationship between sense of coherence and PTSD symptoms (r = -.27, p < .001). This finding suggests that as sense of coherence becomes weaker, PTSD symptoms increase. Across the three subscales of the SOC-29, comprehensibility was most strongly correlated with reported PTSD symptoms (r = -.30, p < .001), followed by manageability (r = -.24, p < .001), and meaningfulness (r = -.13, p < .05). Moreover, 3.9% (n = 15) of subjects who met diagnostic criteria for PTSD exhibited a weaker sense of coherence (M = 136.73) as compared to participants without a PTSD diagnosis (M = 147.99; F = 4.710, p < .05). These findings indicate that individuals who endorsed more PTSD symptoms or who had a PTSD diagnosis had a weaker sense of coherence as compared to individuals who endorsed fewer PTSD symptoms or those without a PTSD diagnosis, with comprehensibility representing the strongest sense of coherence component. Though these findings provide some evidence that sense of coherence and traumatic stress may be related, the cross-sectional design limits the understanding of the causal direction of this relationship. Future research should explore whether sense of coherence influences the perception of traumatic events or whether a traumatic event impacts the strength of sense of coherence. The relationship
between perceived distress related to combat experiences and sense of coherence was examined in the present study.

Further support of the negative association between sense of coherence and traumatic experiences was found by van der Hal-can Raalte, van Ijzendoorn, and Bakermans-Kranenburg (2008). van der Hal-can et al. examined the moderating effect of sense of coherence in the relationship between traumatic experiences and the presence of PTSD. In a sample of 203 child survivors of the Holocaust, participants completed measures assessing Holocaust exposure, PTSD, sense of coherence, and physical health status. First, the authors found that self-reported PTSD symptoms and sense of coherence were negatively correlated ($r = -.43, p < .01$), similar to the results found by Dudek and Koniarek (2000). Results also revealed that SOC significantly moderated the relationship between early childhood traumatic experiences during World War I and subsequent development of PTSD symptoms ($F_{(3, 197)} = 8.64, p < .01$). These authors also examined whether the number of wartime transitions (how many times the participants changed geographical locations during the war to evade arrest or deportation) and sense of coherence effected the endorsement of PTSD symptoms. Sense of coherence ($\beta = -.22, p < .01$), number of wartime transitions ($\beta = 19, p < .01$), and the interaction between SOC and transitions ($\beta = -.15, p < .05$) all contributed to the prediction of PTSD symptoms.

Post-hoc analyses compared a high SOC group versus a low SOC group and found that among the high group, wartime transitions and PTSD symptoms were not significantly correlated ($r = -.11, p > .05$). On the other hand, the low SOC group revealed a significant correlation between wartime transitions and PTSD symptoms ($r = .28, p < .01$) and the correlations were statistically different ($z = 2.36, < .05$). Based on
these results, the authors concluded that sense of coherence acted as a protective factor by diminishing the negative effects of Holocaust transitions on later life PTSD symptoms. These results have important implications in the longitudinal effects of traumatic experiences, however, the authors did not assess for additional traumatic experiences after the Holocaust. It is unclear whether these results can be attributed to a single traumatic experience or a lifetime of stressors that could impact the expression of PTSD symptoms and strength of sense of coherence.

The results of Dudek and Koniarek (2000) and van der Hal-can Raalte et al. (2008) support the negative relationship between sense of coherence and traumatic experiences, in addition to identifying sense of coherence as a mechanism of resilience by protecting individuals from the negative consequences of traumatic experiences, such as the development of posttraumatic stress symptoms. However, not all studies that have examined sense of coherence and trauma have found support for the negative association between these two constructs (Schnyder et al., 2001; Wittmann et al., 2008).

In 2001, Schnyder, Moergeli, Klaghofer, and Buddeberg sought to determine predictive variables in the development of PTSD symptoms one year after a serious motor vehicle accident (MVA). A sample of 106 participants who suffered from severe head injuries after a MVA were assessed 12 months after the accident and completed measures of PTSD, sense of coherence, coping style, and perceived social support. A multiple regression analysis was conducted to identify variables that significantly predicted PTSD symptoms one year after the accident and found that 34% of the variance was accounted for by biographical risk factors, sense of a death threat, intrusive thoughts, and problem-oriented coping skills. Sense of coherence was not a significant predictor of
PTSD symptoms ($\beta = -.07, p = \text{ns}$) in this study. Therefore, among MVA survivors, sense of coherence may not be a significant predictor of subsequent symptoms of traumatic stress.

Further evidence that failed to support the relationship between SOC and PTSD was conducted by Wittmann, Moergeli, Martin-Soelch, Znoj, and Schnyder (2008). The purpose of this study was to utilize structural equation modeling to compare three competing explanatory models of comorbidity within PTSD. Model 1 stated that comorbidity is a consequence of PTSD, Model 2 stated that trauma may result in various disorders, thus PTSD and comorbid disorders share factors of vulnerability (i.e., sense of coherence), and Model 3 stated that comorbidity occurs due to a specific effect of traumatic experiences. A sample of 225 accident survivors was recruited from an inpatient hospital in Zurich, Switzerland and assessed at two time intervals, while hospitalized and a follow-up that averaged around 6 months. Participants engaged in a structured interview and completed a battery of assessments including measures on anxiety, depression, PTSD, dissociative experiences, and sense of coherence. In relation to sense of coherence, model 2 did not support the hypothesis that sense of coherence would influence the relationship between PTSD and comorbidity. As such, the authors did not include this model in the integrative model and no further information was analyzed with regard to sense of coherence.

Results from Schnyder et al. (2001) and Wittmann et al. (2008) suggest that sense of coherence is not significantly related to traumatic experiences, such as accidents. However, considering the amount of empirical support found in the literature as compared to the limited evidence that suggest the contrary, it appears that sense of
coherence is moderately related to traumatic experiences. Therefore, the present study explored whether sense of coherence is a protective factor that reduces the negative impact of combat trauma, which in turn may reduce risk of suicidality.

**Summary of the Limitations of Previous Literature**

In addition to the evident lack of literature involving this study’s core constructs of suicide, sense of coherence, and traumatic experiences among a veteran population, there are a number of limitations among the previously reviewed studies. First, a majority of the studies that have investigated a sense of coherence have been conducted internationally; therefore conclusions regarding this construct are heavily emphasized on international populations. The extensive use of this construct in international countries could perhaps be due to Antonovsky’s work in Israel and the popularity of the concept in surrounding regions. Thus, increased examination of a sense of coherence in the United States is necessary to determine whether the construct is applicable to the U.S. population.

In regard to the studies that were most directly related to the current study (i.e., sense of coherence and suicide in military population) the results from Mehlum (1998) and Giotakos (2003) provided some evidence that military personnel who have a low sense of coherence may be at increased risk of suicidality. However, since so few studies have investigated the connection between these constructs and the veteran population, results must be interpreted with caution and a solid conclusion regarding this relationship is premature. Therefore, further exploration to provide either additional support to add strength to this conclusion or evidence that disproves previous findings is necessary to gain an increased understanding of these variables. Moreover, the methodologies used in
both studies could be significantly improved upon. First, both studies only focused on male military personnel, therefore, the relationship between suicide and sense of coherence among women is unknown. Secondly, participants in both studies were active recruits; therefore, their willingness to report suicidality may have been impacted by fears of being dismissed or stigmatized. Lastly, only young participants were used in each study and as a result, it is difficult to determine whether age may play an important role in strength of an individual’s sense of coherence or risk of suicidality.

A final criticism of previous literature is the heavy use of simple correlational analyses, connecting a sense of coherence to various mental health variables. More sophisticated statistical analysis procedures are necessary to further understand the depth of this relationship, such an examination of the moderated effects of sense of coherence that was utilized in the present study.

The OEF/OIF Veteran Population

Suicidality

Since the beginning of the “war on terror” in 2001, more than 1.6 million United States military personnel have been deployed (Tanielian & Jaycox, 2008) and it is estimated that around 6,400 veterans annually die by suicide (U.S. Department of Veterans Affairs, 2009, September). Based on that estimate, in the last ten years while the country has been at war in Iraq and Afghanistan, 64,000 veterans have died by suicide. Extensive research has investigated suicide rates among active military personnel and veterans, with a specific application to Vietnam veterans (Boehmer, Flanders, McGeehin, Boyle, & Barrett, 2004; Bullman & Kang, 1996; Desai et al., 2008; Eaton, Messer, Wilson, & Hoge, 2006; Farberow et al., 1990; Kaplan et al., 2007). However, conflicting
rates among various studies of veteran suicide have been found, with some studies indicating higher risk of suicide among veterans as compared to the general population (Kaplan et al., 2007; McCarthy et al., 2009), while others have found no difference between the populations (Miller et al., 2009; Sundararaman et al., 2008).

Conflicting rates of veteran suicide may be explained by data collection problems. Most importantly, there is no standardized system of surveillance that reports veteran suicide across the nation (Sundararaman et al., 2008). VA hospitals gather multiple data sources to identify potential veteran deaths by suicide, including the Beneficiary Identification and Records Locator Subsystem and the Social Security Administration. Moreover, data on deaths by suicide can be obtained at a state level by means of death certificates or from the National Death Index (NDI); however, the NDI does not guarantee that the individual’s status as a veteran will be recognized (Peake, 2008). The CDC’s National Violent Death Reporting System (NVDRS) collects data on suicide and includes veteran status; however, the NVDRS is not a national system and is implemented in only a small percentage of states. A national tracking system of veteran suicides could increase reliability of suicide rates within this population.

Complicating data collection problems may be the language of suicide. The suicide nomenclature is complex and lacks universal comprehension (Silverman, 2006). Studies of veteran suicide may vary in the definitions of suicidal ideation, suicide gestures, suicide behaviors, suicide attempt, and suicide completion. Thus, comparisons across studies may limit the accurate identification and understanding of veteran suicidality due to inconsistent language. Additionally, Peake (2008) stated that veteran studies often collect data over a relatively short time period which can deflate the rate of
suicide. In order to draw more meaningful conclusions, longitudinal studies with large sample sizes are necessary to enhance the power of the results. The difficulties in operationally defining suicidality and the methodological nature of suicide studies may contribute to inconsistent rates of veteran suicide.

Another problem with conflicting suicide rates may be due to the “Werther Effect” that can occur among clusters of veterans (Peake, 2008). The Werther Effect is observed when one suicide sparks an increase in the suicide rate within a community or system, which is often referred to as a suicide cluster or copycat suicide. Veteran deaths by suicide have been previously observed in clusters. Rates of suicide may be inflated among veterans who are in close proximity of another, which may be more indicative of a transitory increase in the suicide rate as compared to a prolonged pattern of an increasing rate. Lastly, conflicting rates of veteran suicide may be influenced by the limited information provided in a death certificate. Peake argued that studies based on death certificates only may have inaccurate information regarding the cause of death and precipitating factors. More accurate reports of suicide could be obtained through corroborated evidence from family, friends, and care providers (i.e., the application of psychological autopsies). Overall, the collection of data surrounding the suicide rate among veterans is at best flawed; therefore, rates must be interpreted with caution.

In the beginning years of the OEF/OIF conflicts, the threat of suicide was not a primary concern among researchers and clinicians; however, between 2005 and 2007 a 26% rise in suicide rates among veterans was observed (Bruce, 2010). For example, Kang and Bullman (2008) assessed the rate of suicide among 490, 346 OEF/OIF veterans compared to that of the general population from 2001 to 2005. The authors used a
standardized mortality ratio (SMR) that compared the observed number of veteran suicides to the expected number of suicides in the general population. Results from a matched comparison (by age, sex, race, year of death) in suicide rates indicated that the rate of suicide among OEF/OIF veterans (21.9 per 100,000) did not statistically significantly differ from that of the general population (SMR = 1.15; 95% CI [0.97, 1.35]). Therefore, from 2001 – 2005 the rate of OEF/OIF veteran suicide was not statistically significantly different from that in the general population. However, differences were observed in two subgroups based on active duty status and presence of a mental disorder. Compared to the general population, veterans who were in active duty had significantly higher rates of suicide (24.7/100,000; SMR = 1.33; 95% CI [1.03, 1.69]) and those with a mental disorder had higher rates of suicide (31.0/100,000; SMR = 1.77; 95% CI [1.01, 2.87]). These results may indicate that exposure to combat and the presence of a mental disorder may increase veteran suicide risk.

It is important to note that Kang and Bullman (2008) additionally compared the overall rate of mortality between OEF/OIF veterans and the general population. The authors found that OEF/OIF veterans have significantly lower risk of death by any cause (SMR = 0.56; 95% CI [0.52, 0.60]). This finding highlights the “Healthy Soldier Effect” which suggests that individuals who enter into military service are in better physical and mental health as compared to the general population, thus they have a lower rate of mortality (Bruce, 2010). However, since the suicide rate of OEF/OIF veterans is not statistically different from that of the general population, it may be that the “Healthy Soldier Effect” does not apply to suicide. This could imply that soldiers are protected against physical and mental health conditions due to pre-existing strengths, but are not
protected against suicidality. Military personnel may be at increased risk for suicide due to susceptibility to wartime experiences and stressors.

In contrast to the findings from Kang and Bullman (2008) that examined the years 2001 to 2005, Kang and Bullman (2010) reported that the rate of OEF/OIF veteran suicide is higher than the general population when including the years 2006 to 2007. In a presentation of veteran suicide data at the DOD/VA Suicide Prevention Conference, Kang and Bullman reported a suicide rate of 21.8 per 100,000 among OEF/OIF veterans from the years 2001 to 2007. Again, the authors utilized a standardized mortality ratio (SMR) and matched comparison rates of suicide. The OEF/OIF veteran suicide rate was statistically higher than that of the general population (SMR = 1.21; 95% CI [1.09, 1.33]). Among OEF/OIF veterans with a mental health diagnosis (including depressive disorder, PTSD, and substance dependence), the suicide rate was significantly higher than the general population (42.8/100,000; SMR = 2.46; 95% CI [1.98, 3.02]). Moreover, suicide rates among OEF/OIF veterans appeared to be dependent on the amount of time since active duty. Active duty is defined as serving the armed forces full time, which differs from military reserves who only serve part-time and from veterans who no longer actively serve in the armed forces. For example, in the first two years after active duty, the suicide rate was 23.1, but decreased to 18.1 between two to four years post active duty, and further decreased to 12.9 between four and six years post active duty. Therefore, an inverse relationship may exist between time since active duty and suicide rates among OEF/OIF veterans, with veterans at greater risk in the first few years following active military service. Access to immediate mental health treatment and post-deployment resilience building may help to prevent suicidality. The results from Kang
and Bullman (2008) compared to those two years later by the same authors revealed that the rate of suicide among OEF/OIF veterans may now exceed that of the general population. In order to increase methodological rigor, future research examining the rate of veteran suicide to the rate of the general population should include age-matched group comparisons to further understand how suicide may uniquely impact the veteran population.

As a result of this observed increase between 2005 and 2007, awareness of OEF/OIF veteran suicide has increased and research efforts have been expanded to enhance understandings of potential risk factors (Pietrzak et al., 2010). As identified in Kang and Bullman (2008), risk factors associated with OEF/OIF veterans may include active duty status and mental disorders. Moreover, results from Kang and Bullman (2010) indicated that the first two years after active duty service place OEF/OIF veterans at an increased risk of suicide.

Another important study in relation to risk factors of suicide among OEF/OIF veterans was conducted by Pietrzak et al. (2010). These authors utilized data from the Veterans Needs Assessment Survey that included 272 OEF/OIF National Guard veterans. Risk was assessed via measures of combat exposure, suicidal ideation, PTSD symptoms, alcohol use, psychosocial problems, perceived stigma, and barriers to care. These measures were used as screening tools, not as a diagnostic assessment of mental health disorders. Of the 272 participants, 12.5% endorsed suicidal ideation and participants were divided into non-suicidal ideation veterans \((n = 233)\) and suicidal ideation veterans \((n = 34)\). It was found that among all risk factor variables, veterans who endorsed suicidal ideation were more likely to screen positive for PTSD \((F = 53.22, p < .001)\), screen
positive for depression ($F = 70.50, p < .001$), screen positive for alcohol problems ($F = 8.991, p < .05$), report higher combat exposure ($F = 6.84, p < .05$), report psychosocial difficulties ($F = 38.97, p < .001$), report perceived stigma ($F = 3.98, p < .05$), and report increased barriers to care ($F = 4.49, p < .05$). These results suggest that the presence of psychological disorders, such as PTSD and depression, may increase suicidal risk among OEF/OIF veterans. Despite these findings, the results have limited generalizability due to the unequal comparison groups that may have impacted the error in Pietrzak et al. (2010)’s findings.

Though Pietrzak et al. utilized psychometrically sound measures that have strong empirical support, a major limitation of this study was the use of a single item to assess suicide ideation. Suicide ideation was assessed via one question from the Patient Health Questionnaire (PHQ-9; Kroenke & Spitzer, 2002). The PHQ-9 is a brief, 9-item measure of depressive symptoms and severities. The item related to suicide assesses for ideation in the past two weeks. A more thorough measure of suicidality (i.e., an empirically supported measure in the literature) would be have been more appropriate for the assessment of not only suicidal ideation, but behaviors and attempts as well.

Pietrzak, Russo, Ling, and Southwick (2011) conducted a similar study examining factors associated with suicidality among treatment seeking OEF/OIF veterans. One-hundred and sixty seven veterans were recruited from a VA medical center and completed a battery of self-report measures. This included assessment of combat exposure, PTSD symptoms, depression, alcohol use, and coping strategies. Suicide was assessed via one item measuring current suicidal ideation from PHQ-9. The results indicate that 21.6% ($n = 36$) of the participants reported current suicidal ideation. It was
found that suicidal veterans were more likely to screen positive for PTSD ($\chi^2 = 15.89, p < .001, OR = 5.2, 95\% CI [2.2, 12.3]$) and depression ($\chi^2 = 26.41, p < .001, OR = 14.4, 95\% CI [4.2, 49.4]$) as compared to veterans who did not report suicidality. Moreover, veterans who reported suicidal ideation were more likely to engage in thoughts of self-blame ($t = 5.93, p < .001, d = 1.16$), worry ($t = 4.79, p < .001, d = .92$), avoidance of social activities ($t = 5.16, p < .001, d = .99$) and cognitive avoidance of social relationships ($t = 6.25, p < .001, d = 1.20$) as compared to veterans did not endorse suicidal ideation. These results are similar to the findings from Pietrzak et al. (2010) that suggest PTSD and depression are related to suicidality among OEF/OIF veterans. Pietrzak et al. (2011) provided new information regarding negative coping strategies utilized by veterans who are suicidal that may be a potential risk factor for suicidality.

Similar to Pietrzak et al. (2010) and Pietrzak et al. (2011), Lemaire and Graham (2011) examined factors related to current suicidal ideation among returning OEF/OIF troops. Data were gathered from 1740 retrospective psychological evaluations that assessed for PTSD, depression, substance use, overall psychological functioning, current suicidal ideation, and previous history of suicide attempts. Additionally, self-report data were collected from the Deployment Risk and Resilience Inventory (DRRI, King, King, Vogt, Knight, & Samper, 2006). The DRRI assesses factors related to pre-deployment, deployment/war-zone, and post-deployment. It was found that 6.5% ($n = 113$) of veterans reported current suicidal ideation at the time of the evaluation. No significant differences were observed in the demographic characteristics (i.e., age, gender, race, marital status, level of education) when comparing the group of veterans who reported suicidal ideation (SG) to the veterans who did not report suicidal ideation (NSG). Moreover, OEF/OIF
veterans who reported current suicidal ideation were more likely to report a history of
pre-military physical abuse (SG = 10.6%; NSG = 6.0%; \( p < .01 \)), pre-military sexual
abuse (SG = 16.2%; NSG = 5.9%; \( p < .001 \)), and previous history of a suicide attempt
(SG = 32.2%; NSG = 5.8%; \( p < .001 \)). Veterans who endorsed current suicidal ideation
were also more likely to be diagnosed with a Psychotic Disorder (SG = 36.4%; NSG =
6.4%; \( p < .001 \)), Depressive Disorder (SG = 13.5%; NSG = 1.9%; \( p < .001 \)), and PTSD
(SG = 12.9%; NSG = 4.0%; \( p < .001 \)) based on the clinical evaluations conducted.

Data from the DRRI indicated that pre-deployment factors were not significantly
associated with current suicidal ideation. In comparing deployment related factors
associated with current suicidal ideation, risk factors were found to be negative
deployment environments including perceived threat and combat experiences (SG: \( M =
65.2, \ SD = 12.6; \ NSG: \ M = 60.1, \ SD = 13.2; \ p < .001 \)), family concerns (SG: \( M = 31.1,
\ SD = 8.6; \ NSG: \ M = 28.1, \ SD = 8.5; \ p < .01 \)), and deployment concerns (SG: \( M = 53.6,
\ SD = 12.2; \ NSG: \ M = 46.91, \ SD = 12.6; \ p < .001 \)). Moreover, post-deployment life
stressors were found to be a risk factor among suicidal veterans (\( M = 4.7, \ SD = 2.8 \)) as
compared to non-suicidal veterans (\( M = 2.8, \ SD = 2.6; \ p < .001 \)). Lemaire and Graham
(2011) also conducted a series of regression analyses. These authors found that previous
suicide attempt (\( OR = 4.71, \ 95\% \ CI \ [1.87, 12.16], \ p < .001 \)), female gender (\( OR = 3.18,
95\% \ CI \ [1.51, 6.72], \ p < .01 \)), and a diagnosis of depressive disorder (\( OR = 3.79, \ 95\% \ CI
[1.87, 7.71], \ p < .001 \)) were significantly related to current suicidal ideation. A second
regression analyses comparing depressive disorders and PTSD diagnoses as related to
suicidal ideation, found that a diagnosis of depressive disorder (\( OR = 15.20, \ 95\% \ CI
[7.05, 32.80], \ p < .001 \)), PTSD (\( OR = 10.02, \ 95\% \ CI \ [4.02, 24.97], \ p < .001 \), and co-
morbid depression and PTSD ($OR = 18.83$, 95% CI [8.85, 40.10], $p < .001$) were all statistically significant. These results suggest that veterans may be at increased risk for suicidality if they have a history of abuse, suicide attempts, psychological disorders, deployment/post-deployment related stressors.

The results from Pietrzak et al. (2010), Pietrzak et al. (2011), and Lemaire and Graham (2011) provide important findings related to potential suicide risk factors among OEF/OIF veterans. However, since only three studies have examined risk factors within this specific population, further research is necessary to support these findings. The mental health concerns and risk factors associated with suicidality among recent veterans from the wars on terror have resulted in increased identification of the impact on wartime stressors, particularly on the development of PTSD.

**Traumatic Experiences**

The wars in Iraq and Afghanistan have exposed United States armed forces to potentially traumatic experiences and for some, multiple exposures due to frequent redeployments. As a result, empirical studies have sought to determine the effects of wartime exposure among active duty soldiers and veterans from OEF/OIF. Psychological consequences of the wars include increased rates of PTSD, depression, and substance abuse (Duma et al., 2010; Hoge et al., 2004; McDevitt-Murphy et al., 2010; Milliken et al., 2007; Seal et al., 2007); in addition to physical consequences such as traumatic brain injury and chronic pain (Scioli et al., 2010).

In conceptualizing war as a traumatic experience, a large amount of research has focused on the development and predictors of posttraumatic stress disorder. Prevalence estimates of PTSD among military populations are often conflicting, due to varied means
of data collection, assessment measures, elapsed time since active duty, and sample characteristics such as active duty vs. not, treatment-seeking vs. non-treatment seeking. For example, Lapierre, Schwegler, and LaBauve (2007) surveyed recently returning Army soldiers from Iraq ($n = 2,275$) and Afghanistan ($n = 1,814$) who completed measures on depression, trauma, and life satisfaction. Results indicated that 31% of OIF and 30% of OEF soldiers positively screened for PTSD. However, when compared to the results of Hoge et al. (2006) who also surveyed non-treatment seeking veterans as part of a routine post-deployment health screening two weeks after duty, there appear to be a disparate finding. Hoge et al. (2006) found a prevalence of 9.8% among OIF soldiers ($n = 222,620$) and 4.7% among OEF soldiers ($n = 16,318$). Therefore, in two studies that assessed returning military personnel within a limited time frame, very different rates were observed.

Moreover, inconsistencies are observed in comparing these findings to that of Seal et al. (2007) who surveyed veterans who sought treatment at various VA health care facilities. These authors collected data from the VA National Patient Care Database from 103,788 OEF/OIF treatment seeking veterans. Results indicated that 13% of veterans had a diagnosis of PTSD, which represented 52% of all mental health diagnoses. Though PTSD was found to be the most common diagnosis, the overall rate of 13% was lower than the 30 to 31% rate found by Lapierre et al. (2007), but higher than the 4.7 to 9.8% observed by Hoge et al. (2006). Inconsistent results make it difficult for substantive conclusions to be drawn in relation to the prevalence of PTSD among OEF/OIF veterans. Some researchers have attempted to further understand these conflicting rates.
In an effort to gain an understanding of PTSD rates, Ramchand et al. (2010) reviewed 29 studies that investigated the rate of PTSD among deployed OEF/OIF military personnel. Of these studies, 19 included non-treatment seeking participants and 10 studies with active treatment-seeking participants. Prevalence estimates among military personnel who did not seek treatment ranged from 1.4 to 60%, with a majority between 5 to 20%. PTSD estimates among treatment-seeking personnel ranged from 4.2 to 50%, with a higher concentration between 20 to 50%. These authors also observed that across the majority of the 29 studies, combat exposure was significantly associated to PTSD. It can be concluded that due to the highly variable estimates of PTSD among OEF/OIF personnel, prevalence rates should be interpreted with caution when drawing conclusions from a single study. Additionally, the authors recommended that future research on PTSD prevalence estimates should utilize a universal definition of PTSD and method of data collection; as well as attempts to control for the degree of differences observed in combat exposure.

Numerous studies of OEF/OIF military personnel have sought to determine predictors of PTSD and strong evidence suggests that combat exposure is highly predictive of symptoms of traumatic stress (Booth-Kewley et al., 2010; Ferrier-Auerbach et al., 2010; Phillips et al., 2010; Vasterling et al., 2010; Wojcik et al., 2009). For example, Booth-Kewley et al. (2010) surveyed 1,569 OEF/OIF Marines who completed at least one deployment in order to assess predictors of PTSD. Participants completed measures assessing PTSD symptoms, combat exposure, and stressors. Combat exposure ($r = .31, p < .001$) and deployment related stressors ($r = .44, p < .001$) were found to be significantly correlated with PTSD symptoms and stronger than other variables such as
age, education, marital status, and number of deployments. Univariate regression analysis revealed that medium (OR = 1.86, 95% CI [1.13, 3.06], p < .05), high (OR = 2.89, 95% CI [1.81, 4.62], p < .01), and very high (OR = 6.71, 95% CI [4.30, 10.47], p < .01) reported levels of combat exposure increased the likelihood of reported PTSD symptoms. These results suggest that OEF/OIF military personnel who are exposed to varied levels of combat may be at risk for the development of PTSD. As in previous studies, this study is limited in the generalizability of its results due to most of the participants being male and the use of a cross-sectional design. Moreover, Booth-Kewley et al. did not account for other traumatic experiences that could contribute to the participant’s endorsement of traumatic stress symptoms.

In corroboration, Phillips et al. (2010) examined risk factors for PTSD by assessing OEF/OIF Marines during training and a follow-up at post-deployment. A total of 706 active duty Marines completed the Recruit Assessment Program (RAP) and surveys assessing PTSD, childhood trauma, and combat experiences (e.g., firing a weapon, serious injury, witness another wounded or killed). At the post-deployment assessment, 10.8% of the Marines screened positive for PTSD. It was found that combat exposure significantly increased the likelihood of traumatic stress symptoms as well as previous experiences of violence/trauma. For example, PTSD was predicted by perceived danger and threat of death (OR = 4.63, 95% CI [2.46, 8.73]), injury to self (OR = 3.51, 95% CI [1.58, 7.77]), witnessing injury or death (OR = 2.47, 95% CI [1.08, 5.67]), adverse childhood events (OR = 2.05, 95% CI [1.11, 3.77]), and prior violence exposure to at least 2 events (OR = 2.57, 95% CI [1.42, 4.67]). Phillips et al. concluded that exposure to combat increases the likelihood of PTSD symptom endorsement among
active duty Marines. This study improved upon results from Booth-Kewley et al. (2010) by addressing previous history of violent experiences and childhood trauma. However, since only male participants were recruited for this study, increased research to address PTSD risk factors among women military personnel is recommended.

In addition to the finding that combat exposure and prior traumatic experiences increase the likelihood of Marines endorsement of PTSD symptoms, Phillips et al. (2010) found that prior violent experiences before entering into the Marine Corps predicted PTSD, while controlling for combat exposure ($OR = 2.99$, 95% CI [1.46, 6.10]). This finding suggests that previous history of traumatic experiences may affect current endorsement of traumatic stress. Recently, attention has been given to the impact of complex trauma on presenting PTSD concerns among military personal (Bolton, Litz, Britt, Adler, & Roemer; 2001; Cabrera, Hoge, Bliese, Castro, & Messer, 2007; Fritch, Mishkind, Reger, & Gahm; 2010; Himmelfarb, Yaeger, & Mintz, 2006). In 2001, Bolton, Litz, Britt, Adler, and Roemer found that among 2,947 U.S. Army personnel who were awaiting their first deployment, 74% reported experiencing at least one previous traumatic event and 60% experienced more than one. The high percentage of soldiers who experienced a previous traumatic event may be important in the understanding of traumatic stress among military personnel, especially among those returning from the recent conflicts.

In relation to OEF/OIF military personnel, Cabrera, Hoge, Bliese, Castro, and Messer (2007) sought to determine whether childhood adversity and combat exposure predicted depression and PTSD. A sample of 4529 non-deployed male soldiers was compared to a sample of 2392 post-deployed male soldiers three months after their return.
from Iraq. Participants completed a battery of assessments that measured childhood adversity, combat exposure, symptoms of traumatic stress, and depression. Results indicated that post-deployed soldiers who reported experiencing two or more adverse childhood events were at an increased risk for the development of PTSD (OR = 1.99, 95% CI [1.32, 3.03]) and depression (OR = 1.75, 95% CI [1.06, 2.92]). Moreover, childhood abuse was found to be a significant predictor of PTSD (t = 5.68, p < .001) as was combat exposure (t = 13.4, p < .001). These results suggest that the presence of current symptoms of traumatic stress may be significantly influenced by a history of childhood trauma. One major limitation of this study was the use of self-report data assessing childhood experiences. This study could have been improved by collecting corroborative evidence of childhood abuse experiences, such as previous medical/mental health records or family interviews to increase accuracy of reported experiences. Further support for the influence of childhood trauma, with a specific application to physical abuse, was found in a recent study by Fritch, Mishkind, Reger, and Gahm (2010).

Fritch et al. (2010) examined the effects of childhood physical abuse and combat trauma on the psychological functioning of post-deployed veterans of OEF/OIF. A sample of 1,045 veterans at an outpatient mental health clinic were included in the study, all of whom completed an intake assessment including measures on childhood trauma, combat exposure, PTSD, depression, and alcohol use. Hierarchical regression analysis revealed that childhood physical abuse (β = .28, p < .01) predicted PTSD as did combat exposure (β = .32, p < .01). When childhood abuse and combat exposure were added to the model, they represented a significant contribution to the prediction of PTSD (ΔR² = .08, p < .01). These findings suggest that the effects of combat exposure and childhood
abuse may have a unique role in the development of traumatic stress symptoms within a veteran population. A major limitation related to the methodology of this study was the use of a single item addressing physical abuse as a child. A more in depth assessment of various childhood traumatic experiences may have provided additional evidence to support these findings.

Findings from Phillips et al. (2010), Cabrera et al. (2007), and Fritch et al. (2010) suggest that childhood abuse and combat exposure may both influence current endorsement of traumatic stress symptoms among OEF/OIF veterans. Due to the limited current literature exploring the relationship between childhood trauma and current combat trauma, further research is necessary to understand the impact of complex trauma on returning OEF/OIF veterans.

As the previously reviewed literature has found, OEF/OIF veterans face a number of challenges due to their experiences in the Middle East. Among these problems are the risk of suicidality and psychological maladjustment. Due to the high rates of suicide among OEF/OIF veterans and the negative impact of combat experiences, it is important to examine the association between these factors.

The Relationship between Traumatic Experiences and Suicidality

Despite the plethora of research that has focused on OEF/OIF veterans’ mental health concerns, namely PTSD, limited research has addressed the relationship between traumatic experiences and suicidality. To date, only three known studies have empirically examined the association between PTSD and suicidality among OEF/OIF veterans (Guerra & Calhoun, 2011; Jakupcak et al., 2009; Maguen et al., 2011) and one review of
In an attempt to determine whether PTSD is a significant risk factor for suicidal ideation, Jakupcak et al. (2009) surveyed 407 veterans of the Iraq and Afghanistan wars. Participants completed measures assessing traumatic stress, depression, and substance use. Based on self-reported symptoms, 49.6% of the participants screened positive for PTSD, 34.9% for Major Depressive Disorder, 36.9% for alcohol/drug abuse, and 3% reported a suicide attempt in the last four months. Regression analysis revealed that after controlling for age, depression, and substance abuse, OEF/OIF veterans were over four times more likely to report suicidal ideation if they screened positive for PTSD as compared to veterans who did not screen positive for PTSD ($OR = 4.45$, 95% CI [2.58, 7.67], $p < .01$). To assess whether comorbidity with PTSD increased suicidal risk, regression analyses found that individuals with PTSD plus one comorbid diagnosis were not at increased suicidal risk; however, individuals with PTSD plus two comorbid diagnoses were at increased suicidal risk ($OR = 5.71$, 95% CI [2.09, 23.85], $p < .01$). These results suggest that OEF/OIF veterans with PTSD are more likely to endorse suicidal ideation as compared to veterans without PTSD, providing support for the positive relationship between trauma and suicidality.

Similarly, Guerra and Calhoun (2011) studied the relationship between PTSD and suicidal ideation; in addition to the role of comorbidity. A sample of 393 veterans of the United States Armed Forces participated in a structured clinical interview (SCID-I) and completed a self-report assessment battery including measures of suicide ideation, depression, trauma, and combat exposure. While controlling for previous history of

treatment considerations to reduce suicidality among OEF/OIF veterans suffering from PTSD (Jakupcak & Varra, 2011).
suicide attempts and combat exposure, regression analyses revealed that PTSD ($\chi^2 = 16.73, p < .0001$) and Major Depressive Disorder ($\chi^2 = 12.79, p < .001$) were significantly related to increased suicidal ideation. In contrast to Jakupcak et al. (2009), this study failed to find a significant increase in suicidal ideation when a comorbid diagnosis is present with PTSD as compared to PTSD alone. Moreover, PTSD symptoms related to emotional numbness ($\chi^2 = 5.09, p < .05$) were the only symptom cluster that uniquely predicted suicidal ideation among OEF/OIF veterans with PTSD. These results suggest that the unique contribution of PTSD to suicidality among veterans and the potential negative effects of avoidance (i.e., emotional numbness) are related to traumatic stress.

A third study that assessed the relationship between PTSD and suicide in OIF Army veterans was conducted by Maguen et al. (2011). These authors examined the impact of combat experiences, specifically killing in combat, and mental health conditions on suicidality of 2854 U.S. veterans from the Iraqi war. Participant data was collected from routine post-deployment evaluations that assessed combat exposure, PTSD, depression, and alcohol use. Suicidality was assessed with the use of two questions: “Over the last two weeks, how often have you thought that you would be better off dead or of hurting yourself in some way?” and “Do you feel like hurting yourself at this time?” A total of 67 veterans reported current suicidal ideation and 16 reported thoughts of self-harm. Results from a logistic regression indicate that previous suicide attempt ($OR = 4.69, p < .01$), previous use of psychiatric medicine ($OR = 5.92, p < .05$) and depression ($OR = 1.23, p < .01$) were significantly related to current suicidal ideation. Additionally, previous suicide attempts ($OR = 13.94, p < .01$) and PTSD ($OR = 1.73, p < .01$) were significantly related to thoughts of self-harm. It was also found that
the association between combat killing and suicidal ideation was mediated by both depression \( (\beta = .04, SE = .01, p < .01) \) and PTSD symptoms \( (\beta = .02, SE = .01, p < .05) \), however, the relationship between combat killing and thoughts of self-harm was only mediated by PTSD symptoms \( (\beta = .05, SE = .02, p < .05) \). The results from this study have helped to increase the understanding of suicidal risk among veterans, especially related to combat killing in the OEF/OIF population. Interpretation of these results is limited due to the study population including only Army soldiers from OIF and the failure to use an empirically supported measure of suicidality.

The findings from Jakupcak et al. (2009), Guerra and Calhoun (2011), and Maguen et al. (2011) provide initial support that a significant relationship may exist between suicidality and traumatic experiences among OEF/OIF veterans. However, since limited research has examined this relationship, further research is warranted to increase knowledge of the interaction between traumatic experiences and suicide. The war on terror has persisted for more than nine years and evidence indicates that OEF/OIF troops have been significantly affected by their experiences. However, despite reports of increased suicide and mental health concerns among veterans from the wars in Iraq and Afghanistan, little is understood about protective factors that may foster resilience against suicide.

Resilient Veterans

Increased rates of mental disorders and an elevated suicide risk among OEF/OIF veterans has been observed in recent years. As such, clinical and research efforts have been increased to identify protective factors and enhance psychological resilience among veterans. In the U.S. Army, a program called Comprehensive Soldier Fitness (CSF) has
recently been developed and implemented (Cornum, Matthews, & Seligman, 2011). CSF was designed to increase psychological resilience among both soldiers and their families, with the aim to “create an Army that is just as psychologically fit as it is physically fit” (Cornum et al., 2011, p. 6). The program includes assessment, universal resilience training on physical and psychological health dimensions (e.g., emotional, social, spiritual, and family), individualized training, and trained master resilience trainers who are anticipated to be in each unit of the Army. In addition to increased programming related to resilience, research efforts have also increased. Pietrzak and colleagues have contributed significantly to the literature on veteran resilience, in a series of articles from the same data set of 272 OEF/OIF National Guard veterans from Connecticut who completed a battery of self-report measures that were mailed as part of the Connecticut OEF/OIF Veterans Needs Assessment Survey (VNAS).

Pietrzak et al. (2009a) examined the impact of resilience, both psychological and social, on symptoms of traumatic stress and depression. Resilience was assessed via the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) that was developed based on previous resilience literature with scores that range from 0-100. The CD-RISC includes questions on personal competence, tolerance of negative affect, acceptance of change, personal control, and spiritual beliefs about the future. To determine potential predictors of traumatic stress and depression, regression analyses were conducted. It was found that veterans with PTSD ($M = 50.9, SE = 1.1$) endorsed significantly higher combat scores ($F = 43.38, p < .001, d = .99$) than veterans without PTSD ($M = 36.1, SE = 2.0$). Lower post-deployment social support ($F = 49.30, p < .001, d = 1.02$) was found among PTSD veterans ($M = 47.5, SE = 1.3$) compared to non-PTSD
veterans ($M = 57.6, SE = 0.7$). Additionally, lower unit support ($F = 16.7630, p < .001, d = 0.60$) among PTSD veterans ($M = 35.7, SE = 1.5$) than non-PTSD veterans ($M = 42.9, SE = 0.8$) was found. Therefore, veterans with PTSD reported lower social resilience, including less support from their unit and family/friends. In regard to psychological resilience, veterans with PTSD ($M = 59.5, SE = 2.0$) exhibited lower resilience ($F_{(1, 266)} = 65.29, p < .001, d = 1.08$) than veterans without PTSD ($M = 77.4, SE = 1.0$).

Hierarchical regression analyses revealed that combat experiences ($\beta = .34, t = 4.98, p < .001$) significantly predicted PTSD symptoms above and beyond race, education, relationship status, and duty status ($F = 6.49, p < .001, R^2 = .15$). When unit support, post-deployment social support, and resilience were included in the model, these variables significantly contributed to the prediction of PTSD symptoms ($F = 16.35, p < .001, R^2 = .43$). Unit support was not found to be a predictor, however, post-deployment social support ($\beta = -.31, t = 4.55, p < .001$) and psychological resilience ($\beta = -.34, t = 4.98, p < .001$) were significant predictors. Therefore, the presence of psychological resilience and social support may decrease symptoms of traumatic stress among OEF/OIF veterans. These findings provide initial support for the increased need to identify protective factors in the veteran population. To expand upon Pietrzak et al. (2009a)’s current findings, a second study utilizing the VNAS data set was conducted.

In this study, Pietrzak et al. (2010) investigated suicidal ideation among OEF/OIF National Guard veterans to gain an understanding of risk and protective factors. The results related to risk factors have previously been summarized, thus, only those related to protective factors is presented here. Protective variables were assessed via self-report measures of resilience, unit support, and social support. Psychological resilience was
found to be significantly higher ($F = 24.46, p < .001, d = .75$) among veterans who did not report suicidal ideation ($M = 75.5, SE = 1.0$) as compared to veterans who endorsed suicidal ideation ($M = 60.9, SE = 2.8$). Moreover, non-suicidal veterans ($M = 42.0, SE = 0.8$) reported significantly higher unit support ($F = 7.29, p < .01, d = .47$) than veterans who reported suicidal ideation ($M = 36.1, SE = 2.1$) and non-suicidal veterans ($M = 56.6, SE = 0.7$) reported significantly higher post-deployment social support ($F = 23.25, p < .001, d = .83$) than suicidal veterans ($M = 47.5, SE = 1.8$). These findings indicate that veterans who endorse suicidal ideation may exhibit less psychological and social resilience as compared to non-suicidal veterans. These findings could have important implications related to increased therapeutic and social support systems for returning OEF/OIF veterans.

In a similar study, Pietrzak et al. (2011) examined factors associated with suicide among OEF/OIF veterans. The findings from Pietrzak et al. (2011) related to suicide risk factors have previously been discussed, however, these authors also investigated protective factors associated with suicide among OEF/OIF treatment-seeking veterans. As previously stated, participants completed a battery of assessments which included the CD-RISC which assesses psychological resilience, as well as measures of unit support and perceived social support. It was found that non-suicidal individuals exhibited higher psychological resilience ($t = 6.15, p < .001, d = 1.18$) and had stronger perceived social support ($t = 4.23, p < .001, d = .81$) as compared to veterans who reported suicidal ideation. Interestingly, there were no differences in perceived unit support, with both suicidal and non-suicidal veterans reporting similar support from their units. These results suggest that resilience and social support may be protective factors; however, a major
limitation of this study is the limited understanding of how these variables are related. The findings suggest that a relationship between resilience and suicide may exist, but the causal direction and nature of this relationship remains unclear.

A fourth study that examined both risk and protective factors associated with veteran suicidality was conducted by Lemaire and Graham (2011). In addition to findings related to suicide risk factors that have already been discussed, these authors also found protective factors related suicide. Based on the retrospective data collected from 1740 OEF/OIF veterans, training and preparation during deployment was found to be a protective factor as suicidal veterans reported fewer concerns related to this experience ($M = 46.0$, $SD = 10.5$) as compared to non-suicidal veterans ($M = 50.0$, $SD = 10.9$; $p < .01$). Moreover, post-deployment social support was found to be a protective factor among suicidal veterans ($M = 46.8$, $SD = 10.4$) as compared to non-suicidal veterans ($M = 55.4$, $SD = 10.3$; $p < .001$). One major limitation of the findings related to resilience is the lack of a theoretical framework in conceptualizing resilience. Lemaire and Graham utilized the DRRI to assess resilience associated with pre- during- and post-deployment related factors. Though the DRRI was developed to assess risk and resilience, the inventory was not developed based on a theoretical model of resilience. Future research examining resilience as related to suicide and with a veteran population should examine theoretical models of resilience.

The research efforts by Pietrzak and colleagues and the recent findings by Lemaire and Graham (2011) have increased the knowledge of protective factors among OEF/OIF veterans, including an important emphasis on social support. These findings suggest that both psychological resilience and social resilience may be related to suicidal
ideation, indicating that increased support from family and mental health professionals may be an important factor in post-deployment transitions. Despite these findings, little is known about the underlying mechanism of psychological resilience among OEF/OIF veterans from a theoretical framework. Therefore, the present study attempted to increase understanding of suicide protective factors by exploring Antonovsky (1979; 1987)’s concept of a sense of coherence.

**Limitations of Previous Literature**

As with many behavioral health studies, a majority of the studies within the veteran population rely on self-report data. Self-report data can be flawed due to over or under-reporting, social desirability, or lack of insight on behalf of the participants. Another problem with self-report data is that the reliability of veterans reporting PTSD symptoms may be questioned, especially among veterans seeking compensation (DeViva & Bloem, 2003; Franklin, Repasky, Thompson, Shelton, & Uddo, 2003). Moreover, veterans’ reports of suicidality and posttraumatic stress symptoms may be significantly impacted by the stigma attached to mental health problems resulting in under-reporting (Martin, Ghahramanlou-Holloway, Lou, & Tucciarone, 2009).

Knox (2008) stated that a major criticism of veteran studies is the difficulty in determining the specific contributions of war-related trauma in the endorsement of suicidality among veterans. Many studies of combat trauma in veterans have focused on combat experiences, failing to control for lifetime history of trauma (Bolton et al., 2001; Himmelfarb et al., 2006; Smith et al., 2008). Current controversies have focused on the impact of complex trauma on presenting psychological distress, whether it is a combination of traumas or if the effects of trauma plateau. Due to high incidence of
comorbidity and potential pre-deployment trauma histories, future studies among veterans need to account for covariates that may influence the relationship between combat trauma and suicide.

A third criticism of the previous literature is that the study of suicide is often attached to different mental health diagnoses, as 90% of suicides are estimated to occur among individuals with psychiatric disorders (Joiner et al., 2005). Often, suicide is studied with constructs such as depression and trauma, both of which have components of suicidality inherent in their symptomatic presentation. The separation of suicide and mental health disorders among veterans may aide in reaching our increased understanding of the unique contributions of suicide in the military population.

Lastly, studies have indicated that criteria for PTSD may not be fully met among veterans and often depends on time elapsed between assessment and active duty (Corso et al., 2009; Milliken et al., 2007). Therefore, previous studies may have limited the generalizability to their findings by relying on diagnostic screenings for PTSD, such as the Posttraumatic Stress Disorder Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993). To increase the understanding of trauma and suicide, future research should not equate trauma to a diagnosis of PTSD, but rather, address the phenomenological experience of trauma.

In an effort to control for some of the aforementioned limitations, the current study attempted to improve upon previous methodologies. Despite acknowledged limitations of self-report data, the current study relied on this method of data collection but with an effort to increase honest self-report of symptoms. First, data were collected anonymously in an attempt to decrease participants’ likelihood of under-reporting
suicidality and traumatic experiences. Also, since participant data were anonymous, there is no direct benefit or compensation attached to participation. Anonymity of responses may reduce under-reporting associated with mental health stigmas and increase validity of veteran responses due to minimal personal gain associated with participation. Second, a grounded theoretical framework (i.e., The Salutogenic Model of Health) of resilience was utilized to increase understanding of suicide resilience within a veteran population. Prior resilience research among veterans has failed to utilize a developed theoretical model in understanding the nature of resilience. Third, suicidality was assessed utilizing a brief but psychometrically sound measure of suicidality to increase response validity to the suicidality. This improves upon the use of one-item assessments of suicidality as seen in previous literature. Fourth, the current study examined the moderating effect of sense of coherence on traumatic experiences and suicidality. A majority of previous research has employed correlational analyses in the study of the relationship between variables such as sense of coherence, suicide, and traumatic experiences. This study attempted to gain a more detailed understanding of the relationship between these variables using a moderated regression analysis.

Fifth, previous literature that has examined symptoms of traumatic stress has been limited by the reliance of PTSD screening measures. Rather than assessing for PTSD, the current study focused on examining the phenomenological impact of trauma exposure on suicidality. The phenomenological impact of trauma was measured by assessing the perceived distress related to military combat. Previous literature has been limited by the reliance on PTSD screening measures as this method discounts individuals who may have distress related to combat experiences but do not exhibit symptoms of PTSD. Lastly,
previous literature has demonstrated limited statistical control of confounding variables. The current study controlled for some of the variables that may influence the hypothesized relationships, including time elapsed since active duty, level of combat exposure, and previous history of trauma, because these variables have been shown to relate in prior research.

Research Hypotheses

The current study hypothesized that sense of coherence is a mechanism of resilience and can be specifically applied to suicide resilience. To further understand the relationship between sense of coherence as a resilience factor against suicide, the following hypothesis was examined:

**Hypothesis 1**: Sense of coherence will be positively correlated with Osman and colleagues’ (2004) construct of suicide resilience.

Previous literature has indicated that sense of coherence and suicidality may be negatively related (Edwards & Holden, 2001; Petrie & Brook, 1992; Rothmann & Van Rensburg, 2002); however, this relationship has not been examined in a U.S. veteran population. The following hypothesis could expand upon previous findings to explore the relationship between suicide and sense of coherence among OEF/OIF veterans:

**Hypothesis 2**: Sense of coherence will be negatively related to suicidality, such that a weaker sense of coherence will be associated with higher levels of suicidality.

Extensive research has been conducted examining the relationship between sense of coherence and traumatic experiences, with a majority of findings in support of this relationship (Dudek & Koniarek, 2000; van der Hal-van Raalte et al., 2008) and a few studies that failed to find a significant association between sense of coherence and
traumatic experiences (Schnyder et al., 2001; Wittman et al., 2008). In an attempt to provide further evidence of this relationship, the following hypothesis was explored:

**Hypothesis 3**: Sense of coherence will be negatively related to perceived distress associated with traumatic combat experiences. Veterans who report more severe distress associated with combat will have a lower sense of coherence as compared to veterans who report less severe distress associated with combat.

Recent literature has suggested that the suicide rate among active duty veterans may exceed the suicide rate of the general population (Kang & Bullman, 2008) and that the amount of time since active military service is inversely related to suicidality (Kang & Bullman, 2010). The following hypothesis sought to provide further support for the association between suicidality and active duty service:

**Hypothesis 4**: Suicidality will be negatively related to the number of months since active duty service in the armed forces. Veterans who have been discharged for a longer period of time will endorse fewer items of suicidality as compared to veterans who have been discharged for a shorter period of time.

It has been found that level of combat exposure may be a significant risk factor in the development of posttraumatic stress symptoms (Booth-Kewley et al., 2010; Phillips et al., 2010; Ramchand et al., 2010). However, since these studies relied exclusively on PTSD symptom endorsement, much less is known about the general experience of combat trauma unrelated to PTSD symptomatology. The following hypothesis could expand upon previous findings by examining perceived severity of combat experiences associated with level of combat exposure, rather than PTSD symptoms:
**Hypothesis 5**: Level of combat exposure will be positively related to perceived distress associated with traumatic combat experiences. Veterans who report higher levels of combat exposure will perceive their wartime experience as more distressing as compared to veterans who report lower levels of combat exposure.

Current endorsement of traumatic stress symptoms among OEF/OIF veterans has been found to be related to previous history of traumatic events (Cabrera et al., 2007; Fritch et al., 2010; Phillips et al., 2010). The following hypothesis examined this relationship to provide further support of these findings:

**Hypothesis 6**: The participants who report a history of pre-deployment traumatic experiences will report higher perceived distress associated with traumatic combat experiences than the participants without a history of pre-deployment traumatic experiences. Veterans who report a history of previous traumatic events will perceive their current wartime stressors as more distressing compared to veterans who report no history of traumatic experiences.

Initial evidence has suggested that a significant relationship between trauma and suicidality exists among OEF/OIF veterans (Guerra & Calhoun, 2011; Jakupcak et al., 2009; Maguen et al., 2011). To provide additional support for this relationship, the following hypothesis was examined:

**Hypothesis 7**: Suicidality will be positively related to the level of perceived distress associated with traumatic combat experiences. Increased endorsement of suicidality will be observed among veterans who report more severe distress associated with combat experiences.
To expand upon previous literature, the purpose of the current study is to examine the moderating effect of sense of coherence on the relationship between traumatic combat experiences and suicidality, while controlling for potential covariates as identified in the literature. Thus,

**Hypothesis 8**: After controlling for years since active duty, level of combat exposure, and previous history of traumatic experiences, sense of coherence will moderate the relationship between traumatic combat experiences and suicidality. It is hypothesized that a stronger sense of coherence will be associated with a weaker relationship between perceived combat distress and suicidality.
CHAPTER III
METHODOLOGY

The purpose of the current study was to determine whether the strength of veterans’ sense of coherence moderates the relationship between perceived combat experiences and self-reported suicidal ideation and behavior. This chapter provides a description of the methods utilized to test the research hypotheses as stated in Chapter II. First, descriptions of the sample characteristics and data collection procedures are explained. Second, the self-report instruments used to collect data related to demographic variables, sense of coherence, suicidality, traumatic experiences, and suicide resilience are reviewed. The chapter concludes with statistical hypotheses and data analysis procedures utilized.

Participants

Participants in the current study were recruited from a Midwestern Department of Veterans Affairs Medical Center. Eligibility requirements included persons over the age of 18, veterans who served in Operation Enduring Freedom and/or Operation Iraqi Freedom, and service in a combat zone. Of note, veterans who served in Operation New Dawn (i.e., service in Iraq after 2010) were not differentiated from those who served in OIF in the present study. A power analysis using G-Power statistical software was conducted to determine an a priori estimated minimum sample size for the most sample
intense statistical procedure utilized in this study, multiple regression analysis. To obtain a medium effect size (.15) with a power level of .80 and .05 alpha significance when conducting a multiple regression analysis with six predictors (i.e., distress associated with combat experiences, self-reported suicidal ideation and behavior, the interaction between combat experiences and suicidality, time since last active duty deployment, level of combat exposure, and previous history of traumatic life events), the recommended minimum sample size is 98 (Cohen, 1992). This number is close to the suggested rule of thumb for determining sample size for multiple regression analysis (Green, 1991) which recommends $N \geq 104 + m$, where $m$ symbolizes the number of predictors. Based on this rule, the recommended sample size for the current study with six predictors would be 110. However, the literature suggests that moderation analyses often have low statistical power and require large sample sizes (Aguinis, 1995; McClelland & Judd, 1993; Stone-Romero & Anderson, 1994). The power analysis was re-run with an increased power level of .95, which resulted in a recommended minimum sample size of 146. A total of 162 participants were recruited, however, two participants did not finish the study materials due to conflicts with their medical appointment and three participants had significant missing data points. The final sample size utilized in data analyses was 157.

The sample was predominately male accounting for 93% of the total sample size ($n = 146$) and females comprised the remaining 7% ($n = 11$). The participants’ ages ranged from 25 to 48 ($M = 35.67, SD = 5.0$) years old. A majority of the participants identified as White/European American (76.4%), followed by Black/African American (18.5%), Hispanic/Latino (3.8%), and Biracial/Multiracial (1.3%). Related to marital status and current employment, 51.6% of the participants were single, never married ($n =$
81) and 78.4% were employed ($n = 123$). Only 28% ($n = 44$) of the sample were engaged in current mental health services and 15.9% ($n = 25$) were specifically engaged in alcohol and/or drug treatment. Of the participants engaged in current mental health services, 13.4% were engaged in individual outpatient psychotherapy, 16.6% in outpatient medication management, and 10.8% in group outpatient psychotherapy. A majority of the participants were never diagnosed with a psychiatric disorder ($n = 101$) based on their self-report. For the remaining 56 of the participants who have a mental health diagnosis, the most common diagnoses were Major Depressive Disorder ($n = 32$), PTSD ($n = 23$), and an Alcohol Related Disorder ($n = 21$). A summary of the demographic characteristics of the sample are provided in Table 3.1.

Among the current sample of OEF/OIF veterans, the following service branches of the United States Armed Forces were represented, Air Force ($n = 14$), Army ($n = 67$), Coast Guard ($n = 7$), Marine Corps ($n = 51$), and Navy ($n = 18$). A majority of the participants reported enlisted military service ranks of E3 ($n = 49$), E4 ($n = 52$), and E5 ($n = 25$). A total of 101 of the participants served at least one tour of duty in Operation Enduring Freedom and 60 of the participants served at least one tour of duty in Operation Iraqi Freedom. The participants reported a range of one to five deployments, with an average of 2.57 ($SD = 1.08$) tours of duty. The average length of time since their last active duty deployment was 32.3 months ($SD = 22.63$), with a range from one month to one-hundred and thirty two months. The majority of the participants reported between one to six years since their last active duty deployment ($n = 129$). Table 3.2 summarizes the demographic characteristics specific to the veteran population.
Table 3.1

Demographic Characteristics of the Sample \((N = 157)\)

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<thead>
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### Table 3.2

**Veteran Specific Demographic Characteristics (N = 157)**

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<td><strong>Military Rank</strong></td>
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</tr>
<tr>
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</tr>
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<tr>
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Procedures

Prior to data collection, approval from Louis Stokes Cleveland Department of Veterans Affairs Medical Center (LSCDVAMC) was obtained (see Appendix A). Approval was granted from three departments within the LSCDVAMC, the Institutional Review Board (IRB), the Subcommittee on Research Safety Exemption (SRS), and the Research and Development Committee. The IRB determined that the study demonstrated no more than minimal risk of harm to the participants associated with the self-report of mental health symptoms. A waiver of documentation of informed consent was granted to ensure participant anonymity and confidentiality. Approval from the SRS was obtained since the present study did not involve the use of biohazardous materials, chemicals, radioisotopes, and physical hazards. Lastly, final approval was granted by the Research and Development Committee which enabled data collection procedures to commence.

The participants were recruited from the waiting room of the Primary Care Clinic at the LSCDVAMC. The researcher approached patients waiting for medical appointments. First, to ensure eligibility of the participants the researcher inquired whether the person was a veteran of either or both OEF/OIF conflicts and served in a combat zone. The patients who meet these requirements were then asked if they had five minutes to be informed about a potential research study on the OEF/OIF population. They were ensured that participation was voluntary and listening to the study description did not mean they would have to participate.

The patients who agreed to hear about the study were provided a brief description of the research study utilizing the Oral Consent Script (see Appendix B). The researcher read the consent document to inform the veteran of study related procedures, including
information regarding the purpose of the study, the participant’s rights and responsibilities, potential risks/discomforts, privacy and confidentiality, and contact information. Potential participants were informed that their choice to not participate would not impact the standard of care provided by their treatment provider. The patients were informed that the study would take approximately 30-45 minutes to complete.

Those who consented to participate were provided with a copy of the oral consent, a study packet, and pencil. The study packet included a demographic questionnaire (i.e., age, gender, marital status, veteran status) and five self-report measures (Combat Exposure Scale, Traumatic Events Questionnaire, Sense of Coherence Scale, Suicide Resilience Inventory, and Suicide Behaviors Questionnaire). No identifiable health information was collected. Instructions asked the participants to complete the study packet while waiting for their primary care appointment. The researcher remained in the primary care waiting room while the participants completed the study packet, both to collect completed materials and to answer questions. The participants returned their completed study packet directly to the researcher. As study packets were returned, the researcher asked the participant to wait while she reviewed the measures to ensure that all items were completed. If any missing items were identified, the researcher asked the participant to complete the missing items. After all packets were reviewed and missing items were addressed as necessary, the participants were informed that they completed all study requirements and were thanked for their time.
Measures

Demographic Questionnaire

A demographic questionnaire was developed for the purpose of the current study in order to obtain characteristic information of the current sample (see Appendix C). The demographic questionnaire included questions related to the participant’s background such as age, sex, racial/ethnic identity, marital status, and employment. Three questions were included to gain information about mental health/substance use treatment and diagnoses. Lastly, several questions related to OEF/OIF military background, such as branch of military service, rank, veteran status, length of time since active duty, number of deployments, and previous history of military service unrelated to OEF/OIF were included. No identifiable information was collected to preserve participants’ anonymity and confidentiality.

Sense of Coherence Scale-29

The participants’ sense of coherence was measured by the Orientation to Life Questionnaire (Antonovsky, 1987; see Appendix D), which is more commonly referred to as the Sense of Coherence Scale. Two versions of this scale exist, the original version with 29 items and a shortened version with 13 items. For the purpose of the current study, the original scale with 29 items was used and is referred to as the Sense of Coherence Scale-29 (SOC-29). The SOC-29 is a self-report measure assessing the three components of sense of coherence: comprehensibility, manageability, and meaningfulness. Though sense of coherence is conceptualized as three components, the literature suggests that factor analytic procedures commonly result in a one-factor solution (Antonovsky, 1993b; Frenz, Carey, & Jorgensen, 1993), however, there is some evidence of a three-factor
solution (Flannery, Perry, Penk, & Flannery, 1994). The intended use of the SOC-29 is to measure a global, unidimensional construct (Antonovsky, 1987). In an attempt to develop a multicultural measure in relation to gender, culture, socioeconomic status, and religion, Antonovsky created items using generic terms that could be understood by most individuals. As evidence of the cross-cultural use of the measure, the SOC-29 or SOC-13 have been translated into at least 33 different languages and used in at least 32 different countries (Eriksson & Lindstrom, 2005). Moreover, across various multicultural demographics, sense of coherence has been found to consistently predict both physical and mental health (Eriksson & Lindstrom, 2006).

Based on a seven-point Likert scale, the participants are instructed to select an agreement/disagreement response with two anchoring phrases. Sample items include, “Until now your life has had” (1) “No clear goals or purpose at all” to (7) “Very clear goals and purpose” and “When you face a difficult problem, the choice of a solution is?” (1) “Always confusing and hard to find” to (7) “Always completely clear.” A total cumulative score is obtained by summing the responses, with 13 items requiring reverse coding. Total scores range from 29 to 203, with higher scores indicating a stronger sense of coherence. There is no cut off score to determine a categorical rating such as low, moderate, or high since sense of coherence is conceptualized as existing on a continuum (Antonovsky, 1987). Mean scores in both clinical and non-clinical samples have been found to range from 100.50 ($SD = 28.50$) to 164.50 ($SD = 17.10$) in a review of 124 studies utilizing the SOC-29 (Eriksson & Lindstrom, 2005).

The SOC-29 has been found to be a psychometrically sound measure, demonstrating adequate reliability and validity. Good reliability, in regard to internal
consistency and test-retest reliability in the scores produced by the SOC-29 was found across a number of studies. Antonovsky reviewed 42 studies that utilized either the SOC-29 or the shortened 13-item version and found internal consistency for the SOC-29 to be adequate, with alpha coefficients ranging from 0.82 to 0.95 (Antonovsky, 1993b). Similarly, a more recent review of 124 studies by Eriksson and Lindstrom (2005) found Cronbach’s alpha to range from 0.70 to 0.95. Test-retest reliability after one week has been found to be 0.92 (Frenz et al., 1993), after two weeks 0.91 (Antonovsky, 1993b), after one year to range from 0.52 to 0.78 (Antonovsky, 1993b, Eriksson & Lindstrom, 2005), and ranges from 0.42 to 0.69 after three to five years (Eriksson & Lindstrom, 2005). The low test-retest reliability observed after a three to five year period of time may be explained by the impact of life experiences on shaping SOC, which may strengthen or weaken one’s SOC.

Validity evidence suggests that the SOC-29 accurately assesses a sense of coherence as it is theoretically explained. Antonovsky (1993b) stated that the construction of each SOC-29 item to uniquely represent one of the three main components of sense of coherence demonstrates content validity. In order to establish content validity, three independent reviewers familiar with the construct of sense of coherence examined the 29 items and concurrently agreed that each item represented only one component of SOC. Moreover, Eriksson and Lindstrom (2005) argued that the cross-cultural validation of the SOC-29 demonstrates acceptable face validity because the scale is easily understood by various cultural groups. Evidence for a degree of convergent validity has been found in the relationship between sense of coherence and various theory-related constructs. For example, Antonovsky (1993b) found positive correlations
between sense of coherence and quality of life ($r = .76$), self-esteem ($r = .63$), general well-being ($r = .62$), problem-focused coping ($r = .29$), and hardiness ($r = .50$). Sense of coherence was also found to be negatively correlated with perceived stress ($r = -.73$), trait anxiety ($r = -.61$), physical symptoms ($r = -.26$), emotional distress ($r = -.63$), and emotion-focused coping ($r = -.53$; Antonovsky, 1993b; Frenz et al., 1993). Frenz, Carey, and Jorgensen (1993) also found support for discriminant validity, evidenced by a non-significant correlation between sense of coherence and intelligence ($r = .11$). Moreover, evidence of predictive validity has been found in various studies. For example, SOC-29 predicted quality of life among schizophrenic patients after 18 months ($r = .60$) and predicted disability after five years for individuals suffering from medical complaints ($r = -.34$; Eriksson & Lindstrom, 2005). Cronbach’s alpha for the current sample was .99.

**Suicidal Behaviors Questionnaire-Revised**

Suicidality was assessed using The Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001; see Appendix E). The SBQ-R is a brief self-report assessment of past suicidal ideation and behavior. The original version, the Suicidal Behaviors Questionnaire (Linehan, 1981), contained 34 self-report items assessing the frequency and severity of past suicidal ideation and behaviors. Several different versions of the SBQ have been developed, most notably a 4-item version first introduced by Cole (1988). Example items include, “Have you ever thought about or attempted to kill yourself?”, “How often have you thought about killing yourself in the past year?”, “Have you ever told someone that you were going to commit suicide, or that you might do it?”, and “How likely is it that you will attempt suicide someday?” The four items are rated on a Likert-type scale unique to each item. The four-item SBQ has been utilized with non-
clinical college student populations (Cole, 1988; Cotton, Peters, & Range, 1995) and clinical populations (Cotton et al., 1995; Sabo, Gunderson, Najavits, Chauncey, & Kisiel, 1995). Internal consistency has been found to be adequate, with Cronbach’s alpha of .80 in non-clinical samples and Cronbach’s alpha of .75 in clinical samples (Cotton et al., 1995). Two-week test-retest reliability of .95 has provided further evidence of adequate reliability for the SBQ (Cotton et al., 1995). Evidence of concurrent validity has shown that the SBQ significantly correlates with the Scale for Suicide Ideation in a non-clinical sample \( r = .69 \) and significantly correlates with the Reasons for Living Inventory in a clinical sample \( r = -.34 \). Lastly, the SBQ has been found to be sensitive to changes in suicidal behavior among a clinical sample of patients diagnosed with Borderline Personality Disorder (Sabo et al., 1995).

In 2001, Osman and colleagues revised the SBQ and titled it the SBQ-R. The SBQ-R retained the same four items as the SBQ, however, the Likert-type scales for each item were revised to increase consistency in item responses. A total score is obtained by summing the responses and ranges from 3 to 18. Osman et al. (2001) validated the SBQ-R with clinical samples of adult and adolescent inpatients and non-clinical samples of college and high-school students. Internal consistency for the clinical sample was found to range from .87 - .88 and for the nonclinical samples internal consistency ranged from .76 - .87. These alpha coefficients indicate adequate to moderately high reliability for the SBQ-R. It was also found that the SBQ-R differentiated between suicidal and non-suicidal subgroups in both the adolescent clinical sample (OR = 2.19, 95% CI 1.65-2.92) and adult clinical sample (OR = 1.56, 95% CI 1.27-1.92). To differentiate suicidal individuals from non-suicidal individuals, Osman et al. (2001) utilized receiver operating
characteristic (ROC) analysis to determine the recommended cut-off score for the SBQ-R. For a non-clinical sample, the recommended cut-off score is ≥ 7 (sensitivity = .93; specificity = .95) and for a clinical sample ≥ 8 (sensitivity = .80; specificity = .91). Cronbach’s alpha for the current sample was .87.

**Traumatic Events Questionnaire-Military Version**

In order to assess exposure to traumatic experiences, the Traumatic Events Questionnaire-Military (TEQ-M; Vrana & Lauterbach, 1994; see Appendix F) was used. The TEQ-M is a 14 item self-report screener designed to assess type, frequency, and severity of trauma experiences. Twelve items directly assess specific traumatic experiences including serious accidents, natural disasters, violent crimes, sexual or physical abuse, and war exposure; in addition to two questions regarding traumatic experiences that are not listed or too difficult to describe. The participants were asked whether or not they have experienced the specified traumatic event, responding “Yes” or “No.” If the participant responds “No,” they were instructed to move onto the next item. If the participant responds “Yes,” they were instructed to rate the frequency of the event (once, twice, +three times), and age at occurrence. Additionally, the following four questions were assessed utilizing a 7-point Likert-type scale with anchors (1) Not at all to (7) Severely/Extremely: “Were you injured”, “Did you feel your life was threatened?”, “How traumatic was this for you at that time?”, and “How traumatic is this for you now?”. Since the purpose of the TEQ-M is to screen for exposure to traumatic events, no total score exists for interpretive purposes. A total number of traumatic experiences can be obtained by summing the amount of “Yes” responses to initial item statements, in addition to a severity indicator by summing the four Likert ratings for each traumatic
experience endorsed or a current measure of distress associated with the traumatic event based on the fourth Likert-type question.

Empirical support for reliability and validity of the TEQ-M is limited; however, the National Center for PTSD endorsed the use of the TEQ-M for research and clinical purposes. Vrana and Lauterbach (1994) reported 2-week test-retest reliability among a non-clinical population of students was .91. No further psychometric properties of the TEQ-M were found. No internal consistency for the TEQ-M was computed for the present study due to the inability to correlate items on this measure as they are not intended to measure the same construct, but rather the response associated with different traumatic events.

*Combat Exposure Scale*

The Combat Exposure Scale (CES; Keane et al., 1989; see Appendix G) was utilized to assess severity of combat experiences. The CES is a brief screener with seven items that evaluate wartime stressors including combat patrols, experiencing enemy fire, witness injury of another, and use of fire arms. Responses are based on a 5-point Likert-type rating scale of frequency unique to each item such as amount of times, length in months, or percentage. Sample items include: “Did you ever go on combat patrols or have other dangerous duty?” “Were you ever under enemy fire?” “What percentage of the soldiers in your unit were killed, wounded, or missing in action?” and “How often did you fire rounds at the enemy?” A total score is obtained by converting the raw score for each item into a weighted converted score and then summing the converted scores. The CES total score ranges from 0 to 41 and combat exposure can be categorized as: Light (scores of 0 -8), Light-Moderate (scores of 9-16), Moderate (scores of 17-24), Moderate-
Heavy (scores of 25-32), and Heavy (scores of 33-41). In a population of Vietnam veterans, mean scores were found to range from 25.57 to 29.37 (SD range 6.12 to 10.12; Keane et al., 1989).

Keane et al. (1989) reported good internal consistency for the CES, with a coefficient alpha of .85 and item-total correlations ranging from .64 to .83. Factor analysis yielded a one-factor solution accounting for 57.6% of the common variance, indicating that the items reflect a single construct of combat exposure. Test-retest reliability within a one-week time interval was found to be .97. Further evidence of the psychometric properties of the CES suggested that CES scores differentiated veterans diagnosed with PTSD from those without PTSD ($t = 2.98, p < .01$), indicating potential predictive validity in assessing for PTSD. Cronbach’s alpha for the current sample was .85.

**Suicide Resilience Inventory-25**

As a comparative measure of suicide resilience against the SOC-29, the Suicide Resilience Inventory (SRI-25; Osman et al., 2004; see Appendix H) was utilized. Suicide resilience, as defined by Osman and colleagues, is the “perceived ability, resources, or competence to regulate suicide-related thoughts, feelings, and attitudes” (Osman et al., 2004, p. 1351). The SRI-25 is a relatively new self-report measure that assesses protective factors that safeguard an individual against suicidal behaviors for adolescents and adults over the age of 14 years. Item responses are on a 6-point Likert-type rating scale ranging from (1) Strongly Disagree to (6) Strongly Agreed. The 25 items reflect three global dimensions: Internal Protective, Emotional Stability, and External Protective.
The Internal Protective factor reflects an individual’s self- and environmental beliefs including self-satisfaction, pride, and reasonable goal expectations (Gutierrez & Osman, 2008). Emotional Stability taps into an individual’s effective response to and management of environmental stressors and suicidal thoughts. The final dimension, External Protective, assesses an individual’s ability to recognize and use resources against suicidality including perceived social support, openness to discuss suicidality, and utilization of resources. Sample items from each dimension include: “Regardless of the problem situation I face, I can be happy with myself” (Internal Protective), “I can resist thoughts of killing myself when I feel emotionally hurt” (Emotional Stability), and “I can ask for emotional support from people close to me if I were to think about killing myself” (External Protective). Principal axis factoring supports a three-factor model in the initial analysis of the SRI-25 with a total of 61.8% variance accounted for (Osman et al., 2004). Further support for the three-factor model was found by Rutter, Freedenthal, and Osman (2008).

A total score is obtained by averaging the 25 items, with higher scores indicating strong resilience against suicidality. Average total scores on the SRI-25 were found to range from 5.06 to 5.60 (SD range .70 - .88) in both clinical and nonclinical samples of adolescents and adults (Gutierrez & Osman, 2008; Osman et al., 2004; Rutter et al., 2008). Subscale scores can be obtained for each of the dimensions by averaging the items in each subscale; the Internal Protective subscale has nine items and both the Emotional Stability and External Protective subscales have eight items.

Limited empirical support for the psychometric qualities of the SRI-25 exists due to the recent development of this measure. However, this measure was selected for the
current study due to the lack of another questionnaire measuring the construct of suicide resilience and some initial psychometric findings. Initial evidence of reliability and validity suggest that the SRI-25 may adequately measure suicide resilience. In a non-clinical population of adolescents and adults, high internal consistency was been found with alpha coefficients of .96 for the total scale, .94 for Internal Protective Subscale, .93 for Emotional Stability Subscale, and .90 for External Protective Subscale (Osman et al., 2004). Rutter et al. (2008) reported subscale alpha coefficients that were consistent with Osman et al. (2004), .92, .92, and .86 respectively, in a non-clinical sample of college students.

Evidence of known-groups discriminant validity was reported by Osman et al. (2004). These authors compared adolescents and adults divided into three groups: Non-suicidal, Suicide Ideation, and Suicide Risk. In comparing total SRI-25 scores, the Suicide Risk group ($M = 4.6, SD = 0.9$) exhibited lower suicide resilience as compared to the Non-suicidal group ($M = 5.6, SD = 0.5$) and the Suicide Ideation group ($M = 5.3, SD = 0.6, p < .01$). Moreover, a significant difference in mean scores was observed between the Non-suicidal group and Suicide Ideation group ($t = 6.06, p < .01$). Similar results were found in comparing mean subscale scores for Internal Protective, Emotional Stability, and External Protective across the three groups. Moreover, results from Rutter et al. (2008) suggests that the SRI-25 is negatively correlated with the Beck Hopelessness Scale ($r = -.68, p < .001$) and the Suicide Ideation Questionnaire ($r = -.67, p < .001$); as well as positively correlated with the Multidimensional Scale of Perceived Social Support ($r = .47, p < .001$) providing support for convergent validity. Cronbach’s alpha for the current sample was .99.
Statistical Hypotheses and Data Analyses

**Hypothesis 1:** Sense of coherence scores on the SOC-29 will be significantly positively related to suicide resilience scores on the SRI-25. This hypothesis was tested using a bivariate correlation coefficient.

**Hypothesis 2:** Sense of coherence scores on the SOC-29 will be significantly negatively related to suicidality scores on the SBQ-R. This hypothesis was tested using a bivariate correlation coefficient.

**Hypothesis 3:** Sense of coherence scores on the SOC-29 will be significantly negatively related to perceived distress associated with traumatic combat experiences as evidenced by scores on the TEQ-M. This hypothesis was tested using a bivariate correlation coefficient.

**Hypothesis 4:** Suicidality scores on the SBQ-R will be significantly negatively related to the number of months since active duty service in the armed forces. This hypothesis was tested using a bivariate correlation coefficient.

**Hypothesis 5:** Level of combat exposure as evidenced by scores on the CES will be significantly positively related to perceived distress associated with traumatic combat experiences as evidenced by scores on the TEQ-M. This hypothesis was tested using a bivariate correlation.

**Hypothesis 6:** The participants who reported a history of pre-deployment traumatic experiences will also have reported significantly higher perceived distress associated with traumatic combat experiences compared to the participants without a history of pre-deployment traumatic experiences as evidenced by scores in the TEQ-M. This hypothesis was tested using an independent samples t-test, $p < .05$. 

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Hypothesis 7: Suicidality scores on the SBQ-R will be significantly positively related to the participants’ perceived distress associated with traumatic combat experiences as evidenced by scores on the TEQ-M. This hypothesis was tested using a bivariate correlation coefficient.

Hypothesis 8: Sense of coherence will significantly moderate the relationship between traumatic combat experiences and suicidality. It is hypothesized that the interaction between combat distress and sense of coherence will account for significant variance in suicidality scores above and beyond that which is accounted for by years since active duty, level of combat exposure, previous history of traumatic experiences, combat traumatic experiences, and sense of coherence alone. This hypothesis was tested using hierarchical linear multiple regression. In the first step of the model, years since active duty, level of combat exposure based on CES scores, and previous history of traumatic experiences from the TEQ-M will be regressed on SBQ-R total scores. In the second step in the regression equation, perceived combat distress scores from the TEQ-M and scores on the SOC-29 were regressed on scores from the SBQ-R. The interaction term between scores on the TEQ-M and SOC-29 was added in the final step of the regression equation to test for moderation.
CHAPTER IV
RESULTS

This chapter reports data screening findings, preliminary, and primary analyses. Data were screened for missing items and assumptions of normality were tested. Preliminary analyses related to priming effects on the SBQ-R and principal axis factoring for the SOC-29 are presented. Primary analyses were tested with bivariate correlations, independent sample t-test, and a moderated regression. The chapter concludes with a summary of the data findings.

Data Screening

Screening procedures were conducted to detect issues with the data set prior to statistical analyses. This included an evaluation of missing data, identification of outliers, and tested assumptions of the multiple regression analysis (i.e., normality, linearity, heteroscedasticity, and multicollinearity; Tabachnick & Fidell, 2007).

The data were reviewed to check for missing data points within each of the participant’s survey set. Two of the participant’s data were immediately excluded from analyses due to incomplete survey completion; one participant completed approximately the first half of the measures and the second participant did not complete the TEQ-M or CES. Data from the remaining 160 participants were screened. No data from the SOC-29 or CES were missing. One participant did not include the location of his previous military
service; however, this omission did not affect data analyses and thus was included in the final analyses. Two of the participants failed to respond to all items on the SRI-25, with one and three items missing respectively. Mean substitution was utilized for these items. Three additional data sets were not included in the final analyses due to missing data of critical data points for the current analyses. Several follow-up items on the TEQ-M were left blank by five of the participants; three of these missing items were not relevant to the present analyses. However, two of the participants did not report current level of distress associated with their combat experiences. Additionally, one participant did not complete three items on the SBQ-R. The data from these three participants were not included in the final data set and analyses.

Histograms were examined to detect the presence of univariate outliers on the SBQ-R, SRI-25, SOC-29, TEQ-M item number 10 assessing current distress level associated with combat experience, and the CES. Visual screening of the histograms did not reveal the presence of univariate outliers among these variables (see Figure 4.1). Additionally, the data were screened for multivariate outliers using Mahalanobis distances. Multivariate outliers are detected by a Mahalanobis distance value ($\chi^2$) associated with a $p < .001$ (Tabachnick & Fidell, 2007). No outliers were detected using this criterion.

Variables related to suicidality, suicide resilience, sense of coherence, combat distress, and combat exposure were then screened for normality. Analysis revealed the following skew and kurtosis statistics for each variable: SBQ-R (skewness = .83; kurtosis = -.52); SRI-25 (skewness = -.26; kurtosis = -.63); SOC-29 (skewness = -.12; kurtosis = -.70); Combat distress (skewness = .74; kurtosis = -.60); and CES (skewness = .25;
Figure 4.1. Histograms of univariate outliers.
kurtosis = .00). Based on a visual scan of the distribution of scores on each histogram, as well as skewness and kurtosis statistics within expected values of -1 to 1, scores on the SRI-25, SOC-29, and CES are reasonably normally distributed. A moderate positive skew was found on the SBQ-R and level of combat distress measured on the TEQ-M. However, since the current sample is comprised of non-clinical participants, it is expected that a large proportion of scores on the SBQ-R and current level of distress would be low as similarly found in the general veteran population. Thus, scores on the SBQ-R and TEQ-M were not transformed.

Pairwise scatter plots were then examined to address linearity and homoscedasticity among the multivariate relationships between suicidality and sense of coherence, and suicidality and current level of distress associated with combat experiences. Scatter plots that represent an oval pattern are suggestive of a linear relationship between the variables (Tabachnick & Fidell, 2007). Both relationships represent a general oval pattern, representing linearity among the variables (see Figure 4.2). The plots were also scanned to determine whether the relationships between variables are homoscedastic. Homoscedasticity is observed when the variability in scores across one variable is roughly the same at all values of the second variable (Tabachnick & Fidell, 2007). In both scatter plots, it does not appear that there is greater variability on one variable’s scores for differing values of the second variable and the assumption for homoscedasticity was not violated.

Lastly, the data were screened for multicollinearity of scores on the SBQ-R, SRI-25, SOC-29, TEQ-M item 10, and CES to ensure that no variables were too highly correlated (see Table 4.1). Tabachnick and Fidell (2007) propose that correlations above
**Figure 4.2.** Pairwise scatter plots. Two plots are displayed to examine linearity and homoscedasticity among the multivariate associations, including the relationship between suicidality and sense of coherence as well as suicidality and level of current distress associated with combat experiences.
Table 4.1

*Correlation Matrix (N = 157)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>SBQ-R</th>
<th>SRI-25</th>
<th>SOC-29</th>
<th>TEQ-M</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBQ-R</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>SRI-25</td>
<td>-.69*</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>SOC-29</td>
<td>-.79*</td>
<td>.53*</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>TEQ-M</td>
<td>.66*</td>
<td>-.56*</td>
<td>-.70*</td>
<td>—</td>
</tr>
<tr>
<td>CES</td>
<td>.02</td>
<td>.05</td>
<td>-.03</td>
<td>-.01</td>
</tr>
</tbody>
</table>

*Note. *p < .001*
.90 are suggestive of multicollinearity and recommend this as a cut-off to determine the presence of highly correlated variables. No correlations were above .90. Additionally, multicollinearity can be diagnosed by examining the variance inflation factors (VIF) for the predictors in a multiple regression model. A VIF value refers to the degree to which there is a strong linear relationship between one predictor and the set of multiple regression predictors; a VIF value of 2.5 or greater is suggestive of multicollinearity (Allison, 1999; Miles & Shevlin, 2001). In the current study, VIF values ranged from 1.02 to 2.31. Based on the correlation coefficients between the study measures and VIF values, the assumption for multicollinearity was not violated.

In summary, five of the participant’s data were not included in the sample and analyses due to missing data. No univariate or multivariate outliers were detected. Assumptions of normality, linearity, homoscedasticity, and multicollinearity were not violated. A total of 157 of the participants’ data were included in final analyses.

Preliminary Analyses

To determine whether the veterans were primed to report higher suicidality as a result of completing the TEQ-M first, the survey measures were ordered in two arrangements with the TEQ-M presented first on half of the surveys and the SBQ-R presented first on the remaining half of the surveys. An independent samples t-test was conducted to compare differences in SBQ-R scores between both groups. The average SBQ-R score the first ordered set was 5.72 (SD = 2.96) and the average for second ordered set was 5.1 (SD = 2.6). No statistically significant differences in SBQ-R scores was observed, \( t = 1.45, p > .05 \). Based on these results, the data were analyzed together in the subsequent analyses.
The intended use of the SOC-29 is to measure a global, unidimensional construct (Antonovsky, 1987). Both a one-factor model of the SOC-29 (Antonovsky, 1993b; Frenz, Carey, & Jorgensen, 1993) and a three-factor model (Flannery et al., 1994) have been supported in previous literature. However, to date no studies have reported the factor structure of the SOC-29 within the OEF/OIF veteran population. An exploratory factor analysis was conducted in order to determine the underlying structure of the twenty-nine items in the SOC-29 that assesses Aaron Antonovsky’s sense of coherence construct. The current study sought to explore the factor structure that accounts for as much variance as possible with the least amount of factors. Principal axis factoring was used as the extraction procedure, with squared multiple correlations used as prior communality estimates. In the current sample, Cronbach’s alpha was .99 and positive point-biserial correlations between the twenty-nine items ranged from .64 to .98.

In extracting a one-factor solution, the initial estimate of common variance yielded an eigenvalue 22.68 for the first factor, accounting for 78.19% of the common variance. No other factors had an eigenvalue above 1. Initial communalities ranged from .83 to .98. The scree plot was then examined and also indicated a one-factor solution with the scree between factor 1 and 2 (See Figure 4.3). The unrotated factor matrix showed all twenty-nine items significantly loaded onto the first factor. A significant loading was classified as .40 or above and ranged from .85 to .94. A second extraction was run testing a three-factor solution. The second and third factors yielded eigenvalues of .76 and .68 respectively, accounting for an additional 2.63% and 2.34% of the common variance, which is below the recommendation of 5-10% variance accounted for by the final factor (Thompson, 2004). The scree plot remained unchanged and supported a one-factor
Figure 4.3. Scree plot. This scree falls between factor 1 and 2.
solution. All twenty-nine items significantly loaded again onto factor one, with no
significant loadings on factors one or two.

Overall, it can be concluded that the current data support the SOC-29 one-factor
structure. In EFA, it is recommended that the factor solution account for 70-80% of the
common variance. The first factor accounted for 78.19% of the common variance alone.
Additionally, an examination of the scree plot and factor loadings gave further evidence
that the data are best represented by a one-factor solution. It is important to note that the
current sample size is relatively low (N = 157) as compared to recommended guidelines
for exploratory factor analysis. For example, a subject to variable ratio of at least 15:1
and 30:1 for increased generalizability has been recommended (Pedhauzer, 1997). Also,
Comfrey and Lee (1992) identified the following classifications of sample sizes: 
N = 50
(very poor), N = 100 (poor), N = 200 (fair), N = 300 (good), N = 500 (very good), N =
1000+ (excellent). However, Hatcher (1994) suggested a minimum of 100 participants or
five times the number of variables. Based on that recommendation, the current sample of
157 would be adequate. Therefore, the results of the EFA should be interpreted with
caution, but support the use of a composite score on the SOC-29 for data analysis
procedures.

Primary Analyses

This section describes the statistical results of the eight proposed hypotheses.
Means, standard deviations, and score ranges for the SBQ-R, SRI-25, SOC-29, TEQ-M
item ten assessing current level of distress associated with combat experiences, and CES
are reported in Table 4.2 The average score on the SBQ-R was 5.4 (SD = 2.8), which is
below the recommended cut-off score of 7 for non-clinical samples (Osman et al., 2001).
Table 4.2

Means and Standard Deviations of Study Measures (N = 157)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBQ-R</td>
<td>3 - 13</td>
<td>5.4</td>
<td>2.8</td>
<td>.22</td>
</tr>
<tr>
<td>SRI-25</td>
<td>2.52 - 6</td>
<td>4.67</td>
<td>.89</td>
<td>.07</td>
</tr>
<tr>
<td>SOC-29</td>
<td>52 - 185</td>
<td>120.33</td>
<td>31.44</td>
<td>2.51</td>
</tr>
<tr>
<td>TEQ-M</td>
<td>1 - 7</td>
<td>2.9</td>
<td>1.74</td>
<td>.14</td>
</tr>
<tr>
<td>CES</td>
<td>0 - 33</td>
<td>14.8</td>
<td>6.85</td>
<td>.55</td>
</tr>
</tbody>
</table>
This finding suggests that this sample of OEF/OIF veterans reported a relatively low degree of suicidality. Specific to items on the SBQ-R, no OEF/OIF veterans in the current sample reported a past history of suicide attempts and only 15.9% ($n = 25$) of the sample endorsed having a suicide plan in the past. In the past year, 38.9% ($n = 61$) of the veterans endorsed suicidal ideation on at least occasion and 15.9% ($n = 25$) of the sample endorsed telling someone that they were thinking about suicide.

Related to the SRI-25, the average score was 4.67 ($SD = .89$) which is slightly lower than studies that have found a range from 5.06 to 5.60 in clinical and nonclinical samples (Gutierrez & Osman, 2008; Osman et al., 2004; Rutter, Freedenthal, & Osman, 2008). In both clinical and non-clinical samples average scores on the SOC-29 have been found to range from 100.50 to 164.50 (Eriksson & Lindstrom, 2005). The average score of 120.33 ($SD = 31.44$) on the SOC-29 for the current sample falls within this range. The veterans reported relatively low levels of current distress associated with combat experience as evidenced by an average rating of 2.9 ($SD = 1.74$) on a seven-point Likert-type scale with lower numbers indicating lower levels of distress. The level of combat exposure in the current sample can be categorized as Light-Moderate with an average score of 14.8 ($SD = 6.85$).

**Correlational and t-test Analyses**

The first hypothesis stated that sense of coherence scores on the SOC-29 would be positively related to suicide resilience scores on the SRI-25. To test this hypothesis a bivariate correlation coefficient was computed and tested for statistical significance. A moderate Pearson correlation coefficient of .53 was found to be statistically significant at $p < .001$ with an effect size of $r^2 = .28$. Hypothesis one was supported and indicates that a
stronger sense of coherence is related to higher suicide resilience scores among OEF/OIF veterans. The moderate strength of this relationship suggests that 28% of the variance is explained by the linear relationship between sense of coherence and suicide resilience.

Hypothesis two stated that sense of coherence scores on the SOC-29 would be negatively related to suicidality scores on the SBQ-R. This hypothesis was tested using a bivariate correlation coefficient. Support was found for this hypothesis \( r = -.79, \ p < .001, \ r^2 = .62 \), signifying a strong, negative relationship between sense of coherence and suicidality. As suicidality scores increase, sense of coherence scores decrease suggesting that OEF/OIF veterans with a strong sense of coherence are likely to report lower degrees of suicidality.

In the third hypothesis, it was predicted that sense of coherence scores on the SOC-29 would be negatively related to perceived combat distress as evidenced by scores on the TEQ-M. This hypothesis was tested using a bivariate correlation coefficient and was supported with a Pearson correlation coefficient of \( -.69, \ p < .001, \ r^2 = .48 \). This correlation is reflective of a strong moderate relationship between sense of coherence and combat distress suggesting that OEF/OIF veterans who reported higher combat distress have a weaker sense of coherence.

No support was found for the fourth hypothesis that stated suicidality scores on the SBQ-R would be negatively related to the number of months since active duty service in the armed forces. This hypothesis was tested using a bivariate correlation coefficient but no statistically significant relationship was found between the degree of suicidality and time since active duty service among OEF/OIF veterans \( r = .16, \ p > .05 \).

In hypothesis five, it was predicted that level of combat exposure as evidenced by
scores on the CES would be positively related to perceived combat distress as evidenced by scores on the TEQ-M. A bivariate correlation coefficient was utilized to test this hypothesis and no support was found ($r = -.02, p > .05$). This finding suggests that among OEF/OIF veterans, current distress associated with combat experiences is not related to level of combat exposure.

No support was found for hypothesis six that stated pre-deployment history of traumatic experiences would be positively related to perceived combat distress as evidenced by scores in the TEQ-M. Of the 157 OEF/OIF veterans who participated in this study, 37 reported a history of pre-deployment traumatic experiences. Due to unequal sample sizes and variances between those who reported a history of pre-deployment traumatic experiences and those that did not (Levene’s $F = 4.97, p < .05$), this hypothesis was tested using a non-parametric, independent samples $t$-test. A Mann-Whitney value of 1974.5 was found to be statically insignificant, $p > .05$. This finding suggests that there is no statistically significant difference in current distress associated with combat experiences between the two groups. Thus, OEF/OIF veterans with a history of pre-deployment traumatic experiences are not more likely to report higher combat distress than OEF/OIF veterans without a history of pre-deployment traumatic experiences.

The seventh hypothesis stated that suicidality scores on the SBQ-R would be positively related to perceived severity of combat trauma as evidenced by scores on the TEQ-M. To test this hypothesis, a bivariate correlation coefficient was computed and tested for statistical significance. The hypothesis was supported, $r = .64, p < .001$, $r^2 = .41$, indicating a strong moderate relationship between suicidality and combat distress.
This finding suggests that OEF/OIF veterans who reported a higher degree of suicidality are likely to report higher combat distress.

Moderated Regression Analysis

The final and main hypothesis of the present study stated that sense of coherence would moderate the relationship between traumatic experiences and suicidality. It was hypothesized that the interaction between current level of combat distress and sense of coherence would account for significant variance in suicidality scores above and beyond that which is accounted for by current level of combat distress and sense of coherence alone. It was also hypothesized that months since active duty service, level of combat exposure, and previous history of pre-deployment traumatic experiences would be significant covariates in the model. However, since the relationship between these variables and the variables in the moderated regression equation were found to be unrelated in hypotheses four, five, and six they were not included in the regression model. In order to interpret the main effects, current level of distress scores, sense of coherence scores, and the interaction term were centered.

To test this hypothesis, a moderation analysis was performed. A hierarchical regression model was used; Model 1 regressed suicidality scores from the SBQ-R on current level of combat distress from the TEQ-M and sense of coherence scores on the SOC-29, and Model 2 regressed suicidality scores on current level of combat distress, sense of coherence scores, and the interaction term between current combat distress and sense of coherence.

The first model of the regression equation yielded a significant effect of the predictor variables on suicidality, $F(2, 154) = 137.28, p < .001$. Significant main effects
were found for both combat distress and sense of coherence. Current level of combat distress (\(\beta = .29, p < .01\)) and sense of coherence (\(\beta = -.06, p < .001\)) were both significant predictors of suicidality. An \(R^2\) value of .64 indicates that combat distress and sense of coherence explain 64% of the variance in suicidality. In the second model of the regression analysis, the interaction term between current combat distress and sense of coherence supported a significant increase in the variance of suicidality, \(\Delta R^2 = .02, \Delta F(1,153) = 8.02, p < .01\). The significant \(\Delta F\) between Model 1 and Model 2 indicates that the interaction (\(\beta = -.01, p < .01\)) between combat distress and sense of coherence is a significant and unique predictor of suicidality above and beyond the simple main effects. The interaction term was also found to be the strongest predictor of suicidality when compared to the predictive values of combat distress and sense of coherence alone (see Figure 4.4 that illustrates the moderated relationship and significance of the \(\beta\) weights in the interaction model). Thus, the moderation hypothesis was supported suggesting that the prediction of suicidality from current level of combat distress varies across, or depends on, sense of coherence. Additionally, the final beta values indicate that in Model 2, the predictive value of current combat distress was no longer significant when the interaction term was added to the model.

To interpret the direction of the moderating relationship, the positive value of the \(\beta\) weight for combat distress and the negative value of the \(\beta\) weight for the interaction term suggest that the relationship between combat distress and suicidality becomes weaker as sense of coherence increases. Further evidence to support this direction of the moderated relationship was examined by creating interaction plots using centered data.
Figure 4.4. Graphical depiction of moderated regression. The significance of sense of coherence as a moderator of the relationship between combat distress and suicidality is reported using final Beta weights in Model 2 of the moderated regression equation. 
*p < .01
and the centered regression equation. To create the low and high groups representing sense of coherence, one standard deviation below the mean of the centered data was used to represent the low group and one standard deviation above the mean was used to represent the high group (Aiken & West, 1991). Similarly, to obtain two points across the range of the scores for combat distress, centered scores one standard deviation above and below the mean were utilized. Figure 4.5 depicts the interaction plot among the variables. A visual inspection of the slopes indicated that the slope on the low sense of coherence group appears to be steeper than the slope on the high sense of coherence group which suggests that the relationship between combat distress and suicidality decreases as sense of coherence scores increase.

To test this, two simple slope analyses were conducted to examine whether the slopes for the low and high sense of coherence groups significantly differed from zero. For the high SOC group, the slope did not significantly differ from zero ($B = -.08$, $SE_B = .17$, $\beta = .63$, $p > .05$). However, for the low SOC group the slope was significantly different from zero ($B = .40$, $SE_B = .11$, $\beta = .25$, $p < .001$). This finding confirmed that among OEF/OIF veterans with high sense of coherence scores, combat distress scores are unrelated to suicidality. However, among OEF/OIF veterans with low sense of coherence scores, combat distress is positively related to suicidality. Thus, the positive relationship between combat distress and suicidality is stronger when OEF/OIF veterans report a low sense of coherence. A high sense of coherence acts as a buffer between combat distress and suicidality.
Figure 4.5. Interaction plots of the moderated regression analysis using centered data. The Low SOC group represents OEF/OIF veterans with scores one standard deviation below the mean SOC score and the High SOC represents OEF/OIF veterans with scores one standard deviation above the mean SOC score. In the same way, centered scores one standard deviation below the mean of combat distress scores represents the Low Distress group and one standard deviation above the mean of combat distress scores represents the High Distress group. Suicidality is represented on the y-axis.
Summary of Analyses

Data screening procedures revealed no univariate or multivariate outliers and assumptions of normality, linearity, homoscedasticity, and multicollinearity were not violated. Preliminary analyses suggested that self-reporting traumatic experiences did not prime OEF/OIF veterans to report higher suicidality and an exploratory factor analysis of the SOC-29 supported a one-factor solution so that sense of coherence was interpreted as a composite score. On average, the current sample of 157 OEF/OIF veterans self-reported a low degree of suicidality, low levels of current distress associated with combat experiences, average scores related to suicide resilience and sense of coherence, and experienced light-to-moderate exposure to combat. Several hypotheses were supported, including positive associations between sense of coherence and suicide resilience, and suicidality and perceived combat distress; as well as negative relationships between sense of coherence and suicidality, and sense of coherence and perceived combat distress. No support was found for the relationships between suicidality and time since active duty service, the level of combat exposure and perceived combat distress, or the association between pre-deployment history of traumatic experiences and perceived combat distress. The primary hypothesis that sense of coherence would moderate the relationship between traumatic experiences and suicidality was supported. In this sample of OEF/OIF veterans, the relationship between combat distress and suicidality becomes weaker when sense of coherence is stronger. Thus, a high sense of coherence may act as a protective factor against suicidality among OEF/OIF combat veterans.
CHAPTER V
DISCUSSION

Over the last decade, the wars in Afghanistan and Iraq have exposed more than 1.6 million U.S. service members to demanding deployment requirements, dangerous combat experiences, and prolonged periods of heightened safety concerns (Tanielian & Jaycox, 2008). The consequences of these wars on OEF and OIF veterans include not only physical injuries, but the presence of mental health concerns such as readjustment issues, substance use, depression, and anxiety (Hoge et al., 2004). Previous research has indicated that nearly one-fourth of OEF/OIF veterans suffer from either PTSD or MDD (Tanielian & Jaycox, 2008). Aggravating these growing mental health concerns is the increasing prevalence of suicidality with approximately 6,000 veteran deaths by suicide annually (U.S. Department of Veterans Affairs, 2010). Limited research to date has examined the relationship between combat experiences and suicidality from a strengths-based orientation incorporating psychological resilience. To expand the current literature on resilience among OEF/OIF veterans, the present study examined the relationship between sense of coherence, suicidality, and combat distress. The purpose of this study was to determine if sense of coherence, conceptualized as a mechanism of psychological resilience, is a protective factor against suicide among veterans exposed to traumatic combat experiences. In this chapter, the prevalence of suicidality in the current sample is discussed, results of the research hypotheses are then interpreted, and implications are
drawn from the current findings. Limitations of the study are then presented. The chapter concludes with recommendations for future research.

In the current sample, the prevalence of suicidal ideation and behavior was relatively low, which was expected in a non-clinical sample. None of the 157 OEF/OIF veterans endorsed a history of suicide attempts and only 15.9% reported a history of having a suicide plan at some point in the past. Suicidal ideation was more prevalent, with 38.9% of the sample endorsing having thoughts of suicide in the past year. It is difficult to compare the prevalence rate of suicidal ideation among OEF/OIF veterans in the current sample to that in the existing literature due to varying population characteristics and the measurement of suicidal thoughts. For example, previous studies have reported a wide range in the prevalence of current (i.e., past two weeks) suicidal ideation in non-clinical OEF/OIF veteran samples. Current suicidal ideation was found to vary from 2.3% (Maguen et al., 2011), 6.6% (Lemaire & Graham, 2011), 16.4% (Hellmuth, Stappenbeck, Hoerster, & Jakupcak, 2012) and 32.4% (Corson, Denneson, Bair, Helmer, Goulet, & Dobscha, 2013) across a number of studies. The high percentage of OEF/OIF veterans who reported suicidal ideation in the current study may be explained by the expanded time-frame on the SBQ-R that asked veterans to report suicidal thoughts in the past year as compared to the two-week time-frame in the above mentioned studies. In a clinical sample, the use of an assessment measuring current suicidal thoughts is appropriate as the literature has supported the association between mental health concerns and suicidality (Joiner, Brown, & Wingate, 2005); however, in a non-clinical sample a brief period of two weeks to assess suicidal ideation may not capture the prevalence of suicidal thought due to the likelihood that suicidality in this
population is less chronic than in clinical samples. Thus, the use of an extended time period (i.e., one year) in assessing suicidal ideation among OEF/OIF veterans may more accurately represent the prevalence of suicidal thoughts in this population and potentially explain why one in three veterans in the current sample reported experiencing suicidal thoughts in the past year.

Another important finding related to the prevalence of suicidal ideation is the utilization of mental health services. It has been estimated that approximately 60% of veterans who die by suicide are engaged in mental health services (Lehmann, McCormick, & McCracken, 1995). In the current sample, 61 (38.9%) OEF/OIF veterans endorsed suicidal ideation in past year and only 34 (56%) are currently receiving mental health treatment. This has important implications to support the VHA’s active screening for suicidality among all veterans, regardless of their utilization of mental health services as the current study found that 27 OEF/OIF veterans with suicidal ideation in the past year are not currently receiving mental health services.

Interestingly, 56 veterans in the current sample self-reported being diagnosed with a mental health disorder and of those, 42 endorsed suicidal ideation in the past year. Therefore, 75% of the sample with a mental health diagnosis also reported suicidal ideation. Since this was a non-clinical sample, the percentage of OEF/OIF veterans with a psychological disorder may actually be higher as many are not receiving mental health care and thus, may unknowingly meet criteria for a psychological disorder. For the OEF/OIF veterans who endorsed suicidal ideation, the most prominent mental health diagnosis was Major Depressive Disorder ($n = 26$), followed by PTSD ($n = 17$), Alcohol-related Disorder ($n = 15$), and Drug-related Disorder ($n = 15$). These findings are similar
to reports that depression, PTSD, and alcohol are the most common mental health diagnoses associated with suicidal ideation among returning veterans (Corson et al., 2013; Lemaire & Graham, 2011). Moreover, of the 42 OEF/OIF veterans with a mental health disorder and self-reported suicidal ideation, 26 reported co-occurring psychiatric disorders. Though the current study did not investigate the role of mental health diagnoses as associated with the study variables, this is an important finding as previous research has cited that veterans with co-morbid psychiatric disorders are at higher risk of suicidal ideation as compared to veterans with one psychiatric disorder (Lemaire & Graham, 2011).

Bivariate Conclusions

Before exploring the multivariate associations among sense of coherence, combat distress, and suicidality, bivariate analyses were conducted to first understand if and how these variables are related in addition to their relationship with potential covariates.

In an attempt to examine the relationship between OEF/OIF veterans’ sense of coherence and a measure of suicide resilience, scores on the SOC-29 and SRI-25 were correlated. A moderate, positive relationship was supported in that a stronger sense of coherence is related to higher suicide resilience scores and the variance accounted for within this relationship was 28%. Potential reasons for the moderate effect found in this relationship could be explained by the little empirical support for the SRI-25 in the literature. The SRI-25 is a relatively new instrument developed in 2004 and since then only two studies have examined the psychometric properties with non-clinical samples of adolescents and young adults (Osman et al., 2004; Rutter et al., 2008). Since the SRI-25 has not been validated within the veteran population, it may be that the SRI-25 does not
accurately reflect resilience among veterans and is thus, not strongly related to sense of coherence. Another possible explanation for the moderate effect found between sense of coherence and suicide resilience is that the SRI-25 was largely developed based on literature related to measures of risk and protective factors associated with suicide, as well as psychosocial and psychological correlates of suicidal behavior (Osman et al., 2004), where as the SOC-29 was developed based on a the theoretical construct of sense of coherence that is hypothesized to be a global response to life stressors (Antonovsky, 1987). The moderate effect size may be related to the difference between measuring a universal response to life stressors as compared to a specific response to suicidal thoughts and behaviors.

Furthermore, in examining the subscales of the SRI-25 it intuitively appears that the three subscales may be related to the components of comprehensibility and manageability within sense of coherence. For example, the SRI-25’s Internal Protective subscale (i.e., belief in reasonable goal expectations) is similar to comprehensibility within sense of coherence and the Emotional Stability subscale (i.e., response and management of stressors and suicidal thoughts) and External Protective subscale (i.e., utilization of external supports) are similar to the manageability component within sense of coherence (Gutierrez & Osman, 2008). However, the meaningfulness component is not reflective in the SRI-25 subscales. Antonovsky (1993a) posited that meaningfulness is the most important component of sense of coherence because it influences an individual’s motivation to respond to current stressors. The moderate effect size between the SOC-29 and SRI-25 may be explained by this crucial difference in that the measurement of sense of coherence is likely to be influenced by the motivation of the individual to face life
challenges and the SRI-25 does not appear to measure this variable. Overall, the support found for hypothesis one does not provide meaningful implications in understanding the relationship between sense of coherence and suicide resilience as measured by the SRI-25. The psychometric properties of the SRI-25 should be examined in the veteran population before it is correlated with other measures of resilience.

The relationship between suicidality and sense of coherence has never been explored in a sample of U.S. veterans. Strong support was found for hypothesis two that predicted sense of coherence would be negatively related to suicidality. Among OEF/OIF veterans, those with a strong sense of coherence also reported lower degrees of suicidality. This finding is similar to previous research that has supported the negative relationship between sense of coherence and suicidality in non-veteran populations (Edwards & Holden, 2001; Petrie & Brook, 1992; Rothmann & Van Rensburg, 2002); as well as international veteran populations (Giotakos, 2003; Mehlum, 1998). However, this finding adds to the literature supporting the association between sense of coherence and suicidality within the U.S. OEF/OIF veteran population. With a strong effect size of $r^2 = .62$, the negative relationship between sense of coherence and suicidality among OEF/OIF veterans might aid in the potential understanding of positive psychological factors associated with the veterans’ likelihood of experiencing suicidal thoughts or engaging in suicidal behaviors.

In the current sample, support for hypothesis three was found in that OEF/OIF veterans with a stronger sense of coherence reported lower distress associated with their experiences serving in a combat zone. Similarly, sense of coherence has been found to be negatively linked with traumatic experiences in the extant literature (Dudek & Koniarek,
2000; van der Hal-van Raalte et al., 2008). For example, Dudek and Koniarek (2000) found that higher levels of reported PTSD symptoms were associated with a lower sense of coherence among firefighters and van der Hal-van Raalte and colleagues (2008) reported a similar association among survivors of the Holocaust. Despite these findings in the literature, there is no direct comparison appropriate with the current sample of OEF/OIF veterans as the relationship between sense of coherence and traumatic experiences has not yet been studied in the veteran population.

Moreover, previous research has exclusively examined the association between PTSD symptomatology and sense of coherence. This is the first study known to explore the phenomenological experience of trauma (i.e., distress associated with combat experience) in relation to sense of coherence. This difference may offer a potential reason why some studies have failed to find an association between sense of coherence and PTSD (Schnyder et al., 2001; Wittman et al., 2008). It may be that sense of coherence is more specifically related to the overall experience associated with combat as opposed to a prescribed set of symptoms as dictated by the diagnostic criteria for PTSD. Only 23 OEF/OIF veterans from the current sample self-reported a history of PTSD, yet, a strong association between combat distress and sense of coherence was observed. Antonovsky (1979) proposed that the strength of an individual’s sense of coherence is critical to the person’s ability to manage and regulate tension that arises from life challenges. OEF/OIF veterans with a strong sense of coherence may successfully prevent tension from becoming stress through their cognitive perception that the challenges of serving in combat are understandable and they are motivated to find successful coping resources to face these challenges as life is viewed as meaningful. Previous research has found
support for the relationship between negative cognitive appraisals and sense of coherence among individuals who experienced a recent stressor (McSherry & Holm, 1994). From this cognitive perspective, it is likely that OEF/OIF veterans would not perceive their combat experiences as severely distressing as compared to a veteran with a low sense of coherence. Thus, the relationship between sense of coherence and combat distress may be explained by the cognitive factors involved in how an individual perceives life stressors. Though, one could also argue that the development of PTSD from a cognitive framework based on assimilated and over-accommodated beliefs developed as a result of experiencing a traumatic event may also fit with the conceptualization of sense of coherence. However, this explanation does not account for PTSD symptoms related to behavioral avoidance and physiological arousal that do not easily fit with the conceptualization sense of coherence. Therefore, at its most basic level, the relationship between sense of coherence and perceived severity of combat distress may be driven by the cognitive interpretation of life events.

With negative associations between sense of coherence and both suicidality and combat distress, hypothesis seven explored the final bivariate relationship among the main study variables. Support was found, suggesting that as suicidality increased, OEF/OIF veterans’ self-reported combat distress incrementally increased. This finding aligns with previous findings that trauma and suicide are related among OEF/OIF veterans (Guerra & Calhoun, 2011; Jakupcak et al., 2009; Maguen et al., 2011). One reason why a stronger relationship was not found may be due to the low degree of suicidality reported in the current study’s non-clinical sample. As previously discussed, OEF/OIF veterans with mental health diagnoses in the current sample reported a high
prevalence of suicidality, however, this only accounted for just over one third of the sample (i.e., 35.7\% with a diagnosis). In a sample where the prevalence of suicidality is higher, the relationship between suicidality and combat distress may be stronger.

Moreover, previous research has relied on examining the relationship between PTSD symptoms and severity of symptoms associated with suicidality while this study utilized a phenomenological indicator of distress associated with trauma. It may be that PTSD symptoms and suicidality are more strongly related as compared to the association between combat distress and suicidality. At this point, it is difficult to determine whether this difference may be significant since the design and participants from previous studies are different than that of the current study.

One factor that the current study did not explore was the impact of current stressors on the relationship between suicidality and combat distress. In a recent study by Griffith (2012a), it was found that current stressors are more strongly related to suicidal behavior than deployment-related experiences. Moreover, research has found that recent stressors play a role in maintaining distress associated with past traumatic experiences (Classen et al., 2002). It is possible that current life stressors may mediate or moderate the relationship between suicidality and combat distress. For example, psychosocial stressors have been linked to suicidal behavior among OEF/OIF veterans (Griffith, 2012a; Pietrzak et al., 2010). In the current sample, 15.9\% of OEF/OIF veterans reported that they were separated or divorced and 21.7\% reported that they were unemployed or on disability. Part of the variance accounted for in the association between suicidality and combat distress may be explained by covariates such as recent changes in relationship and employment status.
Several bivariate hypotheses that explored the impact of potential covariates in the relationship between combat distress and suicidality were not supported. Hypothesis four stated that suicidality would be negatively related to the number of months since active duty service. No support was found for this hypothesis despite previous literature linking the amount of time since active military service and suicidality (Kang & Bullman, 2010). However, a recent study by Griffith (2012b) reported little association between suicidal ideation and time since recent deployment. There are several potential explanations why support was not found among this sample of OEF/OIF veterans.

First, recent advances in the VHA have increased programming related to mental health, including suicide awareness and prevention. A suicide prevention coordinator and team are located at each VA facility to offer crisis support and interventions for at-risk veterans, as well as 24-hour access to the veteran crisis line. In addition to an increase in suicide prevention programming, the VA has also implemented numerous initiatives in an effort to provide outreach services and increase service utilization among returning service members. For example, the VA has expanded health care eligibility and provides five-years of cost-free care for OEF/OIF veterans (Malebranche, 2011). Moreover, the Department of Defense initiated the Post-deployment Health Assessment and Post-deployment Reassessment as a screening tool to address mental health concerns. With an increase in attention to readjustment concerns and suicidality among veterans, the availability of suicide prevention services, and increased health care benefits, veterans may have access to more immediate services to help cope with suicidal thoughts and behaviors whereas in the past, services were not readily available for returning service members. A second possible explanation is the chronicity of readjustment problems
facing returning service members. Several studies have shown that readjustment
difficulties and mental health problems among OEF/OIF veterans are enduring and may
even increase over time (Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Sayer et al.,
2010). With persistent psychosocial problems and mental health concerns, the presence
of suicidality among OEF/OIF veterans may not be dependent upon time since their last
active-duty deployment.

No support was found for hypothesis five that stated the level of combat exposure
will be associated with perceived combat distress. The nonsignificant, negative
correlation found in the present study was very low ($r = -.02$). This was a surprising
finding as previous research has documented the link between combat exposure and
symptoms of post-traumatic stress (Booth-Kewley et al., 2010; Phillips et al., 2010;
Ramchand et al., 2010). One possible explanation for this low correlation coefficient may
be the level of combat exposure reported in the current sample. Scores on the CES can
range from 0-41. In the current sample, the average score was 14.8 ($SD = 6.85$) indicating
Light-Moderate combat exposure. Only approximately 10% of OEF/OIF veterans in this
sample reported Moderate-Heavy to Heavy combat exposure. A minimal range of combat
exposure scores observed in the current study may explain the low and nonsignificant
correlation between combat exposure and current level of combat distress.

It is also possible that support for hypothesis five was not found due to differences
in specific duties related to OEF/OIF veteran’s military occupational specialty. The CES
is a general screening tool used for assessing level of combat exposure and does not
necessarily reflect differing types of combat exposure (i.e., direct hand-to-hand combat,
killing enemy insurgents, or civilian casualties) that vary based on a service members
duty assignments. Previous research has demonstrated that killing in combat has a significant impact on the mental health functioning of returning service members, including PTSD symptoms, substance use, suicidal ideation, and interpersonal difficulties (Maguen et al., 2010; Maguen et al., 2011). It may be that the level of combat exposure and current distress associated with combat experiences is more closely related to specific combat duties rather than generalized combat experiences assessed by the CES. Moreover, OEF/OIF veterans’ perceptions of their combat experiences and the meaning these experiences hold may also differ based on their military occupational specialty and have an impact on their current level of combat distress. OEF/OIF veterans’ whose duties included direct killing may perceive their experiences as difficult to understand and experience increased combat guilt associated with this higher level of combat exposure as compared to OEF/OIF veterans’ whom were not responsible for the deaths of insurgents.

Lastly, the results from the present study did not support hypothesis six that stated pre-deployment history of trauma will be related to perceived combat distress. Previous research on the OEF/OIF veteran population has found that severity of PTSD symptoms is related to a history of previous traumatic events, particularly childhood abuse (Cabrera et al., 2007; Fritch et al., 2010; Phillips et al., 2010). Failure to replicate this finding in the current sample is likely due to the unequal sample sizes across the groups utilized in the non-parametric independent samples t-test. Only 23.6% (n = 37) of OEF/OIF veterans endorsed a history a pre-deployment traumatic events as compared to the remaining 120 veterans. Although a non-parametric Mann-Whitney test was conducted, the design for this statistical procedure was unbalanced due to the strikingly unequal group sizes. Another possible explanation is that pre-deployment traumatic experiences are not related
to phenomenological distress associated with combat experiences, but rather, with specific symptoms of psychological disorders (i.e., PTSD symptoms). It may also be that distress is not combat specific, but pre-deployment traumatic experiences are more closely related to overall distress associated with psychological well-being.

One relationship that was not explored in the current study was the impact of childhood trauma on suicidality. Recently, a study by Gradus, Shipherd, Suvak, Giasson, and Miller (2013) found that childhood abuse is strongly associated with suicidal behavior among Marines. Similarly, Griffith (2012a) reported that childhood abuse moderates the relationship between psychosocial stressors and suicidal behavior in a sample of Army National Guard service members. It may be possible that childhood abuse not only impacts how an individual perceives recent traumatic experiences, but also their tendency towards suicidal thought and behavior.

Multivariate Conclusions

In order to study the hypothesized relationship between combat distress and suicidality, a moderated regression was conducted to determine the influence of sense of coherence. It was hypothesized that a strong sense of coherence would be associated with a weaker relationship between perceived combat distress and suicidality. Bivariate correlations supported the negative associations between sense of coherence and both suicidality and combat distress; in addition to the positive relationship between suicidality and combat distress. Similarly, the first model of the moderated regression found that both combat distress and sense of coherence were significant predictors of suicidality. Support for the moderating effect of sense of coherence was found in the second model of the regression analysis. When the interaction between combat distress
and sense of coherence was added, it became the strongest predictor of suicidality and the
contribution of combat distress as a predictor became non-significant. This non-
significance suggests that the variance observed in the relationship between combat
distress and suicidality may be better accounted for by other variables (i.e., sense of
coherece) that affect the strength of this relationship.

This finding is similar to previous literature that has identified co-morbidity and
combat guilt as potential contributing factors to the variance within the relationship
between trauma and suicidality among Vietnam veterans (Hendin & Pollinger-Haas,
1991; Kramer, Lindy, Green, Grace, & Leonard, 1994). The current study’s findings may
provide one potential explanation as to why previous research has found inconsistent
support for the relationship between trauma and suicidality among veterans. To date,
minimal research has explored the role of moderating or mediating factors that may better
explain how trauma and suicidality among veterans are related. This study provides
initial support for the moderating role of sense of coherence as it relates to combat
distress and suicidality.

To determine whether sense of coherence impacts the direction of the relationship
between combat distress and suicidality, interaction plots were examined. It was
concluded that the relationship between combat distress and suicidality becomes weaker
as sense of coherence increases. OEF/OIF veterans with a high sense of coherence
demonstrated that the relationship between combat distress and suicidality is non-
significant. This non-significance suggests that regardless of OEF/OIF veterans’
perceived distress associated with serving in a combat zone, those with a high sense of
coherece report similar degrees of suicidality. Thus, a strong sense of coherence had a
unique influence on the relationship between combat distress and suicidality in that it buffers suicidality in light of varied distress levels associated with combat experiences. Among OEF/OIF veterans with a weak sense of coherence, the relationship between combat distress and suicidality is stronger in that the degree of suicidality is higher among those with higher perceived combat distress. Therefore, OEF/OIF veterans with a low sense of coherence who report minimal distress associated with combat are more likely to report lower degrees of suicidality as compared to veterans with a low sense of coherence who report high distress.

Based on these findings, it appears that sense of coherence can be applied to OEF/OIF combat veterans. Combat does not fit into the range of normal human experiences, and for some veterans, it may be difficult to understand and make meaning out of these experiences. Sense of coherence offers one possible explanation in how OEF/OIF veterans may successfully adapt to challenging deployment-related experiences. Previous literature has found that survivors of traumatic experiences are capable of finding meaning in these experiences (Davis, Nolen-Hoeksema, & Larson, 1998) and sense of coherence may function similarly. Veterans with a high sense of coherence are likely to understand their role as a soldier in the context of war, utilize their available resources, and are capable of finding meaning in light of their challenging wartime stressors. It is important to consider however, that OEF/OIF veterans in the current sample are treatment-seeking, thus these findings may not generalize to non-treatment seeking OEF/OIF veterans. Nevertheless, Antonovsky (1987) stated that the meaningfulness component of sense of coherence is the most dynamic and influential appraisal that impacts the strength of an individual’s sense of coherence. Approaching
difficult situations with a positive and realistic orientation towards life challenges, OEF/OIF veterans with a strong sense of coherence possess the necessary problem-solving skills to successfully cope with their combat experiences and prevent subsequent suicidality despite how traumatic they perceive their experiences to be. This process appears similar to Masten’s (1994) definition of resilience among children as a developmental and dynamic process in the adjustment to life experiences. Individuals’ with a high sense of coherence accept both positive and negative life experiences as being a natural part of the human experience. Sense of coherence is dynamic in that as a person experiences more adversity in their life, the more opportunities there are to shape their orientation towards solving these challenges. Development across time based on life experiences is crucial in forming the relative strength of a person’s sense of coherence (Antonovsky, 1987). As Masten (1994) defines resilience as dynamic and developmental process among children, sense of coherence may help to provide an initial definition of psychological resilience among OEF/OIF veterans.

Since suicide is often conceptualized as a problem-solving behavior and sense of coherence is viewed as an orientation towards solving difficult life challenges, results from this study suggest that a high sense of coherence possessed by OEF/OIF veterans is reflective of psychological resilience against suicidality (Shneidman, 1985). A strong sense of coherence appears to function as a buffer to protect OEF/OIF veterans from vulnerability to suicidality as they are able to find meaning in life and believe themselves capable of managing their stressors through the use of internal and external resources. One could argue that as a mechanism of resilience, OEF/OIF veterans’ high sense of coherence serves as a protective factor. Protective factors alter an individual’s response in
situations that increase the likelihood of negative stress responses (Rutter, 1987). The current study’s finding that sense of coherence functions as a protective factor against suicidality is similar to research conducted among non-veteran samples. Previous literature has supported the notion that psychological resilience may be a protective factor against suicide behaviors (Roy, Sarchiapone, & Carli, 2007), and specifically, resilience against suicidality may be comprised of social, emotional, cognitive, and behavioral processes (Everall, Altrows, & Paulson, 2006; Johnson, Gooding, Wood, & Tarrier, 2010). Sense of coherence functions as a modifier of OEF/OIF veterans’ interpretation of their combat experiences to increase emotional engagement in life challenges and motivate behavioral changes, which in turn decreases the likelihood of subsequent suicidality.

**Practical Implications**

Among OEF/OIF veterans, the interrelations among combat distress, sense of coherence, and suicidality has important implications that can be applied in both clinical and research domains. The following section addresses potential areas in which the current study’s findings may be applicable. First, the notion of sense of coherence as a dispositional state as compared to a modifiable response to psychological trauma is briefly discussed. Then, the importance of assessing the phenomenological experience of combat is discussed. Next, the study’s findings are presented in support of sense of coherence as a mechanism of resilience. Potential clinical implications are then addressed in the conceptualization of sense of coherence as a protective factor against suicidality among OEF/OIF veterans. The section concludes with a discussion of conducting resilience research utilizing a theoretical framework.
Antonovsky’s Salutogenic Model of Health posits that previous life experiences, stressors, and sense of coherence are all influential in an individual’s placement on the health dis-ease continuum (1979). These factors are interrelated and as a person develops, the relationship between the three is constantly changing as human beings experience new challenges and triumphs continuously throughout their lives. Although Antonovsky conceptualized sense of coherence as a personality disposition, he acknowledged that it is continually modified throughout life based on the unique set of experiences an individual is exposed to. By early adulthood, he believed the strength of an individual’s sense of coherence is established, but may be dependent on future life experiences (Antonovsky, 1996b). Some research has supported the stability of sense of coherence over a one-year period (Feldt, Leskinen, Kinnunen, & Mauno, 2000); however, other research has indicated that traumatic events have a significant impact on the strength of an individual’s sense of coherence (Schnyder, Buchi, Sensky, & Klaghofer, 2000; Snekkevik, Anke, Stanghelle, & Fugl-Meyer, 2003). Clearly, more research is needed to determine the stability of sense of coherence and whether or not its strength is altered as a result of experiencing trauma. As such, the following practical implications are offered as potential ways that sense of coherence could be applied to the OEF/OIF population, with the caution that longitudinal research is needed to determine the stability of sense of coherence as well as the prospective utility of interventions to strengthen an individual’s sense of coherence.

Phenomenological Experience of Combat

This was the first study known to examine the phenomenological experience (i.e., current level of distress) associated with OEF/OIF veterans’ deployment to a combat-
The findings of this study suggest that the phenomenological experience of combat is related to both the strength of OEF/OIF veterans’ sense of coherence and suicidality. Previous research has examined the associations between trauma and both sense of coherence and suicide; however is limited in the exclusive use of PTSD symptom inventories in examining these relationships (Dudek & Koniarek, 2000; Guerra & Calhoun, 2011; Jakupcak et al., 2009; Maguen et al., 2011 van der Hal-van Raalte et al., 2008). Symptoms patterns of PTSD may fail to fully capture the psychological experience of OEF/OIF veterans who served in a combat-zone. Moreover, it appears that the presence of a psychological disorder may not fully explain the strength of veterans’ sense of coherence as only 14.7% of OEF/OIF veterans in the current sample reported a diagnosis of PTSD. As research indicates, a majority of individuals’ who experience trauma will never develop PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), yet most research relies on PTSD symptom inventories in examining the impact of trauma on the mental health functioning of veterans.

This study provides initial evidence that combat distress and sense of coherence are moderately related among OEF/OIF veterans. Increasing coping resources and psychological resilience among OEF/OIF combat veterans, regardless of the presence of a mental health diagnosis, is an important implication based on this finding. One area that this could be applied is offering resilience workshops or groups for all returning service members who served in a combat zone. To incorporate the three components of sense of coherence, workshops could include interventions targeted towards increasing comprehensibility, manageability, and meaningfulness. To increase comprehensibility, activities could be designed to help veterans make sense of their combat experiences and
understand their behaviors in the context of war. Research has indicated that killing in war is a predictor of traumatic stress responses (Maguen et al., 2010), thus, exploring these experiences immediately following discharge may aid in strengthening veterans understanding of their experience in combat. Manageability refers to the perception that both internal and external resources are available to successfully meet the demands of life challenges. Dissemination of resources to enhance internal coping strategies and a list of VA and community resources may strengthen OEF/OIF veterans belief that adequate resources are available to them should they need to access these services. Lastly, the critical component of meaningfulness could be targeted by incorporating interventions to help returning service members increase engagement in family and peer activities and make social connections in the community which may increase the sense of purpose and meaning as they re-adjust back to civilian life. Many of these potential activities that could be included in resilience workshops may parallel cognitive and behavioral interventions in psychotherapy; however, they all reflect the core components of sense of coherence and differ based on the availability of these programs to all service members regardless of the presence of a mental health diagnosis.

The moderate association found between suicide and combat distress may not have the same implications as those found when examining sense of coherence. In the moderated regression analysis, the significant role of combat distress in predicting suicidality became non-significant when the interaction between sense of coherence and combat distress was added to the regression model. This suggests that the strength of this relationship may be better explained by other potential mediating or moderating variables as found in the current study. Other moderating variables have been found to influence
the relationship between PTSD and suicidal behavior, such as distress tolerance (Anestis, Tull, Bagge, & Gratz, 2012) and a sense of belongingness (Bryan, McNaughton-Cassill, & Osman, In press). The same effect may hold true for distress associated with combat. More research is needed in this area to determine whether the phenomenological experience of combat can uniquely predict suicidality or if potential moderator and/or mediating variables account for greater variance in this relationship.

*Sense of Coherence as a Mechanism of Resilience*

The current study purported that sense of coherence serves as a mechanism of resilience. The results of both bivariate and multivariate associations support the notion that sense of coherence functions similarly to Rutter (1987)’s assertion that resilience operates on the following four mechanisms: risk reduction, reduced negative consequences, development of self-concept, and increased opportunities. First, Rutter (1987) identified that resilience reduces the impact that stressors have on an individual which reduces the risk of negative responses. Since cognitive appraisals and perception of experiences influence an individual’s response style, a resilient individual may perceive stress as less threatening, thus reducing the impact of stressors. Similar to previous research that has reported negative correlations between sense of coherence and PTSD (Dudek & Koniarek, 2000; van der Hal-can et al., 2008), the current study found a significant, negative association between sense of coherence and combat distress suggesting that OEF/OIF veterans with a strong sense of coherence perceive combat experiences as less severe. Thus, the impact of combat stress is reduced depending on the strength of veterans’ sense of coherence. This finding supports that sense of coherence can function as a risk reduction mechanism of resilience aligning with Rutter’s theory.
Second, resilience reduces negative chain reactions that may result from the unsuccessful management of stress and may exacerbate the effects of risk (Rutter, 1987). Increased resilience in the face of negative life experiences may diminish the cyclical pattern of maladaptive responses and consequences to stressors. The finding that sense of coherence moderates the relationship between combat distress and suicidality supports this mechanism of resilience. Despite negative perceptions of combat exposure, OEF/OIF veterans with a high sense of coherence are at a decreased risk of suicidality as compared to OEF/OIF veterans with a high sense of coherence who perceives their combat experiences as distressing. Similar functions of sense of coherence as reducing negative consequences have been found in the literature. For example, Gana (2001) found that sense of coherence moderates the relationship between stressors and psychological well-being.

The third mechanism of resilience according to Rutter (1987) is the development of a self-concept that includes feelings about the self, the environment, and the ability to effectively cope. Self-concept may enable an individual to manage perceived stressors. Previous literature has found a positive association between sense of coherence and meaning in life, as well as a negative association between sense of coherence and emotion-oriented coping (Edwards & Holden, 2001). Thus, finding meaning in life and utilizing effective coping strategies may be indirectly related to self-concept. A sense of coherence is defined by an individual’s perception that their world makes sense, that life has meaning in both positive and negative experiences, and the confidence that their internal and external resources will appropriately manage stressors. This study found that sense of coherence was negatively related to suicidality. Inherent in a strong sense of
coherence may by a self-concept that allows OEF/OIF veterans to engage in effective stress management skills to reduce suicidality.

Lastly, Rutter (1987) posited that psychological resilience could open opportunities for personal growth. Though the hypothesis proposed in the current study do not provide direct support for the notion that sense of coherence promotes growth opportunities, one could argue that the significant, negative association between sense of coherence and suicidality may suggest that a strong sense of coherence provides OEF/OIF veterans with the necessary skills to solve life’s challenges. OEF/OIF veterans with a strong sense of coherence successfully manage life stressors and are less likely to engage in suicidal thoughts and behaviors, providing them with the opportunity to live more fully.

Overall, the findings from the current study support the application of Rutter (1987)’s four mechanisms of resilience to sense of coherence. Since these mechanisms can be applied to a sense of coherence, this suggests that sense of coherence functions as a mechanism of resilience. This finding adds to the resilience literature by giving support for a specific construct, sense of coherence, and its application to resilience.

Sense of Coherence as a Protective Factor Against Suicidality

To date, a majority of research has focused on the identification of risk factors associated with suicide among returning service members. It is critical that the U.S. military and Department of Veterans Affairs identify potential predictors of psychological resilience that could be incorporated in suicide prevention programming, training, and post-deployment intervention services. The following section addresses the
potential applications of sense of coherence as a protective factor against suicidality within the OEF/OIF veteran population.

Based on the finding that sense of coherence moderates the relationship between combat distress and suicidality, sense of coherence could be viewed as a protective factor against suicidality. Though this relationship has not been directly studied in the literature, similar findings have been reported in relation to mental health functioning. Pietrzak and colleagues (2009a) found that psychological resilience (as measured by the CD-RISC, Connor & Davidson, 2003) and social support are related to the severity of PTSD and depression among OEF/OIF veterans. The authors recommended that psychological interventions could be utilized to bolster resilience as a protective factor against symptoms of mental health. In combination with the current study’s findings, important implications related to the preventative model in both the reduction of risk and the promotion of strengths among OEF/OIF combat veterans is indicated (Arbona & Coleman, 2008).

In concordance with the promotion of strengths and resilience is the underlying importance of preventative care. According to Gordon’s (1983) model of disease prevention, prevention can be categorized at three qualitatively different levels, universal, selective, or indicated. Universal prevention represents the broadest conceptualization of preventive efforts, focusing on the general population in an attempt to prevent or delay the development of both mental and physical conditions. Suicide prevention efforts at the universal level often include psychoeducation at schools and within the community of concern. Based on the identification of risk factors, selective prevention targets subgroups of individuals who are at-risk for the development of a specific condition. For
example, veterans have been identified as at-risk for suicide above and beyond that of the general population (Kang & Bullman, 2010). Prevention programming at this level could include outreach and community building within the VA. At the last level, indicated prevention aims to target those individuals who have been identified as at-risk through examination or assessments. Indicated prevention efforts assess individual risk and develop appropriate treatment plans to prevent the exacerbation of the identified problem. Within the veteran population, this is usually addressed via mental health interventions. Therefore, suicide preventative efforts aim to avert the development of suicidal ideation and behaviors in addition to the reduction of psychological distress by promoting healthy well-being and enhancing protective factors (i.e., resilience). Additionally, Romano and Hage (2000) identify five dimensions of prevention, with one stating “Strengthens knowledge, attitudes, and behaviors that promote emotional and physical well-being” (p. 741). In accordance with this dimension, the fostering of resilient behaviors and attitudes is synonymous with prevention. Thus, prevention of psychological distress among OEF/OIF veterans who have experienced combat exposure may be fostered via fostering a strong sense of coherence in an effort to prevent suicidality.

One application of sense of coherence in the prevention of suicide could be implemented at the universal level through fostering psychological resilience among newly discharged veterans through universal resilience workshops. Current suicide prevention programs within the veteran community often focus on increasing awareness of suicide risk and the identification of at-risk veterans (Mann et al., 2005). Prevention programs could be expanded by incorporating resilience workshops structured on sense of coherence and developed to augment cognitive-behavioral interventions that are
traditionally provided to veterans engaged in mental health services. Research indicates that returning veterans’ engagement in mental health services is poor, both in seeking initial support and active follow through in treatment program (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009b; Seal et al., 2010). Reasons for the poor utilization of mental health services may include perceived stigma associated with mental health, maladaptive coping strategies, frequent deployments, and concerns related to confidentiality of services (Corso et al., 2009; Pietrzak et al., 2009b). Workshops incorporating the components of sense of coherence may help decrease stigma associated with mental health treatment and increase service utilization among returning service members.

Another area that sense of coherence could be applied to suicide prevention at the selected/indicated level is in post-deployment screening. OEF/OIF veterans who report a low sense of coherence and high distress associated with their combat experiences may be at greater risk of suicidality as compared to those who report a high sense of coherence regardless of distress level. Appropriate referrals to OEF/OIF case management or Services for Returning Veterans-Mental Health (SeRV-MH) teams may help at-risk veterans connect with services and foster strengthening of the manageability component in sense of coherence which reflects an individual’s belief that they can and will access and utilize appropriate resources. Offering support services to OEF/OIF veterans who only screen positive for PTSD may fail to recognize veterans who perceive the combat experience as distressing and may not have the available resources to adequately cope which may place them at higher risk of suicidality. Screenings identifying the strength of returning service members sense of coherence may help to fill this gap. Potential
interventions for those who screen positively at-risk for suicidality could include increasing coping efficacy through effective problem solving strategies to reduce suicidality, which inherently incorporates elements of sense of coherence as a problem-solving orientation to potentially increase resilience against suicidality.

Lastly, there are potential implications at the indicated level of prevention involving the provision of psychotherapy services. Engagement in mental health services may have an impact on the strength of OEF/OIF veterans’ sense of coherence. One study reported that women with a history of childhood sexual abuse who engaged in psychodynamic group therapy reported a stronger sense of coherence at the conclusion of treatment (Lundqvist, Svedin, Hansson, & Broman, 2006). To date, this is the only study known to report changes in sense of coherence after engagement in psychotherapy. Future research examining the stability of sense of coherence before and after mental health treatment from different theoretical frameworks may provide additional support in the utility of psychotherapy to strength sense of coherence among OEF/OIF veterans.

**Theory-driven Resilience Research**

Psychological resilience encapsulates a broad definition that involves the successful management of adverse life experiences to promote positive adjustment and well-being (Rutter, 1985). However, the specific factors involved in influencing psychological resilience have frequently been debated (Luthar, Cicchetti, & Becker, 2000). One major criticism within resilience research is the lack of a consistent and measurable definition of resilience. Ambiguity in defining resilience has likely lead to the misuse of the term in both research and clinical practice. Since resilience is often defined differently across studies, the meaningfulness of resilience research is dubious.
Moreover, the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) is a widely-utilized measure of resilience that was developed based on the findings of various researchers without consideration of well-developed theory. Scale development of this nature is inherently problematic with a construct that is ill-defined in the literature.

An important implication of this study is the use of more theory-driven resilience research. This study was the first to examine one potential mechanism of psychological resilience, sense of coherence, among OEF/OIF veterans from a theoretical framework. Karr and Larson (2005) discussed the importance of using theory in research because it helps researchers ask meaningful questions, organize large amounts of data, and more fully understand and interpret findings. Use of theory in research may also minimize the gap between science and practice because as theory informs future research, research modifies theory. The Salutogenic Model of Health and more specifically, sense of coherence were utilized in the current study to examine the relationship between combat distress and suicidality (Antonovsky, 1979). The interrelations among these variables were hypothesized based on the extant literature supporting Antonovsky’s theory of successful adaptation to life stressors. By utilizing a well-defined and empirically supported theory based on strengths, the finding that sense of coherence functions as a moderator between combat distress and suicidality among OEF/OIF veterans may help inform future theory-based resilience research within this population as the focus on protective factors as compared to risk factors has increasingly gained more attention. Grounded theoretical frameworks may help researchers better understand protective factors against both mental health concerns and suicidality among returning veterans as theory-driven research is adept to examine the application of theory to real life problems.
For example, Joiner (2005)’s Interpersonal-Psychological Theory of suicide has recently been studied within the veteran population as it relates to risk factors associated with veteran deaths by suicide (Bryan, Morrow, Anestis, & Joiner, 2010; Selby et al., 2010). The field of suicidology is in need of a theory to identify and describe the function of potential protective factors against suicidality to inform resilience research among OEF/OIF veterans.

Limitations

Although this study is the first to examine the role of sense of coherence as a moderator between combat distress and suicidality among OEF/OIF veterans, it is not without several limitations that are important to consider. First, several threats to internal and external validity are present. The internal validity of the study may have been compromised by the lack of random participant selection and a lack of control over extraneous variables that could have potentially impacted participant responses. OEF/OIF veterans in the current sample were not randomly selected to participate in this research. Data collection methods involved the researcher approaching potential veterans in the waiting area of a VA primary care clinic. Not all potential participants in this location were approached and research bias in the selection of participants may have been introduced. Additionally, the testing conditions were not uniform for all participants. Some OEF/OIF veterans completed the study materials during peak hours in which the waiting area was noisy and others completed the materials while waiting with family members or peers. Potential distractions could have influenced their attention to study materials. Due to the fact that the OEF/OIF veterans were waiting to attend a primary care appointment, it is possible that some veterans hastily completed the study measures.
due to concerns about being done when they were called for their appointment. Moreover, several participants began to complete the study materials, stopped to attend their appointment, and finished after their appointment was over. Therefore, it was impossible to control for all potential extraneous variables that could have influenced the way in which the veterans complete the study materials.

Concerning external validity, the findings of the current study have limited generalizability to clinical sample of OEF/OIF veterans, to veterans of other service eras, to non-treatment seeking veterans, and demographic groups that were not well represented in the current sample (i.e., female veterans, older veterans, racially diverse veteran groups). Additionally, data were collected from one, Mid-western VA Medical Center. The culture and social climate of this geographic location may limit the generalizability to other geographical locations across the United States. Therefore, the sample is not representative of the military population as a whole and conclusions should be interpreted in light of the demographic characteristics of the current sample.

In relation to the measurement of study variables, several limitations are noted. First, the study design relied solely on self-report measures. It is possible that some OEF/OIF veterans provided socially desirable responses to mitigate stigma associated with suicidality. Although an oral script was utilized to increase participant anonymity and confidentiality, some veterans may have been hesitant to report socially undesirable endorsement of suicidality. Second, the SBQ-R was used because research has demonstrated good psychometric support and is a brief measure assessing suicidality. One limitation of this measure is that suicidal ideation and suicidal behaviors were examined together. Therefore, differences between the two were not compared and it is
unknown whether suicidal ideation and behaviors have a similar relationship to combat
distress and sense of coherence. A third limitation related to measurement is the reliance
on OEF/IF veterans’ perceived severity of distress associated with combat experiences.
There may be differences between the actual severity of their combat experiences and
perceived severity. The current study was unable to determine whether these differences
exist and how this could potentially impact the findings.

The statistical design and analyses utilized in the current study have several
limitations. First, the study was cross-sectional. No longitudinal data are available as data
were collected at one time period; thus we cannot understand the findings as temporal
relationships. Additionally, inferences of causality cannot be made at this time based on
the limitations of correlational and regression analyses. Thus, only associations between
study variables were explored. Second, there are potential limitations in the use of mean
substitution for missing data. Schlomer, Bauman, & Chard (2010) recommend the use of
multiple imputation or full information maximum likelihood to manage missing data as
mean substitution may result in biased regression coefficients and standard error values.
In the current study, the analyses were re-ran without the two participants’ data where
mean substitution was used and no changes in significant results were observed.
However, it is important note the limitations of utilizing mean substitution and to utilize
alternative methods in the future. Another limitation is the possibility of low statistical
power that is often inherent in moderated regression analyses. Aguinis (2004) suggested
that moderated regression analyses have low statistical power due to poor variable
distributions, incorrect operational use of criterion and predictor variables, low sample
size and unequal moderator subgroups. In the current sample, it is possible that the
variance in predictor variable (i.e., current combat distress) is smaller than the variance in the general population of OEF/OIF veterans due to a majority of the current sample reporting low combat distress with approximately 67% of the sample reporting low distress. Also, the low sample size of the current study could have reduced power in the moderated regression analysis.

A fourth limitation related to the statistical design and analyses is that the model tested (i.e., moderated regression) does not signify the only possible relationship among the studied variables. It is possible the variables may be related in other ways (i.e., combat distress as a moderator between sense of coherence and suicidality) or that an unknown variable could have introduced bias into the results. Though a goal of the current study was to understand the relationship between combat trauma and suicidality without utilizing mental health symptom inventories and diagnoses, this is also a limitation of the study as these variables were not controlled for in the analyses. It is possible that the presence of one or multiple psychiatric diagnoses could also act as a moderator or mediator between combat distress and suicidality. A final limitation is the relatively low sample size ($N = 157$). Due to the small sample size, factor analysis procedures were limited in statistical power to determine whether sense of coherence among OEF/OIF veterans supports a one or three factor solution. Future research with a larger, more diverse sample of OEF/OIF veterans would be useful in determining the structure of sense of coherence.

Recommendations for Future Research

Based on the findings and limitations of this study, several recommendations for future research are presented to expand the current findings related to sense of coherence
as moderator between combat distress and suicidality. Several recommendations based on the bivariate analyses were identified. First, future research is needed to compare whether the relationship between trauma and suicidality is more strongly linked to PTSD symptomatology or the phenomenological experience of trauma within the same sample of OEF/OIF veterans. Second, to account for the potential influence of recent life stressors future research should determine whether current stressors impact the strength or direction of the relationship between OEF/OIF veterans’ suicidality and combat distress. Another area for future research is to explore the relationship between type of combat and sense of coherence. It is possible that OEF/OIF veterans with various duties as related to their military occupational specialty (i.e., support service in a combat zone, direct engagement with insurgents, killing in combat) may report differences as related to the strength of their sense of coherence. This could have important implications related to enhancing psychological resilience among OEF/OIF veterans depending on the type of combat they engaged in while in the armed forces. Lastly, the role of childhood abuse both as it is related to current combat experiences and suicidality should be explored in an OEF/OIF veteran sample with relatively equal comparisons groups between veterans with and without a history of childhood trauma.

Additional recommendations for future research as related the current statistical model and study design are provided next. First, the current study proposed and tested a specific model examining the relationship between combat distress, suicidality, and sense of coherence. The moderation analysis did not allow for causality to be inferred and also, the relationship among the variables may be explained by other factors not included in the study. More complex statistical analyses to further understand the relationship
between experiencing combat trauma, suicidality, and resilience factors while also accounting for covariates in these relationships are recommended. The moderation model may be too simplistic for the data and minimize the impact that covariates may have in explaining the relationship between trauma and suicide. SEM or path analysis may be equipped to build a new, more complex model. Moreover, sense of coherence may not be the only moderator between combat distress and suicidality. Other variables such as cognitive schema, appraisal strategies, and previous history of trauma may also account for additional variance explained in this relationship.

A second recommendation is for researchers to utilize longitudinal data within a sample of OEF/OIF veterans to determine if sense of coherence functions as an attribution style or if it changes in response to psychological trauma. This could be accomplished by exploring the strength of sense of coherence from the time service members enter the military through their discharge from active duty service. In the current literature, the notion of resilience as a trait is widely debated (Luthar, Cicchetti, & Becker, 2000). Sense of coherence is not immune the arguments associated with this debate as Antonovsky himself appeared conflicted on the stability of sense of coherence (1996b). Evidence for the stability of sense of coherence could have important implication in the use of resilience building workshops and psychotherapy to increase sense of coherence.

OEF/OIF veterans in the current sample were predominately young to middle aged adult, White, males. Potential differences in age, gender, and race may exist as related OEF/OIF veterans’ perceived combat distress, degree of suicidality, and the
strength of sense of coherence. More diverse samples in the future could increase external validity as related to the generalizability of the results.

Lastly, the current sample of OEF/OIF veterans reported no history of suicidal behaviors and it may be that the relationships observed in the current findings are better explained by suicidal ideation as opposed to suicidal behavior. Research has indicated that the clinical presentation of suicide ideators and suicide attempters are different in relation to severity of risk (Rudd, Joiner, & Hasan, 1996). Moreover, the relationship between trauma and suicide may be further differentiated by severity of suicidality. For example, in a non-clinical community sample Sareen et al. (2007) found that after controlling for mental health co-morbidities, PTSD was significantly related to suicide attempts but not suicidal ideation. Future research should examine potential differences in suicidal ideation and behaviors as they may function differently in relation to both combat distress and the strength of sense of coherence among OEF/OIF veterans.

Conclusions

This was the first study known to examine a theoretical framework of psychological resilience, a sense of coherence within the Salutogenic Model of Health (Antonovsky, 1979), among OEF/OIF veterans. Specifically, the study explored the moderating influence of sense of coherence on the phenomenological experience of combat trauma (i.e., current distress) as related to suicidality. Results supported the primary hypothesis, suggesting that a high sense of coherence acts as a buffer between combat distress and suicidality. One the other hand, a low sense of coherence may place veterans at greater risk for suicidal thoughts and behaviors as their level of combat distress increases. These findings may have important implications in understanding the
phenomenological experience of combat (as compared to mental health symptom inventories) as it relates to psychological resilience and suicidality. The current study also provides initial evidence that sense of coherence functions as a mechanism of resilience. More specifically, sense of coherence may possibly act as a protective factor against suicidality among OEF/OIF veterans. The identification of a psychological protective factor against suicidality is an important finding as research has previously focused on the identification of risk factors. These findings could be applied to post-deployment resilience workshops and screening assessments. Finally, the use of a theoretical framework to study a mechanism of resilience may help inform future resilience research based on the foundations of psychological theory.
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APPENDICES
APPENDIX A

STUDY APPROVAL

Louis Stokes Cleveland VAMC
Study Approval Tracking Sheet

11/6/12

Dr. Yamokoski,

Congratulations, your study entitled "Suicide Resilience Among OEF/OIF Veterans: Sense of Coherence as a Moderator Between Experiences and Suicide" has obtained the following Louis Stokes Cleveland VAMC approvals:

- Final Research & Development Committee Approval on: 11/1/2012
- Institutional Review Board Approval on: 10/8/2012
- Subcommittee on Research Safety Exemption on: 8/24/2012

Now that you have obtained approval from all applicable subcommittees you may begin your project. Please remember that within 1 year, or sooner if required by specific subcommittee(s), of the approval dates, you must submit continuing renewals. If you should need anything in the interim, please do not hesitate to contact the Research Office.

Best Regards,

Neal S. Peachey, Ph.D.
Associate Chief of Staff for Research (ACOS/R)

Svetlana Pundik, M.D.
Vice-Chairperson, Research & Development Committee
APPENDIX B

ORAL CONSENT SCRIPT

Title of Study: Suicide Resilience Among Operation Enduring Freedom and Operation Iraqi Freedom Veterans: Sense of Coherence as a Moderator between Traumatic Experiences and Suicidality.

Investigators: Principal Investigator Cynthia Yamokoski, Ph.D. VAMC: Cleveland (541)

ORAL CONSENT SCRIPT

PURPOSE OF THE STUDY
The purpose of this research study is to further understand the experiences of veterans from Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF). Specifically, the researcher is interested in obtaining information regarding OEF/OIF combat experiences and how these experiences may be related to coping abilities and thoughts of or attempts to harm self. You are invited to participate because you are a veteran of one or both of these Conflicts. The researchers are hoping to enroll a total of 150 participants in this study.

DESCRIPTION OF THE STUDY
If you consent to participate in this study, you will be asked to complete a survey packet. This packet may be completed while you wait for your scheduled appointment or you may take the survey packet home to complete. If you choose to complete the packet while you are waiting, please return the packet to the study researcher once it is complete. If you chose to take the survey packet home, we ask that you please return the packet on your next visit to the Louis Stokes Cleveland Department of Veterans Affairs Medical Center (LSCD/VAMC). Once your packet is completed, you will be asked to place it in a sealed envelope and return it to a secure drop box labeled "Research Project" located in the primary care waiting room. You will only complete this survey once and there will be no further participation required once the survey has been completed. The amount of time required for your participation is estimated that completion of the survey will take approximately 30-45 minutes.

INCONVIENCES
There are no identified inconveniences in the participation of this study, aside from the time spent to complete the survey packet.

DISCOMFORTS OR RISKS
Your participation in this study may involve a risk of emotional discomfort due to sensitive questions related to traumatic experiences and life-threatening behaviors. Some of the questions in the survey packet may be upsetting or you may feel uncomfortable answering them. If you choose not to answer a question, skip it and go on to the next question. If you experience emotional distress as a result of participating in this study or are having thoughts of harming yourself, please tell the study researcher immediately to help you seek appropriate care. The study researcher will help you contact your current mental health provider or primary care provider. If

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that person is unavailable, the researcher will help you access other services including escorting you to the psychiatric ER at the LSCDVAMC or the closest emergency room. You may also choose to call the veterans’ crisis line at 1-800-273-8255 (press 1), call 911, or go to the closest emergency room. If you complete the study not in the presence of the study researcher and/or you feel unsafe once you have returned home, please call the veteran’s crisis hotline at 1-800-273-8255 (press 1), call 911, or go to the closest emergency room.

BENEFITS
There is no direct personal benefit from participating in this research study. However, your participation in this study may aid in the understanding of psychological adjustment to combat experiences and potentially assist in improving care to other veterans. Since this study offers no direct benefit to participants and is voluntary, the only alternative is to not participate.

PRIVACY AND CONFIDENTIALITY
Any information obtained about you in this study will be treated as confidential and will be safeguarded in accordance with the Privacy Act of 1974. To protect your anonymity, no identifiable information will be collected in the survey packet. Please do not write your name anywhere on the survey packet. The research records will be kept in a password-protected computer file that only the study team has access to. The results of this research study may be published in scientific journals or presented at scientific meetings, but your name and identity will not be used.

VOLUNTARY PARTICIPATION
Your participation in this study is voluntary and you don’t have to take part in it if you don’t want to. If you choose not to participate, your refusal will not result in any penalty or loss of VA or other benefits to which you are entitled. And if you join the study, you have the freedom to withdraw from it at any time without penalty or loss of VA or other benefits to which you are entitled.

CONTACT INFORMATION
To answer questions about the research or if you sustain a research related injury contact the following:

- Principal Investigator: Cynthia Yamokoski, Ph.D. at (216) 791-3800 ext. 6937.

For answers to questions about rights as a research participant or to voice a concern or complaint contact the following:

- The Research Administrative Officer at (216) 791-3800 ext. 4657
- The LSCDVAMC Patient Representative at (216) 791-3800 ext. 4026

If you wish to speak with someone other than study staff to provide input concerning the research process, check whether a study is being conducted at the LSCDVAMC, and if study staff are permitted to represent the study contact:

- The LSCDVAMC Institutional Review Board Office at (216) 791-3800 ext. 4658

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to use of this version from
10/1/22 to 10/1/23

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APPENDIX C

DEMOGRAPHIC QUESTIONNAIRE

DIRECTIONS: Please answer the following questions honestly and accurately by writing your answer on the space provided or checking the appropriate box. This information is anonymous, so please do not write your name on this sheet. Thank you for your time and cooperation.

1. How old are you? ______________

2. What gender do you identify as?
   □ Male
   □ Female
   □ Transgendered
   □ Prefer not to answer

3. Which race/ethnicity best describes you?
   □ American Indian/Alaska Native
   □ Asian American/Pacific Islander
   □ Black/African American
   □ White/European American
   □ Hispanic/Latino(a)
   □ Biracial/Multiracial
   □ Other (please specify): ______ □ Prefer not to answer

4. What is your current marital status?
   □ Single, never married
   □ Married/Partnered
   □ Separated
   □ Divorced
   □ Widowed

5. Are you currently employed?
   □ No, unemployed
   □ No, unemployed and on disability
   □ Yes, part-time
   □ Yes, full-time

6. Are you currently receiving any of the following mental health treatment? (Please check all that apply)
   □ No current treatment
   □ Individual outpatient psychotherapy
   □ Individual outpatient medication management
   □ Group outpatient psychotherapy
   □ Partial hospitalization
   □ Inpatient hospitalization
7. Are you currently receiving treatment for alcohol and/or drug-related problems?
   □ No   □ Yes

8. If a mental health provider has ever diagnosed you with any of the following conditions, please check all that apply:
   □ Major Depression   □ PTSD
   □ Alcohol-Related Disorder   □ Bipolar Disorder
   □ Drug-Related Disorder   □ Schizophrenia
   □ Other __________

9. What branch of the United States Armed forces did you serve for?
   □ Air Force   □ Coast Guard   □ Navy
   □ Army   □ Marine Corps   □ Other ______

10. What is your service rank? ________________________

11. Are you currently on active duty or on reserve?
   □ No, neither   □ Yes, active   □ Yes, on duty   □ Yes, on reserve

12. Are you a veteran of Operation Enduring Freedom?
   □ No   □ Yes

13. Are you a veteran of Operation Iraqi Freedom?
   □ No   □ Yes

14. How many deployments did you serve in OEF/OIF? ________________

15. What is the length of time since your last active duty deployment in OEF/OIF? __

16. Do you have a previous history of military service unrelated to OEF/OIF?
   □ No
   □ Yes (Please list your previous service)

________________________________________________________________
________________________________________________________________
________________________________________________________________
APPENDIX D

SENSE OF COHERENCE SCALE- 29

DIRECTIONS: Below is a series of questions, each with seven possible answers. Please mark the number which expresses how best the statement represents you, with numbers 1 and 7 as extreme. If the words under 1 are right for you, circle 1, if the words under 7 are right for you, circle 7. If you feel differently, circle the number which best expresses your feeling. Please give only one answer to each question.

1. When you talk to people, do you have the feeling that they don’t understand you?

1 2 3 4 5 6 7
Never have this feeling
Always have this feeling

2. In the past, when you had to do something, which depended upon the cooperation with others, did you have the feeling that it:

1 2 3 4 5 6 7
Surely would not get done
Surely would get done

3. Think of the people with whom you come into contact daily, aside from the ones to whom you feel closest. How well do you know most of them?

1 2 3 4 5 6 7
You feel that they’re strangers
You know them well
4. Do you have the feeling that you don’t really care about what goes on around you?

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<tr>
<td></td>
<td>Very seldom or never</td>
<td>Very often</td>
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5. Has it happened in the past that you were surprised by the behavior of people with whom you thought you knew well?

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<tr>
<td></td>
<td>Never happened</td>
<td>Always happened</td>
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6. Has it happened that people whom you counted on disappointed you?

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<td>Never happened</td>
<td>Always happened</td>
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</table>

7. Life is:

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<tbody>
<tr>
<td></td>
<td>Full of interest</td>
<td>Completely routine</td>
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8. Until now your life has had:

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<tbody>
<tr>
<td>No clear goals or purpose at all</td>
<td>Very clear goals and purpose</td>
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9. Do you have the feeling that you’re being treated unfairly?

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<tr>
<td>Very often</td>
<td>Very seldom or never</td>
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10. In the past ten years your life has been:

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<tbody>
<tr>
<td></td>
<td>Full of changes without your knowing what will happen next</td>
<td>Completely consistent and clear</td>
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11. Most of the things you do in the future will probably be:

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<tbody>
<tr>
<td></td>
<td>Completely fascinating</td>
<td>Deadly boring</td>
<td></td>
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</table>

12. Do you have the feeling that you are in an unfamiliar situation and don’t know what to do?

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<tbody>
<tr>
<td></td>
<td>Very often</td>
<td>Very seldom or never</td>
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13. What best describes how you see life:

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<tbody>
<tr>
<td></td>
<td>One can always find a solution to painful things in life</td>
<td>There is no solution to painful things in life</td>
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14. When you think about your life, you very often:

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<tbody>
<tr>
<td></td>
<td>Feel how good it is to be alive</td>
<td>Ask yourself why you exist at all</td>
<td></td>
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<td></td>
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</tbody>
</table>
15. When you face a difficult problem, the choice of a solution is?

1 Always confusing and hard to find
2 Always completely clear
3
4
5
6
7

16. Doing the things you do every day is:

1 A source of deep pleasure and satisfaction
2 A source of pain and boredom
3
4
5
6
7

17. Your life in the future will probably be:

1 Full of change without your knowing what will happen next
2 Completely consistent and clear
3
4
5
6
7

18. When something unpleasant happened in the past your tendency was:

1 “To eat yourself up” about it
2 To say “okay, that’s that, I have to live with it,” and go on
3
4
5
6
7
19. Do you have very mixed-up feelings and ideas?

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<tr>
<td></td>
<td>Very often</td>
<td>Very seldom or never</td>
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20. When you do something that gives you a good feeling:

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<tr>
<td></td>
<td>Its certain that you’ll go on feeling good</td>
<td>Its certain that something will happen to spoil the feeling</td>
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21. Does it happen that you have feelings inside you that you would rather not feel?

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<tr>
<td></td>
<td>Very often</td>
<td>Very seldom or never</td>
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22. You anticipate that your personal life in the future will be:

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<tbody>
<tr>
<td></td>
<td>Totally without meaning or purpose</td>
<td>Full of meaning and purpose</td>
<td></td>
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23. Do you think that there will always be people whom you’ll be able to count on in the future?

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<tbody>
<tr>
<td></td>
<td>You’re certain there will be</td>
<td>You doubt there will be</td>
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</table>
24. Does it happen that you have the feeling that you don’t know exactly what’s about to happen?

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<tr>
<td></td>
<td>Very often</td>
<td></td>
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<td></td>
<td></td>
<td>Very seldom or never</td>
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</table>

25. Many people, even those with a strong character, sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past?

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<tbody>
<tr>
<td></td>
<td>Never</td>
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<td>Very often</td>
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26. When something happened, have you generally found that:

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<tr>
<td></td>
<td>You overestimated or underestimated its importance</td>
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<td></td>
<td></td>
<td>You saw things in the right proportion</td>
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</table>

27. When you think of difficulties you are likely to face in important aspects of your life, do you have the feeling that:

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<tbody>
<tr>
<td></td>
<td>You will always succeed in overcoming difficulties</td>
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<td></td>
<td>You won’t succeed in overcoming difficulties</td>
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</table>

28. How often do you have the feeling that there’s little meaning in the things you do in your daily life?

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<tr>
<td></td>
<td>Very often</td>
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<td>Very seldom or never</td>
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</table>
29. How often do you have feelings that you’re not sure you can keep under control?

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<th>7</th>
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<tbody>
<tr>
<td></td>
<td>Very often</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very seldom or never</td>
<td></td>
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</table>
APPENDIX E

SUICIDE BEHAVIORS QUESTIONNAIRE- REVISED

DIRECTIONS: Please circle the number beside the statement or phrase that best applies to you.

1. Have you ever thought about or attempted to kill yourself? (Circle only one)
   1 = Never
   2 = It was just a brief passing thought
   3 = I have had a plan at least once to kill myself but did not try to do it
   4 = I have had a plan at least once to kill myself and really wanted to die
   5 = I have attempted to kill myself, but did not want to die
   6 = I have attempted to kill myself, and really hoped to die

2. How often have you thought about killing yourself in the past year? (Circle only one)
   1 = Never
   2 = One time
   3 = Two times
   4 = Three to four times
   5 = Five or more times

3. Have you ever told someone that you were going to commit suicide, or that you might do it? (Circle only one)
   1 = No
   2 = Yes, at one time, but did not really want to die
   3 = Yes, at one time, and really wanted to do it
   4 = Yes, more than once, but did not want to do it
   5 = Yes, more than once, and really wanted to do it
4. How likely is it that you will attempt suicide someday? (Circle only one)
   0 = Never
   1 = No chance at all
   2 = Rather Unlikely
   3 = Unlikely
   4 = Likely
   5 = Rather Likely
   6 = Very Likely
APPENDIX F

TRAUMATIC EVENTS QUESTIONNAIRE- MILITARY VERSION

DIRECTIONS: This questionnaire is comprised of a variety of traumatic events that you may have experienced. For each of the following "numbered" questions, indicate whether or not you experienced the event. If you have experienced one of the events, check "Yes" and complete the "lettered" items immediately following it that ask for more details. If you have not experienced the event, check "No" and go to the next "numbered" item.

1. Have you been in or witnessed a serious industrial, farm, car accident, large fire or explosion? ______NO ______YES
   a. How many times? □ once □ twice □ three +
   b. How old were you at that time(s)? _____
   c. Were you injured?
      Not at all                      Severely
      1  2  3  4  5  6  7
   d. Did you feel your life was threatened?
      Not at all                      Extremely
      1  2  3  4  5  6  7
   e. How traumatic was this for you at that time?
      Not at all                      Extremely
      1  2  3  4  5  6  7
   f. How traumatic is this for you now?
      Not at all                      Extremely
      1  2  3  4  5  6  7
   g. What was the event(s)? ________________________
2. Have you been in a natural disaster such as a tornado, hurricane, flood or major earthquake?

______NO  ______YES

a. How many times? □ once □ twice □ three +

b. How old were you at that time(s)?

c. Were you injured?

Not at all  Severe
1 2 3 4 5 6 7

d. Did you feel your life was threatened?

Not at all  Extremely
1 2 3 4 5 6 7

e. How traumatic was this for you at that time?

Not at all  Extremely
1 2 3 4 5 6 7

f. How traumatic is this for you now?

Not at all  Extremely
1 2 3 4 5 6 7

g. What was the event(s)? ________________________

3. Have you been a victim of a violent crime such as rape, robbery, or assault?

______NO  ______YES

a. How many times? □ once □ twice □ three +

b. How old were you at that time(s)?

c. Were you injured?

Not at all  Severe
1 2 3 4 5 6 7

d. Did you feel your life was threatened?

Not at all  Extremely
1 2 3 4 5 6 7

e. How traumatic was this for you at that time?

Not at all  Extremely
1 2 3 4 5 6 7

f. How traumatic is this for you now?

Not at all  Extremely
1 2 3 4 5 6 7

g. What was the crime(s)? ________________________
4. **As a child, were you the victim of either physical or sexual abuse?**

   ______NO ______YES

   a. How old were you when it began? ______

   b. How old were you when it ended? ______

   c. Were you injured?

   

   Not at all  |  Severely  
   1  |  2  |  3  |  4  |  5  |  6  |  7  

   d. Did you feel your life was threatened?

   Not at all  |  Extremely  
   1  |  2  |  3  |  4  |  5  |  6  |  7  

   e. How traumatic **was** this for you at that time?

   Not at all  |  Extremely  
   1  |  2  |  3  |  4  |  5  |  6  |  7  

   f. How traumatic **is** this for you now?

   Not at all  |  Extremely  
   1  |  2  |  3  |  4  |  5  |  6  |  7  

   g. Was the assailant male or female? Male ☐ Female ☐

   h. Check all categories that describe the experience.

   ☐ physical abuse
   ☐ sexual penetration of the mouth, anus or vagina
   ☐ no sexual penetration, but the assailant attempted to force you to complete such an act
   ☐ other form of sexual contact e.g., touched your sexual organs, or forced to touch assailant's sexual organs
   ☐ no sexual contact occurred, however, the assailant attempted to touch your sexual organs, or make you touch his/her sexual organs
5. **As an adult**, have you had any unwanted sexual experiences that involved the threat or use of force?

   ______NO ______YES
   a. How many times? □ once □ twice □ three +
   b. How old were you at that time(s)? ______
   c. Were you injured?
      Not at all                       Severely
      1  2  3  4  5  6  7
   d. Did you feel your life was threatened?
      Not at all                       Extremely
      1  2  3  4  5  6  7
   e. How traumatic **was** this for you at that time?
      Not at all                       Extremely
      1  2  3  4  5  6  7
   f. How traumatic **is** this for you now?
      Not at all                       Extremely
      1  2  3  4  5  6  7
   g. What was the crime(s)? ___________
   h. Was the assailant male or female? Male □  Female □
   i. Check all categories that describe the experience.
      - sexual penetration of the mouth, anus or vagina
      - no sexual penetration, but the assailant attempted to force you to complete such an act
      - other form of sexual contact e.g., touched your sexual organs, or forced to touch assailant's sexual organs
      - no sexual contact occurred, however, the assailant attempted to touch your sexual organs, or make you touch his/her sexual organs

6. **As an adult**, have you ever been in a relationship in which you were abused either physically or otherwise?

   ______NO ______YES
   a. How old were you when it began? ______
   b. How old were you when it ended? ______
   c. Were you injured?
      Not at all                       Severely
      1  2  3  4  5  6  7
   d. Did you feel your life was threatened?
      Not at all                       Extremely
      1  2  3  4  5  6  7
   e. How traumatic **was** this for you at that time?
      Not at all                       Extremely
      1  2  3  4  5  6  7
   f. How traumatic **is** this for you now?
      Not at all                       Extremely
      1  2  3  4  5  6  7
7. Have you witnessed someone who was mutilated, seriously injured, or violently killed? (DO NOT INCLUDE MILITARY EXPERIENCES)

_____ NO  ____ YES

a. How many times? □ once □ twice □ three +
b. How old were you at that time(s)? _____
c. Were you injured?

Not at all  Severely
1  2  3  4  5  6  7
d. Did you feel your life was threatened?

Not at all  Extremely
1  2  3  4  5  6  7
e. How traumatic was this for you at that time?

Not at all  Extremely
1  2  3  4  5  6  7
f. How traumatic is this for you now?

Not at all  Extremely
1  2  3  4  5  6  7
g. What was the event(s)? ___________________________

8. Have you been in serious danger of losing your life or of being seriously injured? (DO NOT INCLUDE MILITARY EXPERIENCES)

_____ NO  ____ YES

a. How many times? □ once □ twice □ three +
b. How old were you at that time(s)? _____
c. Were you injured?

Not at all  Severely
1  2  3  4  5  6  7
d. Did you feel your life was threatened?

Not at all  Extremely
1  2  3  4  5  6  7
e. How traumatic was this for you at that time?

Not at all  Extremely
1  2  3  4  5  6  7
f. How traumatic is this for you now?

Not at all  Extremely
1  2  3  4  5  6  7
g. What was the event(s)? ___________________________
9. Have you received news of the mutilation, serious injury, or violent or unexpected death of someone close to you?

______NO    ______YES

a. How many times? □ once  □ twice  □ three +

b. How old were you at that time(s)? ______

c. Were you injured?
   Not at all                        Severely
   1  2  3  4  5  6  7

d. Did you feel your life was threatened?
   Not at all                        Extremely
   1  2  3  4  5  6  7

e. How traumatic was this for you at that time?
   Not at all                        Extremely
   1  2  3  4  5  6  7

f. How traumatic is this for you now?
   Not at all                        Extremely
   1  2  3  4  5  6  7

10. Did you ever serve in a war zone where you received friendly or hostile incoming fire from small arms, artillery, rockets, mortars, or bombs?

______NO    ______YES

a. How many times? □ once  □ twice  □ three +

b. How old were you at that time(s)? ______

c. Were you injured?
   Not at all                        Severely
   1  2  3  4  5  6  7

d. Did you feel your life was threatened?
   Not at all                        Extremely
   1  2  3  4  5  6  7

e. How traumatic was this for you at that time?
   Not at all                        Extremely
   1  2  3  4  5  6  7

f. How traumatic is this for you now?
   Not at all                        Extremely
   1  2  3  4  5  6  7
11. Were you ever a Prisoner of War?

_____NO  _____YES

a. How many times? □ once □ twice □ three +
b. How old were you at that time(s)? _____
c. Were you injured?
   Not at all  Seversly
   1  2  3  4  5  6  7
d. Did you feel your life was threatened?
   Not at all  Extremely
   1  2  3  4  5  6  7
e. How traumatic was this for you at that time?
   Not at all  Extremely
   1  2  3  4  5  6  7
f. How traumatic is this for you now?
   Not at all  Extremely
   1  2  3  4  5  6  7

12. Did you ever observe others or participate in atrocities, such as torturing prisoners, mutilating enemy bodies, or harming civilians?

_____NO  _____YES

a. How many times? □ once □ twice □ three +
b. How old were you at that time(s)? _____
c. Were you injured?
   Not at all  Seversly
   1  2  3  4  5  6  7
d. Did you feel your life was threatened?
   Not at all  Extremely
   1  2  3  4  5  6  7
e. How traumatic was this for you at that time?
   Not at all  Extremely
   1  2  3  4  5  6  7
f. How traumatic is this for you now?
   Not at all  Extremely
   1  2  3  4  5  6  7
13. Have you ever had any other very traumatic event like these?

______NO  _____YES

a. How many times? □ once □ twice □ three +
b. How old were you at that time(s)? ______
c. Were you injured?
   Not at all                       Severely
   1    2    3    4    5    6    7
d. Did you feel your life was threatened?
   Not at all                       Extremely
   1    2    3    4    5    6    7
e. How traumatic was this for you at that time?
   Not at all                       Extremely
   1    2    3    4    5    6    7
f. How traumatic is this for you now?
   Not at all                       Extremely
   1    2    3    4    5    6    7
g. What was the event(s)? ___________________________

14. Have you had any experiences like these that you feel you can't tell about?  
   (note: you don't have to describe the event)

______NO  _____YES

a. How many times? □ once □ twice □ three +
b. How old were you at that time(s)? ______
c. Were you injured?
   Not at all                       Severely
   1    2    3    4    5    6    7
d. Did you feel your life was threatened?
   Not at all                       Extremely
   1    2    3    4    5    6    7
e. How traumatic was this for you at that time?
   Not at all                       Extremely
   1    2    3    4    5    6    7
f. How traumatic is this for you now?
   Not at all                       Extremely
   1    2    3    4    5    6    7
APPENDIX G

COMBAT EXPOSURE SCALE

DIRECTIONS: Please circle the number above the answer that best describes your experience.

1. Did you ever go on combat patrols or have other dangerous duty?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1-3x</td>
<td>4-12x</td>
<td>13-50x</td>
<td>51+ times</td>
<td></td>
</tr>
</tbody>
</table>

2. Were you ever under enemy fire?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>&lt;1 month</td>
<td>1-3 months</td>
<td>4-6 months</td>
<td>7 mos or more</td>
<td></td>
</tr>
</tbody>
</table>

3. Were you ever surround by the enemy?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1-2x</td>
<td>3-12x</td>
<td>13-25x</td>
<td>26+ times</td>
<td></td>
</tr>
</tbody>
</table>

4. What percentage of the soldiers in your unit were killed (KIA), wounded, or missing in action (MIA)?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1-25%</td>
<td>26-50%</td>
<td>51-75%</td>
<td>75% or more</td>
<td></td>
</tr>
</tbody>
</table>

5. How often did you fire rounds at the enemy?

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<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1-2x</td>
<td>3-12x</td>
<td>13-50x</td>
<td>51 or more</td>
<td></td>
</tr>
</tbody>
</table>

6. How often did you see someone hit by incoming or outgoing rounds?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1-2x</td>
<td>3-12x</td>
<td>13-50x</td>
<td>51 or more</td>
<td></td>
</tr>
</tbody>
</table>

7. How often were you in danger of being injured or killed (i.e., being pinned down, overrun, ambushed, near miss, etc.)?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1-2x</td>
<td>3-12x</td>
<td>13-50x</td>
<td>51 or more</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX H

SUICIDE RESILIENCE SCALE- 25
DIRECTIONS: Please answer each statement as carefully and honestly as you can; your answers will be kept confidential. Circle a number to the right of each statement to indicate how much it describes your attitudes, beliefs, or feelings.

1 = Strongly Disagree  3 = Somewhat Disagree  5 = Moderately Agree  2 = Moderately Disagree  4 = Somewhat Agree  6 = Strongly Agree

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There are many things that I like about myself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Most of the time, I see myself as a happy person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>People close to me would find the time to listen if I were to talk seriously about killing myself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I can deal with the emotional pain of rejection without thinking of killing myself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I like myself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>I could openly discuss thoughts of killing myself with people who are close to me, when it is necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>I can find someone close to me to give me support (e.g., financial, shelter) if I find myself in a jam.</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>8</td>
<td>I can resist thoughts of killing myself when I feel emotionally hurt.</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>9</td>
<td>Most of the time I set goals that are reasonable for me to meet.</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>I can resist the urge to kill myself when I feel depressed or sad.</td>
<td></td>
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<tr>
<td>11</td>
<td>I am satisfied with most things in my life.</td>
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<td></td>
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<tr>
<td>12</td>
<td>I can resist thoughts of killing myself when faced with a difficult or life-threatening situation.</td>
<td></td>
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<tr>
<td>13</td>
<td>I am proud of many good things about myself.</td>
<td></td>
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<tr>
<td>14</td>
<td>I can control the urge to harm or hurt myself when I am criticized by someone.</td>
<td></td>
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<tr>
<td>15</td>
<td>I can ask for emotional support from people close to me if I were to think about killing myself.</td>
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<tr>
<td>16</td>
<td>Even if people close to me are angry with me, I can approach them if I want to talk about my personal problems.</td>
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<tr>
<td>17</td>
<td>I can find someone (parent, friend, spouse, or relative) who can help me cope if I should think about killing myself.</td>
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<tr>
<td>18</td>
<td>I can handle thoughts of killing myself when I feel lonely or isolated from other people.</td>
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<tr>
<td>19</td>
<td>I feel that I am an emotionally strong person.</td>
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<tr>
<td>20</td>
<td>Regardless of the problem situation I face, I can be happy with myself.</td>
<td></td>
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<td></td>
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<tr>
<td>21</td>
<td>If I am in trouble, I can ask for help from people close to me rather than attempt to kill myself.</td>
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<td></td>
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</tr>
<tr>
<td>22</td>
<td>I have close friends or family members that I could turn to for emotional support if I were to think of killing myself.</td>
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<td></td>
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<tr>
<td>23</td>
<td>I can resist thoughts of killing myself when faced with humiliating or embarrassing situations.</td>
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<tr>
<td>24</td>
<td>I can resist thoughts of killing myself when I feel hopeless about the future.</td>
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<tr>
<td>25</td>
<td>I feel cheerful about myself.</td>
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</table>