

WHO PROTECTS OUR MARINES? AN INVESTIGATION OF THE PROTECTIVE IMPACT OF
DISTINCT SOURCES OF SOCIAL SUPPORT.

by

SHERRIE LEIGH WILCOX

(Under the Direction of David DeJoy)

ABSTRACT

There is a strong evidence base suggesting the importance of the general construct of social support, however, little is known about the protective impact of distinct sources of support, particularly among military service members. This cross-sectional study investigated the protective impact of five distinct sources of social support on stress and mental health symptoms among 431 active duty U.S. Marines. Both pre- and post-war Marines were included in this study in order to assess a spectrum of military-related stress, rather than only focusing on stress specific to deployment or combat exposure in post-war service members. Hypotheses regarding the factor structure of social support were examined to determine whether participants discriminate between five distinct sources of support (i.e., a special person, family members, military peers, non-military friends, and military leaders), and to determine which of the distinct sources of support were most protective against post-traumatic stress disorder (PTSD), major depressive disorder (MDD), and generalized anxiety disorder (GAD) symptoms. The results revealed that Marines discriminated between the five distinct sources of support as expected, and that the five-factor structure was a better model of social support compared to a general construct of social support. Additionally, the five distinct sources were protective against symptoms of MDD and GAD, but not PTSD. Support from the special person provided the most protection against MDD when highly stressed. Support from military-leaders provided the most protection against GAD symptoms when highly stressed and the second most protection against

MDD when highly stressed. Despite the noted limitations, this study contributed to the literature by helping to map out the social network and potentially protective sources of support involved in the stress-mental health relationship among active duty military service members in the United States.

INDEX WORDS: anxiety, depression, family, friends, leaders, military, mental health, moderation, peers, perception, protective factors, PTSD, service members, significant other, social support, stress, support sources

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DEDICATION

This dissertation is dedicated to the special person in my life, my husband, Gunnery Sergeant Kevin Joseph Williams, Junior.

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CHAPTER 1

INTRODUCTION

Military service members have a high exposure to interpersonal violence. Combat and routine military operating procedures expose service members to intense situations. Consequences of repeated exposure to intense training experiences or combat exposure include psychological trauma and distress. It is not surprising that combat, deployment, and routine military procedures have been shown to be strongly associated with mental health problems (Hoge, Auchterlonie, & Milliken, 2006; Hoge & Castro, 2006; Hoge et al., 2004; Kang, Natelson, Mahan, Lee, & Murphy, 2003; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Military training, by design, consists of experiences and opportunities to increase physical strength and emotional resilience, which can help sustain service members during combat. However, the self-preservation behaviors instilled by the military, although essential for military training, can cause difficulty after intense training and combat situations, and can interfere with well-being when reintegrating into the civilian world.

Exposure to commonly traumatic events does not always cause psychological distress. Specific events are not defined as traumatic unless an individual perceives an event as traumatic. These events are called *potentially traumatic events* (PTEs) while the individual is appraising the event and available coping resources (Antonovsky & Kats, 1967; Cohen & McKay, 1984; Lazarus & Folkman, 1984). PTEs can involve life threat, injury, or death. In the military, PTE's may consist of intense military training, preparation for war, deployment to combat zones, and experiences in combat zones. Once a PTE is appraised as a traumatic event, the individual may develop posttraumatic stress disorder (PTSD). Many individuals are exposed to PTEs, but relatively few develop mental health problems, including PTSD, depression, or anxiety.

Mental Health Problems of Interest

The specific mental health problems of interest in this study include symptoms of posttraumatic stress disorder (PTSD), major depressive disorder (MDD), and generalized anxiety disorder (GAD). Service members are not only at risk for developing PTSD, but also MDD and GAD, as well as co-morbidities among these mental health problems. Baker and colleagues (2009) found that service members were more likely to have co-morbid PTSD and depression than either depression or PTSD alone. A 20-year longitudinal study of 664 service members by Ginzburg and colleagues (2010) found that nearly half of service members studied report a lifetime triple co-morbidity with PTSD, depression, and anxiety. Thus, it is appropriate to examine these multiple mental health problems and their symptoms, rather than PTSD, depression, or anxiety alone.

PTSD is an anxiety disorder that results in response to an event that is perceived as traumatic. The clinical diagnostic criteria for PTSD involve three clusters of symptoms: a) intrusion symptoms, such as flashbacks or other reminders of the event, b) persistent avoidance of stimuli associated with the event, including people, places, or conversations, and c) increased arousal associated with the event, such as sleep disturbances, aggressive behavior, and exaggerated startle response (American Psychiatric Association, 2000). A diagnosis of PTSD is typically made when these symptoms have persisted for at least one month and when there is impairment in social, occupational, or interpersonal functioning.

Depression is a mood disorder and can occur as a single episode or in multiple episodes (recurrent). MDD refers to persistent sadness, feeling hopeless or guilty, feeling restless or irritable, loss of interest in once pleasurable activities, fatigue and decreased energy, difficulty concentrating, insomnia or excessive sleeping, overeating or appetite loss, thoughts of suicide, suicide attempts, or persistent aches and pains (American Psychiatric Association, 2000). The severity and frequency of the signs and symptoms of depression vary across individuals.

GAD is an anxiety disorder in which anxiety and worry carry on for days. The clinical diagnostic criteria for GAD include excessive anxiety and worry for more days than not for at least six months, and individuals must have at least three of the following symptoms: restlessness or feeling keyed up, easily fatigued, difficulty concentrating or mind going blank, irritability, muscle tension, and sleep disturbance. Additionally, the individual should find it difficult to control the anxiety and worry. The focus of the anxiety and worry should not be confined to features of some other disorder (i.e., social phobia or panic disorder), should not occur excessively from PTSD, should not be due to physiological effects of substance or medical condition, and should cause significant impairment or distress in important areas of functioning (American Psychiatric Association, 2000).

Many service members may experience PTSD, MDD, or GAD symptoms that do not meet the full clinical diagnosis and may not be receiving proper treatment, if any treatment (Pietrzak, Goldstein, Malley, Johnson, & Southwick, 2009). Clinical diagnostic criteria for PTSD, MDD, or GAD may be too restrictive to identify all individuals who may need help (Pietrzak, Goldstein, et al., 2009). Thus, the assessment of PTSD, depression, and anxiety *symptoms* is critical to more appropriately identify individuals who are in need of help. Assessing symptoms will identify individuals who do not meet clinical diagnostic criteria for PTSD, MDD, or GAD, but still have symptoms of mental health problems that impair functioning and psychological well-being.

Mental Health Among Military Service Members

Among the general population of adults over the age of 18 in the United States, the lifetime prevalence of any mental health disorder was 46.4%, which is nearly half of the U.S. population (Kessler et al., 2005). Kessler and colleagues (Kessler, Chiu, Demler, & Walters, 2005) estimated the lifetime prevalence of any mental disorder to be approximately 26.2% in a given year (Kessler, Berglund, et al., 2005). When applying this estimate to the 2008 U.S. census population data, this translates to roughly 60.3 million Americans (U.S. Census Bureau,

2008). The same study estimated the 12-month prevalence of PTSD, MDD, and GAD to be 3.5%, 6.7%, and 3.1%, respectively (Kessler, Chiu, et al., 2005). The lifetime prevalence of PTSD, MDD, and GAD were estimated to be 6.8%, 16.6%, and 5.7%, respectively (Kessler, Berglund, et al., 2005).

Epidemiologic studies have revealed that exposure to traumatic events are common. The National Comorbidity Survey (NCS) reported the lifetime history of exposure to at least one traumatic event to be 61% for men and 51% for women, and 25-50% of individuals have experienced two or more traumas (M. B. Stein, Walker, Hazen, & Forde, 1997). Interestingly, PTSD is not highly common among trauma survivors. Among adults over the age of 18 in the United States, the lifetime prevalence of PTSD was estimated to be 6.8% in a given year (Kessler, Chiu, et al., 2005).

A recent study estimate that over 300,000 of the newer generation of veterans suffer from mental health problems (Tanielian et al., 2008). The rates of mental health problems among service members generally tend to be higher than in the general population. Early cross-sectional research by Hoge and colleagues (2004) found rates of PTSD to be 12% and 18% three to four months after returning from combat for troops serving in Afghanistan and Iraq, respectively. This study also found pre-deployment rates of PTSD, MDD, and GAD to be 9.4%, 11.4%, and 15.5% immediately before deployment to combat. That is, service members are at risk for mental health problems before even being deployed to a combat zone, which is presumably due to intense training and/or anticipation of combat and deployment. The rates of any mental health problem increased after deployment to a combat zone. The rates of post-deployment PTSD, MDD, and GAD for Soldiers and Marines deployed to Iraq and Afghanistan ranged from 6-13%, 14-15%, and 6-8% months after deployment. The rates of any mental health concern among Soldiers and Marines was 19.1% for those who served in Iraq, 11.3% for those who served in Afghanistan, and 8.5% for those who served in other locations, including Turkey, Bosnia, Uzbekistan, Kosovo, or on a ship (Hoge, et al., 2006).

Most research on mental health problems on military service members tends to focus on PTSD, rather than MDD or GAD. In 2006, Hoge and colleagues found rates of PTSD among Soldiers and Marines who were re-deployed to be 9.8% and 4.7%, for Iraq and Afghanistan, respectively, within weeks after returning from deployment (Hoge, et al., 2006). Further cross-sectional research by Vasterling and colleagues (2006) found PTSD rates in Soldiers to be 11.6% shortly after re-deployment. In 2007, Hoge and colleagues found rates of PTSD in Soldiers one year post-deployment to be 16.6% (Hoge, Terhakopian, Castro, Messer, & Engel, 2007). More recent cross-sectional research of troops 18-36 months post-deployment found PTSD to be at 14% (Schell & Marshall, 2008), and Sundin and colleagues have found rates of PTSD among U.S. military service members returning from the current wars in Iraq and Afghanistan to be as high as 31% (Sundin, Fear, Iversen, Rona, & Wessely, 2010).

Overall, the rates of PTSD, MDD, and GAD among service members are higher than the general population, and available figures are generally thought to underestimate true prevalence rates for these conditions. Depending on the type of trauma, estimates of mental health problems can be much higher (Kessler, et al., 1995). For example, traumatic events involving interpersonal violence produce mental health problems more often than natural disasters and motor vehicle accidents. An important distinction between combat-related mental health among service members and mental health problems in the general population is that service members can be both “perpetrators *and* survivors of trauma” (D. J. Stein, Seedat, van der Linden, & Zungu-Dirway, 2000). To reiterate, service members are not only at an increased risk of witnessing traumatic events, but also may commit acts of violence in combat that are perceived as traumatic.

Protective Factors

A number of studies have examined the extent to which protective factors can buffer the negative effects of stress on mental health (Pietrzak et al., 2010). These studies tend to focus on resilience and social support, and consistently find these factors to be protective. Social

support as a protective factor is not surprising, considering the extent of research on social support as a beneficial and protective factor in a variety of aspects of life (Cassel, 1976; Cohen, 2004; Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997; Cohen & Wills, 1985; Lazarus & Folkman, 1984). However, it is time to go beyond the general aspects of support and to investigate the protective impact of specific types of social support on mental health problems. This will allow more effective interventions to be developed to reduce and prevent mental health problems, especially among service members, who are frequently exposed to potentially traumatic events (Weathers & Keane, 2007) and have higher proportions of mental health problems and suicide than the general population (Hoge, et al., 2006; Hoge & Castro, 2006; Hoge, et al., 2004; Hoge et al., 2005).

Social support has been linked directly to specific health problems and the protective effects of social support on health have long been a research topic of interest (Caplan, 1974; Cobb, 1976; Dean & Lin, 1977; Kaplan, Cassel, & Gore, 1977). Perceptions of support have been consistently demonstrated to protect against the effects of stress on mental health (Kessler & McLeod, 1985). The appraisal of having support available to help cope with stress improves the chance that the stressor will not have a significantly negative impact on psychological health and well-being (Cohen & Wills, 1985; Glanz & Schwartz, 2008; Thoits, 1986; Wethington & Kessler, 1986; Wills & Cleary, 1996). To reiterate, *actual* support received tends to be less important than the *perception* of support, whether or not the perception is accurate (Wethington & Kessler, 1986).

Although limited research exists that examines the protective effects of social support on mental health among service members, research has found a significant relation between mental health outcomes and the perceived adequacy of social support from distinct sources among service members who have experienced combat (Wilcox, 2010). Specifically, greater levels of perceived social support from specific sources, including the spouse, military peers, and family member, are related to lower levels of mental health problems after combat. In

general, service members and veterans report that having the opportunity to connect with other service members (high perceived support from military peers and leaders) is beneficial and helpful in promoting psychological health and well-being (Ruzek et al., 2004).

Theoretical Approach

This study takes a theory-based approach to understand the underlying processes in the stress-mental health relationship by testing and building upon existing theories and models. Moderation models can address “when” or “for whom” a predictor variable would more strongly predict an outcome (Baron & Kenny, 1986; Holmbeck, 1997). This study builds upon Cassel’s (1976) stress-buffering and main-effects models, and examines distinct sources of support as protective or risk factors in moderation models. Research (Cutrona & Cole, 2000) recognizes the importance of optimizing support from natural networks to improve mental health outcomes, which includes support from individuals that naturally form into groups of support. For service members, these groups may include military peers, military leaders, non-military friends, family members, and a special person.

Most research in this area focuses on testing the buffering (moderating) effect of general social support versus the main (direct) effect of general social support, and often neglects to assess social support from relevant distinct sources. The stress-buffering model posits that when stressed, the presence of social support is protective against mental health problems (Cassel, 1976; Cohen & Wills, 1985). On the other hand, the main-effect model suggests that social support is protective regardless of the level of stress (Cassel, 1976). Early research recognized the limitations of focusing on testing main versus buffering effects, and suggested the importance of looking at other contextual factors, including specific sources of support (Quittner, Jackson, & Glueckauf, 1990). Few studies have examined the impact of distinct sources of support, and fewer have comprehensively examined relevant sources of support, particularly among service members. This study will test the moderating (i.e., buffering) effects of distinct sources of social support, which can provide initial findings for a functional model

describing the protective impact of distinct sources of social support. Figure 1.1 presents the basic moderation model that will be tested in this study.

Purpose of the Study and Research Questions

This study will focus on the protective impact of social support and will decompose support into components in which active duty military service members differentiate support – support from distinct sources (Wilcox, 2010). This study builds upon previous research conducted by the current investigator on military service members that preliminarily investigated a) whether or not military service members differentiate between specific sources of support and b) the impact of each specific source of support on PTSD symptomatology (Wilcox, 2010). Wilcox (2010) found that service members differentiate between specific sources of support, including family, friends, significant other, and military peers, and that some specific sources of support (i.e., military peers, family, and significant others) have more of a protective impact against PTSD symptomatology than other sources of support (i.e., friends). The current study will expand upon previous findings by examining additional relevant sources of support and mental health problems. The current study will also expand on the previous study (Wilcox, 2010) by examining a different, high-risk branch of the military, the United States Marine Corps (USMC).

Marines are the youngest service members across all branches of the U.S. military. The USMC has the most teenagers, most males, and most single (non-married) service members, all of which are risk factors for mental health problems and suicide. Mental health problems are strongly and positively related to suicidal behaviors (Chan, Cheadle, Reiber, Unutzer, & Chaney, 2009; Gradus et al., 2010; Oquendo et al., 2003), and the suicide rate in the USMC is higher than any other branch of the military and higher than the rates for the U.S. population (Stander, Hilton, Kennedy, & Robbins, 2004). In the USMC, suicide is also greater in men than women (Hilton, Service, Stander, Werbel, & Chavez, 2009), and suicide is one of the leading causes of death in the military (Stander, et al., 2004). This study, however, will not specifically

assess suicidal behavior, but will examine mental health problems, as mental health problems are a significant predictor of completed suicide among service members (Hilton, et al., 2009).

In sum, mental health problems, as well as suicide, are increasing among service members and the potential mechanisms of the protective influence of social support are unclear. The purpose of this study is to investigate protective impact of distinct sources of social support on stress and mental health problems among service members. This study will build upon existing research (Wilcox, 2010) and will map out the social network and potential protective sources involved in the stress-mental health relationship.

This study will address the following questions:

Research Question 1: Do Marines differentiate between the protective factors by the five distinct sources of support? If not, in what way are the sources of support differentiated?

Based upon findings from a previous study (Wilcox, 2010) on service members and distinct sources of support, it is hypothesized that this sample of service members (i.e., Marines) will differentiate between the distinct sources of support. If the service members do not differentiate between the sources of support as expected (i.e., family members, a special person, non-military friends, military peers, and military leaders), then the specific subgroups in which the individuals differentiate will be analyzed as the specific sources of support. It is important to understand the specific sources of support in which military service members differentiate to ensure that the model is tested appropriately and so that appropriate interventions can be developed to address these specific sources of support.

Research Question 2: Which sources of social support protect against negative mental health symptoms that may result from stress?

This question is more exploratory in nature, as most studies have examined general social support as a buffer, rather than distinct sources of support. Although research by Wilcox (2010) indicates that social support from family members, a special person, and military peers

were protective against PTSD, to date, no known studies have comprehensively examined social support from military peers, military leaders, family members, non-military friends, and a special person as protective factors for mental health problems in active duty service members. However, it is hypothesized that the distinct sources of social support will moderate the stress-mental health relationships. Furthermore, based upon findings from a previous study (Wilcox, 2010), it is hypothesized that the protective impact of the distinct sources of support on mental health symptoms will vary depending on the source of support. Specifically, support from non-military friends is expected to be less protective than support from family, the significant other, and military peers. Support from military leaders is also expected to be more protective than support from non-military friends. Although Wilcox (2010) found that social support from friends was not significantly protective, this study did not specify “non-military friends” versus “friends,” who were assumed to be non-military. Additionally, support from the significant other (i.e., the spouse) was protective, despite having extremely low levels of perceived support compared to the other sources (Wilcox, 2010).

Overall, service members are expected to differentiate between the distinct sources of support in some way, rather than group support into one general construct. Moreover, each of the distinct sources of support will have varying protective impacts against stress and mental health outcomes. That is, some pathways from each source of support to the outcomes will be stronger than other pathways.

Overview of Methodology

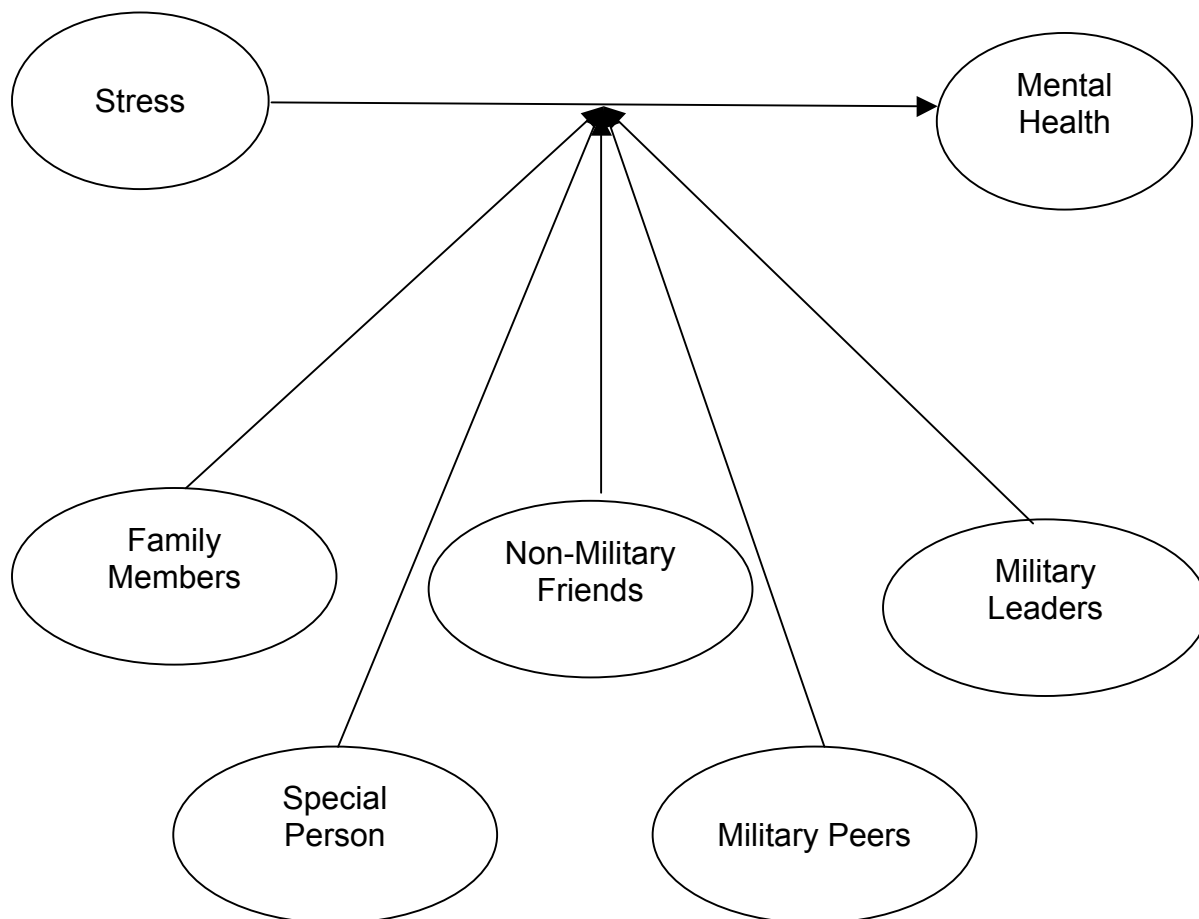
To answer the research questions, this study will use a cross-sectional survey design. Both pre- and post-war military service members will be included to assess a spectrum of military related stress, rather than only focusing on stress specific to combat exposure in post-war service members. Participants will include approximately 350 active duty service members in the United States Marine Corps who have completed basic training (Phase I Training). Participants will complete a survey to assess their demographics and military background,

perceived stress, perceived social support from family, friends, significant other, military peers, and military leaders, and mental health symptoms (PTSD, MDD, and GAD symptoms).

To answer research question 1, confirmatory factor analytic techniques will be utilized to determine whether the service members differentiate between the distinct sources of social support as expected. To answer research question 2, moderation techniques will be implemented using techniques described by Hayes and Matthes (2009). Any significant interaction will be probed using an approach described by Aiken and West (1991).

The information gathered will be used to provide much needed insight on the service member's mental health and social network, can lead to development and application of behavioral theories to decrease mental health problems, and can suggest modifications to existing mental health interventions that need to be made.

Figure 1.1
Basic Moderation Model



CHAPTER 2

REVIEW OF THE LITERATURE

The intention of this study is to enhance the knowledge of the protective impact of social support against mental health outcomes among military service members. The high levels of stress and exposure to intense situations that military service members experience, in addition to the rising rates of mental health problems and suicide, underscore the importance of studying protective factors among active duty service members. This study will focus on the military occupational environment with specific emphasis on active duty U.S. Marines. This chapter will review theoretical perspectives that will guide this study, and will review the literature on stress and mental health problems among service members, as well as literature on social support as a protective factor against mental health problems.

Traditional Models of Stress, Social Support, and Mental Health

In the general research literature it is largely agreed that social support reduces negative mental health outcomes. In the late 1970s Cassel (1976) and Cobb (1976) proposed models to assess the impact of support on mental health: the buffering model and the main effects model, respectively. Despite being developed more than thirty years ago, the buffering (i.e., moderating) and main-effects (i.e., direct effects) models continue to influence research on social support and stress. In recent years, Cohen has conducted extensive research on these models (Cohen, 1988, 2004; Cohen, Cummings, Greene, & Karraker, 1991; Cohen & Janicki-Deverts, 2009; Cohen, Underwood, & Gottlieb, 2000). This section will review evidence pertinent to these “traditional” models of stress, social support, and mental health.

The Buffering Model

The buffering model posits that when stressed, the presence of social support will be beneficial or protective against mental health outcomes. In this model, the moderating effect of

social support on the stress-mental health relationship is of interest. Substantial research indicates that social support can serve as a buffer in the stress-mental health relationship and can protect against depression and anxiety, and other mental health outcomes (Cohen & Wills, 1985).

In this study, moderators address “when” or “for whom” perceived social support would more strongly predict mental health outcomes. Moderators would alter the direction or strength of the perceived stress-mental health relationship. Essentially, it is an interaction effect whereby the impact of perceived stress on mental health would depend on the level of social support for each distinct source of social support. If social support is a significant moderator, then the impact of perceived stress increases or decreases mental health outcomes more for those with lower or higher levels of social support for each distinct source. That is, the social support from each source is not automatically protective if it is a moderator, as the interaction must be probed to determine the exact effect of the interaction.

Cohen and Wills (1985) conducted a literature review on studies examining social support and consequences of stress, and found evidence to support the stress-buffering model and the protective effects of general social support. Specifically, having a) social resources that *matched the demand* (i.e., the stressor) and b) having greater *perceived* availability of social support reduced the impact of stress on health.

A match between the demands of the stressor and the type of social support is another important factor in the stress-buffering model (Cohen & Wills, 1985; Harlow & Cantor, 1995). For example, receiving money in response to the death of a loved one may not be as helpful as receiving emotional support. On the other hand, it may be that as long as the support is perceived as helpful, whether or not it matches the demand, may still be most important – the perception of support. If an individual perceives something as helpful and feels that someone else is trying to help, this may be more beneficial, regardless of the match. The match between the stressor and support, however, may more strongly predict whether or not the support is

perceived as beneficial. Both the match between the demand and the perception of support are essential constructs that are central to the buffering model (Cohen, 1988, 2004; Cohen & Wills, 1985; Uchino, Cacioppo, & Kiecolt-Glaser, 1996).

Perceptions of support have consistently been demonstrated to buffer the effects of stress on mental health (Kessler & McLeod, 1985). The appraisal of having support available to help cope with stress improves the chance that the stressor will not have a significantly negative impact on health and well-being (Cohen & Wills, 1985; Glanz & Schwartz, 2008; Thoits, 1986; Wethington & Kessler, 1986; Wills & Cleary, 1996). In other words, in the stress-buffering model, the *actual* support received is less important than the *perception* of support, whether or not the perception is accurate (Wethington & Kessler, 1986). For example, a military service member who receives support from his or her unit-leader in the form of providing counseling and help with daily tasks at work is not necessarily beneficial unless the individual receiving support perceives it as helpful. Perceiving that others will help in a time of need is the essence of perceived support.

The stress-buffering model suggests that in the presence of extreme stress, high levels of perceived support will protect against mental health problems, particularly if the perceived support matches the demand of the stressor. This model has long been of interest to researchers, but the exact mechanisms through which social support buffers are still not entirely understood. Essentially, this model allows researchers to know that social support may be beneficial in the stress-mental health relationship, but does not provide specific information regarding processes or mechanisms that make social support beneficial. A moderation (i.e., buffering) model will be tested in this study to examine which sources of social support may be beneficial, or protective, in the stress-mental health relationship among active duty Marines.

The Main Effects Model

The main effects model suggests that the presence of social support alone is beneficial for preventing mental health problems, regardless of the level of stress (Cohen & Wills, 1985;

Norris & Kaniasty, 1996). In this model, the direct relationship of social support on mental health is of interest. In other words, in this model, stress is not a factor of interest, as those who are more socially integrated will generally be less stressed compared to those with lower levels of social integration (SI); that is, this model assumes that stress is not generally an issue, since social support has an overwhelming protective effect.

In the main effects model, SI is the main construct of interest. That is, having a greater number of *social relationships*, higher SI, will protect against mental health problems by inducing health-promoting behaviors and responses, and promoting psychological well-being (Cohen, 2004). Thus, greater levels of SI are posited to be beneficial for mental health (Cohen & Janicki-Deverts, 2009).

However, SI can also have a negative impact on health and health behaviors (Cohen & Lemay, 2007). Cohen and Lemay (Cohen & Lemay, 2007) found that greater interaction with others in a low-SI group was associated with increases in unhealthy behaviors, including smoking, alcohol consumption, and physical inactivity. Other research indicates that low levels of SI can also be associated with unhealthy behaviors and greater stress levels (Shiffman & Wills, 1985). Moreover, lower SI does not always mean more negative outcomes. Research by Quittner and colleagues (1990) suggests that, in response to stress, individuals may become less socially integrated, but this will not negatively influence perceptions of support. In other words, changing the network size in response to stress is not necessarily detrimental to social or psychological well-being. Quittner and colleagues found that although network size was reduced, perceptions of support remained the same. Additionally, perceptions of support were more strongly related to psychological distress than was SI.

The main-effects model has also been criticized for the lack of focus on stress. Assuming that stress is not a factor in the stress-health relationship is unrealistic, as individuals can be stressed regardless of the number of social connections. In fact, being highly socially integrated could serve as a source of stress. SI may not represent a valid explanation for the

beneficial effects of social support on psychological well-being in the main effects model; SI alone may not be a sufficient or appropriate measure of social relationships and social well-being, as both high and low levels of SI may be harmful to health and well-being.

The main effects model suggests that social support can directly influence mental health outcomes. Specifically, greater SI is directly related to fewer mental health problems. This model does not, however, take stress into account, and also does not address the impact of the varying effects of SI on mental health and perceptions of support. In general, the main effects model has not been supported in research. It is likely that this model has not been supported in research due to the lack of a focus on stress. This model also only allows researchers to examine simple relationships between social integration and mental health outcomes, rather than examining potential processes of protection.

Military, Stress, and Mental Health

Military Service Members in the United States

Each branch of service has a specific name for the service members: “Soldier” for those in the Army, “Marine” for those in the Marines, “Sailors” for those in the Navy, and “Airmen” for those in the Air Force. In July 2011, an estimated 1,433,418 Americans were serving on active duty in the U.S. military, with an additional 43,233 Americans in the Coast Guard (United States Department of Defense, 2011). Additionally, nearly 737,542 American civilians work directly for the military (U.S. Department of Defense, 2008). Table 2.1 presents the breakdown by active-duty branch of the military.

In 2010, the United States Census Bureau and the United States Department of Veterans Affairs estimated the Veteran population in the United States (U.S.) as comprising nearly 23 million Americans (U.S. Census Bureau, 2010; United States Department of Veterans Affairs, 2010). Schlenger and colleagues (1992) show that nearly 15% of Vietnam veterans have a mental health problem years after their service. As service members reintegrate back into society, it is important to ensure that they receive proper mental health prevention and

treatment. The individual mental health burden service members experience while working to protect the United States should be enough to warrant increased efforts and research on preventing and reducing mental health problems (Merklinghaus, 2009). Mental health problems that emerge among service members not only impact individuals and families, but also hamper military effectiveness and impact society as a whole; in addition to the individual burden on service members and their families, there is also an economic burden to society. Mental health problems create a significant burden to society; the estimated annual loss of earnings attributed to mental health problems is over \$193 billion (Kessler et al., 2008). Despite the overwhelming burden of mental health problems in the United States, only 6.2% of health care spending in the United States is devoted to treatment of mental health problems (Mark et al., 2007). Service members make up a large and important part of the United States population, and it is necessary to take care of the individuals who work hard to protect the country.

Stressors Unique to the Military

The military has a unique culture. Service members, as well as their families, are governed by military laws, norms, and traditions, as well as cultural and organizational values that set them apart from their civilian counterparts. Many studies that compare military occupations to civilian occupations often do not account for unique stressors that service members face and the ability of the military environment to increase the complexity and intensity of non-military specific occupational stressors. For instance, leading non-military specific occupational stressors include change in responsibilities at work, change in work hours or conditions, difficulty with a supervisor, passed over for promotion, and change to a different line of work (Pflanz, 2001). This section will briefly describe some unique ways in which the military occupational environment differs from many civilian occupations.

Although service members have similar stressors as the general working population (Pflanz, 2001), they face some unique stressors such as not being able to quit their job without facing legal repercussions (Department of Defense, 2011), including possible jail time. Service

members face disciplinary action (e.g., reduction in rank/pay; confinement to living quarters or other restrictions) for doing some things that would normally go unpunished in the civilian occupational world (i.e., messy or sloppy living space), and service members face the stress of the possibility of being killed on the job or ordered into dangerous and hostile environments. With these unique circumstances, it is not surprising that Pflanz (2001) found that 52% of service members report that work stress is causing significant emotional distress. In civilian work life, an employee who is distressed can often take time off from work or go on a vacation. In the military, getting time off from work can be difficult and complicated to arrange, and simply leaving to go on a vacation without permission will result in “away without leave” (AWOL) status, which is a punishable offense.

A more notable difference that service members experience is deployment. In the vast majority of circumstances, service members do not have the option of refusing deployment. Deployments place increasing demands on service members and their families (Eastman, Archer, & Ball, 1990). Deployment in general has been shown to be strongly associated with mental health problems, such that mental health problems increase with deployments (Hoge, et al., 2006; Hoge & Castro, 2006; Hoge, et al., 2004; Kang, et al., 2003; Kessler, et al., 1995). Service members have the risk of being deployed to countries around the world, with or without their family, and may need to work in combat zones. Since the terrorist attacks of September 11, 2001, there has been an increase in the number of service members who are sent to combat zones (Hoge, et al., 2006; Hoge & Castro, 2006; Hoge, et al., 2004).

Service members have a high exposure to interpersonal violence. Combat, as well as routine military operating procedures, exposes service members to intense and dangerous situations, which are strongly associated with greater mental health symptoms (Hoge, et al., 2006; Hoge & Castro, 2006; Hoge, et al., 2004; Kang, et al., 2003; Kessler, et al., 1995). Exposure to combat or being in a combat-zone is enough to cause mental health problems, even in the absence of actual physical injury (Hoge, et al., 2006; Hoge, et al., 2004). In other

words, uninjured working service members in a combat zone still have high rates of mental health problems (Hoge, et al., 2004); serving in a combat zone is sufficient for the development of mental health problems.

In addition to combat exposure, service members may develop mental health problems in response to standard military training. Military training, by design, consists of experiences and opportunities to increase physical strength and emotional resilience, which can help sustain service members during combat. However, these self-preservation behaviors instilled by the military can cause difficulty when reintegrating into the civilian world. Repeated exposure to these intense training experiences can cause trauma and stress. Early cross-sectional research by Hoge and colleagues (2004) found pre-deployment rates of PTSD to be 9% - before ever going to war. Thus, service members are at risk for mental health problems before going to war, which may be a result of their typically intense and stressful training. It is important to note that although military training is intense and may cause some service members to develop mental health problems, the training is necessary and essential for the military's "warrior culture."

Service members experience unique stressors and a majority of service members report being stressed. The intense military occupational environment puts service members at an increased risk for mental health problems, particularly post-traumatic stress disorder (PTSD) (American Psychiatric Association, 2000). Service members also have a greater likelihood of experiencing mental health problems from exposure to traumatic events and combat, which may be exacerbated by disciplinary actions and the inability to leave the job during times of distress. Besides causing new mental health problems, the stressors of military life may also exacerbate existing mental health problems.

Military Service Members and Mental Health

Mental health problems are a significant predictor and risk factor for completed suicide among military service members (Hilton, et al., 2009). Mental health problems, particularly

PTSD, anxiety, and depression, are strongly and positively related to suicidal behaviors (Chan, et al., 2009; Gradus, et al., 2010; Oquendo, et al., 2003). Both suicide and mental health problems are rising across all branches of the military and suicide is one of the leading causes of death in the military (Stander, et al., 2004).

The suicide rate in the United States Marine Corps (USMC) is higher than any other branch of the military and higher than the overall rate for the U.S. population (Stander, et al., 2004). In the USMC, suicide is also more prevalent among men than women (Hilton, et al., 2009). Among Marines who completed suicide, few had sought mental health treatment before completing suicide. Hilton and colleagues (2009) found that only 8% of completed suicides in the USMC from 1999-2007 had sought mental health treatment within 30 days prior to their suicide. This study will not directly examine suicide or suicidal ideation, rather this study will examine the mental health problems that are associated with military-related stressors and are suggested to be precursors to suicide, attempted suicide, or suicidal ideation.

In the USMC, mental health problems and suicide are most common among young, junior-enlisted, white men. Hilton and colleagues found social stressors to be related to completed suicides, including low social support and social relationship problems. In fact, social stressors, specifically relationship problems, were the most commonly reported stressors (Hilton, et al., 2009).

This study will focus on Marines as the target population. The USMC is the smallest branch of the military with the lowest amount of funding for military operations (U.S. Department of Defense, 2008; United States Department of Defense, 2010). Marines are also the youngest service members across all branches of the U.S. military. The USMC has the most teenagers, most males, and most single service members (U.S. Marine Corps, 2010). In fact, younger age and being single have been identified as risk factors for mental health problems (Kulka et al., 1990; Wolfe, Erickson, Sharkansky, King, & King, 1999).

The USMC places emphasis on combat readiness, which often requires Marines to be the “first responders” in crisis and combat situations. Marines are exposed to intense and unexpected situations while serving as first responders. The Marine Corps, by its very mission, maintains a heightened sense of combat readiness in order to rapidly deploy in support of expeditionary operations (United States Marine Corps, 2000). The USMC has three primary purposes: 1) to defend naval bases, 2) to conduct amphibious (ship-to-shore) operations, and 3) other duties as assigned by the President of the United States (U.S. Government Printing Office, 2008). In order to prepare for missions that serve the purposes of the USMC, Marines are constantly training for combat situations. Military service members, especially Marines, are regularly exposed to stressful and intense environments that put them at risk for mental health problems, which may lead to suicide.

The Protective Impact of Sources of Social Support

Early research by Lazarus suggests the importance of successful social relationships, supports, and adaptations in protecting against stress (Lazarus, 1966, 1993; Lazarus & Folkman, 1984). Social support has been linked directly to specific health problems and the protective effects of social support interested researchers for several decades (Caplan, 1974; Cobb, 1976; Dean & Lin, 1977; Kaplan, et al., 1977). Social support is a complex and multifaceted construct. Cohen (2004, p. 676) describes social support as referring to a “social network’s provision of psychological and material resources intended to benefit an individual’s ability to cope with stress.” Social support tends to be viewed as a resource that is there if needed - as a coping resource. However, social support can be seen as a coping *resource* or *strategy*, depending on the way in which social support is utilized. If social support is actively sought out, managed, or otherwise utilized to help an individual adapt to a situation, then it is seen as a coping strategy. If social support is perceived as a potential for action, then it is a coping resources (Gore, 1985; Pearlin & Schooler, 1978). This study focuses on the perceptions of support available, or perceptions of support as an available coping resource.

Early research on social support suggests that the impact of negative events on health may be buffered by distinct sources of social support (Zimet, Dahlem, Zimet, & Farley, 1988). Early research by Zimet and colleagues (1988) found that individuals differentiate between distinct sources of support, including support from family, friends, and a significant other. Moreover, Abbey and colleagues (1985) found that each specific source of social support has a special contribution to make to the individual. Although general social support is important, social support from specific sources can be more predictive of the positive impact of social support on health. Other research has found results similar to Zimet and colleagues (1988), providing compelling evidence for various protective effects of social support on health, depending on the source of support (Clara, Cox, Enns, Murray, & Torgrudc, 2003).

Specific sources of social support can have a positive impact on the effects of mental health problems among service members (Laffaye, Cavella, Drescher, & Rosen, 2008). Specifically, Laffaye and colleagues (2008) found that military peers generally provide more support than stress. Other research indicates that social support from family members, military peers, and a significant other can protect against mental health problems among service members (Wilcox, 2010). In addition to support from military peers, it is expected that support from military leaders will also be an important source of support, due to the close working relationship that military leaders tend to provide.

Social Support from Military Sources: Peers and Leaders

Service members are expected to work together as a team in order to function effectively during times of war, as well as in times of peace. Social cohesion and effective interaction are important goals of military training. Moreover, service members tend to spend long periods of time together during training and combat, often in confined spaces and under intense circumstances. It is not surprising that Laffaye and colleagues (2008) found military peers to be the most numerous, important, and valued source of social support. In other words, these

findings suggest that service members tend to seek support from their military co-workers more than any other source of support.

A study by Brailey and colleagues (2007) examined PTSD symptoms, life events, and unit cohesion among U.S. Soldiers. This study found that life events and unit cohesion both strongly and independently predicted PTSD symptoms but in opposite directions. That is, major life events increased stress and PTSD symptoms, whereas unit cohesion reduced stress and PTSD symptoms. This study highlights the importance of unit cohesion and greater levels of social support among service members, peers and leaders. Pietrzak and colleagues (2009b) found that greater levels of unit support allowed service members to be more resilient, which improved their mental health outcomes.

Interestingly, Tucker and colleagues (2005) conducted a study on 1,489 Army Soldiers and found that military groups (e.g., platoons) generally have a shared level of stress-related perceptions and that group members tend to respond to stress similarly. In other words, group cues on how to respond to stress can influence the individual stress response. Considering that social cohesion is an important part of the military occupation (Bliese & Britt, 2001; Wright et al., 2009), as well as an important goal of military training, it is not surprising that service members who tend to work individually, rather than as a group, have more health-related problems (J. S. Tucker, et al., 2005).

Research on civilian samples has also found co-workers and leadership to be important sources of support. In a civilian occupational sample of 1,791 University and corporate employees, Vagg and colleagues (1998) found that lower levels of support from leadership were consistently related to increased occupational stress levels. This study did not examine support from sources other than leadership, such as from coworkers.

Research by Allen and Ortlepp (2000) found that high levels of perceived social support was associated with lower mental health problems (i.e., post traumatic stress symptom severity) in 142 security guards in South Africa. The source of social support was strongly related to the

reported mental health outcomes. Specifically, social support from the supervisor formed a stronger negative relationship with mental health than did support from co-workers. The authors suggested that this may be the result of distancing themselves from their co-workers after a traumatic on-the-job experience (Allen & Ortlepp, 2000). Similarly, a study on a civilian sample of mostly white male manufacturing plant workers (E. Baker, Israel, & Schurman, 1996) suggests the importance of measuring the type and source of social support. This study found that social support from the supervisor more strongly influenced occupational stress levels than social support from co-workers.

A study by Marcelissen and colleagues (1988) on 1,416 Dutch civilian employees found support from colleagues and leadership to be important. Interestingly, colleagues were found to provide more social support than leaders, although support from leaders was more important than support from colleagues. Similarly, a meta-analysis by Chiaburu and Harrison (2008) on 77,954 employees in 161 independent samples found that co-worker support is very unique and important for occupational stress and the resulting impact on mental health. This meta-analysis found that co-workers provide more social support than leaders in the workplace across studies, and that co-worker support is linked to higher job satisfaction and involvement, and greater commitment to the job and organization. On the other hand, Chiaburu and Harrison (2008) found that antagonism from co-workers was related to counterproductive work behaviors that were directed back at co-workers. Thus, the type of support (i.e., positive or negative) and the specific source of support (i.e., co-workers) may both influence mental health outcomes.

Among service members, it is vital to prevent and reduce combat stress and related mental health problems in order to maintain high performance so that missions can be accomplished. In the USMC, the small-unit leader is responsible for maintaining the “morale and efficiency” of the troops within the small-unit, which includes recognizing negative mental health symptoms (United States Marine Corps, 2000). Maintaining morale and efficiency includes seeking appropriate resources for members within the small-unit who are showing

symptoms of mental health problems. Small-unit leaders are the backbone of Marine Corps leadership. Close relationships are developed between seniors and subordinates within small operational units, and these relationships are seen as critical to mission performance in the USMC. Two basic objectives of Marine Corps leadership include a) mission accomplishment and b) troop welfare. Although the mission comes first, there is a strong emphasis on troop welfare, which is a well-known and vital component of military leadership. Theoretically, the Marine Corps is comprised of thousands of small units that together form the Marine Corps. Each small unit is comprised of approximately 40 Marines, but vary in size depending on the location and purpose of the small unit. This makes it essential to have high levels of interactions within each of the small units, as well as between units. Most importantly, this strategy incorporates interactions between service members on a normal basis, encouraging social relationships and open communication.

To help train small-unit leaders, the USMC provides handbooks to military leaders in order to “prevent, reduce, identify, and treat” combat stress (United States Marine Corps, 2000, p. 5). The USMC handbook, *Combat Stress* (United States Marine Corps, 2000), recognizes the importance of social support and positive social relationships. The handbook encourages small-unit leaders to share feelings, communicate, serve as role models, and provide guidance to their troops. To help control combat stress, small-unit leaders are encouraged to provide social support to troops, interact with the spouse and family members, establish points of contact for troops to help with family or mental health problems, establish support networks, and facilitate open communication with mental health professionals, in addition to usual military training (United States Marine Corps, 2000).

Essentially, the USMC has designed social support interventions to be in place within the USMC structure. However, the protocol may not be implemented with high fidelity, as small-unit leaders often spend long hours performing military tasks and training, which may distract social support efforts. Often, mandatory small-unit training sessions are held, which reviews

support items from the USMC handbook (United States Marine Corps, 2000). However, these sessions may not provide adequate training for small-unit leaders to provide support on an interpersonal level. This notwithstanding, there appears to be sufficient evidence indicating the importance of peer and leadership support in protecting against mental health outcomes among service members (Wilcox, 2010).

Social Support from Non-military Sources: Special Person, Family, & Non-military

Friends

In addition to support from military sources, support from non-military sources, including a special person (e.g., spouse or partner), non-military friends, and family members are also related to mental health.

Wilcox (2010) found that greater perceived support from the spouse and family members are related to lower levels of PTSD. This study found that individuals with lower levels of PTSD reported greater perceptions of support from the special person (i.e., the spouse) and family members. Interestingly, in this study, there was not a significant difference between perceptions of support from friends and the levels of PTSD. This study, however, did not differentiate between military friends and non-military friends, and this may be a reason for the findings. A notable finding from this study was the difference in the level of perceived support from the spouse; the amount of perceived support from the spouse that was needed to be protective was much lower than for any other group. In other words, even lower levels of perceived support from the spouse was protective against PTSD, whereas much higher levels of perceived support were needed from military peers and family members to be protective.

The special person can not only be an important source of social support, but also an excellent resource for helping the service member obtain needed mental health care. Milliken and colleagues (2007) report that spouses of service members are willing to seek care for their partner and help them make the decision to seek treatment early. A review by Erbes and colleagues (2008) found couples therapy to be an effective mean of increasing social support

from the spouse of the service member. This study discussed the importance of the spouse in helping the combat veteran with mental health problems and suggested that interventions should focus on increasing social support from the spouse. A recent study by Skopp and colleagues (2011) found that simply having an intimate partner was inversely associated with suicidal ideation, which has been associated with various mental health outcomes (Panagioti, Gooding, & Tarrier, 2009).

Laffaye and colleagues (2008) reported that greater social support from the spouse, from relatives, and from non-military friends were significantly negatively related to PTSD at two time points. This suggests the potential protection of these sources of support against PTSD among service members. This study also reported that the number of non-veteran friends were significantly lower than for family members, as well as military peers. That is, service members report having significantly fewer non-military friends than family members and military peers. Despite these findings, non-military friends provide more social support than relatives, but still less than the spouse and military peers.

Since service members tend to spend most of their time together, they may often have relatively few non-military friends. However, non-military friends may still have an impact on the mental health of service members. A study by Tucker and colleagues (2009) on 50 single United States Navy mothers found that social support from friends, as well as social support from within their military workgroup, was more important than support from family and the community. Specifically, greater support from friends, as well as from sources within the workplace, was related to better psychological health.

Distinct sources of social support can be protective against mental health problems. Among service members, there are several distinct sources of support that can be distinguished, including support from military peers, military leaders, significant others, non-military friends, and family members. Military-specific sources of support may be more influential than other sources of support, due to the typically high level of cohesion found among

military peers (Bliese, Adler, Castro, & Britt, 2006; Wilcox, 2010; Wright, et al., 2009). However, support from other, non-military specific sources, should also have a protective effect, as more social support, in general, is more protective. In order to develop effective social support interventions for service members, it will be important to determine which sources of social support are most influential and in what way they are influential.

Summary and Conclusions

Military service members are uniquely stressed and the occupational stressors they experience can cause or exacerbate mental health problems. Social support has been identified as a protective factor against mental health problems that result from stress. Service members have been found to differentiate between various sources of social support and each of these sources influence service members uniquely, where some may have a greater protective impact than others. Specifically, five distinct sources of social support were identified as being protective: a) military peers, b) military leadership, c) a special person, d) non-military friends, and e) family members. However, few studies have comprehensively examined these sources together in a single study as protective factors against mental health problems in service members.

A moderation model examining the specific sources will allow the protective sources of support to be identified. The knowledge gained from this study can help guide theory and intervention development, help enhance support sources influential to service members, and promote successful adjustment to civilian life after a military career. Most importantly, this study can better address stress and mental health problems among service members, as well as the population at large, by guiding the development of more appropriate interventions that target social support (MacCorquodale & Meehl, 1948; MacKinnon, 2008; MacKinnon & Luecken, 2008). An early presentation by Cassel (1976) urged researchers to focus on improving and strengthening social support and social relationships, rather than attempting to reduce stress or reduce exposure to stress. Early research by Cobb (1976) supported Cassel's statement, and

echoed the importance of focusing on improving social support in both sick and well, stress and unstressed. Social support is protective against stress and can be more controllable than stress. This is a reason that interventions need to focus on improving social support, rather than focusing on reducing stress. However, to improve social support, it is necessary to understand how it can function to protect against mental health outcomes in the face of stress.

Table 2.1
Armed Forces Estimates, 2011

Active Duty Military Branch	Estimate (%)
Air Force	333,822 (23.29)
Army	570,387 (39.79)
Marine Corps	201,019 (14.02)
Navy	328,190 (22.90)
Total Active Duty	1,433,418 (100)

Source: (United States Department of Defense, 2011).

CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate factors that protect against mental health problems among military service members. Specifically, this study examined distinct sources of social support as protective factors against stress and mental health problems among active duty Marines. This study utilized a cross-sectional survey design. Data was collected at one time point from 431 active duty U.S. Marines over the age of 18. Data collection occurred primarily online, without collaboration from any military-specific entities. The research protocol was reviewed and approved by the University of Georgia's institutional review board.

Participants and Procedures

Description of Participants

A good sample is one that is representative of the population. Selection bias results from obtaining an unrepresentative sample. Special efforts were made to include female participants and those representing ethnic and racial minority groups, as appropriate, based upon published demographics of active duty Marines (Marine Corps Headquarters, December 2008). The unit of analysis for this study was the individual. Four hundred thirty-one qualified individuals participated in this study.

Sampling Strategy

Participation was voluntary and anonymous. The human subjects considerations are available in Appendix A. Recruitment took place over a 17-week period. Two recruitment strategies were used for this study to increase the reach of the study and help ensure a mix of participants were recruited. The primary recruitment method included utilizing online social networking tools and other Internet resources to recruit participants to complete an online version of the survey. Specifically, the project was advertised on Facebook and a link to the

online version of the survey was provided. In the secondary recruitment method, the current investigator posted flyers around the military installation to advertise the project and distributed postcards that included a brief description of the study and a link to the online survey. Laptops were available to those who wished to complete the survey immediately. The investigator also helped to extend the reach of the study by encouraging respondents to promote the study to other qualified participants.

Power Considerations

Power analyses in structural equation models are not always as easily conducted as for other statistical methodologies. The sample size and power associated with testing the fit of such models were estimated based on published algorithms and tables (Hancock, 2006; MacCallum, Browne, & Sugawara, 1996), the R version 2.12.0 program (Preacher & Coffman, 2006; The R Project, 2011), published Monte Carlo simulations, and general recommendations.

The root mean square error of approximation (RMSEA) value of .00, which is an ideal that is never attained since it indicates perfect fit, is the target RMSEA, and .08 is the critical value above which to reject the good fit of the analytical model. The range between .00 and .10 represents normal targets for determining fit of the model. The power analysis indicates that a sample size of approximately 50 would be needed to obtain .90 power for the each analysis (Preacher & Coffman, 2006). Additionally, although no direct power estimates for structural equation modeling exist, Monte Carlo simulations have been conducted to provide sample size guidelines, and generally suggest a sample size of 200, although samples as small as 50 can be useful (Brown, 1997; Finch, West, & MacKinnon, 1997; Fritz & MacKinnon, 2007; Muthén & Muthén, 2002; Williams, December 2004).

This study recruited 431 participants, which exceeded the minimum requirements of 100-200 participants usually recommended to structural equation modeling (MacCallum, Widaman, Zhang, & Hong, 1999), and exceeded the minimum 50 sample size for adequate power for each analysis.

Incentives

To maximize recruitment, incentives were provided as compensation for the time required to participate in this study (\$10 Wal-Mart gift cards). Incentives were distributed upon completion of the survey. Participants were allowed to use an alias to have their gift card mailed. Addresses were kept in a locked data file until the end of the study and were held separately from survey data. Addresses were deleted at the end of the study.

Measures

This section describes the measures that were used in this study. The online version of the study measures is available in the Appendix B. It is important to note that the measures for PTSD, anxiety, and depression were used to *assess symptoms* of each respective mental health outcome, rather than to *diagnose* any mental health outcome. Participants did not receive any feedback related to any of the measures or scales used in the study.

Demographic Information

Demographic data included: gender, age, education, and marital status, as well as military-specific information, including time in service, military rank, military occupational specialty (MOS), number and locations of previous deployments, and combat history. This information helped to provide background on the study sample and can be used to compare the study sample to the population of Marines and to other military branches.

Anxiety Symptoms

Generalized anxiety disorder (GAD) is one of the most common anxiety disorders. The GAD-7 (Spitzer, Kroenke, Williams, & Lowe, 2006) was used to assess anxiety symptoms and consists of seven items that reflect GAD criteria from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). The items inquired how often in the past two weeks the participants were bothered by the symptoms. Items were rated on a 4-point scale ranging from 0-3, where 0 = "not at all," 1 = "several days," 2 = "more than half the days," and 3 = "nearly every day." A total score was calculated by summing the scores; total score for the

items ranged from 0 to 21. A score from 0-5 represents mild anxiety, 6-10 moderate anxiety, 11-15 moderately severe anxiety, and 15-21 severe anxiety.

The items on the GAD-7 have excellent internal consistency (Cronbach's alpha = 0.92) (Spitzer, et al., 2006), as well as good test-retest reliability and good procedural validity. The GAD-7 also has good convergent validity with the Beck Anxiety Inventory ($r = 0.82$) and the anxiety subscale of the Symptom Checklist-90 ($r = 0.74$) (Spitzer, et al., 2006). An exploratory factor analysis of items from the GAD-7 and a depression scale (i.e., PHQ-8) found that the GAD-7 items clearly loaded onto a single factor separate from the depression items, suggesting factorial validity (Spitzer, et al., 2006).

Depression Symptoms

Symptoms of major depressive disorder (MDD) were assessed with the nine-item depression scale of the Patient Health Questionnaire (PHQ-9) (Spitzer, Kroenke, & Williams, 1999; Spitzer et al., 1994). The PHQ-9 was based on diagnostic criteria for major depressive disorder from the DSM-IV. The items inquired how often in the last two weeks the participants were bothered by the symptoms. Items were rated on a 4-point scale ranging from 0-3, where 0 = "not at all," 1 = "several days," 2 = "more than half the days," and 3 = "nearly every day." A total score was calculated by summing the scores; total score for the items range from 0 to 27. A PHQ-9 score from 5-9 represents minimal symptoms, 10-14 minor depression, 15-19 moderately severe major depression, and greater than or equal to 20 severe major depression. The PHQ-9 was used primarily in clinical settings, and can provide a diagnosis of depressive disorder and can indicate the severity of the depression symptoms.

Dum and colleagues (2008) found the PHQ-9 to be a cost-effective and shorter alternative to the Beck Depression Inventory II (BDI-II) (Beck, Steer, Ball, & Ranieri, 1996). The reliability of the PHQ-9 has been found to be very good (Cronbach's alpha = 0.90) (Dum, et al., 2008). The PHQ-9 was also found to have convergent validity of depression (Beck, et al., 1996).

Posttraumatic Stress Disorder Symptoms

PTSD symptoms were assessed with the PTSD Checklist, Military Version (PCL-M) (Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL-M is a 17-item assessment of PTSD symptoms from recommended diagnostic criteria in the DSM-IV (American Psychiatric Association, 2000). The items were specific to stressful military experiences and were appropriate for service members. Respondents rated the frequency that each symptom had been bothersome in the past month on a 5-point scale where 1 = "Not at all," 2 = "A little bit," 3 = "Moderately," 4 = "Quite a bit," and 5 = "Extremely." A total score was calculated by summing the scores; total score for the items range from 17 to 85. Weathers and colleagues (1993) recommend a cutoff score of 50 to indicate probable PTSD. This cutoff value has been supported by other researchers (Andrykowski, Cordova, Studts, & Miller, 1998; Forbes, Creamer, & Biddle, 2001).

A recent analysis of the psychometrics of the PCL on trauma-exposed undergraduate students (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008) found the internal consistency to be high ($\alpha = .91$). Other studies have also found the PCL to have adequate internal consistency on a variety of samples, including motor cycle accident victims and sexual assault victims ($\alpha = .94$) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), older primary care patients ($\alpha = .85$) (Cook, Elhai, & Arean, 2005), university students ($\alpha = .94$) (Ruggiero, Del Ben, Scotti, & Rabalais, 2003), and survivors of bone marrow transplantation ($\alpha = .89$) (Smith, Redd, DuHamel, Vickberg, & Ricketts, 1999). Usage of the PCL on military service members has also yielded adequate measures of internal consistency in female primary care veterans ($\alpha = .96$) (Lang, Laffaye, Satz, Dresselhaus, & Stein, 2003), male Vietnam war veterans ($\alpha = .97$) (Weathers, et al., 1993), and Gulf war veterans ($\alpha = .96$) (Weathers, et al., 1993).

A validation study by Bliese and colleagues (2008) found that the PCL performed well as a clinical screening instrument for PTSD in service members. There was also adequate evidence for convergent validity and discriminant validity for the PCL compared to other well-

established assessments of PTSD (i.e., Impact of Event Scale and The Mississippi Scale for PTSD) (Ruggiero, et al., 2003). Evidence for convergent validity and discriminant validity has been echoed in multiple studies (Adkins, et al., 2008; Keen, Kutter, Niles, & Krinsley, 2008; Smith, et al., 1999).

Sources of Social Support

The distinct sources of social support were assessed with a modified 20-item version of the Multidimensional Scale of Perceived Social Support (Zimet, et al., 1988). The original MSPSS assesses perceived social support from family, friends, and a significant other. The modified version of the MSPSS used in this study assessed perceived social support from family, non-military friends, a special person, military peers, and military leaders. Respondents use a 7-point scale Likert-type scale where 1 = "Very strongly disagree," 2 = "Strongly disagree," 3 = "Disagree," 4 = "Neither disagree nor agree," 5 = "Agree," 6 = "Strongly agree," and 7 = "Very strongly agree." Scores can be calculated for each subgroup and for the total score by summing the items for each respective subgroup, and summing all items for the total score. Scores for each subgroup can range from 4 to 28 and the total score ranges from 20 to 140, higher scores indicate greater perceived social support.

The original MSPSS has been found to have high reliability on the family, friends, and significant other subscales ($\alpha = .90, .94, \text{ and } .95$, respectively), as well as on the total scale ($\alpha = .91$) (Dahlem, Zimet, & Walker, 1991). The original MSPSS has been found to have factorial validity, such that each of the subgroups formed a specific factor as expected (Dahlem, et al., 1991). Another modified version of the MSPSS using "Military Peers" as a fourth group also found the factors to develop for each of the subgroups, as expected (Wilcox, 2010). Kazarian and McCabe (1991) found support for concurrent validity of the original MSPSS with the Social Support Behaviors Scale, as well as support for construct validity of the original MSPSS with the Beck Depression Inventory and the Piers-Harris Self-Concept Scale.

Perceived Stress

Perceived stress was assessed with a modified version of the 10-item Perceived Stress Scale (PSS10). The original PSS10 consists of 10 items that assess perceptions of stress in the last month on a five-point scale where 0 = "Never," 1 = "Almost Never," 2 = "Sometimes," 3 = "Fairly Often," and 4 = "Very Often." The positively worded items on the scale were reverse scored. The total score for the PSS10 ranges from 0-40, where higher scores indicate greater perceived stress.

The modified version of the PSS10 used in this study contained ten additional items to assess stressors unique to the military (Zohar et al., 2004), including a lack of privacy, a harassing commander, love quarrels, unfairness, embarrassment, sickness or injury, extra tasks, deployment, missed family, and missed lover. The version of the PSS used in this study is referred to as the PSS20-Military. The PSS20-Military was rated on a five point scale where 0 = "Never," 1 = "Almost Never," 2 = "Sometimes," 3 = "Fairly Often," and 4 = "Very Often." The positively worded items on the scale were reverse scored. The total score for the PSS20-Military ranges from 0-80, where higher scores indicate greater perceived stress.

The PSS has been found to have adequate reliability, ranging from $\alpha = .84-.86$ in college students (Cohen, Kamarck, & Mermelstein, 1983; Cohen, Spacapan, & Oskamp, 1988). Cohen and colleagues (1983) have also found evidence for concurrent and predictive validity of the original PSS. The PSS10 has been found to have adequate reliability, $\alpha = .85$ (Cohen, Tyrrell, & Smith, 1993), and $\alpha = .78$ (Cohen & Williamson, 1988).

Social Desirability

Social desirability refers to the tendency for respondents to present responses in a favorable position. Social desirability can hide true relationships or influence the nature of the true relationships (Ganster, Hennessey, & Luthans, 1982). In order to measure socially desirable response style tendencies, social desirability was assessed using the 13-item

Marlowe-Crowne Social Desirability - Short-form (MCSD-13) (Crowne & Marlowe, 1960; Reynolds, 1982).

On the MCSD-13, respondents were asked to rate each item as “True” or “False.” Higher scores on the MCSD-13 indicated greater desire for social approval. The MCSD-13 has been found to have good reliability (KR-20 = .76) (Reynolds, 1982). Reynolds (1982), however, did not evaluate the MCSD-13 separately from the original 33-item MCSD. Il and Sipps (1985) found the MCSD-13 to have adequate reliability, (KR-20 = .74), suggesting that the MCSD-13 is a viable alternative to the full 33-item MCSD, which has been supported by other studies (Robinette, 1991).

Affectivity Traits

Negative affect (NA) is a personality trait that tends to emphasize negative emotionality and may inflate self-reports of stress (Watson & Clark, 1984). Individuals with high NA tend to be more distressed and have a negative view of the self, compared to individuals without NA (Watson & Clark, 1984). To assess NA, the NA items from the Positive and Negative Affect Schedule (PANAS) were used (Watson, Clark, & Tellegen, 1988). The PANAS consists of 10 items to assess positive affect and 10 items to assess negative affect. Respondents were instructed to rate each item to indicate to what extent they have felt in the past few days. The items were rated on a 5-point scale where 1 = “very slightly or not at all,” 2 = “a little,” 3 = “moderately,” 4 = “quite a bit,” and 5 = “extremely.” Greater scores in each section of the scale indicated greater levels of negative affect or positive affect, respectively. The PANAS has been found to have excellent internal consistency for positive affect ($\alpha = .86-.90$) and negative affect ($\alpha = .84-.87$) (Watson, et al., 1988).

Validity and Reliability Concerns

The generalizability (Shadish, Cook, & Campbell, 2002) of the proposed study is limited to service members, specifically Marines. The structure of other branches of the U.S. military is similar to the Marine Corps, although each branch is unique with regard to their purpose and

combat duties. Demographics are also relatively consistent across active-duty branches of the military, although Marines tend to be the youngest and slightly more male. To help improve validity of this study (Shadish, et al., 2002), reliable measures for all variables of interest were used. The reliability of all measures was assessed as part of the proposed study to ensure the measures were reliable in the sample of Marines studied.

Reliability

Reliability refers to whether or not the instrument is a good indicator of an individual's "true" score (Crocker & Algina, 2008). In classical test theory, a true score is thought of as an individual's average of all observed scores across all possible sets of items, raters, and occasions. However, because of various sources of error, the actual observed score may vary from the true score. Therefore, the instrument may not always produce an individual's true score. Reliability is therefore, theoretically defined as the relationship between the true and observed scores on a test (Crocker & Algina, 2008).

The most commonly used type of reliability is coefficient alpha (Cortina, 1993). It is important to note that coefficient alpha is *not* a measurement of the degree of unidimensionality or homogeneity of a set of items (Cortina, 1993). Rather, alpha is a measure of the internal consistency or interrelatedness of items. Reliability of all scales were assessed using cronbach's alpha to test the internal consistency of scale and subscale items (Cronbach, 1951).

Validity

Reliability is generally seen as a prerequisite to validity; if something is not being measured accurately or consistently, then it is difficult to determine whether or not the inferences are valid. However, greater reliability does not necessarily mean greater validity. Validity refers to the extent to which inferences can be accurately made based upon tests scores. There are many different types of validity evidence, each of which is appropriate for a different purpose (Messick, 1995). Obtaining validity evidence is an ongoing process and the

test itself is not judged as valid or invalid, rather the inferences that are made from the measure or the purpose for which the measure is used are valid or invalid.

Construct validity refers to the degree to which a test is considered appropriate as an operational definition for the construct, perceived social support for specific sources. Construct validity was assessed on the mental health variables and social support variables. Construct validity is an important type of validity for showing that the results from a scale can be validly interpreted as measures of the construct of interest (Messick, 1995), and to help rule out substantial method effects (Conway & Lance, 2010). It was expected that the mental health variables (depression, anxiety, and PTSD) would be negatively related to social support variables, and significantly positively related to perceived stress. Correlations were performed among the variables to examine construct validity.

Confirmatory factor analyses are often used as validity evidence of the construct they purport to measure. Messick (1995) referred to this as a “structural aspect” of validity, in which the evidence investigates the degree to which the interrelationships among the subscales support the hypotheses. Most commonly, the hypotheses are on the loadings and factor correlations, and should include the expected magnitude of the factor loadings or correlations, and the presence or absence of measurement error or covariances. Kane (1992) stated that validity should be explicitly stated in the form of logical arguments. In other words, the researcher must specify what they expect to happen *a priori* in order to validity to be supported. Therefore, simply describing the fit of the (CFA) model does not provide adequate validity evidence, as hypotheses or expectations should be explicitly stated. In this study, it was hypothesized that the factors would load on to each subgroup as expected for family members, non-military friends, a special person, military peers, and military leaders. Support for this hypothesis can provide evidence for the “structural” validity (Messick, 1995) of the modified version of the MSPSS in this sample.

Data analysis

Data was analyzed using SPSS version 19 for Mac (SPSS, 2008) and Mplus 6.1.1 for windows (Muthén & Muthén, 2011).

Data Screening

Normality and outliers. Outliers can obscure the results of statistical analyses, particularly with small sample sizes. The data was screened for outliers and normality using DeCarlo's macro (DeCarlo, 1997). Skewness and kurtosis values were set to 2 and 7, and values above these ranges were identified as skewed or kurtotic, respectively. To test for outliers, Mahalanobis distances were calculated with alpha set to 0.05.

Missing data. For the analyses conducted in MPlus, missing data was handled using full information maximum likelihood (FIML). FIML uses maximum likelihood to estimate the missing data and allows all of the available data to be used in the analyses (Wothke, 1998). However, Mplus deletes cases in which the covariates contained missing values, which is a default procedure that cannot be changed in Mplus. That is, since the model was estimated on the condition of the covariates, there was listwise deletion of the cases with missing values on the covariates, and FIML was used on the rest of the missing data.

For analyses conducted with the SPSS macro, missing data was handled using default procedures for the MODPROBE macro, which was listwise deletion. Listwise deletion assumes that the data are missing completely at random and removes incomplete cases from the dataset. The interaction values from the MODPROBE macro did not differ significantly from Mplus output, likely due to the low level of missing data.

Method Bias

Method biases are one of the main sources of measurement error, which can threaten the validity of conclusions of a study (Brannick, Chan, Conway, Lance, & Spector, 2010; Lance, Dawson, Birkelbach, & Hoffman, 2010). Podsakoff and colleagues (2003) review factors that influence common method biases in behavior research. The error resulting from such biases

can lead to misleading conclusions (Brannick, et al., 2010; Campbell & Fiske, 1959; Podsakoff, et al., 2003). To help reduce any potential common method biases, both procedural and statistical remedies were utilized.

Procedural remedies. Three procedural remedies were used in this study to help reduce method bias. The first procedure was a temporal and psychological separation of measurement. Between each of the three major constructs of interest (e.g., stress, social support, and mental health), a separation measure was inserted (e.g., affectivity questions, social desirability questions). This helped to reduce bias by essentially distracting the participant enough to eliminate saliency regarding response cues (Podsakoff, et al., 2003). The second procedure was to protect the participants' identification by allowing the questionnaires to be completed anonymously. This procedure helped to reduce apprehension and allow respondents to answer honestly (Podsakoff, et al., 2003). The third procedural remedy was to include scale items with high reliability and that have been previously validated. This technique helped to ensure that items were not confusing and that respondents easily understood the items.

Statistical remedies. Harman's single-factor test was used to help identify potential method biases. All study variables were loaded into an exploratory factor analysis to examine whether or not a single factor emerged. This approach assumes that the presence of a general factor that accounts for a the majority of covariance may be indicative of method effects (Podsakoff, et al., 2003).

Social desirability (SD) and negative affectivity (NA) were expected to account for some of the correlation between stress, social support, and mental health problems. SD was measured as the presumed cause of method bias due to the stigma associated with mental health problems, particularly among service members, who may face discharge from the military for mental health problems (i.e., being unfit for duty) (Kim, Thomas, Wilk, Castro, & Hoge, 2010; Nash, Silva, & Litz, 2009; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009a; Pietrzak,

Johnson, et al., 2009b; Wright, et al., 2009). NA was also selected as a presumed cause of method bias based upon previous research on NA and work-related stress (Brief, Burke, George, Robinson, & Webster, 1988; Burke, Brief, & George, 1993; Chen & Spector, 1991; Schaubroeck, Ganster, & Fox, 1992). Therefore, all analyses controlled for SD and NA, which helped reduce any potential method effects. This technique assumes the source of method variance (i.e., social desirability and negative affectivity) as covariates in the statistical analysis (Podsakoff, et al., 2003). This is a relatively straightforward technique to help reduce method bias, but it does not completely correct for method effects.

Testing Research Questions

Research Question 1: Do Marines differentiate between the protective factors by the five distinct sources of support? If not, in what way are the sources of support differentiated? It was hypothesized that service members would differentiate between the distinct sources of social support, rather than group social support into a single general construct. Specifically, it was assumed that service members would differentiate the sources of support into each of the subgroups specific to this study (i.e., family members, non-military friends, a special person, military peers, and military leaders).

To test Research Question 1, factor analytic techniques were performed to test the factor structures. This research question was exploratory in nature, and despite the MSPSS subgroups tending to form as expected in previous studies, it was possible that the subgroups may have formed unexpectedly, particularly since the subgroups have been modified with additional categories. However, a confirmatory factor analysis (CFA) was first conducted to test the factor structure of the subgroups of social support using the expected groups: family members, a special person, non-military friends, military peers, and military leaders. In the event that the CFA model did not fit well, an exploratory factor analysis (EFA) would have then be conducted to determine how the social support sources emerge. The hypothesized CFA model was compared to a CFA model with a general social support construct.

CFA estimation method. Maximum likelihood (ML) was the CFA estimation method used in this research question. ML produces estimates that are unbiased, consistent, and efficient, and considered to be accurate when the model is misspecified (Olsson, Foss, Troye, & Howell, 2000). ML also assumes multivariate normality. Although the data in this study were multivariate normal, it is important to note that using non-normal data with ML will cause standard errors to be underestimated, which then affects significance tests and inflate Type I errors (Chou & Bentler, 1995; West, Finch, & Curran, 1995). To test Research Question 1, a confirmatory factor analysis (CFA) was conducted using Mplus Version 6.11. No errors or irregularities were encountered while running the model.

Fit indices. Since no single criterion for assessing goodness of fit has been established, multiple fit indices were used to test model fit (Hu & Bentler, 1995, 1998, 1999; Quintana & Maxwell, 1999; Weston & Gore, 2006). The chi-square (χ^2) value assessed the magnitude of discrepancy between the original and the model-implied covariance matrices, and therefore directly tested how well a model fit the observed data. There are, however, some limitations with χ^2 , including the possibility of rejecting the model even when reproducing the original data well, particularly with a large sample size (Hu & Bentler, 1995; Weston & Gore, 2006). Therefore, it was important to examine fit indices in addition to χ^2 to test model fit. The following fit indices were used to establish model fit: standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis Index (TLI).

Stand alone fit indices. Stand alone fit indices do not compare the specified model with any other model, and thus assess how well the tested model reproduces the original data, without consulting a reference model (Hu & Bentler, 1999). Stand alone fit indices used in this study included: SRMR and RMSEA (Kline, 2005).

SRMR is the measurement of standardized differences between the observed and predicted covariances. A value of zero indicates perfect fit and values less than .10 indicate

good fit. The Root Mean Square Error of Approximation (RMSEA) is a standardized measure of the lack of fit not due to sampling error that corrects for model complexity (Kline, 2005). RMSEA is sensitive to model misspecification and is not sensitive to distribution or sample size. Although RMSEA is recommended, the value of RMSEA may be inflated for small models (Fan & Sivo, 2007).

Incremental fit indices. The incremental fit indices measure improvement in fit by comparing the tested model with a baseline or null model, and for this reason are also referred to as comparative fit indices (Hu & Bentler, 1995). Incremental fit indices examined in this study included the CFI and TLI.

The CFI compares the tested and baseline model non-centrality parameters. CFI is sensitive to model misspecification and is recommended by Hu and Bentler (1998). The TLI, also referred to as the Non-Normed Fit Index (NNFI), takes the complexity of the model into consideration by using the degrees of freedom for the baseline and tested model (Kline, 2005).

Research Question 2: Which sources of social support protect against negative mental health symptoms that may result from stress? The goal of this research question was to examine the effect of stress on mental health outcomes and how much, if at all, that effect depended on the perceptions of support from distinct sources of support. It was expected that some sources of social support would be more protective than other sources of social support for each mental health outcome. Thus, moderation analyses were performed with each distinct source of support as a proposed moderator for each mental health outcome.

In order to do this, the moderators were tested using ordinary least squares (OLS) regression techniques in Mplus. In order to probe the interactions, the MODPROBE macro developed by Hayes and Matthes (2009) was implemented. The macro probes the interaction in order to better understand the conditions of the moderator. In this study, the pick-a-point approach was used to probe the interaction. The values of the moderator that were probed were one standard deviation above and below the mean of the moderator. That is, simple

regressions of mental health outcomes on perceived stress at conditional values of the moderator were evaluated (Aiken & West, 1991; Preacher, Rucker, & Hayes, 2007). It is important to note that during the testing for and probing of interactions, none of the variables were dichotomized.

CHAPTER 4

RESULTS

This study decomposed support into five distinct components pertinent to active duty service members and focused on the protective impact of social support from each of the distinct sources. This study expanded upon previous research (Wilcox, 2010) by examining additional relevant sources of support and mental health problems in a structural relationship. The current study also expanded on previous research by examining a different, high-risk branch of the military, the United States Marine Corps (USMC). This section presents the demographic and psychological characteristics of the study participants, presents reliability and validity data on the study measures, and provides the findings from the statistical analyses for the research questions.

Description of Participants

Demographic Characteristics of Participants

Four hundred thirty-one active duty U.S. Marines completed the study. At the closing of the 17-week online survey, 2,065 surveys had been opened via the website link, of which 983 started the screening questions, and 431 were eligible participants (active duty U.S. Marines over the age of 18). Spouses of service members, service members from other U.S. military branches, former service members, and non-military civilians completed the remaining 552 ineligible completed surveys, which were not included in this study.

The majority of the eligible 431 participants were non-Hispanic, white, male, junior (E-5/Sergeant and below), enlisted Marines. The average age of participants was 28.7 years ($SD = 6.20$, Range = 19-43). Overall, this sample was representative of the overall population of active duty U.S. Marines (Marine Corps Headquarters, December 2008).

Psychological Characteristics of Participants

This section provides an overview of the psychological characteristics of study participants, which can be used for comparison purposes with other samples of active duty U.S. Marines, or other service members. This study did not provide diagnoses to participants, nor were the measures in this study used to diagnose mental health problems. The psychological characteristics of study participants are based upon the scoring criteria for each measure described in Chapter 3. Overall, the psychological characteristics of this sample are representative of the psychological characteristics of the general populations of service members.

Anxiety symptoms. The mean score on the GAD-7 was 4.28 ($SD = 5.06$). Based upon the scoring criteria for GAD, 65.4% ($n = 282$) of participants would be classified as having mild anxiety, 21.6% ($n = 93$) moderate anxiety, 9.5% ($n = 41$) moderately severe anxiety, and 3.5% ($n = 15$) severe anxiety.

Depression symptoms. The mean score on the PHQ-9 was 5.57 ($SD = 6.35$). Based upon the scoring criteria for depression using the PHQ-9, 57.1% ($n = 246$) have less than minimal symptoms, 19.3% ($n = 83$) of participants would be classified as having minimal symptoms, 12.5% ($n = 54$) minor depression, 7.2% ($n = 31$) moderately severe major depression, 3.7% ($n = 16$) major depression, and 0.2% ($n = 1$) was missing.

PTSD symptoms. The mean score on the PCL-M was 34.42 ($SD = 16.81$). Based upon the scoring criteria for PTSD using the PCL-M, 22.7% ($n = 98$) of participants would be classified as having probable PTSD, and 77.3% ($n = 333$) would be classified as not having probable PTSD.

Perceived stress. The mean score on the PSS20 was 24.54 ($SD = 14.21$), which would be reflective of minor perceived stress. When the PSS20 was broken down into the original PSS10 and the newly added PSS10-Military items, the PSS10-original mean was 15.15 ($SD = 7.27$) and the PSS10-military mean was 11.39 ($SD = 8.72$). Interestingly, the general life stressors (e.g., feeling nervous, feeling out of control, feeling overwhelmed) were slightly higher

than the military stressors (e.g., lacking privacy, harassing commander, extra tasks related to the military).

Sources of support. The mean scores on each of the MSPSS subscales were moderately high: 21.83 ($SD = 7.00$), 21.75 ($SD = 6.72$), 19.18 ($SD = 6.72$), 20.01 ($SD = 6.48$), and 19.12 ($SD = 6.90$), respectively for a special person, family member, non-military friends, military peers, and military leaders subscales. The greatest level of perceived support came from the special person, followed by family members, military peers, non-military friends, and military leaders.

Validity and Reliability

Reliability

The reliabilities for the overall 20-item MSPSS ($\alpha = .973$), special person subscale ($\alpha = .952$), family subscale ($\alpha = .953$), non-military friend subscale ($\alpha = .943$), military peers subscale ($\alpha = .952$), and military leaders subscale ($\alpha = .972$) were each excellent. Reliability was also excellent for each of the mental health measures, PTSD ($\alpha = .970$), MDD ($\alpha = .935$), and GAD ($\alpha = .942$). The PSS-20 also exhibited excellent reliability ($\alpha = .900$). The high Cronbach's alphas indicate that instrument were good indicators of the "true" score (Crocker & Algina, 2008), and thus more reliable.

Construct Validity

It was expected that the mental health scales (depression, anxiety, and PTSD) would be negatively related to the social support scale, and positively correlated with the stress scale. Correlations were performed among the scales to examine construct validity. As hypothesized, the mental health scales were all significantly negatively correlated with each of the social support scales, and significantly positively correlated with the stress scale. Table 4.2 presents the correlations for the mental health, stress, and social support scales that provide support for construct validity.

Structural Validity

In this study, it was hypothesized that the factors would load onto each subgroup as expected for family, friends, a significant other, military peers, and military leaders (Wilcox, 2010). A confirmatory factor analysis revealed that each of the social support subgroups loaded as hypothesized. Even though χ^2 indicated lack of model fit (χ^2 (df=190, N =425) = 704.66, p < .001), all the other fit indices suggested moderately good model fit (CFI = .956, TLI = .947, $RMSEA$ = .08, $SRMR$ = 0.027). Thus, the five distinct sources of social support grouped as expected, and were suitable for further analyses. This provided evidence for the “structural” validity (Messick, 1995) of the modified version of the MSPSS in this sample.

Data Analysis

Data Screening

Based upon the values of skewness and kurtosis from DeCarlo’s Macro, the scales for the final analyses were normally distributed. Skewness values (g_1) ranged from .38 to 1.29, and kurtosis values ranged from .02 to .81. The macro also revealed ten cases with large Mahalanobis distances ($critical F$ (.05/ n) = 35.30, df = 11, 355) that were significant at the 0.05 level. These cases were screened for data entry errors, and it was determined by the researcher that these cases could be included in the final analysis. Keeping the outliers in the data is valid once the data has been re-examined for data errors, as the cases represent real patterns of values for which the variables differed in some way from the other observations. The data also were analyzed without the outliers and there were no major differences in the results.

Method Bias

The results of the Harman’s single-factor test clearly revealed more than one factor, suggesting no major method effects exist (Podsakoff, et al., 2003). To further control for any potential method effects, partial correlation procedures were used in which social desirability and negative affectivity were partialled out of predictor and criterion variables.

Negative affectivity. The average score for negative affectivity was 19.08 ($SD = 9.34$). Negative affectivity was also significantly positively correlated with the mental health and stress scales, and negatively correlated with each of the social support subscales. As such, all further analyses controlled for negative affectivity.

Social desirability. The average score for social desirability was 6.72 ($SD = 2.71$). Social desirability was significantly negatively correlated with the mental health and stress scales. Social desirability was significantly positively correlated with the social support subscales, with the exception of the non-military friends subscale. As such, all further analyses controlled for social desirability.

Research Question 1

The first research question examined whether or not this sample of Marines differentiated between the protective factors by the distinct sources of social support. Additionally, this research question sought to determine the specific ways in which the sources of social support are differentiated. It was expected that the service members would differentiate the sources of social support and would group them in to five categories: military peers, military leaders, non-military friends, family members, and a special person. To test the first research question, a confirmatory factor analysis was conducted with each of the types of social support as latent variables. The hypothesized CFA model was compared to a CFA model with general social support as a latent construct. The results of the fit indices and parameter estimates are presented below.

Fit indices. Model fit was analyzed based on the recommendations by Hu and Bentler (1998, 1999) and Quintana and Maxwell (1999) from the available indices in Mplus (Muthén & Muthén, 2011). The chi-square value for the hypothesized five-factor model indicated poor fit (χ^2 (df=190, $N=425$) = 704.66, $p < .001$). However, the Comparative Fit Index (CFI; .956), Tucker-Lewis Index (TLI; .947), and standardized root mean square residual (SRMR; .027) indices indicated good model fit, while the Root Mean Square Error of Approximation (RMSEA)

value (.08 with the 90% confidence interval .074 to .086) showed adequate model fit. In sum, even though χ^2 showed lack of overall model fit, the other recommended fit indices recommended showed good fit for the five-factor model.

The chi-square value for the general social support model indicated poor fit (χ^2 (df=208, $N=425$) = 4500.22, $p < .001$). Additionally, the Comparative Fit Index (CFI; .636), Tucker-Lewis Index (TLI; .598), standardized root mean square residual (SRMR; .094), and Root Mean Square Error of Approximation (RMSEA) value (.22 with the 90% confidence interval .215 to .226) values from the analysis all indicated poor model fit. In sum, the fit indices provided very little support for the general social support model. The parameter estimates of the general social support model were not examined, given the strong indication of poor model fit.

Parameter estimates. The measurement model of structural equation models (i.e., CFA) allows researchers to evaluate how well the observed variables combine to identify underlying hypothesized constructs. Figure 4.1 presents the standardized parameter estimates for the five-factor model. All of the factor loadings were statistically significant, indicating that they were each good measures of the latent factor.

Comments on overall fit of the model. All the parameters hypothesized in the five-factor model were statistically significant, and the signs and magnitudes of the path coefficients were as expected. Even though χ^2 indicated lack of model fit for the five-factor model, all of the other fit indices suggested good model fit. An examination of standardized residuals could have provided further insight regarding model fit, but these values were not available in Mplus with missing data. A diagrammatic representation of the CFA model is presented in Figure 4.1. Table 4.3 presents the factor correlations. Overall, the five-factor model fit appeared to be a good model and the five distinct sources of support were used for further analyses. As hypothesized, the sample of active duty U.S. Marines did differentiate between the five distinct sources of social support as expected, rather than grouping social support into a single factor or some other unexpected combination of groups. Specifically, the distinct sources of support

differentiated were a special person, family members, non-military friends, military peers, and military leaders, rather than a general social support construct.

Research Question 2

The second research question sought to determine which of the five distinct sources of social support were most protective against mental health symptoms resulting from stress. It was expected that the protective impact of the distinct sources of support on mental health symptoms would vary depending on the source of support and therefore some sources of social support would be more protective than other sources of social support. To test the second research question, a moderation analysis was conducted in Mplus using OLS regression techniques, similar to the MODPROB macro developed by Hayes and Matthes (2009). In the moderation analysis, the interaction between perceived stress and each source of support was tested for each of the mental health outcomes. Moderation exists when the association between PSS and each of the mental health outcomes is not the same at all levels of social support from each of the sources.

Table 4.4 presents the results from the series of regression equations testing the sources of social support as moderators for each of the mental health outcomes. For the posttraumatic stress disorder (PTSD) model, none of the distinct sources of social support moderated the effects of PSS on PTSD. In the major depressive disorder (MDD) and generalized anxiety disorder (GAD) models, social support from each of the distinct sources moderated the effects of PSS on MDD and GAD, respectively. Essentially, among individuals with high levels of stress, greater levels of perceived social support from each source were protective against MDD and GAD.

PTSD symptoms. The results of the regression analyses revealed that for PTSD symptoms, the effect of the social support and stress product terms each were not statistically significant. Table 4.4 presents the results from the regression series. These results suggest

that the effects of perceived stress on PTSD symptoms did not depend on the level of support from any of the five distinct sources of social support.

MDD symptoms. For MDD symptoms, the regression analyses revealed that the interactions between perceived stress (PSS) and each of the distinct sources of social support were statistically significant. Therefore, the relationship between PSS and MDD symptoms is contingent on social support from each of the five distinct sources. Table 4.4 presents the results from the regression series. The negative coefficient for the interaction terms indicated that as the five sources of social support increase, the effect of perceived stress on MDD symptoms decreases.

To understand the nature of the interaction, a probe of the interaction effects for high (1 standard deviation above the mean) and low (1 standard deviation below the mean) levels of the moderator was conducted. The probe revealed that with high levels of PSS, those with high levels of social support reported significantly fewer symptoms of MDD compared to those with low levels of social support. Moreover, with high PSS, those with high levels of support from a special person (SP) and from military leaders (ML) reported the lowest levels of MDD symptoms. The results of the probe are presented in Table 4.5. The interaction at the high and low (probed) levels of the moderators (sources of social support) and independent variable (PSS) for MDD symptoms are presented in Figure 4.2.

In summary, social support from each of the five sources moderated the PSS→MDD relationship. A probe into the simple effects revealed that with higher levels of stress, social support protected against MDD symptoms, and the protective effect was most pronounced for those with high levels of social support from a special person and from military leaders. These results highlight the importance of social support in protecting against MDD symptoms during times of high stress. High levels of social support were most protective during high levels of stress. During high levels of stress, social support from the special person and military leaders were among the more protective sources of social support.

GAD symptoms. For GAD symptoms, the regression analyses revealed that the effect for each of the five sources of social support and the stress product terms were all statistically significant. That is, social support from each of the five sources moderated the PSS→GAD relationship. Table 4.4 presents the results from the regression series. Similar to MDD symptoms, the effects of perceived stress on GAD symptoms depended on the level of social support from military peers, military leaders, non-military friends, family members, and a special person. The negative coefficient for the interaction terms indicated that as the sources of social support increase, the effect of perceived stress on GAD symptoms decreases.

A probe of the interaction effects for high (1 standard deviation above the mean) and low (1 standard deviation below the mean) levels of the moderator revealed that with high levels of PSS, those with high levels of social support reported fewer symptoms of GAD compared to those with low levels of social support. Moreover, with high PSS, those with high levels of support from military leaders (ML) reported the lowest levels of GAD symptoms. The results of the probe are presented in Table 4.5. The interaction at the high and low (probed) levels of the moderators (sources of social support) and independent variable (PSS) for GAD symptoms are presented in Figure 4.3.

In summary, social support from each of the five sources moderated the PSS→GAD relationship. A probe into the simple effects revealed that with higher levels of stress, social support protected against GAD symptoms, and the protective effects were most pronounced in those with high levels of social support from military leaders. These results highlight the importance of social support protecting against GAD symptoms. High levels of social support were most protective during high levels of stress. During high levels of stress, social support from military leaders was among the more protective sources of social support.

Table 4.1
Demographic Characteristics of Participants

Characteristic	Percent
Age Group	
18-20	2.3% (<i>n</i> = 10)
21-25	32.7% (<i>n</i> = 141)
26-30	31.2% (<i>n</i> = 135)
31-40	28.0% (<i>n</i> = 121)
41+	5.7% (<i>n</i> = 24)
Sex	
Male	76.8% (<i>n</i> = 331)
Female	23.2% (<i>n</i> = 100)
Ethnicity	
Hispanic	10.9% (<i>n</i> = 47)
Non-Hispanic	89.1% (<i>n</i> = 384)
Race	
White	80.1% (<i>n</i> = 345)
Black	6.7% (<i>n</i> = 29)
Asian	3.7% (<i>n</i> = 16)
Native American	.9% (<i>n</i> = 4)
Multiracial	5.1% (<i>n</i> = 22)
Other	3.5% (<i>n</i> = 15)
Marital Status	
Single	28.5% (<i>n</i> = 123)
In a relationship	9.0% (<i>n</i> = 39)
Married	59.4% (<i>n</i> = 256)
Widowed	.2% (<i>n</i> = 1)
Divorced	2.3% (<i>n</i> = 10)
Separated	.5% (<i>n</i> = 2)
Children	
Yes	54.3% (<i>n</i> = 234)
No	45.7% (<i>n</i> = 197)
Highest level of Education	
High school or GED	32.7% (<i>n</i> = 141)
Some College	31.3% (<i>n</i> = 135)
Technical School	7.0% (<i>n</i> = 30)
Associate Degree	9.3% (<i>n</i> = 40)
Bachelors Degree	16.9% (<i>n</i> = 73)
Masters Degree or higher	2.8% (<i>n</i> = 12)
Status	
Enlisted	82.4% (<i>n</i> = 355)
Officer	11.1% (<i>n</i> = 48)
Missing/Other	6.5% (<i>n</i> = 28)
Pay Grades (Ranks)	
E-3 (Lance Corporal) and below	25.1% (<i>n</i> = 108)
E-4 (Corporal) - E-5 (Sergeant)	31.3% (<i>n</i> = 135)
E-6 (Staff Sergeant) and above	26.0% (<i>n</i> = 112)
Officer	11.1% (<i>n</i> = 48)
Missing/other	6.5% (<i>n</i> = 28)

Table 4.1, continued
Demographic Characteristics of Participants

Characteristic	Percent
Been to Combat	
Yes	49.2% (<i>n</i> = 212)
No	50.8% (<i>n</i> = 219)
Been Deployed	
Yes	51.3% (<i>n</i> = 221)
No	48.7% (<i>n</i> = 210)
Combat Locations	
Iraq	16.7% (<i>n</i> = 72)
Afghanistan	7.4% (<i>n</i> = 32)
Both Iraq and Afghanistan	8.6% (<i>n</i> = 37)
Iraq/Afghanistan and other combat	3.5% (<i>n</i> = 15)
Other combat	3.5% (<i>n</i> = 15)
Missing/Not Applicable	60.3% (<i>n</i> = 260)

Table 4.2

Construct validity support: Pearson's correlations for select scales

Scale	PTSD	MDD	GAD	PSS
SSSP				
Pearson's Correlation	-.234	-.257	-.202	-.202
Significance	<.001	<.001	<.001	<.001
N	431	430	431	429
SSFam				
Pearson's Correlation	-.205	-.220	-.192	-.192
Significance	<.001	<.001	<.001	<.001
N	431	430	431	429
SSFrd				
Pearson's Correlation	-.132	-.148	-.147	-.139
Significance	.006	.002	.002	.004
N	431	430	431	429
SSMP				
Pearson's Correlation	-.173	-.224	-.206	-.222
Significance	<.001	<.001	<.001	<.001
N	431	430	431	429
SSML				
Pearson's Correlation	-.220	-.282	-.251	-.303
Significance	<.001	<.001	<.001	<.001
N	431	430	431	429
PSS				
Pearson's Correlation	.741	.727	.745	--
Significance	<.001	<.001	<.001	--
N	429	428	429	--

Note: SSSP = perceived social support from a special person, SSFam = perceived social support from family members, SSFrd = perceived social support from non-military friends, SSMP = perceived social support from military peers, SSML = perceived social support from military leaders, PSS = perceived stress scale, 20 items.

Table 4.3
Latent factor correlations for the five factor CFA model

Factor	SSMP	SSML	SSFrd	SSFam	SSSP
SSMP	--				
SSML	.886	--			
SSFrd	.597	.577	--		
SSFam	.713	.633	.708	--	
SSSP	.705	.614	.662	.901	--

Note: SSMP = perceived social support from military peers, SSML = perceived social support from military leaders, SSFrd = perceived social support from non-military friends, SSFam = perceived social support from family members, SSSP = perceived social support from a special person.

Table 4.4
Results from regression series testing social support sources as moderators

Regression equation	SSMP (B, se)	SSML (B, se)	SSFrd (B, se)	SSFam (B, se)	SSSP (B, se)
PTSD					
PTSD on Stress (a)	.618, .133**	.629, .120**	.675, .131**	.727, .160**	.691, .131**
PTSD on SS (b)	.128, .165	.146, .149	.149, .150	.153, .168	.058, .146
PTSD on PSSxSS (c)	-.003, .006	-.004, .005	-.007, .006	-.008, .006	-.007, .005
MDD					
MDD on PSS (a)	.335, .058**	.327, .049**	.338, .054**	.382, .069**	.395, .054**
MDD on SS (b)	.139, .059*	.141, .053**	.156, .052**	.169, .062**	.169, .051**
MDD on PSSxSS (c)	-.007, .002**	-.007, .002**	-.007, .002**	-.008, .003**	-.009, .002**
GAD					
GAD on PSS (a)	.270, .039**	.275, .035**	.272, .040**	.303, .052**	.264, .041**
GAD on SS (b)	.135, .041**	.160, .037**	.138, .040**	.161, .049**	.119, .043**
GAD on PSSxSS (c)	-.006, .002**	-.006, .001**	-.006, .002**	-.006, .002**	-.005, .001**

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

Note: PSS = Perceived Stress, PTSD = posttraumatic stress disorder symptoms, MDD = major depressive disorder symptoms, GAD = generalized anxiety disorder symptoms, SSSP = perceived social support from a special person, SSFam = perceived social support from family members, SSFrd = perceived social support from non-military friends, SSMP = perceived social support from military peers, SSML = perceived social support from military leaders, SS = social support (for each distinct source), PSSxSS = interaction of PSS and each specific source of SS.

Table 4.5
Probing MDD and GAD interactions

Value of Moderator	SSMP (<i>B, se</i>)	SSML (<i>B, se</i>)	SSFrd (<i>B, se</i>)	SSFam (<i>B, se</i>)	SSSP (<i>B, se</i>)
MDD					
Low (1SD below M)	.243, .023*	.240, .022*	.249, .023*	.258, .024*	.259, .022*
High (1SD above M)	.155, .025*	.141, .025*	.154, .024*	.149, .024*	.132, .024*
GAD					
Low (1SD below M)	.195, .017*	.198, .017*	.200, .017*	.205, .018*	.193, .017*
High (1SD above M)	.124, .019*	.112, .018*	.122, .018*	.119, .018*	.126, .019*

* $p < .01$

Note: MDD = major depressive disorder symptoms, GAD = generalized anxiety disorder symptoms, SSSP = perceived social support from a special person, SSFam = perceived social support from family members, SSFrd = perceived social support from non-military friends, SSMP = perceived social support from military peers, SSML = perceived social support from military leaders.

Figure 4.1
Standardized parameter estimates for CFA Model

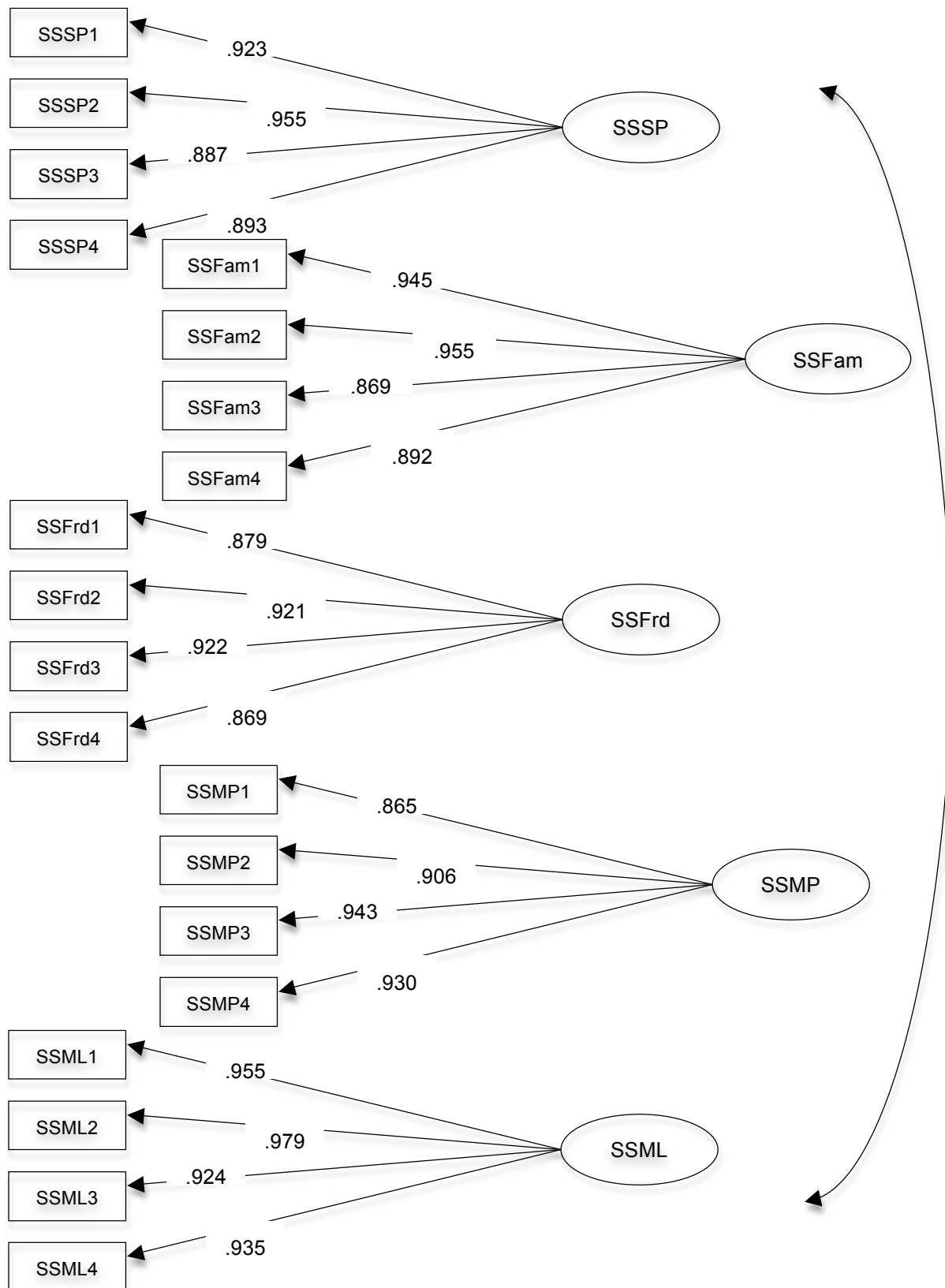
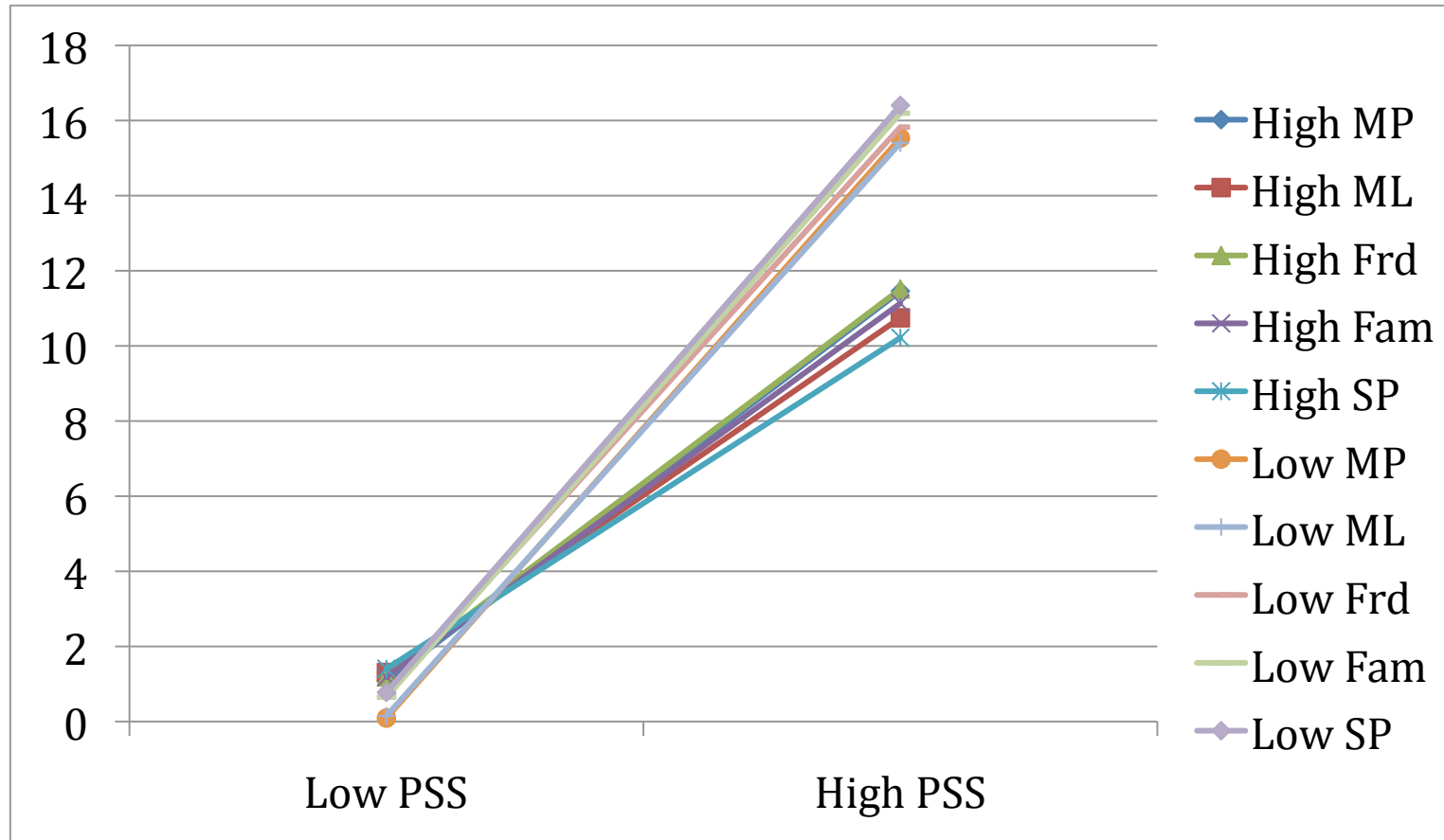


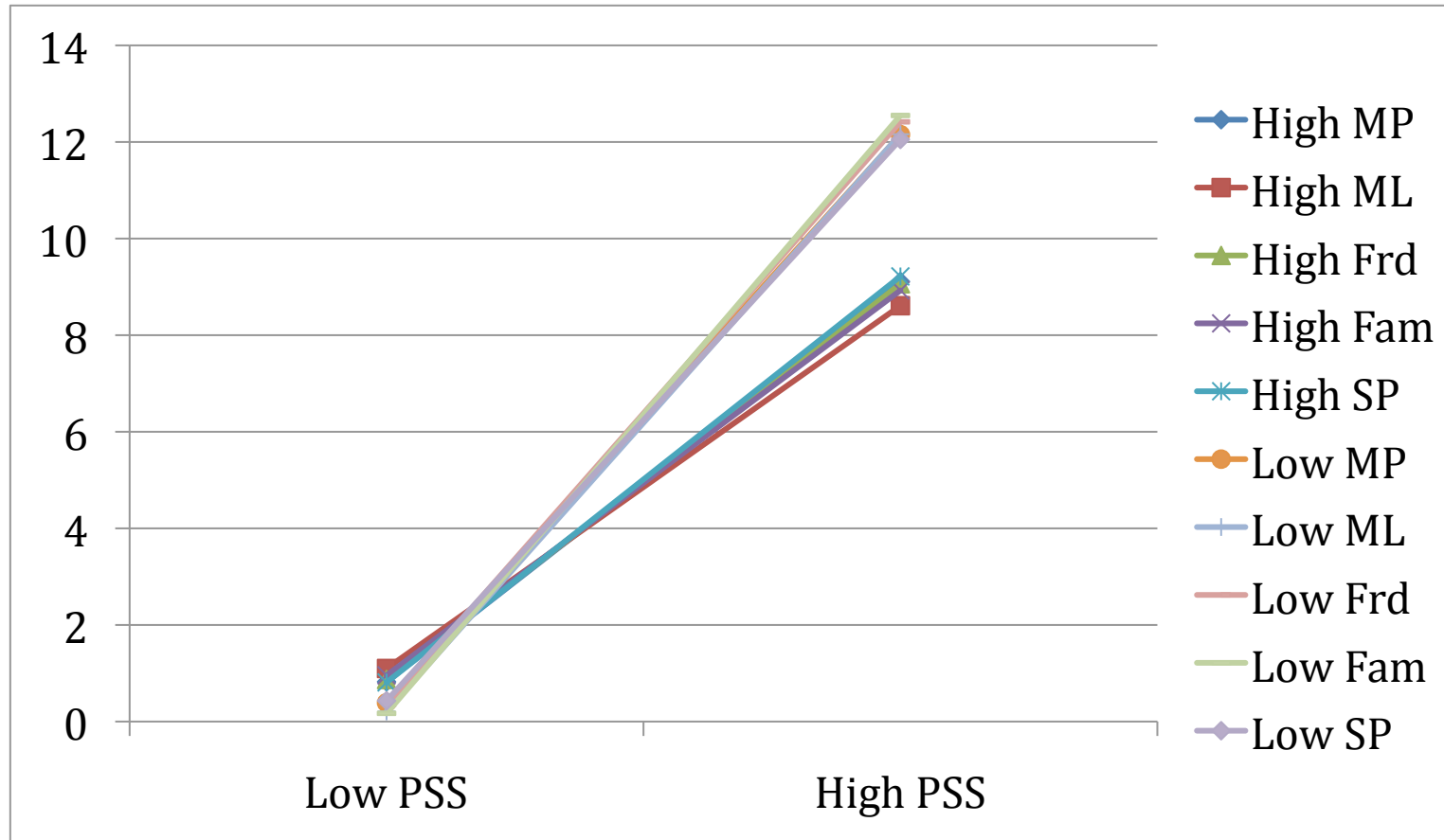
Figure 4.2

Moderation of sources of social support in the PSS-MDD relationship



Note: The Y-axis represents the levels of MDD symptoms. Low/High PSS = Low/High levels of perceived stress, High/Low SP = high/low levels of perceived social support from a special person, High/Low Fam = high/low levels of perceived social support from family members, High/Low Frd = high/low levels of perceived social support from non-military friends, High/Low MP = high/low levels of perceived social support from military peers, High/Low ML = high/low levels of perceived social support from military leaders.

Figure 4.3
Moderation of sources of social support in the PSS-GAD relationship



Note: The Y-axis represents the levels of GAD symptoms. Low/High PSS = Low/High levels of perceived stress, High/Low SP = high/low levels of perceived social support from a special person, High/Low Fam = high/low levels of perceived social support from family members, High/Low Frd = high/low levels of perceived social support from non-military friends, High/Low MP = high/low levels of perceived social support from military peers, High/Low ML = high/low levels of perceived social support from military leaders.

CHAPTER 5

DISCUSSION & IMPLICATIONS

The current sample of active duty U.S. Marines reported a low to moderate degree of PTSD, anxiety, and depression symptoms, and current perceived stress. Additionally, the active duty U.S. Marines reported high levels of perceived social support from five distinct sources, with perceived support from a special person as the highest, followed by support from family members, military peers, non-military friends, and military leaders. Despite Marines reporting the lowest levels of perceived support from military leaders, the support from military leaders was found to be an important source of support that can protect against MDD and GAD during high levels of stress. Support from a special person and from military leaders were the more protective sources of support.

Principal Findings

Differentiating sources of social support. Social support has long been conceptualized as an important factor that protects against stress and adverse mental health outcomes. However, few studies have assessed the protective impact of social support from distinct sources, rather than social support as a general construct or overall support. Research Question 1 examined whether or not the participants differentiated between distinct sources of social support. It was hypothesized that the participants would differentiate between five distinct groups of social support: a special person, non-military friends, family members, military peers, and military leaders. Similar to past research (Laffaye, et al., 2008; Wilcox, 2010), and as hypothesized, the current study found that this sample of Marines differentiated between these distinct sources of support.

The current findings suggest that when assessing social support, particularly among military service members, it is appropriate to differentiate between the various distinct sources

of social support. Previous research (Laffaye, et al., 2008; Wilcox, 2010) has found that certain sources of social support can be more protective than others. Specifically, support from military peers, family members, and a special person have been found to be more protective than support from (non-military) friends (Wilcox, 2010). Assessing the perception of support from the distinct sources of social support can direct researchers where to more effectively intervene. That is, the sources of social support that are most protective provide potential leverage points for intervention development.

Protective factors. While general social support has been studied for decades as a protective factor (Cassel, 1976; Cohen, 2004; Cohen, et al., 1997; Cohen & Wills, 1985; Lazarus & Folkman, 1984), this study examined the potential protective effects of specific sources of social support that have been previously differentiated among service members (Laffaye, et al., 2008; Wilcox, 2010) on multiple mental health outcomes, and expanded upon the results of Research Question 1. Research Question 2 examined which of the distinct sources of social support were protective. Although this question was exploratory in nature, it was hypothesized that the sources of support would moderate the relationship between perceived stress and mental health symptoms, and that some sources of social support would be more protective than other sources. The moderation models tested the impact of perceived stress levels on reported mental health symptoms with each of the sources of support present as a function of perceived level of support from distinct sources. The presence of an interaction indicated that the sources of social support were potentially protective, or buffered the relationship, depending on the nature of the interaction (Aiken & West, 1991).

Contrary to expectations, perceptions of support from distinct sources of support did not significantly moderate the relationship between perceived levels of stress and PTSD symptoms. Although the correlations between PTSD symptoms and each of the distinct sources of social support suggest a strong inverse relationship, the direct paths from social support to PTSD symptoms did not indicate significant predictive relationship. That is, despite strong inverse

relationships, social support was not predictive of PTSD symptoms, regardless of the level of stress.

Consistent with expectations and previous research (Cohen & Wills, 1985), there were significant interactions between perceptions of support from distinct sources and the stress→MDD and stress→GAD relationships. The results indicated that for MDD and GAD symptoms, the impact of stress on the development of MDD and GAD may be different depending on the level of perceived social support from the distinct sources. The results from the moderation models suggest that to help prevent or reduce MDD and GAD symptoms among active duty service members, it is important to increase and maintain high levels of perceived social support from the five sources of social support examined in this study, particularly support from military leaders and a special person. Specifically, during high levels of stress, lower levels of support were associated with greater mental health symptoms, whereas higher levels of support were associated with fewer mental health symptoms. The detrimental effect of perceived stress on MDD and GAD symptoms depended on the extent of perceived social support from each of the five distinct sources. These findings suggest that higher levels of perceived social support from these sources are important resources and protective factors; as social support increased, MDD and GAD symptoms decreased. Conversely, lower levels of social support from these sources were risk factors for MDD and GAD symptoms, particularly during high stress.

Discussion & Recommendations

The stress-buffering model posits that when stressed, the presence of social support is protective against mental health problems (Cassel, 1976; Cohen & Wills, 1985). Moreover, having a match between the support and demands, and assessing perceptions of support, rather than actual support, are important components of the protective relationship. This study underscores the relevance of traditional models of social support among the current generation of service members, but expands upon the traditional models by taking them a step further to

more comprehensively understand the protective components of social support. That is, rather than assessing social support as a general undifferentiated construct that can come from almost any source, it was important to distinguish support from distinct sources and assess the impact of each source.

An interesting finding in this study was that none of the sources of social support moderated the impact of stress on PTSD symptoms. A likely explanation is that there was a mismatch between the demand and the support (Cohen & Wills, 1985). Previous research highlights the importance of having a match between support and the demand. The support from each of the sources examine in this study involved having someone available to provide support, being able to talk about problems, being able to get emotional support, and feeling that others try to help (Dahlem, et al., 1991; Zimet, et al., 1988). These types of support may have been more appropriate to protect against anxiety and depression, but not PTSD, which develops in response to a traumatic event (American Psychiatric Association, 2000). PTSD may require different types of support from specific individuals that can more appropriately address the specific traumatic event. Future research in this area is recommended.

On the other hand, social support from the distinct sources moderated the impact of stress on MDD and GAD symptoms, with the most pronounced effects found in support from military leaders and a special person, who was often a spouse or partner. The special person was the most protective source of support against depression, followed by military leaders. It is not entirely surprising that greater support from a special person would result in fewer depressive symptoms. The relationship between the service member and the special person (i.e., spouse or partner) can predict vulnerability to mental health problems (Sayers, Farrow, Ross, & Oslin, 2009). This is particularly true after deployment, such that developing mental health symptoms can complicate readjustment and reintegrate back into family life, which can lead to further mental health (i.e., depression) symptoms (Sayers, et al., 2009). However, a

more supportive spouse or partner can facilitate more effective reintegration and can lead to fewer depressive symptoms in the service member (Baptist et al., 2011).

Involving the special person in the service member's mental health treatment provides a more positive and comprehensive approach that can be beneficial to both the service member and the special person (Park, 2011). Recent research indicates that most service members would prefer to have their significant other involved in their mental health treatment (Batten et al., 2009). Such interventions could facilitate more supportive marital relationships, which could then help promote treatment utilization and success (Meis, Barry, Kehle, Erbes, & Polusny, 2010). Involving a special person in the service member's mental health treatment can also help the special person be more aware of symptoms related to the mental health problem and to become more supportive to the service member.

Support and encouragement from a special person can be an essential component of mental health treatment. Research has demonstrated the effectiveness of indirect persuasion, in which an individual (i.e., the service member) is encouraged to engage in a particular behavior (i.e., get treatment for depression) (Clark-Hitt, Smith, & Broderick, 2011). Thus, prompts from a special person (i.e., spouse or partner) to seek treatment are often related to more positive perceptions regarding treatment seeking (Vogel, Wade, Wester, Larson, & Hackler, 2007) and reduced mental health symptoms. Individuals who are perceived as trusted and honest are more likely to have success in helping the service member seek treatment (Clark-Hitt, et al., 2011). Both the special person and military leaders are likely to be sources that are perceived as trustworthy and honest, and may have greater persuasive influence, which can indirectly help reduce mental health symptoms.

Support from military leaders was the most protective source of support against anxiety, and was the second most important source of support against depression. It is not entirely surprising that the military-specific sources of support were the more protective sources of support. Military leaders have an important role in influencing the health and well-being of unit

members. Support from military sources are the most numerous, important, valued, and sought out sources of support (Laffaye, et al., 2008). Military-specific sources of support, who have shared experiences and understand the unique military culture, can facilitate a genuine understanding of the need of the service members, which can increase perceptions of support from these sources of support (Cohen & McKay, 1984; Currie, Day, & Kelloway, 2011).

The protective impact of military leadership may also occur indirectly through other pathways. Military leadership has been found to influence other factors related to mental health outcomes, including stigma and seeking care for mental health problems. Britt and colleagues (2006) found that more positive perceptions of unit leadership were associated with low levels of stigma and barriers to care associated with seeking help. Wright and colleagues (2009) assessed the impact of military leadership on stigma and barriers to care in a sample of 680 Army Soldiers who were three-months post-combat in Iraq. The study found that those with more positive perceptions of military leaders, as well as unit cohesion, were more likely to report lower scores on stigma and barriers to care. Additionally, Bartone (2006) suggested that military leadership can influence resiliency, and thus mental health outcomes. The culture of the Marine Corps depends on unit cohesion, which refers to the ability of Marines to effectively work together in order to successfully accomplish missions. Unit cohesion is a necessity to mitigate operational stress and create combat synergy. These studies highlight the importance of perceptions of military leaders and the relationships among service members within a unit (i.e., unit cohesion) (Pietrzak, Johnson, et al., 2009b).

In order to provide military leaders with information and guidelines on mental health and well-being to enhance the effectiveness of military operations, an exploratory team was created by NATO in April 2003 (Adler et al., 2008). In general, the level of mental health support provided to the unit members varied across the deployment cycle. Although some type of support was generally available to unit members, many leaders reported receiving little or no training related to addressing operational stress issues for unit members. Many of the leaders

felt that stress-related mental health outcomes were normal and reported offering unit members support in seeking help from other sources (Adler, et al., 2008).

In 2007, the Marine Corps started to mandate the Combat and Operation Stress Control (COSC) program (United States Marine Corps, 2007). COSC provides procedures, regulations, and tools to help Marines deal with the stressors associated with military life and duties. Combat and operational stress control is considered to be a responsibility of all Marines. Readiness and unit cohesion of the Marine Corps depends upon the ability of Marines to serve as an effective, and mentally healthy, fighting force. Support provided by military leaders can help strengthen the bonds between military leaders and subordinates who feel their leaders have a personal interest in their wellbeing. These bonds can then strengthen unit cohesion. Additionally, resources for trainings have become sparse and COSC trainings may be limited. The results of this study can help shape combat and operational stress control trainings by focusing on strategies that may have the greatest impact on health and well-being. Specifically, it may be beneficial to train military leaders on how to effectively approach and talk to their Marines about stress and mental health. Although the reported levels of perceived support from military leaders was the lowest, it was associated with the lowest reported levels of mental health symptoms. This suggests that even small amounts of support from military leaders can be very beneficial, and may outweigh support from any other of the sources examined. Thus, focusing on improving support from military leaders is an area of high importance.

Bliese and Halverson (2002) discussed the importance and significance of fostering support from military leaders at the unit level, rather than the individual level, where “unit” refers to a group of individuals in the military who work together. The study suggests that focusing on improving leadership support on a broader scale (i.e., within the unit) is more likely to make the unit resilient during times of high stress (Bliese & Halverson, 2002). Therefore, when developing or revising programs or initiatives that focus on boosting support from military leaders, it may be more practical and efficient to intervene at the group level. Group-level

behaviors are strongly influenced by the social context and may provide a more practical intervention approach.

In the U.S. military, and especially within the U.S. Marine Corps, all Marines are generally considered to be a leader and to have a leader. Additionally, there are ranks within the U.S. military that can help clarify the leadership hierarchies (O'Reilly, Caldwell, Chatman, Lapiz, & Self, 2010), and the military infrastructure can help guide intervention development for the specific tiers of leadership within the unit by providing rank-specific tools. This would also be an interesting area for further investigation. Future research should examine the protective impact from various tiers of military leadership against mental health symptoms.

The general findings of this study are consistent with the findings from Cohen and Wills (1985) in that it is important to have a match between the social resources and the demand, and that greater perceptions of social support can reduce the impact of stress on health. Additionally, consistent with the buffering model, the distinct sources of social support were most protective during high levels of stress.

Limitations

This study utilized a cross sectional design, thus participants were assessed only at one time point. The cross-sectional nature of this study clearly precludes inferences regarding causal structure of the observed associations and limits this study. A notable limitation of using a cross sectional design is difficulty establishing a causal analysis from a lack of identification of time order of effects. In other words, all of the variables were measured only at one time point, thus limiting the ability to determine which variables may have occurred before other variables. The lack of a time dimension limits cross-sectional research to measure *differences* between groups on the dependent variables, rather than *changes* between the groups. However, this study suggested that perceptions of social support, particularly from a special person and from military leaders, may be important factors in refining existing models and interventions for service members aimed to reduce mental health outcomes. In order to obtain a more precise

understanding of the impact of social support as a protective or risk factor in the stress-mental health and/or mental health-stress relationships, it will be necessary to collect data at multiple time points. Future research will benefit from obtaining data prior to deployment, during deployment, immediately after deployment, and 18-24 months after deployment.

Another limitation was that this study was conducted only on active duty U.S. Marines. This limits the generalizability of the findings. Future research should also include other branches of the military, as well as the reserve component of the military. Moreover, this study was based only on self-reported survey data. The participants may not have answered completely honestly to avoid any potential stigma related to stress and mental health symptoms. However, it is important to note that recent research indicates that service members who complete mental health surveys anonymously are more likely to answer honestly, compared to when they have to provide their name and other personally identifying information (Warner et al., 2011). The anonymity associated with the study participants may have encourage participants to answer more honestly.

Some of the service members were also more likely to report greater levels of social desirability and negative affectivity than others. However, both social desirability and negative affectivity were controlled for in all analyses. Additionally, service members may not have completely understood some of the research questions on the survey. To help ensure more reliable and valid data, measures that were previously found to be reliable and valid were used.

A potential limitation was the retrospective recall of stress and mental health problems, and perceptions of social support from the different sources. To address this problem, the participants were asked to recall in a shorter time period (i.e., the past two weeks). However, the shorter time period and lack of longitudinal data may limit some of the previous or more longer term stress and mental health symptoms that may have been experienced and were not present within two weeks of data collection. Again, this highlights the need to collect data from multiple time periods.

Although not a limitation, it should be noted that the levels of mental health symptoms among this sample may seem relatively low. It is important to note that this was not a clinical sample, but rather a sample of functioning active-duty Marines. Moreover, the rates of mental health symptoms in this sample were similar to the averages rates of mental health symptoms for service members. There is a growing recognition that mental health problems do not need to be at a clinically significant level in order to have a negative impact on well-being and functioning (Currie, et al., 2011; Ford et al., 2001). Indeed, the clinical diagnostic criteria for PTSD, MDD, or GAD may be too restrictive to identify all individuals who may need help (Pietrzak, Goldstein, et al., 2009). The negative outcomes from impaired well-being and functioning can lead to burnout, decreases in productivity, and lower levels of readiness (J. S. Tucker, et al., 2005). Thus, despite a lack of clinically significant mental health problems, the reported symptoms in this study can still lead to impairment. Future research should include measures of functional impairment and quality of life in order to gain more insight into the negative impact of mental health symptoms that are below clinical significance.

Conclusions

Supportive social relationships are important to improving and maintaining positive psychological health and well-being. Consistent with the stress buffering model (Cohen, Sherrod, & Clark, 1986), this study found that distinct sources of social support can protect against mental health outcomes during high levels of stress. However, this study differentiated between the protective impact from distinct sources of support, rather than support as a general construct. Furthermore, this study found that some sources are more protective against mental health outcomes, compared to other sources.

Based on the results and discussion, the following conclusions were drawn as they apply to similar samples (i.e., other service members) as the one studied herein:

1. Military service members differentiate between the following distinct sources of social support: military peers, military leaders, non-military friends, family members, and a special person.
2. All of the distinct sources of social support studied moderated the relationship between stress and mental health outcomes (particularly for symptoms of MDD and GAD, but not for PTSD symptoms).
3. Some sources of social support are more protective against mental health outcomes than others (e.g., military leaders and a special person).

Perceptions of social support are very powerful and can have significant effects on health and well-being. In fact, a recent study found that in the year 2000, approximately 162,000 deaths were attributable to low social support, which is comparable to death from lung cancer (Galea, Tracy, Hoggatt, DiMaggio, & Karpati, 2011). In order to provide appropriate support, however, it is necessary to break down social support into distinct components that can be realistically integrated into mental health promoting interventions. All of these findings emphasize the importance of maintaining strong and positive social relationships, and the potentially detrimental impact associated with low levels of social support, particularly during times of high stress.

At the Navy-Marine Corps Relief Society Ball on April 17, 2010, the former Commandant of the Marine Corps (CMC) spoke about why Marines fight in combat (Kopets, May 7, 2010). In his speech, General James T. Conway said that the reason Marines can and do fight in wars is that, "They do it for their buddies. They do it because they believe that their unit is the baddest unit assigned to that theater of operations. They do it for the Corps. And they do it because they know there's a great country standing behind them." Essentially, an important reason Marines can and do fight in wars, and are mentally able to serve in combat, is that they have a high level of perceived support from various sources – from their peers, from their leaders, from the USMC, and from their country. It is this perceived support that allows them to be able to do

the things they do – to be able to run out in gun fire, to shoot at enemies, to help their wounded buddies, and to continue to do this day after day, month after month, until the mission is accomplished and it is time to go home. Providing Marines with high levels of support and ensuring that Marines perceive support as helpful can be essential to securing their psychological well-being and ensuring that we have a strong fighting force.

Social support should not only be provided after a Marine has developed a mental health problem, but also before the problem develops; as soon as an individual joins the military, and throughout their military career, social support systems and social relationships should be developed, reinforced, and maintained; this may be the most effective method for ensuring social support among service members - start early and maintain the social support.

The USMC needs effective interventions to be put in place immediately and to target the risk and protective factors for mental health problems and suicidal behaviors. Military service members cannot wait years for research to be conducted, and for interventions to be tested and evaluated; they need help now. The existing programs and interventions may not be effective or well utilized, given the increasing rates of suicides and mental health problems. This study provided preliminary evidence on specific sources of support that are protective against mental health problems among military service members so that interventions can be developed or revised to appropriately target these sources of support. This study identified military leaders and a special person as specific sources of social support that may be most influential. These protective sources of support should be targeted throughout the service member's career – from enlistment to separation.

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APPENDIX A

HUMAN SUBJECTS CONSIDERATIONS

Human Subjects Considerations

Measures to minimize the risks and discomforts to participants. To minimize the risks and discomforts to participants, all participants were informed of the purpose of the study and the anonymity associated with their responses. Participants were fully aware that they could refuse to answer any questions at any time.

All active duty marines over the age of 18 were eligible to participate in this study. Mental health diagnoses were not a part of this study, nor was suicidal ideation or other suicidal information assessed in this study. Participation was anonymous, and thus it was not possible to track or otherwise follow-up with participants. However, as a safeguard, participants were given information about available local and national, and military and non-military counseling and mental health resources that could be accessed if needed.

Potential direct benefits to study participants. A potential direct benefit to study participants was having an opportunity to assess their psychological well-being and social resources, which may lead to increased awareness of any potential problems that might need to be addressed through the resources available to them. A potential indirect benefit was a positive feeling knowing that the completion of the questionnaire will ultimately potentially benefit military personnel.

Potential benefits to society or humankind. The potential benefit of this study to society was having a better understanding of factors that may influence the psychological well-being of military personnel. It may also direct future studies and provide insight for interventions to promote well-being among this population.

Quality control. Quality control procedures were implemented to monitor the quality and consistency of data collection. Quality control for data collection included verifying data

entry procedures and allowing study data to be entered only by the investigator, who followed standardized data entry procedures. To maintain privacy of completed questionnaires, all questionnaires were stored in a locked data file.

APPENDIX B
SURVEY SCREEN SHOTS

Instructions: Please answer the following questions.

*** 1. Are you an active-duty Marine 18 years of age or older?**

Yes

Other (please specify)

2. What is your SEX?

Male

Female

3. What YEAR were you BORN?

4. What is your MARITAL status?

Single

In a relationship

Married

Widowed

Divorced

Separated

5. Do you have children?

Yes

No

6. Please specify your ETHNICITY.

Hispanic or Latino

Not Hispanic or Latino

7. Please specify your RACE.

- White
- Black
- Asian
- Native American or Other Pacific Islander
- American Indian or Alaska Native
- Multi-Racial
- Other

8. Check your HIGHEST level of education.

- High school graduate or GED
- Some College
- Technical School
- Associate Degree
- Bachelors Degree
- Masters degree or higher

9. What YEAR did you JOIN the military?**10. What is your RANK/GRADE in the military?****11. Please indicate your MOS or job title:****12. Have you been deployed?**

- No
- Yes

If yes, please specify

13. Have you been to a combat zone?

No

Yes

If yes, please specify

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

1. Indicate how you feel about each statement.

	VERY STRONGLY DISAGREE	Strongly Disagree	Mildly Disagree	NEUTRAL	Mildly Agree	Strongly Agree	VERY STRONGLY AGREE
There is a special person who is around when I am in need.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a special person with whom I can share my joys and sorrows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My family really tries to help me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get the emotional help and support I need from my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a special person who is a real source of comfort to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My non-military friends really try to help me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can count on my non-military friends when things go wrong.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk about my problems with my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have non-military friends with whom I can share my joys and sorrows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a special person in my life who cares about my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My family is willing to help me make decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk about my problems with my non-military friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk about my problems with my military peers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My military peers care about my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My military peers really try to help me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get the emotional help and support I need from my military peers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk about my problems with my military leaders.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Military leaders really try to help me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Military leaders care about my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Military leaders are willing to help me make decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Who is the "special person" in your life (from the questions above)?

(Example: spouse/significant other, girlfriend/boyfriend, best friend)

Instructions: Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is True or False as it pertains to you personally.

1. Read each item and decide whether the statement is True or False as it pertains to you personally.

	TRUE	FALSE
It is sometimes hard for me to go on with my work, if I am not encouraged.	<input type="radio"/>	<input type="radio"/>
I sometimes feel resentful when I don't get my way.	<input type="radio"/>	<input type="radio"/>
On a few occasions, I have given up doing something because I thought too little of my ability.	<input type="radio"/>	<input type="radio"/>
There have been times when I felt like rebelling against people in authority even though I knew they were right.	<input type="radio"/>	<input type="radio"/>
No matter who I'm talking to, I'm always a good listener.	<input type="radio"/>	<input type="radio"/>
There have been occasions when I took advantage of someone.	<input type="radio"/>	<input type="radio"/>
I'm always willing to admit it when I make a mistake.	<input type="radio"/>	<input type="radio"/>
I sometimes try to get even rather than forgive and forget.	<input type="radio"/>	<input type="radio"/>
I am always courteous, even to people who are disagreeable.	<input type="radio"/>	<input type="radio"/>
I have never been irked when people expressed ideas very different from my own.	<input type="radio"/>	<input type="radio"/>
There have been times when I was quite jealous of the good fortune of others.	<input type="radio"/>	<input type="radio"/>
I am sometimes irritated by people who ask favors of me.	<input type="radio"/>	<input type="radio"/>
I have never deliberately said something that hurt someone's feelings.	<input type="radio"/>	<input type="radio"/>

Instructions: Below is a list of problems and complaints that veterans sometimes have in response to stressful military experiences. Please read each one carefully, then check one of the circles to the right to indicate how much you have been bothered by that problem in the past 2 weeks.

1. Please read each one carefully, then check one of the circles to the right to indicate how much you have been bothered by that problem in the past 2 weeks.

	NOT AT ALL	A Little Bit	MODERATELY	Quite A Bit	EXTREMELY
Repeated, disturbing memories, thoughts, or images of a stressful military experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Repeated, disturbing dreams of a stressful military experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suddenly acting or feeling as if a stressful military experience were happening again (as if you were reliving it).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling very upset when something reminded you of a stressful military experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having physical reactions (heart pounding, trouble breathing, sweating) when something reminded you of a stressful military experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding thinking about or talking about a stressful military experience or avoiding having feelings related to it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding activities or situations because they reminded you of a stressful military experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble remembering important parts of a stressful military experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of interest in activities that you used to enjoy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling distant or cut off from other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling emotionally numb or being unable to have loving feelings for those close to you.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling as if your future will somehow be cut short.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble falling or staying asleep.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling irritable or having angry outbursts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having difficulty concentrating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being "super alert" or watchful or on guard.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling jumpy or easily startled.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Instructions: Over the last 2 weeks, how often have you been bothered by any of the following problems? Read each item carefully, and check your response.

1. Over the last 2 weeks, how often have you been bothered by any of the following problems? Read each item carefully, and check your response.

	NOT AT ALL	Several days	More than half the days	NEARLY EVERY DAY
Little interest or pleasure in doing things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling down, depressed, or hopeless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble falling or staying asleep, or sleeping too much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling tired or having little energy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor appetite or overeating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling bad about yourself, feeling that you are a failure, or feeling that you have let yourself or your family down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble concentrating on things, such as reading the newspaper or watching television.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts that you would be better off dead or that you want to hurt yourself in some way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. If you checked off any of the problems, how difficult have these problems made it for you to do your work, take care of things, or get along with other people?

- Not difficult at all
- Somewhat difficult
- Very difficult
- Extremely difficult

Instructions: Over the last 2 weeks, how often have you been bothered by any of the following problems? Read each item carefully, and check your response.

1. Instructions: Over the last 2 weeks, how often have you been bothered by any of the following problems? Read each item carefully, and check your response.

	NOT AT ALL	Several days	More than half the days	NEARLY EVERY DAY
Feeling nervous, anxious, or on edge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not being able to stop or control worrying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about different things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble relaxing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that it is hard to sit still.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid as if something awful might happen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. If you checked off any of the problems, how difficult have these problems made it for you to do your work, take care of things, or get along with other people?

- Not difficult at all
- Somewhat difficult
- Very difficult
- Extremely difficult

Instructions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past few weeks. Use the following scale to check your answers.

1. This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past few weeks. Use the following scale to record your answers.

1 = Very slightly or not at all

2 = A little

3 = Moderately

4 = Quite a bit

5 = Extremely

Example:

Happy = 4

Interested	<input type="text"/>
Irritable	<input type="text"/>
Distressed	<input type="text"/>
Alert	<input type="text"/>
Excited	<input type="text"/>
Ashamed	<input type="text"/>
Upset	<input type="text"/>
Inspired	<input type="text"/>
Guilty	<input type="text"/>
Nervous	<input type="text"/>
Scared	<input type="text"/>
Determine	<input type="text"/>
Hostile	<input type="text"/>
Attentive	<input type="text"/>
Enthusiastic	<input type="text"/>
Jittery	<input type="text"/>
Proud	<input type="text"/>
Afraid	<input type="text"/>

Instructions: The questions in this scale ask you about your feelings and thoughts during the last two weeks. In each case, you will be asked to indicate by checking how often you felt or thought a certain way.

1. The questions in this scale ask you about your feelings and thoughts during the last two weeks. In each case, you will be asked to indicate by checking how often you felt or thought a certain way.

Never

Almost Never

Sometimes

Fairly Often

Very Often

	NEVER	Almost Never	SOMETIMES	Fairly Often	VERY OFTEN
In the last 2 weeks, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt nervous and "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you been angered because of things that were outside of your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you been upset because you felt that you have a lack of privacy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt that you have a harassing commander?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt upset because of love quarrels?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you been angered because of unfairness you experienced in the military?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt embarrassed because of something you experienced in the military?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you felt upset because of sickness or injury related to the military?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last 2 weeks, how often have you been angered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

because of extra tasks related to the military?

In the last 2 weeks, how often have you been upset because of military related deployments?

In the last 2 weeks, how often have you found that you have missed your family because of military-related separation?

In the last 2 weeks, how often have you found that you have missed your lover because of military-related separation?

*Actual website content varies slightly due to formatting, only study measures shown here