

ROLE OF COPING AND FAMILY RELATIONSHIPS IN
ADAPTATION OF POST-DEPLOYMENT MARINES

By

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To my dear uncle, Wayne M. Haddad, whose passion for serving the Marines as a Navy Chaplain not only inspired this work, but also made it a reality

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LIST OF ABBREVIATIONS

ASR	Achenbach Adult Self Report
COSR	Combat operational stress reaction
DRRI	Deployment Risk and Resilience Inventory
FES	Family Environment Scale
OIF	Operation Iraqi Freedom (i.e., war in Iraq)
OEF	Operation Enduring Freedom (i.e., war in Afghanistan)
PTG	Posttraumatic growth
PTGI	Posttraumatic Growth Inventory
PTSD	Posttraumatic stress disorder

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The psychological needs of U.S. military service members and families have been well established; however, the research demonstrating the specific needs is incomplete. Coping strategies, family environments, and mental health were examined in 152 post-deployment Marines. To help promote a comprehensive conceptualization of both the positive and negative impacts of combat-operational deployment stress on mental health, posttraumatic growth was also examined.

The factor structure of the Brief COPE suggested three clusters of coping strategies used by Marines: *problem-focused coping*, *support-seeking coping*, and *avoidant coping*. Furthermore, relations between coping and mental health, as measured by Achenbach Adult Self Report, were examined. Avoidant coping was significantly related to mental health problems. In addition, avoidant coping was found to weaken relations between combat-operational deployment stress and mental health problems, suggesting that avoidance may actually serve somewhat as a protective factor for Marines who have experienced high levels of combat-operational deployment stress.

Posttraumatic growth was unrelated to degree of combat exposure, perceived threat during deployment, or time since deployment. However, PTG was significantly negatively related to mental health problems, regardless of the amount of combat operational deployment stress reported, suggesting that correlates of PTG in active duty personnel are different than previous studies indicated. Finally, family relationships were negatively related to mental health problems, such that more positive family relationships were associated with fewer mental health problems in Marines. Overall, findings suggest that researchers and clinicians need to carefully consider the extent of avoidant coping and family relationships in understanding and treatment the active duty service member. Furthermore, promotion of posttraumatic growth may be considered a tool to help Marines reintegrate into their families and communities, regardless of extent of combat exposure.

CHAPTER 1 LITERATURE REVIEW

Combat and Mental Health

Since the start of the Global War on Terror (GWOT) in 2001, over 1.8 million service members have been deployed in support of Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF). In the last few years, concern for military personnel and families has extended from the American public, to mental health professionals, to the Department of Defense, and to the U.S. Capitol. The growing concern is underscored by recent congressional legislation allocating large sums of money for mental health research and treatment of service members and their families. The American Psychological Association (APA) has developed several task forces to examine psychological needs of service members and their families, and the Center for Deployment Psychology (funded by the Department of Defense) trains both military and civilian psychologists in the deployment-related needs of families. In just a few years, resources for military families have grown to include a myriad of books, informational websites, support blogs, and organizations dedicated to serving those who serve. Unfortunately, concern for the psychological needs of military personnel and families seems to have grown faster than the science identifying the specific needs of service members and their families, the family dynamics involved with adjustment to combat deployments, and the most effective interventions. In addition, research has often been disease-focused, rather than strength-based. Although psychological diagnoses, such as posttraumatic stress disorder (PTSD), assist clinicians and researchers by providing a common language with which to conceptualize and treat mental health problems, diagnoses may or may not be helpful for patients. For example, a diagnosis may help

an individual or his family understand their experiences, but for others, a diagnosis may create a sense of helplessness or shame. Undoubtedly, the needs of the military population would be more fully served by also understanding the strengths or resilience factors that buffer the potential impacts of war on service members and their families. Maintaining a strength-based approach to prevention and intervention programs would be culturally sensitive (i.e., the independent, problem-solving culture of the military) and likely more accepted by population than an approach that focused on deficits.

The psychological effects of war have been well-documented. The label for these effects has changed, but the symptoms remained basically the same (Sadock & Sadock, 2003; p.628). In the Civil War, it was called “irritable heart” and was characterized by fatigue, shortness of breath, heart palpitations, headache, excessive sweating, dizziness, and disturbed sleep. World War I referred to “Effort Syndrome” or “Shell shock” and added difficulty concentrating as a symptom. World War II saw a rise of the term “Combat stress reaction,” which included all the above symptoms plus forgetfulness. During the Vietnam War, the term “Posttraumatic Stress Disorder” (PTSD) was created and continues to be used today.

Empirical research has demonstrated a connection between combat and a variety of long-term mental health, social, and occupational effects (Kulka, et al., 1990). Recently, attempts have been made to investigate the current experiences of service members during and after wartime deployments, in order to aid in early intervention and treatment of problems that may occur following deployments. In particular, the Office of the U.S. Army Surgeon General has established the Mental Health Advisory Team (MHAT) to assess the experiences of Army soldiers in theater (combat zone, such as

Iraq or Afghanistan). Even on non-combat deployments, service members face physical and environmental stressors, such as extreme temperatures, poor living conditions, loss of sleep, and insufficient supplies. When combat experiences are included, additional stressors are endured: (a) being attacked or ambushed; (b) seeing/handling dead bodies or human remains; (c) knowing/seeing someone seriously injured or killed; (d) receiving incoming artillery, rocket, or mortar fire, etc. (MHAT-V, 2008). Chronic, less dramatic deployment concerns identified by over 40% of deployed soldiers and Marines include the following: (a) being separated from family; (b) lack of privacy or personal space; (c) Boring and repetitive work, (d) Uncertain redeployment date; (e) Lack of personal time off; and (f) long deployment length (MHAT-V, 2008).

In 2003, the Department of Defense began requiring that service members complete a Post Deployment Health Assessment (PDHA) to examine each service member's health, including mental health, deployment exposures, and deployment related health concerns. The PDHA is a three page self-report instrument with approximately one half page of mental health questions. Researchers at Walter Reed Army Institute of Research (Hoge et al., 2004; Hoge, Auchterlonie, & Milliken, 2006; Milliken, Auchterlonie, & Hoge, 2007) have utilized these post-deployment screenings of soldiers and Marines returning from OEF, OIF, and other deployments to determine the relationship between combat deployment and mental health care access during the first year after deployment. Findings from PDHA examination posit that 19% of soldiers (n = 1320) and Marines (n = 447) screen positive for a mental health "concern" immediately after combat deployment (Hoge et al., 2006). PTSD was assessed with a 4-item screener developed by the National Center for PTSD (Primary Care-PTSD or PC-

PTSD; Prins, Ouimette, Kimerling, et al., 2004), and prevalence rates of screening positive (endorsing ≥ 2 items) were 10% for OIF, 5% for OEF, and 2% for other locations. Amount of combat exposure was related to a servicemember's screening positive, especially for acute stress symptoms. In addition, theater of operation (i.e., Iraq or Afghanistan) was related to a positive screen, such that combat-exposed service members returning from Iraq were more likely to experience acute stress symptoms than service members returning from Afghanistan because of the differences in the warzone experiences.

A follow up study examined the Post-Deployment Health Reassessment (PDHRA - a questionnaire mandated by the Assistant Secretary of Defense for Health Affairs 3-4 months post-deployment), and found that PTSD positive screening rates among National Guard and Active Duty service members doubled from immediate post-deployment to 3-4 months after return (Milliken, Auchterlonie, & Hoge, 2007). Likewise, a longitudinal study of physically wounded soldiers at Walter Reed Army Medical Center showed increased PTSD rates at months 4 and 7, as compared to month 1 (Grieger et al., 2006). This emphasizes both the possible underestimation of PTSD, as well as the likelihood of delayed onset of PTSD during the months of readjustment following deployment. It is imperative for clinicians to remain cognizant of these suggested trends, although such trends make it difficult to estimate the actual prevalence of PTSD.

The best estimates of mental health disorders following exposure to combat come from a review detailing studies about the prevalence of PTSD, depression, and traumatic brain injury (TBI) among returning service members (Ramchand et al., 2008). The authors estimated from published articles that between 5 and 15 percent of

returning service members have or will develop PTSD. However, the authors also discussed several methodological limitations. First, most studies reviewed had limited generalizability to the entire military because of exclusion of many of the service members with poorer outcomes, who would have been medically evacuated or discharged. In addition, many studies focused heavily on service members in combat-related military occupational specialties (MOS), a focus which would neglect the many individuals who were deployed to combat theaters but were not in combat positions. Thus, the accuracy of estimates of PTSD in the general population of service members is difficult to estimate. Furthermore, although many studies used a well-validated measure of PTSD, such as the PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993), other studies used screening measures to estimate PTSD, and these screening measures have not been psychometrically evaluated. Regardless, most studies had strengths and have allowed a base from which to develop further research about the incidence of psychological diagnoses (Ramchand et al., 2008).

Although the use of diagnoses helps health care professionals communicate about and treat constellations of symptoms that typically co-occur, focusing on diagnoses may actually limit a clinician's understanding of the far reaching impacts of combat. It is important to note that PTSD is not synonymous with post-combat reactions (combat operational stress reactions), which are considered typical reactions to extraordinary stressors. Instead, the term Combat Operational Stress Reaction (COSR) is the standard, but not yet official, term across the Services to describe the range of normal and abnormal reactions to the stressors of deployment and war (Moore & Reger, 2006). Such impacts may span biological, psychological, interpersonal, and spiritual aspects of

a service member's life. COSR prevention/intervention efforts, such as the Army's Combat Stress Control multidisciplinary teams, are in place and provide mental health care to service members in theater.

Given the broad impacts of war, and the literature's focus on diagnosable disorders, more research is needed using broad, standardized, psychometrically valid measures of mental health. In addition, focusing on a range of problems, rather than diagnosable disorders, provides a more complete picture of post-war experiences of service members. This study used a standardized, psychometrically valid measure to examine the mental health of active duty service members.

Adaptation to Trauma

In the early years of psychology, it was assumed that any servicemember with a mental health problem had a personality defect or pre-existing weakness. However, after DSM-III defined posttraumatic stress disorder, post-combat difficulties were assumed to occur solely because of exposure to trauma or combat. In addition, certain aspects of trauma exposure, such as intensity and duration, have been demonstrated to impact mental health and overall functioning. However, research has also demonstrated that exposure to trauma is not entirely responsible for subsequent PTSD (King, King, Gudanowski, & Vreven, 1995). Instead, DSM-IV-TR recognizes the necessary interplay between the objective stressor and the subjective experience or *reaction* to the stressor. It is well documented that people not only differ in the extent to which they experience distress, but also the degree to which they will report subjective distress following experience of an objective stressor. For example, in a sample of men who had experienced combat, only 34% described responding to the combat with intense fear, helplessness, or horror (Breslau & Kessler, 2001), a DSM-IV criteria for PTSD.

In addition to characteristics and perceptions of the trauma that are important for subsequent adaptation, research has demonstrated the importance of pre-trauma and post-trauma factors in understanding posttraumatic adaptation. A meta-analysis of risk factors for PTSD found that female gender, low SES, childhood abuse, post trauma stress, and lack of social support contribute to a multicausal view of mental health problems following trauma exposure (Brewin, Andrews, & Valentine, 2000). When considering the post-deployment social support, it is obvious that the family would have a significant and dynamic role in the post-deployment environment of returning service members. Despite recognition of the importance of supporting families throughout the cycle of deployment, research has not yet evaluated the role of the family environment in service members' adaptation. The current study examined the protective role of family relationships in Marines' adaptation to combat trauma.

Coping and Trauma

Experts on coping strategies have divided coping strategies on various dimensions. One example of the categorization of coping strategies is problem-focused or emotion-focused coping. Here, problem-focused coping attempts to resolve the stressor and includes behaviors such as making plans, seeking information, and seeking instrumental support (Folkman, Lazarus, Gruen, & DeLongis, 1986). On the other hand, emotion-focused coping centers on managing emotions resulting from the stressor and includes strategies such as venting, emotional disengagement, and seeking emotional support (Folkman et al., 1986). Other coping experts have conceptualized coping on an approach/ avoidance coping continuum (Snyder & Pulvers, 2001). Approach coping is focused on the stressor and managing one's reaction to it, while avoidant coping focuses on avoiding the stressor or one's response to it.

Examples of approach coping include seeking support and planning, while avoidant coping includes withdrawal, denial, and disengagement. A recent meta-analysis further divided coping strategies by integrating the two conceptualizations (Littleton, Horsley, John, & Nelson, 2007) to examine problem/behavioral approach coping (i.e., planning, information seeking), emotion/cognitive approach coping (i.e., seeking emotional support, restructuring cognitions), problem/behavioral avoidant coping (i.e., disengaging from trying to resolve stressor, withdrawal), and emotion/cognitive avoidant coping (i.e., denial).

In their meta-analysis, Littleton and colleagues (2007) evaluated the relationship between approach and avoidant coping and distress following trauma, particularly interpersonal violence and severe injury. The authors also evaluated the moderating effect of type and duration of trauma on the relationship between coping and distress. Overall, results suggested a significant association between overall avoidant coping and distress, with no difference between problem/behavioral avoidant coping and emotion/cognitive avoidant coping. Additionally, no overall association was found between approach coping and distress. It is notable, however, that the relationship between approach coping and less distress was stronger within studies that included trauma of longer duration, a finding that has direct relevance for the current study, because combat exposure is generally of long duration.

In a study examining coping patterns among Vietnam combat veterans, findings suggested that some coping strategies (such as event processing, reflection, religion, and denial) were associated with symptomatology (Wolfe, Keane, Kaloupek, Mora, & Wine, 1993). In their intervention study, recovery from combat trauma was associated

with the process of reconnecting to others (Wolfe et al., 1993), and this conclusion is consistent with other research (Brewin et al., 2000) emphasizing the importance of social support as protective factor against long-term psychopathology following exposure to trauma.

Another study examining readjustment of Vietnam combat veterans who were not treatment-seeking suggested that nonavoidant (i.e., direct, problem-focused) coping was much more common in well-adjusted veterans. In the same study, nonavoidant coping predicted current adjustment better than exposure to combat (Wolfe et al., 1993). In Gulf War veterans, avoidance and passive coping were common and were associated with and predicted PTSD (Benotsch et al., 2000; Stein et al., 2005). Despite the utility of research on coping and adjustment in Vietnam and Gulf War combat veterans, the vast differences between veterans from other conflicts and OIF/ OEF veterans require studies about coping and mental health that address today's veterans. This study examined how service members describe their coping and examined the relations among combat-operational deployment stress, post-deployment coping, and current mental health.

Posttraumatic Growth

A recent trend in the study of adaptation after trauma is the notion that people may experience enhanced functioning following the trauma. Tedeschi and Calhoun (2004) define posttraumatic growth (PTG) as a positive psychological change experienced following the struggle with highly challenging circumstances. Also known as benefit-finding (Tomich & Helgeson, 2004), PTG has been studied mainly in response to chronic illness and bereavement (Linley & Joseph, 2004).

PTG has been associated with a number of psychosocial variables, such as greater perceived threat of the trauma, certain aspects of personality, and coping strategies, such as problem-focused coping, acceptance, and positive religious coping (Linley & Joseph, 2004). In the review, rumination, avoidance, and intrusions were also found to be associated with growth, suggesting the importance of cognitive processing following the post-trauma devastated world views (Janoff-Bulman, 1992). The review also noted inconsistent findings between time since event and PTG, suggesting that further research needs to be done in this area. Finally, from inconsistent relations between growth and distress, Linley and Joseph (2004) concluded that they are not merely opposite ends of one continuum, but instead are separate independent experiences.

Apart from three combat-related studies reviewed by Linley and Joseph (2004), two additional studies that examined PTG following combat-related experiences were located. The first study examined PTG in a sample of Gulf War veterans (N = 61) and found that PTG was related to variables such as military status, perceived threat during deployment, and post-deployment social support (Maguen, Vogt, King, King, & Litz, 2006). The other study examined PTG in a sample of Vietnam POWs. PTG was associated with length of captivity, time since capture, and optimism, but not psychopathology (Feder et al., 2008). To advance our understanding of this phenomenon, the current study examined PTG in OIF/OEF veterans to explore associations between PTG and variables such as perceived threat, objective threat of combat exposure, mental health problems, and time since deployment.

Research Questions and Hypotheses

The first aim of this study was to examine a second-order factor structure of a measure of coping strategies reported by active duty Marines.

Hypothesis 1: Coping strategies, as measured by the Brief COPE, would load onto three hypothesized factors: emotion/cognitive approach coping, problem/behavioral approach coping, and avoidant coping. Specifically, Use of Emotional Support, Positive Reframing, Religion, and Acceptance were expected to cluster together onto a factor of emotion/cognitive approach coping. Subscales of Active Coping, Use of Instrumental Support, and Planning would cluster together as problem/behavioral approach coping. Subscales of Self-Distraction, Denial, Self-Blame, and Behavioral disengagement were also hypothesized to cluster together on a factor of avoidant coping.

The second aim of this study was to examine relations between Marines' trauma exposure (combat-operational deployment stress) and mental health symptoms and to assess the moderating impact of coping on that relationship.

Hypothesis 2.1: Marines' use of avoidant coping would be positively related, while use of approach coping would be negatively related, to mental health problems, as measured by the Achenbach Adult Self-Report (ASR) *Total Problems scale*.

Hypothesis 2.2: Avoidant coping would moderate the relationship between combat-operational deployment stress, as measured by the Deployment Risk and Resilience Inventory (DRRI) subscales *Combat Exposure*, *Deployment Concerns*, and *Post-Battle Experiences*, and mental health problems, as measured by the ASR *Total Problems scale*. It was hypothesized that higher reported avoidant coping would strengthen the association between combat-operational deployment stress and mental health problems.

Hypothesis 2.3: Approach coping would moderate the relationship between combat-operational deployment stress, as measured by the Deployment Risk and Resilience Inventory (DRRI) subscales *Combat Exposure*, *Deployment Concerns*, and *Post-Battle Experiences*, and mental health problems, as measured by the ASR *Total Problems scale*. It was hypothesized that higher reported approach coping would weaken the association between combat-operational deployment stress and mental health problems.

The third aim was to examine the extent to which trauma exposure is related to personal growth following deployment.

Hypothesis 3: It was hypothesized that reported subjective threat (DRRI *Deployment Concerns*) and objective threat during deployment (DRRI *Combat Experiences* and *Post-Battle Experiences*) would be positively associated with posttraumatic growth (PTG), as measured by the Posttraumatic Growth Inventory (PTGI).

The fourth aim of this study was to assess the relations between family relationships and mental health and to determine the moderating impact of family relationships on the relations between Marines' combat-operational deployment stress and mental health symptoms.

Hypothesis 4.1: It was hypothesized that married Marines would report fewer mental health problems than nonmarried Marines.

Hypothesis 4.2: It was hypothesized that the Relationship Dimension of the Family Environment Scale (FES), measured by *Cohesion*, *Expressiveness*, and *Conflict* (reverse-scored), will be negatively associated with total mental health problems.

Hypothesis 4.3: It was hypothesized that family relationships would moderate the relations between combat-operational deployment stress exposure and mental health

problems. In other words, more positive family relationships would weaken the association between combat-operational stress and mental health problems, as measured by the ASR *Total Problems scale*.

CHAPTER 2 METHOD AND PROCEDURES

Participants

Participants were volunteers from an active duty Marine battalion located in Parris Island, South Carolina. All Marines in the battalion—both enlisted and officer personnel—were invited to participate in a battalion-wide assessment of mental health and resilience. The battalion is composed of approximately 335 Marines, ranging in age from 18 to 50 and in rank from Private First Class to Colonel. The battalion is approximately 96% male. The study includes 152 enlisted, male Marines. Although 196 Marines in the battalion-wide study completed the informed consent process (59% participation rate), only 175 Marines returned their questionnaires. Furthermore, 4 were excluded from the current study because they were female and 5 were excluded because they were officers. Of the remaining 166 enlisted males, 1 was excluded from all analyses because his response pattern was invalid. Two Marines were excluded because their ages and total time served were statistical outliers (i.e., greater than 3 standard deviations above the mean). Eleven participants who had never been deployed were also excluded from subsequent analysis. No significant differences were found between these 11 never-deployed Marines and the Marines retained for this study on variables of age, mental health problems, and coping strategies. Table 2-1 reports demographic characteristics of participants (N = 152).

Of the participants (N = 152; age: $M = 24.33$, $SD = 2.21$) retained for analyses, self-reported racial/ethnic background was comparable to the general Active Duty population: Caucasian (71%), African American (11%), Hispanic (13%), Asian American (1%) and Other (4%). As expected in a sample of enlisted Marines, 80% reported high

school as their highest level of education, 19% reported some college, and 1% reported college or beyond. In addition, 69% reported being married, 21% reported being single, and 9% reported being divorced or separated.

Of the 92 participants who reported having children, 60% had 1 child, 30% had 2 children, 9% had 3 children and 1% had 4 children. The majority of the 139 children live with the participant (91%). Of the children who currently live with the study participants, 87% are 5 years of age or younger, 10% are 6-12 years of age, and 2% are 13 years of age or older.

The participants' total time in active duty ranged from 1 to 13 years ($M = 5.39$, $SD = 1.68$). Although each Marine included in this study reported at least one deployment during his career (at least 1 deployment ever), Marines reported being deployed up to 3 times in the 4 years prior to this study (range 0-3, $M = 1.83$, $SD = 0.78$), with total time deployed ranging up to 23 months of the previous 48 months ($M = 12.09$, $SD = 5.43$). They reported 2 to 58 months ($M = 20.12$, $SD = 12.65$) since returning from their most recent deployment. Most Marines reported their most recent deployment to be to a combat theater: Afghanistan (8%) and Iraq (78%). Other locations for most recent deployments (10%) included Marine Expeditionary Unit deployments (MEU: a naval deployment that spans multiple areas), Korea, and other middle eastern countries.

The Marines who attended the information sessions were generally amenable to participating. Several asked if their commanding officers would have access to their answers or if the information obtained would be going into their medical records. Following assurance about confidentiality, most expressed satisfaction and chose to participate. As one Marine submitted completed questionnaires, he commented that he

had “never been honest on these things” in the past but was open in his answers for the study. Following participation, other Marines expressed gratitude for the researcher’s interest in their well-being and described additional factors that they thought impacted their adjustment, such as their spouses’ understanding of deployment circumstances. In the days following the data collection, the battalion chaplain reported an increase in people requesting some counseling related to matters of family adjustment and spirituality. This increase in support-seeking suggests that completing study questionnaires facilitated self-assessment or self-awareness in some Marines.

Table 2-1. Demographic characteristics (N = 152)

Characteristic	%	M	SD	Min	Max
Age ^a		24.33	2.21	20	32
Time Active Duty (in years)		5.39	1.68	1	13
Education					
% High School	80				
% Some College	19				
% College or Beyond	1				
Ethnicity/Race					
% Caucasian	71				
% African American	11				
% Hispanic	13				
% Asian	1				
% Other	4				
Marital Status					
% Single	21				
% Married	69				
% Divorced/Separated	9				
% Unknown	1				

^a Based on n = 144

Design

A correlational, cross-sectional design was used to examine the impact of coping and family relationships on relations between combat operational deployment stress exposure and mental health of Marines. The same design was also used to examine

relations between combat operational deployment stress exposure and posttraumatic growth.

Measures

The measures were selected with consideration both for administration time and psychometric strength, particularly test-retest reliability and construct validity.

Psychometric support for each measure is described below.

Demographic and Background Information

Demographic Questionnaire. This questionnaire provides descriptive information about the Marine including sex, age, race/ethnicity, education, and factors related to military service, such as total years in active duty, and rank (enlisted or officer).

Information about previous deployments was also obtained (length and locations of each deployment in the last four years). The demographic questionnaire can be found in Appendix A.

Combat-Operational Deployment Stress

Deployment Risk and Resilience Inventory (DRRI; King, King, & Vogt, 2003). This research inventory is a collection of measures of 14 constructs related to deployment stress. All measures were derived using a rigorous psychometric approach to scale construction. Three scales from the DRRI were used in this study based on theoretical relevance to the study questions and their strong psychometric properties with samples of Gulf War and OIF veterans. This study included *Deployment Concerns*, *Combat Experiences* (as revised in Vogt, Proctor, King, King, & Vasterling, 2008), and *Post-Battle Experiences* (also revised as a Likert scale). Each scale comprises 15 items. Internal consistencies for the scales range from .85 to .89 (King et al., 2003) in a sample of Gulf War veterans and from .78 to .94 in this study. Research supports the validity of

the measures as they relate to health outcomes and has demonstrated the DRRI's ability to discriminate between combat and noncombat veteran subgroups (Vogt et al., 2008). Evidence of criterion-related validity with a population of OIF veterans is strong (Vogt et al., 2008). Two participants (#64 and #76) were excluded from analyses involving DRRI due to complete missing DRRI data. Furthermore, because of multiple missing items, two participants (#29 and #182) *Deployment Concerns* scores were excluded and two participants (#10 and #82) *Combat Experiences* scores were excluded.

Coping

Brief COPE (Carver, 1997). The Brief COPE is a 28-item self-report scale that measures multiple domains of coping in response to general stress or a specific stressor. Items are rated on a 4-point Likert scale (Not at all, A little bit, A medium amount, A lot). Because of possible risk to participants, questions regarding drug/alcohol use were replaced with questions about exercise and relaxation, but these items were not used in this study. Dimensions of coping used in this study included Use of Emotional Support, Positive Reframing, Acceptance, Religion, Active Coping, Use of Instrumental Support, Planning, Denial, Self-Blame, Self-Distraction, and Behavioral Disengagement. Each scale is created by summing its two items. Psychometric data suggested good internal consistency for the above scales (Cronbach's alpha ranged from .60 - .83 in this study), with the exception of Acceptance and Self-Distraction (Cronbach's alpha of .53 and .35, respectively). However, the items from these subscales were still included in composites because they were highly correlated with the other items. Research has also shown the Brief COPE to demonstrate a factor structure similar to the full length COPE (Carver, Scheier, & Weintraub, 1989; Carver,

1997) with evidence of validity. Two participants' (#201 and #83) Brief COPE responses were excluded from analyses because they were fully or partially incomplete.

Family Relationships

Family Environment Scale – Short Form (FES; Moos & Moos, 1994). The FES is a self-report measure of the social climate of families that has been widely used for clinical and research purposes. It consists of 90 true-false items, resulting in 10 subscales within three domains. This study used the Relationship domain (Cohesion, Expressiveness, Conflict), measured with 27 items. Approximately half of the items were reverse coded to indicate positive family functioning. The FES has normative data from over 1400 families. Cronbach's alpha for the Relationship domain was .77 in this study. The FES has demonstrated evidence of test-retest reliability, construct validity, and discriminant validity (Moos & Moos, 1994). It has also demonstrated negative relations to life stress in a sample of Navy families (Eastman, Archer, & Ball, 1990). One participant's responses (#81) were excluded from analyses because responses were half complete.

Mental Health

Adult Self Report for Ages 18-59 (ASR; Achenbach & Rescorla, 2003). The ASR is a 123-item self-report measure of adult emotional and behavioral problems. Each item is rated on a three-point scale from (0) *not true*, to (2) *very true* or *often true*. Item scores are summed into empirically derived narrow- and broad-band scale scores. To eliminate possible risk associated with participation, five questions were excluded: #6 I use drugs; #92 Does things that may cause trouble with the law; #124-126 regarding tobacco, alcohol, and drug use. This study used the Total Problems Scale, which is the sum of all items, with the exception of 11 items measuring socially desirable behaviors

(#2, 4, 15, 49, 73, 80, 88, 98, 106, 109, 123). Item ratings may also be used to derive scores corresponding to DSM-IV diagnoses. In this study, internal consistency for the Total Problems Scale was 0.95.

Posttraumatic Growth

Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). The PTGI is a 21-item self report measure that measures positive changes following a difficult event (adversarial growth) using a 6-point scale. The PTGI has been reported to show overall alpha reliability of .90 and 2-month test-retest reliability of .71 (Tedeschi & Calhoun, 1996). It has been used to examine change following a variety of traumas, but showed excellent alpha consistency (.96) in a sample veterans previously deployed to the Persian Gulf (Maguen, Vogt, King, King, & Litz, 2006). In this study, the PTGI Total Score was used and demonstrated Cronbach's alpha of 0.92.

Procedures

Approval to recruit participants was obtained from the Commanding Officer (CO) of Weapons and Field Training Battalion. Following approval by the University of Florida IRB-01 and the Office of Naval Research, the study was advertised to Marines via the family newsletter and posted bulletins on base. In addition, the PI attended a battalion meeting, described the study, and informed the Marines of the specific location and times that she would be available to further describe the study and consent interested individuals. When Marines came to the designated study location, the voluntary nature of participation was emphasized. To further reduce the possibility of group pressure and to increase anonymity, all Marines who came to the study information sessions received an Informed Consent Form (ICF) and an envelope with questionnaires. After the ICF was explained and questions answered, the Marines were told to write "not interested"

on the ICF if they did not want to participate. They were told to sign and date the ICF if they agree to participate. The ICFs were collected separately from the questionnaires. The PI was available after the meeting or by phone/email to answer questions privately. Marines were given the option to complete the questionnaires in person or to return the envelope to a locked box regardless of their participation, thus increasing anonymity. All Marines who received a packet of questionnaires was given a list of local no/low-cost mental health providers.

CHAPTER 3 RESULTS

Data analysis was conducted using the Statistical Package for the Social Sciences 17.0 (SPSS). Preliminary statistical analyses, descriptive statistics, and specific analyses for each hypothesis are detailed below.

Preliminary Analyses

Demographic data, including age, total time active duty, and total # of deployments in the last four years were examined for outliers using boxplots and z-scores of variables. It was expected that no more than 5% of the z-scores (absolute value) would be greater than 1.96, no more than 1% of z-scores greater than 2.58, and no z-scores greater than 3.29 (Field, 2005). As described in the *Participants* section, two participants were removed from further analysis because their age and total time in active duty were statistical outliers (greater than 3.29 standard deviations above the mean).

To manage missing data, randomly missing item values were replaced with the individual's subscale mean when the number of missing items was less than 10% of the total number of items. On the DRRI, seven items were replaced with mean *Combat Experiences* score, and six items were replaced with *Post-Battle Experiences* score. On the Brief COPE, data replacement was not conducted because each subscale has only two items. As described above, two participants' Brief COPE scores were excluded from analyses because of missing data. One additional participant had a single missing item, which resulted in a missing score for *Behavioral Disengagement* subscale.

On the Family Environment Scale, missing items were also replaced when no more than one item of the subscale was missing. Five items were replaced with the

Cohesion score, and two were replaced with the *Expressiveness* score. On the Posttraumatic Growth Inventory, a total of four item scores were replaced with the individual's mean for the particular subscale of the PTGI.

To ensure univariate normal distribution, descriptive statistics were examined for the DRRRI subscales and composites, Brief COPE subscales and composites, FES *Relationship Index*, ASR *Total Problems*, and PTGI *Total*. The DRRRI Total score was made by summing z-scores of *Combat Experiences*, *Deployment Concerns*, and *Post-Battle Experiences*. Z-scores were necessary because the subscales are measured on different scales. DRRRI Total appeared normally distributed based on visual inspection of histogram and boxplots, as well as non-significant Kolmogorov-Smirnov and Shapiro-Wilk normality tests.

On the subscales of the Deployment Risk and Resilience Inventory, *Deployment Concerns* and *Combat Experiences* appeared normally distributed by visual inspection of histograms and boxplots. Values of skewness and kurtosis did not indicate non-normality, and the Kolmogorov-Smirnov(a) and Shapiro-Wilk tests indicated nonsignificant deviances from normality. *Post Battle Experiences* appeared slightly positively skewed, with three outliers. However, once *Post Battle Experiences* and *Combat Experiences* were combined into a composite of Objective Deployment Threat, the distribution did not have outliers. Because visual inspection suggested that the distribution was positively skewed, square-root transformation was made to Objective Deployment Threat. On the transformed data, values of skewness and kurtosis did not indicate non-normality, and the Kolmogorov-Smirnov(a) and Shapiro-Wilk tests likewise indicated nonsignificant deviances from normality. Finally, the Subjective Deployment

Threat score was equivalent to the *Deployment Concerns* subscale. The histogram and boxplot suggested normal distribution, and values of skewness (z-skewness = 1.86) and kurtosis (z-kurtosis = 0.28) did not indicate non-normality.

Descriptive statistics, histograms, and boxplots of Brief COPE subscales were examined for normality. For subscales of *Active Coping*, *Planning*, *Self Blame*, and *Positive Reframing*, values of skewness and kurtosis were consistent with visual inspection of normality and did not indicate significant deviance from normality.

However, for subscales of *Emotional Support*, *Religion*, *Denial*, and *Behavioral Disengagement*, absolute values of skewness z-scores were greater than 2.58, suggesting significant skewness at $p < .01$. In addition, *Instrumental Support* had a skewness z-score greater than 1.96, suggesting significant skewness at $p < .05$.

Although Kolmogorov-Smirnov and Shapiro-Wilk normality tests were significant for all Brief COPE subscales used, such results were interpreted with caution because of the large sample size (Field, 2005). Because of the restricted range of these non-normally distributed subscales, it was not possible to transform these variables to sufficiently meet assumptions of univariate normality, which is necessary for Confirmatory Factor Analysis (CFA). Hence, hypothesized factors of emotion/cognitive approach coping, avoidant coping and problem/ behavioral approach coping could not be tested statistically with CFA.

Although unable to be confirmed statistically, the a priori constructs were used for Aim 2 because of the theoretical basis on which they were combined. For the construct of avoidant coping, *Self-Distraction*, *Denial*, *Self-Blame*, and *Behavioral Disengagement* were summed. Although Cronbach's alpha was low for the subscale of *Self-Distraction*,

both items were moderately correlated ($r > 0.5$) with the total avoidant coping score. In addition, Cronbach's alpha was higher when the avoidant coping score included the two items originally considered to be part of the *Self-Distraction* scale than when those same items were excluded. Avoidant coping was examined for normality. The histogram, boxplot, and values of skewness and kurtosis indicated nonsignificant deviances from normality.

Approach coping was also created on a theoretical basis: *Use of emotional support*, *Positive reframing*, *Religion*, *Active coping*, *Acceptance*, *Use of instrumental support*, and *Planning* were summed. Although Cronbach's alpha for *Acceptance* was moderate ($\alpha = 0.53$), items were included in approach coping because of their theoretical relation to the construct. Cronbach's alpha was not impacted by inclusion of *Acceptance*. Approach coping was examined for normality. The histogram, boxplot, and values of skewness and kurtosis indicated nonsignificant deviances from normality.

The Relationship Dimension of the Family Environment Scale (FES) was made by summing the *Cohesion*, *Expressiveness*, and *Conflict* and subscales of the married Marines. Some items of each subscale were reverse-coded so that the score was consistent with more positive family relationships. *Conflict* was scored so that higher scores were indicative of lower conflict. Visual inspection of histograms and boxplots demonstrated that the Relationship Index was significantly negatively skewed. To normalize the distribution, a square-root transformation was conducted on the reverse-coded data. To help with interpretability, the data was reverse-coded again, so that higher numbers meant more positive family relationships.

Visual inspection of the ASR Total Problems demonstrated positively skewed distribution. To normalize the distribution, a square-root transformation was conducted on the ASR Total Problems. On the transformed data, values of skewness and kurtosis did not indicate non-normality, and the Kolmogorov-Smirnov(a) and Shapiro-Wilk tests likewise indicated nonsignificant deviances from normality.

Visual inspection of histograms and boxplots of PTGI Total demonstrated slight negatively skewed distribution. The z-score value of skewness (1.98) was at the upper-threshold for acceptability, but the values of kurtosis (0.42) did not indicate non-normality. Transformations of PTGI Total score resulted in significant deviances from normality, so nontransformed data was used for analyses.

Descriptive Statistics

Means, standard deviations, ranges, and Cronbach's alphas for each scale used in this study are detailed in Table 3-1. Presented are the three subscales of the DRRI, including the original dichotomous score and revised frequency score for *Combat Experiences* and *Post-Battle Experiences*, two hypothetical constructs derived from the Brief COPE, the *Total Problems* score of the ASR, and the PTGI Total score.

Main Analyses

Hypothesis 1

For Hypothesis 1, that responses on the Brief COPE will load onto 3 a priori factors, a confirmatory factor analysis (CFA) was unable to be conducted because the distributions of Brief COPE subscales deviated significantly from normality. Because CFA uses statistical inference to test a hypothesized factor structure, univariate normality is a necessary assumption for CFA.

Exploratory Factor Analysis (EFA) is often used to descriptively summarize relationships in a large set of variables; therefore, assumptions regarding univariate normality are not in force (Tabachnick & Fidell, 2007). Its purpose is to find the dimensionality of reliable, common, shared variance (in contrast to PCA which tries to find dimensions that account for all the variance in a dataset). An initial EFA of the 11 Brief COPE subscales (2 items each) was conducted to identify a probable factor structure. Listwise deletion was used to manage data of the 5 participants who did not have complete responses to the Brief COPE. Based on the initial hypothesis, combining theoretical continua of avoidance- approach coping and emotion-problem focused coping, a three-factor solution was anticipated: *Emotion/Cognitive Approach*, *Problem/Behavioral Approach*, and *Avoidance*.

Promax rotation was used to allow for correlated factors. Based on Kaiser's rule, which posits that only components with eigenvalues greater than or equal to 1 should be interpreted, an interpretation of a 3-factor solution was supported. The first factor measures an individual's self-efficacy in managing the problem through both problem-solving and cognitive reframing. The second factor measures the individual's use of support from others, including instrumental support, emotional support, and religion (i.e., support from faith and beliefs). The third factor measures the degree to which the individual avoids managing the stressor or the associated emotions. The pattern of standardized regression coefficients for the three-factor solution is detailed in Table 3-2.

Despite use of Promax rotation to allow for correlations among factors, the factors were minimally related: *problem-focused coping* was positively correlated with *support-*

seeking coping ($r = .36$). *Avoidant coping* was negatively related to *problem-focused coping* ($r = -.12$) and was negligibly related to *support-seeking coping* ($r = .04$).

To assess stability of extracted factors, Cronbach's alpha was calculated for each factor. The subscale with a split loading was included in the factor with the highest loading. *Problem-focused coping* demonstrated internal consistency of .74, *support seeking coping* had Cronbach's alpha = .65, and *avoidant coping* had Cronbach's alpha = .61. Although EFA was not conducted on the individual items of the Brief COPE, Cronbach's alpha improved for each factor when the original item responses were used to calculate it: *Problem-focused coping* ($\alpha = .80$), *support seeking coping* ($\alpha = .79$) *avoidant coping* ($\alpha = .69$).

Because of the exploratory nature of this factor analysis, two- and four-factor solutions were also extracted and examined for interpretability. In the two-factor solution, *active coping*, *planning*, *positive reframing*, *instrumental support*, *emotional support*, *acceptance*, loaded onto the first factor with coefficients greater than .40. *Religion* also loaded onto the first factor with a loading of .38. *Denial*, *behavioral disengagement*, *self-blame*, and *self distraction* loaded onto the second factor. Although Kaiser's rule suggests only three factors be interpreted because eigenvalues of interpreted components should be greater than 1, the fourth factor had an eigenvalue of .954 and was therefore examined. Interestingly, the four-factor solution was very similar to the three-factor solution, with the exception of *Self-Blame*, which loaded by itself onto the fourth factor.

Hypotheses 2.1–2.3

For the second aim of the study, examining relations between Marines' combat trauma exposure and mental health symptoms and the moderating impact of coping,

two hierarchical multiple regressions were conducted. In the first regression, total combat operational deployment stress and time since deployment were entered in Block 1, Approach Coping was entered in Block 2, and the interaction between combat operational deployment stress and approach coping was entered in Block 3. To protect the analysis from multicollinearity, which makes interpretation of b-weights difficult, the residualized interaction term was entered into Block 3. To obtain the residualized interaction term, the product of total combat operational deployment stress and approach coping was computed, then orthogonalized by regressing total combat operational deployment stress and approach coping onto the product and saving the unstandardized residuals. The residual was then entered in Block 3 to test for the interaction.

For the first multiple regression, the model did not predict Total Problems, $R^2 = 0.07$ ($F[4,128] = 2.28, p = .064$). Contrary to the hypothesis that Approach coping and the interaction of Approach Coping and deployment stress would be negatively related to mental health, Blocks 2 and 3 did not explain significantly more variance in Total Problems than the first Block (See Table 3.3). In the second regression predicting mental health problems, total combat operational deployment stress and time since deployment were entered in Block 1, Avoidant Coping was entered in Block 2, and the interaction between combat operational deployment stress and avoidance coping was entered in Block 3. Again, the product-term was orthogonalized by regressing total combat operational deployment stress and avoidant coping onto their product and saving the unstandardized residuals, which were entered in Block 3. Overall, the model significantly predicted Total Problems, $R^2 = 0.319$ ($F[4,127] = 14.90, p < .001$). In this

regression, the addition of Avoidant Coping explained significantly more variance in Total Problems, $\Delta R^2 = .227$ and $\Delta F = 40.61$, $p < .001$. Furthermore, the interaction between Avoidant Coping and Deployment stress explained significantly more variance in Total Problems, $\Delta R^2 = .035$ and $\Delta F = 6.49$, $p = 0.012$. As hypothesized, Avoidant Coping was significantly positively related to total problems; however, the interaction was significantly negatively related to total mental health problems. Thus, contrary to the hypothesis, the relationship between combat operational deployment stress and total mental health problems was stronger for individuals with lower, not higher, avoidant coping. In other words, the relationship between combat operational deployment stress and mental health problems was negative for individuals who reported more avoidant coping. Figure 3-1 demonstrates the somewhat protective nature of avoidant coping on mental health problems. Thus, overall, avoidant coping was positively related to total problems, but when combined with high levels of combat operational deployment stress, the interaction was related to fewer total problems.

Hypothesis 3

For Hypothesis 3, examining relations among combat operational deployment stress and posttraumatic growth, a hierarchical multiple regression was conducted predicting posttraumatic growth. To control for background variables that may be related, Pearson product-moment and point-biserial correlations (for continuous and dichotomous variables, respectively) were calculated between PTG and background/demographic variables of age, marital status, ethnicity, time since last deployment, total deployments in last 4 years, and recent theatre of deployment (i.e. Iraq, Afghanistan, or other), and Total Mental Health Problems. PTG was significantly related to Total Problems ($r = -.22$, $p < .01$). Thus, Total Problems was entered in Block

1. Block 2 included Objective Deployment Threat, made by summing DRRRI subscales *Combat Experiences* and *Post-Battle Experiences*, and Subjective Deployment Threat, measured by DRRRI *Deployment Concerns*. Overall, the model explained significant variance in PTG, $R^2 = 0.11$ ($F[3,130] = 5.80$, $p < .01$). However, only the main effect of Total Problems was significant; neither Objective Threat nor Subjective Threat predicted significant variance in PTG.

Hypotheses 4.1–4.3

For Hypothesis 4.1, that married Marines would report fewer mental health problems than nonmarried Marines, a t-test was performed to compare the means of the ASR Total Problems. The analysis indicated nonsignificant differences [$t(135) = -0.38$] in reported mental health of married Marines ($M = 7.23$, $SD = 1.89$) and single Marines ($M = 7.37$, $SD = 1.74$).

For Hypothesis 4.2, that family relationships will moderate the relations between combat-operational deployment stress and mental health, a hierarchical multiple regression was conducted predicting mental health (ASR Total Problems) of married Marines. The Family Relationship construct was made by scores for each of the three subscales, Cohesion, Expressiveness, and Conflict, with higher scores indicating more positive relationships and lower scores indicating worse functioning. As such, a higher Conflict score meant less family conflict.

Total combat operational deployment stress and time since deployment were entered in Block 1, family relationships was entered in Block 2, and the interaction between combat operational deployment stress and family relationships was entered in Block 3. Again, the product-term was orthogonalized by regressing total combat operational deployment stress and family relationships onto their product and saving the

unstandardized residuals, which were entered in Block 3. Overall, the model significantly predicted Total Problems, $R^2 = 0.225$ ($F[4,85] = 6.18$, $p < .001$). In this regression, the addition of Family Relationships explained significantly more variance in Total Problems, $\Delta R^2 = .151$ and $\Delta F = 16.24$, $p < .001$. The addition of the residualized interaction between Family relationships and combat-operational deployment stress did not explain significantly more variance.

Supplemental Analyses

To better understand relations between combat exposure and mental health problems, Marines were divided into tertiles by their total reported combat operational deployment stress. Figure 3-2 shows the percentage of Marines in the study who endorsed clinically significant elevations of mental health problems. Clinically significant elevations were determined by T-scores of 64 or higher, as recommended by the ASR manual (Achenbach & Rescorla, yr). Based on the distribution of mental health problems in the general population, one would expect approximately 8% of the population to endorse such elevations. It is interesting that there seems to be a dose-response of combat operational deployment stress for Total Problems reported, but the relations between stress and symptoms are not linear for internalizing or externalizing problems.

Figure 3-3 shows the percentage of Marines in the study who endorsed borderline or “at-risk” elevations of mental health problems. At-risk elevations were determined by T-scores between 60 and 63, as recommended by the ASR manual (Achenbach & Rescorla, yr). Based on the distribution of mental health problems in the general population, one would expect approximately 6% of the population to endorse such

elevations. When compared to the Figure 3-1, a different dose-response pattern is observed.

Because of the ways that internalizing and externalizing symptoms may differentially relate to study variables examined, exploratory bivariate correlations were conducted. Table 3-7 lists the correlations. Of note, avoidant coping was significantly related to both externalizing and internalizing problems, while approach coping was significantly related to posttraumatic growth only. In addition, family relationships were related positively to posttraumatic growth. Family relationships were also significantly negatively related to externalizing and internalizing problems, and avoidant coping.

Table 3-1. Means and standard deviations for measures used

Variable	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>Alpha</i>
DRRI^a				
<i>Deployment Concerns</i>	45.34	9.64	19.0 - 66.0	0.78
<i>Combat Experiences</i>				
Frequency-Based	41.27	13.46	15.0 - 75.0	0.93
Original Scale (Yes-No)	10.7	3.56	0.0 - 15.0	0.88
<i>Post Battle Experiences</i>				
Frequency-Based	38.61	13.25	15.0 - 75.0	0.94
Original Scale (Yes-No)	11.4	4.14	0.0 - 15.0	0.92
Brief COPE				
<i>Avoidant Coping</i>	15.98	3.80	8.0 - 27.0	0.69
<i>Approach Coping</i>	34.28	6.70	19.0 - 52.0	0.83
FES <i>Relationship Index</i>	18.56	4.60	3.0 - 26.0	0.77
ASR <i>Total Problems</i>	57.98	27.78	8.0 - 154.0	0.95
PTGI <i>Total</i>	59.6	19.55	0.0 - 102.0	0.92

^aThe original scale used for *Combat Experiences* and *Post-Battle Experiences* was dichotomous. Revisions were made to allow for a greater variability in scores. Both scores are reported for comparison to previous populations.

Table 3-2. Factor loadings based on exploratory factor analysis with Promax rotation for 11 subscales from the Brief COPE

Subscale	Problem-focused	Factor Support seeking	Avoidance
Planning	.73		
Active Coping	.69		
Acceptance	.62		
Positive Reframing	.46		
Emotional Support		.83	
Instrumental Support		.77	
Religion		.35	
Denial			.65
Behavioral Disengagement			.66
Self Distraction	.45		.50
Self Blame			.45

Note: Factor loadings < .3 are suppressed

Table 3-3. Regression of deployment stress, approach coping, and the interaction of stress and coping onto total mental health problems

	B	SE B	β
Block 1			
Constant	7.13	0.30	
Months since deployment	0.01	0.01	.09
Total Deployment Stress	0.17	0.07	.23**
Block 2			
Constant	7.51	.92	
Months since deployment	0.01	0.01	.09
Total Deployment Stress	0.17	0.07	.22*
Approach Coping	-0.01	0.03	-.04
Block 3			
Constant	7.61	0.93	
Months since deployment	0.01	0.01	.08
Total Deployment Stress	0.17	0.07	.22*
Approach Coping	-0.01	0.03	-.04
Deployment Stress X Approach Coping	-0.01	0.01	-.08

Note $R^2 = .06$ for Block 1; $\Delta R^2 = .01$ for Block 2; $\Delta R^2 = .01$ for Block 3.

* $p < .05$, ** $p < .01$. *** $p < .001$

Table 3-4. Regression of deployment stress, avoidant coping, and the interaction of stress and coping onto total mental health problems

	B	SE B	β
Block 1			
Constant	7.09	0.30	
Months since deployment	0.01	0.01	.09
Total Deployment Stress	0.17	0.07	.22*
Block 2			
Constant	3.40	0.64	
Months since deployment	0.00	0.01	.01
Total Deployment Stress	0.11	0.06	.15
Avoidance Coping	0.24	0.04	.49***
Block 3			
Constant	3.18	0.63	
Months since deployment	0.00	0.01	.02
Total Deployment Stress	0.10	0.06	.13
Avoidance Coping	0.26	0.04	.51***
Deployment Stress X Avoidance Coping	-0.04	0.01	-.19*

Note $R^2 = .06$ for Block 1; $\Delta R^2 = .23$ for Block 2; $\Delta R^2 = .04$ for Block 3.

* $p < .05$, ** $p < .01$. *** $p < .001$

Table 3-5. Regression of mental health, objective deployment threat, and subjective deployment threat onto posttraumatic growth

	B	SE B	β
Block 1			
Constant	81.06	6.23	-
Total Problems	-2.79	0.81	.28*
Block 2			
Constant	64.43	11.10	-
Total Problems	-3.14	0.82	.31*
Objective Threat	0.90	1.17	.07
Subjective Threat	0.29	0.17	.15

Note: $R^2 = .08$ for Block 1; $\Delta R^2 = .03$ for Block 2.

* $p < .05$, ** $p < .01$. *** $p < .001$

Table 3-6. Regression of deployment stress, family relationships, and the interaction of stress and family relationships onto total mental health problems

	B	SE B	β
Block 1			
Constant	6.96	0.36	
Months since deployment	0.01	0.02	.06
Total Deployment Stress	0.17	0.08	.22*
Block 2			
Constant	13.02	1.54	
Months since deployment	-0.01	0.01	-.06
Total Deployment Stress	0.15	0.07	.19*
Family Relationships	-1.08	0.27	-.41***
Block 3			
Constant	13.08	1.53	
Months since deployment	-0.01	0.01	-.06
Total Deployment Stress	0.14	0.07	.19
Family Relationships	-1.10	0.27	-.41***
Deployment Stress X Family Rel.	-0.17	0.11	-.15

Note $R^2 = .05$ for Block 1; $\Delta R^2 = .15$ for Block 2; $\Delta R^2 = .02$ for Block 3.

* $p < .05$, ** $p < .01$. *** $p < .001$

Table 3-7. Bivariate correlations among study variables.

	Externalizing Problems	Internalizing Problems	Months Since Deployment	Approach Coping	Avoidant Coping	Combat-operational Deployment Stress	PTGI Total
Externalizing Problems	1						
Internalizing Problems	.545 ***	1					
Months Since Deployment	.168	.035	1				
Approach Coping	-.127	-.021	.060	1			
Avoidant Coping	.361 ***	.500 ***	.185	.117	1		
Combat-Operational Deployment Stress	.220	.127	.025	-.022	.103	1	
PTGI Total	-.184	-.183	-.135	.245 **	-.097	.119	1
Family Relationships	-.321 ***	-.295 ***	-.186	.040	-.286 ***	-.043	.381 ***

* $p < .05$, ** $p < .01$, *** $p < .001$

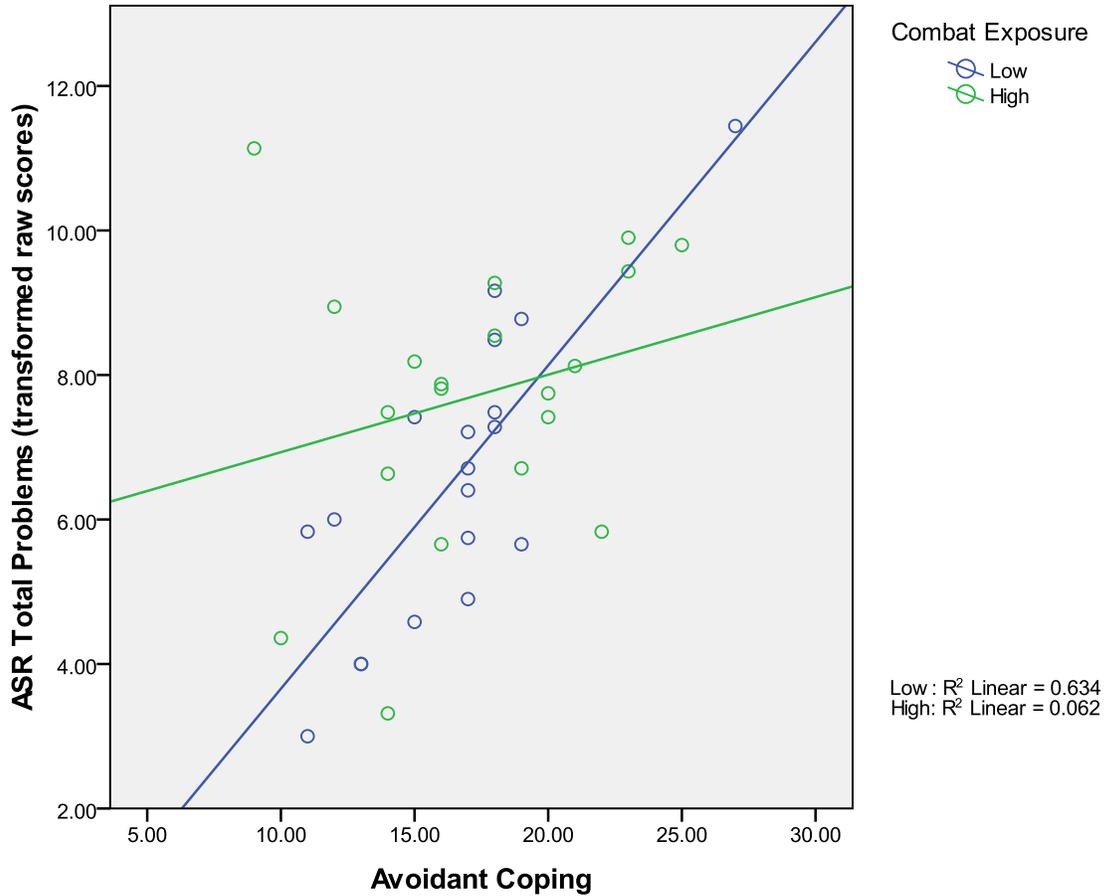


Figure 3-1. Interaction of avoidant coping and combat-operational stress exposure on mental health problems

Note: Low combat-operational deployment stress was determined by scores greater than 1 standard deviation below the mean (N=22) , while high combat-operational deployment stress was determined by scores greater than 1 standard deviation above the mean (N=21).

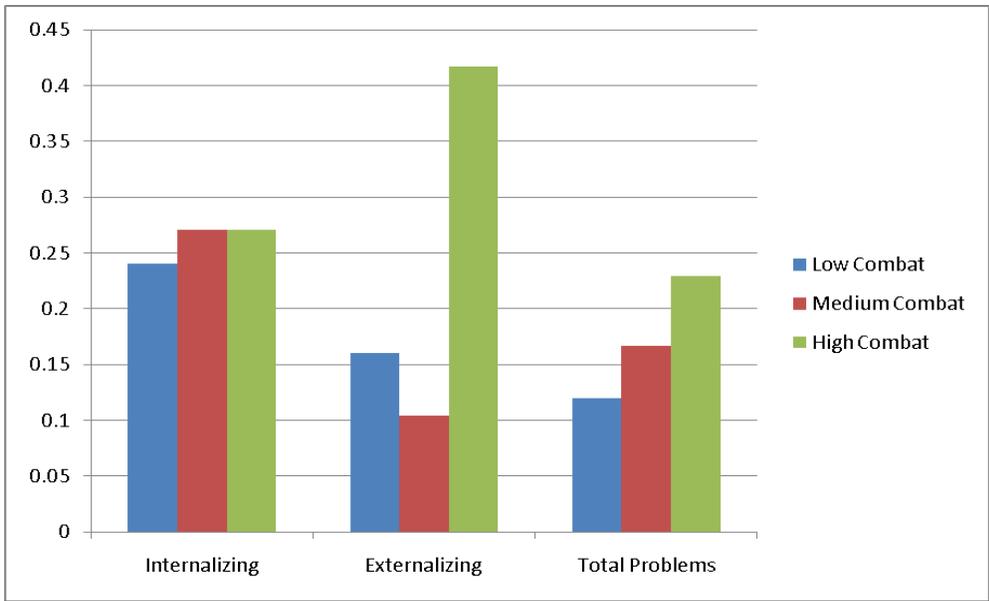


Figure 3-2. Percentage of Marines with clinically significant mental health problems ($T \geq 64$) by total combat exposure.

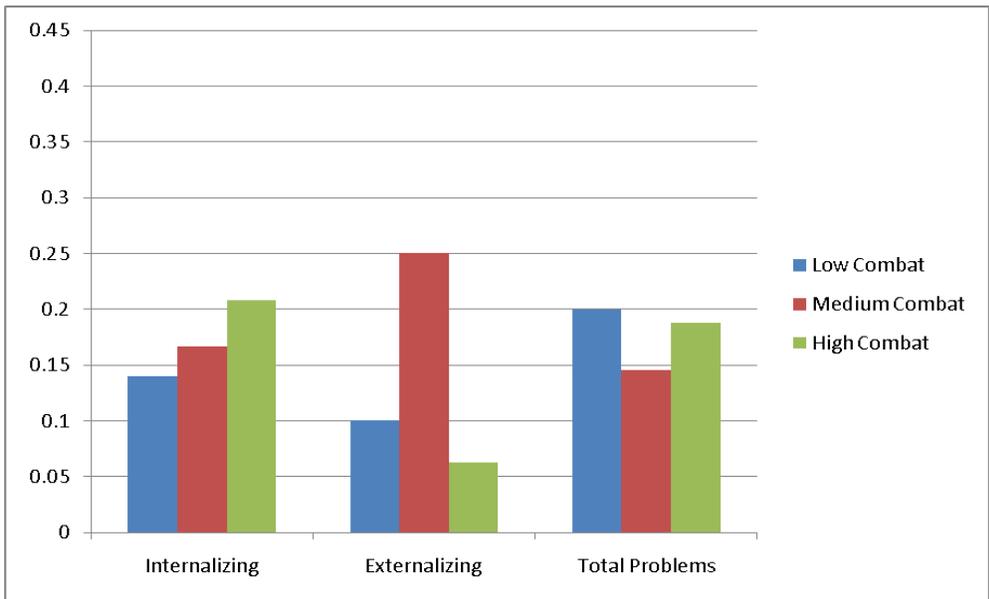


Figure 3-3. Percentage of Marines with borderline clinically significant mental health problems ($T \geq 60$ & $T \leq 63$) by total combat exposure.

CHAPTER 4 DISCUSSION

Summary of Results

The purpose of this study was to determine how Marines' coping and family relationships relate to mental health and influence the relations between combat-operational deployment stress and mental health problems. This study also assessed the posttraumatic growth (or positive outcomes) resulting from deployment of Marines, to examine relations among PTG, combat exposure, and mental health.

The first aim of the study was to explore the factor structure of a measure of coping strategies. The first hypothesis was that Marines' coping strategies would fall into three overarching coping approaches, reflecting a combination of approach and avoidance coping with problem and emotion focused coping (Littleton et al., 2007): emotion/ cognitive approach coping, problem/ behavioral approach coping, and avoidant coping. An exploratory factor analysis of the 11 subscales of the Brief COPE suggested three clusters of coping strategies fairly similar to the hypothesized factors. The first factor clustered together four subscales of the Brief COPE -- Planning, Active Coping, Acceptance, and Positive Reframing -- that seemed to measure a person's self-efficacy in reducing the impact of the stressor through problem-solving, such as planning and cognitive restructuring. This first factor was labeled *problem-focused coping*. The second factor clustered together three subscales -- Religion, Use of Emotional Support, and Use of Instrumental Support -- that appeared to represent *support-seeking coping*. The third factor clustered together the four remaining maladaptive subscales of the Brief COPE -- Denial, Behavioral Disengagement, Self-Distraction, and Self-Blame, which had been hypothesized to cluster together as

avoidant coping. Although three clusters of coping were obtained from the factor analysis, caution is warranted in their interpretation because of the small sample size, which may result in the obtained factors being unstable.

The coping subscales did not cluster precisely as hypothesized; however, the pattern appears conceptually sound. Similar to previous research, Active Coping, Planning, and Positive Reframing clustered together (Carver, 1997). A study of military recruits found that the Acceptance subscale also loaded onto this first factor, although Positive Reframing did not (Cohn & Pakenham, 2008). Consistent with the current study, Use of Emotional Support and Use of Instrumental Support formed a factor in the original COPE and the Brief COPE validation studies (Carver, Scheier, & Weintraub, 1989; Carver, 1997). In the current study, though, these two subscales combined with Religion to form the second factor. Although Religion was less related to support-seeking coping than the other two subscales, it is understandable that it would be related. For example, individuals may use religion to seek support from God or a “higher power,” but they may also use a congregation for instrumental or emotional support. Considering the low endorsement of spirituality/ religiosity of Marines in this study, a significant relation between Religion and support-seeking coping was unexpected and suggests a need for additional research in this area. If additional research finds religion to be an important aspect of Marines’ coping, the implication would be that it would benefit the military to continue to provide access to faith- or spirituality-based supports, such as chaplains.

Although the Brief COPE subscales of Denial, Behavioral Disengagement, Self-Distraction, and Self-Blame grouped together as hypothesized based on theory

categorizing coping strategies as approach or avoidance coping (Littleton et al., 2007), these subscales did not cluster together similarly in other factor analytic studies of the Brief COPE. For example, in a sample of military recruits (i.e. people in early stages of training to be in the military), Denial and Self-Blame loaded onto separate factors without Behavioral Disengagement or Self-Distraction (Cohn & Pakenham, 2008).

The divergence of this study's findings from previous factor analytic findings of the Brief COPE may have resulted from examination of a different population, measurement of a slightly different construct, or from statistical procedures. The sample used to validate the Brief COPE (Carver, 1997) was a sample of hurricane survivors ($N = 168$, 66% female), arguably a population likely to use different coping strategies than Marines. Cohn and Pakenham (2008) studied a population of military recruits, who are demographically more similar to the sample in the current study than the general population. However, the recruits differed in one very important way from the current study population - they had not yet been exposed to combat deployments. Given that the spectrum of posttraumatic symptoms includes dissociative and avoidant behaviors, people who have endured combat may demonstrate a different pattern of coping from people who have not endured combat.

In addition, the Brief COPE can ask about one's general response to stress or it can inquire about one's response to a specific stressor. Given the importance of dispositional versus situational coping in the adaptation to military trauma (Punamäki et al., 2008), this may be an important differentiation. The current study asked the participants to report how they generally deal with stress, leaving the interpretation of "stress" open to the participant. It is possible, therefore, that participants may have

considered different stressors while answering the items. It has been suggested that adaptive coping strategies will depend on the controllability of the stress (Folkman et al., 1986). Thus, the factor structure of the Brief COPE could be dependent upon whether the participant were considering a controllable stressor (such as a family disagreement), a noncontrollable stressor (such as work duties), or an inconsistent combination of the two.

Finally, the factor structure of the Brief COPE may be different depending on the statistical methods used. The study used to validate the Brief COPE (Carver, 1997) conducted an exploratory factor analysis with all items on the measure (first order factor analysis), but the sample was small for such an analysis. Cohn and Pakenham (2008) conducted a second-order factor analysis of the 14 subscales of the Brief COPE, whereas the current study used only 11 subscales because of their theoretical relevance to constructs of interest. In addition, the Cohn and Pakenham study (2008) used both principal components analysis and confirmatory factor analysis on the same dataset – warranting caution in interpretation.

Although the factor structure in the current study diverged from factor structures found in earlier studies, definitive conclusions or interpretations cannot be made because of the exploratory nature of the studies. Thus, future research is needed to standardize and validate the COPE and Brief COPE on a large population of adults, as well as a large military population. Such standardization will be necessary to be able to fully interpret the observed patterns of responses. Any major differences between Marines' coping behaviors and the general population's coping behaviors may have implications for researchers interested in examining coping in service members.

Furthermore, by understanding the relations between service members' coping strategies and post-deployment adaptation, unit leaders and clinicians can promote interventions that include positive coping strategies that are sensitive to the military culture.

The second aim of this study was to examine relations between Marine's combat-operational deployment stress and mental health symptoms. Further, coping was examined to determine its relation to with mental health and to see if it changed the relations between combat operational deployment stress and mental health. Based on previous studies of coping in war veterans (Mikulincer & Solomon, 1989), it was hypothesized that Marines who reported using more approach coping would be less impacted (i.e., have better mental health) by combat operational deployment stress. On the other hand, it was hypothesized that Marines who reported more avoidant coping would be more impacted by combat operational deployment stress, and therefore show worse mental health if they reported high combat exposure. Regardless of their self-reported coping strategies, Marines who reported higher combat-operational deployment stress also reported more mental health symptoms, when time since the most recent deployment was taken into consideration. Contrary to the hypothesis, however, approach coping was not significantly related to mental health symptoms, nor did it change the relationship between combat-operational deployment stress and mental health. This was unexpected because the meta-analysis of coping and trauma demonstrated a stronger association between approach coping and distress for people who experienced traumas of longer duration compared to people who had experienced

trauma of shorter duration, and deployment could be easily considered as such a trauma of longer duration. (Littleton et al., 2007).

On the other hand, Marines who reported using more avoidant coping strategies also reported more mental health problems, as hypothesized. In addition, avoidant coping was found to weaken relations between combat-operational deployment stress and mental health problems. In other words, when Marines reported high levels of avoidant coping and combat operational deployment stress, they reported fewer mental health problem when compared to Marines with low levels of avoidant coping and high levels of combat operational deployment stress. This correlation, although small in magnitude, suggests that avoidance may actually serve as a protective factor for Marines who have experienced high levels of combat-operational deployment stress.

Although this second aim was to determine how coping and combat-operational deployment stress were related to mental health, many additional factors likely contribute to this relationship. It is possible that the observed relations differ in Marines reporting clinically significant mental health problems, and that by using all Marines for the analyses, some of the effects in essence “washed out.” Further, as the significant interaction effect between avoidant coping and combat operation deployment stress suggests, relations may be different for Marines who have experience high versus low combat stress. Although the obtained findings can help us understand patterns of coping and mental health, an epidemiological approach (i.e., use of risk ratios) may help us understand the impact of a given risk factor for post-deployment adaptation. The examination of general mental health problems on a continuum, rather than categorically by DSM-IV diagnosis, was a strength of this study. However, coping may

be differentially related to internalizing and externalizing problems or even subgroups of symptoms. Thus, it may be important for future research to examine relations between coping and specific symptom groupings.

The significant association between avoidant coping and mental health has implications for clinicians and unit leadership. The promotion of healthy coping strategies is important following deployment, but it is also very important to recognize the potential utility of avoidant coping strategies in Marines who have experienced higher levels of combat operational deployment stress than their peers. For clinicians working with service members with PTSD, this finding suggests that some cognitive behavioral therapy or prolonged exposure therapy could be useful and healthy, but elimination of all avoidant coping strategies may result in increased problems. Furthermore, the current study's supplemental analyses suggests that avoidant coping is not equally related to externalizing and internalizing problems, suggesting that additional research needs to empirically examine the amount of avoidant coping to promote or allow within the context of mental health treatment, depending on the presenting problem.

The third aim of this study was to examine posttraumatic growth (PTG). Contrary to the hypotheses, PTG was unrelated to degree of combat exposure, perceived threat during deployment, or time since deployment. In contrast, Marines who reported fewer mental health problems also reported greater positive change resulting from deployment, regardless of the amount of combat operational deployment stress they reported.

Findings from this study contradict previously published results concerning PTG in veterans. Research with personnel returning from conflicts in Iraq or Afghanistan is quite limited, however, and no previous study of PTG included OIF/OEF veterans. In a study of Gulf War veterans, PTG was related to perceived threat during deployment (Maguen et al., 2006). However, the experiences of service personnel in the Gulf War vary greatly when compared to personnel who served in OIF/OEF. Gulf War veterans reported significantly lower scores on *Combat Experiences* ($M = 3.99$, $SD = 3.24$; King, King, Vogt, Knight, & Samper, 2006) than the Marines in this study ($M = 10.7$, $SD = 3.56$). They also reported lower scores on *Post-Battle Experiences* ($M = 5.99$, $SD = 4.11$; King et al., 2006) than Marines in this study ($M = 11.4$, $SD = 4.14$). Interestingly, *Deployment Concerns* reported by Gulf War veterans ($M = 47.37$, $SD = 11.13$) were similar to reports in this study ($M = 45.34$, $SD = 9.64$). Thus, it is plausible that in Gulf War veterans, PTG was related to perceived threat in the absence of high levels of objective threat. Because Marines in the current study reported high levels of objective threat, it is likely that PTG will demonstrate a different course than it did following the Gulf War.

Another finding in this study that diverged from an earlier study of PTG was one conducted with Vietnam POWs in which PTG was related to length of captivity, time since capture, and optimism, but not psychopathology (Feder et al., 2008). The current study found a significant relation between PTG and mental health problems, but not with time since deployment. It is unknown if the divergent findings are due to measurement differences, population differences, or both. For example, the Vietnam POW study examined the relations between PTG and a diagnosis of PTSD, while the current study

assessed mental health problems on a continuum. By assessing a broader range of psychopathology, the current study may have been better able to examine the relation between psychopathology and PTG than studies that only examined one type of symptomatology. Furthermore, the amount of time that had elapsed for PTG to occur was much longer for the Vietnam veterans than for the Marines in the current study, possibly providing a chance for more positive reframing, or necessary cognitive processing. Given that the relation between time and PTG is inconsistent in the literature (Linley & Joseph, 2004), the current study furthers the understanding of the temporal course of PTG. Thus far, issues related to the temporal course of PTG remain unclear.

PTG is recognized as an important part of a comprehensive understanding of the sequelae of trauma, yet much of the literature focuses on adaptation to chronic illness, single trauma, or bereavement (Linley & Joseph, 2004) rather than the adaptation to the multiple combat-related deployments of current conflicts. In a review of empirical studies examining positive changes following trauma and adversity (Linley & Joseph, 2004), only three studies examined growth after combat, and none of those three used a standardized measure of PTG (Schnurr, Rosenberg, & Friedman, 1993; Waysman, Schwarzwald, & Solomon, 2001; Fontana & Rosenheck, 1998). In addition to studies of PTG in combat veterans located by the meta-analysis, we identified two additional studies that examined PTG in veterans -- the Feder et al. (2008) study and the Maguen et al. (2006) study, discussed earlier. The importance of the findings on PTG in this study is that it advances our understanding of PTG in present-day Marines, which has

implications for clinicians who work with OIF/OEF veterans who have endured combat-related traumas.

The fourth aim of this study was to examine associations between combat operational deployment stress, family relationships, and mental health problems. Although marriage has been consistently linked with better mental health in individuals, as compared to single counterparts, findings in the current study did not suggest significantly different mental health in married versus non-married Marines. Two possible explanations for this difference from the general population should be examined in future research. First, comparable mental health problems may be the result of additional stressors or worries that married Marines must contend with throughout the cycle of deployment. However, on the other hand, it may be that the cohesion and brotherhood of the military create for the single Marines a social support system unlike what a male civilian might experience.

As hypothesized, Marines who reported better family relationships (greater cohesion, greater expressiveness, and less conflict) also reported fewer mental health problems. However, more positive family relationships did not moderate the way that Marines' combat-operational deployment stress and mental health were related. Thus, conclusions cannot yet be made regarding the importance of social support in recovery from combat-operational deployment stress. Future research should more fully examine this because of importance of social support found in recovery from other sources of trauma (Brewin et al., 2000). Few studies have addressed the influence of the family among active duty personnel, and evidence supporting the positive effects of family cohesion, expressiveness, and low conflict on the mental health of returning

Marines. This finding emphasizes the importance clinical assessment and promotion of positive family relationships in treatment of service members' mental health problems . Future longitudinal research needs to be conducted to determine causality – in other words, the current study does not provide information as to whether poor family relationships lead to worse mental health after deployment or if poor mental health leads to worse family relationships or even if both mental health and family environment result from a third variable.

Limitations

This study has several limitations that are important to note. First, because the study design was correlational, causation cannot be inferred. Conclusions about any variable causing mental health problems cannot be made. Instead , we can only make conclusions about the strong relations among the variables. Considering the complex nature of traumatic sequelae, it is likely that causation is reciprocal (or circular) , in that changes in one variable lead to changes in the other. Coping strategies may impact mental health problems following combat exposure, but mental health problems may also impact coping strategies.

Further, this study was also unable to control for every possible risk factor for poor adaptation following deployment. For example, early childhood trauma, caregiver attachment, and pre-trauma coping have been demonstrated to relate significantly to an individual's post-trauma adaptation (Brewin et al., 2000; Yehuda, 2004). Similarly, this study could not account for every resilience factor that has been associated with posstrauma recovery. Future research will be needed to integrate associated risk and resilience factors into a cumulative risk index to help identify people who are at greatest

risk for developing mental health problems following deployments and to provide treatment.

Another study limitation is the time span of information obtained about deployments. To reduce participant burden and error in recall, the demographic questionnaire asked about deployments that occurred only in the last four years. However, given the conflicts in Afghanistan have been ongoing since 2001, more detailed information about the lengths and specific locations of deployments could have provided a measure of total time in combat theaters, which has been found to relate to post-deployment adaptation (Castro & McGurk, 2007).

Although the battalion was demographically representative of the U.S. Marine Corps, the findings of this study may not generalize to other branches of the military. It is especially important to keep in mind the vastly different duties of sailors and airmen, as compared to Marines. Although experiences of soldiers in Iraq and Afghanistan may be most similar to the Marines' experiences, significant contextual differences exist in their deployment. For example, soldiers tend to have 18-month deployment, whereas a typical Marine deployment is approximately 7 months. In addition, a study of Marines and soldiers experiencing combat found that the soldiers were slightly older, more likely to have children, more educated, and had longer deployments (Castro & McGurk, 2007). Such differences may impact how service members adjust. Thus, the study results are only generalizable to other Marines and service members with combat experiences and demographic background similar to Marines.

For this study, self-report measures were carefully selected on the basis of their solid psychometric properties. Although a strength of this study was that it was

unrelated to the Department of Defense, which may increase honesty in responses, self-report measures remain subject to social desirability bias. Furthermore, only one measure had been specifically validated for use with a population of veterans (i.e., the Deployment Risk and Resilience Inventory). Although we expect that the measures are psychometrically sound based on their previous psychometric studies, it is possible that the measures perform differently within a population of Marines when compared to the populations on which they were standardized. Such differences would have implications for conclusions that could be inferred from results. Although a lack of psychometric data with Marines is less than ideal, this study provides an important first step for researchers interested in how these measures perform in a sample of Marines.

Another study limitation related to measurement is the measurement of coping. Littleton and colleagues (2007) suggested that self-report measures of coping strategies may confound coping behavior with distress (i.e., I give up trying to deal with it) and coping outcome. Such a confound is related to circular causality— stress impacts coping strategies, which also impact stress. Observational data, such as physiological reactivity to a stressor or performance on a learned helplessness task, may provide additional helpful information in the measurement of Marines' coping. Third-party report, such as Marines' coping reported by spouses, may also provide additional insight about Marines' coping. Finally, asking about a specific stressor, rather than general coping, may help clarify the differences in situational versus dispositional coping.

Finally, statistical limitations existed in this study. As noted, a confirmatory factor analysis could not be used because the data deviated significantly from normality. In addition, the sample was somewhat small to conduct a factor analysis. Hence, definitive

conclusions about the factor structure of the Brief COPE cannot be made. Instead, the findings can be viewed as a beginning point for future research on the Brief COPE. Other statistical limitations involve its cross-sectional design, which prevents the ability to infer causality.

Future Directions

Although this study advances our understanding of the broad impact of combat-operational deployment stress on service members, much more research is needed before we fully understand the intricacies of long term exposure to combat. Because of the potential confound of retrospective self-report of combat experiences with psychopathology, future research should measure the amount of exposure while the service member is in theater – a feat which may not be logistically simple.

Competing models of combat stress injuries implicate learning theory, cognitive theories, and biological models of stress (Nash & Baker, 2007) in understanding the impacts of combat stress on service members. Research that integrates these three approaches may help elucidate the complementary nature of the models. For example, by continuing to understand conditioned fear responses, clinicians can better treat service members presenting with PTSD. Similarly, more standardized research on the shattered world views and cognitive distortions (Janoff-Bulman, 1992) implicated in post-combat psychological disorders would aid in prevention and intervention efforts.

Future research must also integrate the biological effects of combat. Recent years have seen an explosion of research in the biological impacts of stress, and a thorough review of the literature is beyond the scope of this study. However, biological consequences of cumulative stress have been associated with both physical and psychological disorders (De Klout, Vreugdenhil, Oitzl, & Joëls, 1998; Heim, Ehlert, &

Hellhammer, 2000). Animal studies suggest that cortisol (stress hormone) induces damage to the hippocampus (Sapolsky, 2000), a brain structure implicated in memory and belief systems in humans, and better understanding is needed to aid in treatment planning. Furthermore, long-term exposure to significant stressors, and therefore cortisol, damages the HPA (hypothalamic-pituitary-adrenal) axis, contributing to an individual's increased stress reactivity (Nash & Baker, 2007). Intervention studies provide evidence that normalization of hypothalamic-pituitary-adrenal (HPA) axis function co-occurs with improved behavioral functioning (i.e., Felmingham, et al., 2007; Martin, Martin, Rai, Richardson, & Royall, 2001). Hence, additional research on Marines' physiological reactivity would help us further understand relations between cumulative biological effects of stress, coping behaviors, and problem behaviors, such as dysregulated affect, poor impulse control, and aggression.

Because of the way that learning theories, cognitive theories, and biological responses to stress interact with each other, future research should measure pre- and post-deployment coping to help disentangle coping as a *risk factor* for post-deployment psychopathology from coping as an *outcome* of deployment. In other words, it is possible that the biological impacts of stress mediate the experience of combat and subsequent maladaptive coping behaviors. For example, denial and avoidance may be an adaptive response to extreme stress, yet such coping becomes maladaptive when individuals respond to routine stressors in the same way.

Another very important research direction is the family environment as a function of repeated parental deployments. Again, longitudinal research would clarify the causal processes between family environment as a pre-deployment risk factor and as a post-

deployment outcome. Furthermore, the use of a trauma-informed developmental perspective would be ideal for examining the adaptation of military children to repeated, dangerous deployments and for investigating the presence of any post-deployment mental health difficulties of the children and the non-deployed spouse.

Because many service members and families seek mental health services, it is important for clinicians to make decisions based on the best available research, consistent with the principles of Evidence-based Practice in Psychology (American Psychological Association, 2006). It is also important for clinicians to continue to incorporate their clinical expertise with literature when working with a military population – especially because of the limited research with OIF/ OEF veterans . Essentially, it is the iterative process between clinicians and researchers that would result in delivery of the highest quality services for military service members and their families.

Please specify **monthly** income in the household. Include spouse/partner if applicable.

Service Member

Spouse/Partner

\$ _____	Wages from Employment (before taxes)	\$ _____
\$ _____	Special Pay (e.g. jump, dive, demo, etc.)	\$ _____
\$ _____	Public Assistance	\$ _____
\$ _____	Social Security	\$ _____
\$ _____	Disability Compensation	\$ _____
\$ _____	Unemployment Compensation	\$ _____
\$ _____	Alimony	\$ _____
\$ _____	Child Support	\$ _____
\$ _____	Monies from Relatives	\$ _____
\$ _____	Interest from Investments	\$ _____
\$ _____	Veteran's Benefits	\$ _____

Does any other adult in the household have an income? Y / N

If yes, amount monthly: \$ _____

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BIOGRAPHICAL SKETCH

Corissa Callahan entered the doctoral training program in the Department of Clinical and Health Psychology at the University of Florida in August 2006. In the clinical child psychology track, she was a graduate research assistant for Sheila Eyberg, Ph.D., on an NIMH-funded study examining group versus individual parent-child interaction therapy for preschoolers with attention deficit hyperactivity disorder. In 2004, Corissa obtained a Bachelor of Science degree in human development from Cornell University, where she completed an honors thesis under the mentorship of Gary Evans, Ph.D. After graduation from Cornell, Corissa worked at the University of California–Los Angeles, as a research assistant for Michelle Craske, Ph.D., in the Anxiety Disorders Behavioral Research Program. There, she coordinated an NIMH-funded study of risk factors for developing mood and anxiety disorders in late adolescence.

Corissa plans to focus her research and clinical work on the psychological needs of United States (U.S.) military personnel and their families, a passion she has already begun to pursue. She has given multiple university presentations and four conference presentations on this topic, and in October 2008, she was funded by Division 19 of the American Psychological Association to attend the APA Presidential Task Force on the Psychological Needs of U.S. Service Members and their Families as a student monitor. She is completing her predoctoral psychology residency at the Medical College of Georgia / Charlie Norwood Veterans Administration Consortium, where she has begun integrating her clinical interests by working with children and families and a veteran population.