ABSTRACT

Title of Dissertation: DEPLOYMENT STRESSORS, USE OF MILITARY

AND CIVILIAN RESOURCES, AND POST-

DEPLOYMENT ADJUSTMENT FOR WIVES OF

ACTIVE DUTY SERVICE MEMBERS

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In the current climate of sustained and intensive military operations in the Middle East, spouses of recently deployed active duty service members are negatively affected both psychologically and relationally. Although there is a growing body of literature on spouses' adjustment during the deployment cycle, the role of accessing military and civilian resources in reducing distress has not been examined. Guided by Family Stress Theory and the ABC-X model, it was hypothesized that accessing military or civilian resources would weaken the relationships between high levels of deployment cycle stressors and spouses' post-deployment levels of mental health problems and marital satisfaction. The current study used a sample of almost 10,000 female spouses of active duty service members from the Military Family Life Project, a secondary dataset collected and maintained by the Department of Defense. Two types of hierarchical regression appropriate for non-normal data were used to analyze the relationships

between four deployment cycle stressors, three types of military and civilian resources, and spouses' post-deployment levels of mental health problems and marital satisfaction. Findings indicate that spouses who experience more challenges at home during the deployment and who perceive more post-deployment adjustment problems in their service member husbands also experience higher levels of mental health problems and lower marital satisfaction. Accessing more types of social support resources was found to be related to lower levels of post-deployment mental health problems, whereas accessing more types of counseling resources was found to be related to higher levels of mental health problems. In addition, two interactions between accessing information and counseling resources while experiencing high levels of at-home deployment challenges were found to be significant for reductions in levels of mental health problems. The overall pattern of findings suggests that spouses' personal at-home experience of the deployment is more important than the external characteristics of the deployment itself, that there are meaningful differences between spouses' post-deployment mental health and marital satisfaction, and that accessing social support operates differently for active duty military wives than for other populations of women. The implications of study findings for theory, future empirical research, policy and practice, are discussed.

DEPLOYMENT STRESSORS, USE OF MILITARY AND CIVILIAN RESOURCES,

AND POST-DEPLOYMENT ADJUSTMENT FOR WIVES OF

ACTIVE DUTY SERVICE MEMBERS

By

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: STATEMENT OF THE PROBLEM

Post-Deployment Adjustment of Military Spouses

Family members of military service members now outnumber active duty service members themselves and represent a growing portion of the US population (Department of Defense [DOD), 2011a]. Service members' readiness for deployment is increasingly considered to be related to the well-being of their families (Land, 2010). A growing body of evidence likewise suggests that the service members' health affects the health of their spouses (Battaglia & Macedonia, 2012). In the recent climate of sustained combat operations in the Middle East, spouses of active duty service members are negatively affected both psychologically and relationally (Galovski & Lyons, 2004). Specifically, spouses have been found to experience high levels of adjustment stress and poor marital satisfaction during the period following their partners' deployment.

While military spouses can be male or female, the bulk of the research to date focuses on military wives for several reasons. First, active duty military are majority male (86%) and compared to female service members, are more likely to be married (58% married male service members, 46% married female service members) (DOD, 2011a). Additionally, female service member marriages are distinct in that they are more likely to be dual-military marriages, where both spouses are active duty (47% of females compared to 7% of males).

Adjustment stress, a broad term that connotes general psychological distress, is prevalent among spouses of active duty service members (Padden, Connors, & Agazio, 2011). The reported experience of adjustment stress among wives of active duty service members has been linked to increases in sexual frustration (Allen, Rhoades, Stanley, &

Markman, 2011), physical health complaints (Burton, Farley, & Rhea, 2009), and endorsement of more barriers to seeking mental health care (Warner, Appenzeller, Warner, & Grieger, 2009). Many wives of service members report significant adjustment and emotional problems that interfere with their quality of life, including depression and anxiety (Eaton et al., 2008). Depression symptoms include diminished pleasure in daily activities, irritability, hopelessness, and intense sadness (American Psychological Association [APA], 2013). The APA (2013) defines anxiety symptoms as uncontrollable worry, restlessness, and difficulty concentrating on daily activities. Wives of active duty members are more likely to experience depression and anxiety than civilian wives (Mansfield, Kaufman, Marshall, Gaynes, Morrissey, & Engel, 2010). Depression diagnoses have been found to persist throughout the stages of a deployment into the post-deployment period while anxiety does not, suggesting that depression may be a lasting psychological impairment for military families (Lester et al, 2010). Both types of psychological distress symptoms have important implications for the health and well-being of military spouses as they adjust to the service member's return after a deployment.

The relationships between military service and marital quality are complex, and research that investigates these links is growing (Karney & Crown, 2007). The experience of poor marital satisfaction can be debilitating for service members and spouses who are enduring the stressors of military service. In particular, among spouses of service members who have been deployed, poor marital satisfaction has been linked to other deployment-related mental health stressors such as posttraumatic stress disorder in the service member and caregiver stress for the spouse (Allen, Rhoades, Stanley, &

Markman, 2010; Renshaw, Rodrigues, & Jones, 2008). When the service member returns from deployment and the couple is reunited, the quality of their marriage is an important factor in the overall post-deployment adjustment experiences of role renegotiation, sexual intimacy, and communication (Baptist et al., 2011).

Current research calls for an examination of the psychological and relational adjustment among wives of service members who have returned from deployment. The Department of Defense (DOD) has begun to conceptualize military service member health through the holistic lens of "total force fitness," a notion that acknowledges the important role of military family members on the mission-readiness of service members (Land, 2010). Negative post-deployment adjustment among civilian spouses has been found to be associated with poor post-deployment adjustment for the service member (Battaglia & Macedonia, 2012). Military programs and initiatives are increasingly focused on the unique needs and experiences of spouses throughout the deployment cycle, and more research is needed to further understand the relationships between spouses' psychological health and service members' force fitness.

Deployment Cycle Stressors

In examining post-deployment adjustment experiences for spouses of active duty service members, it is important to consider the influence of deployment cycle stressors. The staged experience of preparing for a deployment, experiencing the separation of a deployment, and then reuniting as a family when the service member returns from a deployment, is collectively known as the deployment cycle (Logan, 1987; Pincus, House, Christenson, & Adler, 2001). Spouses of active duty service members have been found to be at increased risk for negative outcomes during the post-deployment cycle stage when

their husbands have returned from deployment and the family is readjusting to his return (MacDermid Wadsworth, 2010). Several components that influence the experience of the post-deployment cycle stage have been found to be especially relevant to spouses' adjustment, including the number of service member deployments, deployment to a combat zone, the experience of challenges at home during deployment, and the service member's adjustment to post-deployment.

Specific characteristics of deployment are related to a high risk for negative outcomes for spouses of active duty service members, including the number of deployments and whether the deployment was to a combat zone. Multiple deployments may lead to negative outcomes through the accumulation of stress (Mansfield et al., 2010; Phillips, LeardMann, Gumbs, &Smith, 2010); however, more research is needed to fully understand the cumulative effects of multiple deployments over time (Sheppard, Malatras, & Israel, 2010). Combat deployments are consistently associated with increased risk for negative outcomes due to their high intensity and association with posttraumatic stress disorder (Allen et al., 2010; Cozza, 2005; Hoge, Auchterlonie, & Milliken, 2006; Renshaw, Allen, Rhoades, & Blais, 2011). Particularly with the nature of the current conflicts where there is no "front line," many service members not assigned to combat-designated units actually experience combat situations or enemy fire (Galvoski & Lyons, 2004). Together, these specific deployment characteristics confer risk for the post-deployment adjustment of spouses of active duty service members.

Spouses' adjustment during the post-deployment stage are also related to their experience of the preceding deployment stage (MacDermind Wadsworth, 2010). Spouses report a variety of stressors at home while their service member husbands are deployed,

including health or emotional problems in the family, marital problems or loneliness, and problems managing the children, home or bills (Joseph & Afifi, 2010; Warner et al., 2009). These experiences have been found to increase the likelihood of post-deployment stress and poor marital quality (Merolla, 2010). It is important to further examine how experiencing these problems during a deployment while the service member is away may spill over into the post-deployment stage when the service member is home, cumulating into a continuation of stress.

Research on service members' post-deployment adjustment outcomes during the recent military operations in the Middle East is vast and growing. Service members have been found to experience a wide range of negative outcomes, including heavy alcohol and prescription drug use (National Institute on Drug Abuse [NIDA], 2011), depression and posttraumatic stress disorder (Shen, Arkes, & Williams, 2012) and suicide (Hyman, Ireland, Frost, & Cottrell, 2012). Spouses of active duty service members have been found to have high levels of depression and adjustment stress, especially when their husbands are also suffering from mental health challenges (Price & Stevens, 2011). The service member's response to the post-deployment reunion is also associated with marital satisfaction; service members and spouses who have difficulty readjusting to one another may experience poor marital quality (Allen et al., 2010; Allen et al., 2011). Spouses have been found to assess their husbands' level of post-deployment distress as accurately as the clinicians treating them for psychological problems (Biddle, Elliott, Creamer, Forbes, & Devilly, 2002). Additionally, a spouse's report of the service member's adjustment is more strongly associated with her outcomes than is his report of his adjustment,

indicating that her appraisals of his adjustment are meaningful and important to her post-deployment mental health (Renshaw et al., 2008).

Together, the number of deployments, deployment to a combat zone, the spouse's experience of deployment challenges at home, and the service member's experience of post-deployment adjustment problems are important factors when examining the determinants of spouses' risk for post-deployment adjustment distress.

Use of Military and Civilian Resources

In an effort to mitigate the effects of deployment cycle stressors for service members and spouses, both military and civilian organizations have made large investments in resources for service members and their families as they cope with deployments (DOD, 2004; Meredith et al. 2011). Resources are available at each deployment cycle stage and come in a variety of formats. Informational resources in the form of briefings and classes are provided by military units and military installation offices. Information about preparing for deployment and guides for moving through the entire deployment cycle, as well as a vast and expanding number of websites dedicated to military issues, are also widely available from both military and civilian organizations. Social support is provided by the military, through Family Readiness Groups and military spouse support groups, and by friendships with civilians. These social supports build friendly networks and connectedness, provide camaraderie and opportunities for recreation, and facilitate the flow of information among spouses within the group. The military provides a variety of confidential counseling services at no cost to spouses of active duty service members, including in-person, telephone, web-based, and chaplain

counseling options. Counseling from civilian providers is also common, and some spouses may prefer to seek mental health help from outside the military.

Use of these resources is meant to improve a family's response to the stress of deployment and improve deployment experiences; however resources use has rarely been studied for its relationship to the post-deployment adjustment phase. The RAND Corporation recently reviewed 23 of a list of 77 DOD programs for service members and their families to assess their incorporation of total force fitness resilience factors (Meredith et al., 2011). The authors found that many representatives of these programs report barriers to implementation, including lack of support from military leadership, and that they also report barriers to evaluation, such as no standardized criteria to assess utilization and impact. Certain civilian organizations, such as The Coming Home Project, have been formally evaluated, but findings are limited in generalizability to the greater military population as services are provided for limited groups of service members or family members (Yosick et al., 2012).

The multitude of government websites often creates confusion and inefficiency, rather than enabling the transfer of important information (Phillips, 2011). Although the National Resource Directory was developed by the DOD to streamline the online housing of all information for military service members and families, more awareness of the Directory as a resource is needed to increase its utilization (DOD, 2011b). Many military families now live off bases and in civilian communities, which isolates them from traditional base-centric resources such as Family Readiness Groups and Family Assistance Offices. Stigma also prevents spouses from seeking social support or counseling resources, sometimes through a fear of being singled out for having problems

(Warner et al., 2009). The military-wide ethos of self-sufficiency and the perception of needing to handle adjustment problems within the family also inhibit help-seeking.

These limited findings regarding effectiveness of military and civilian resources lead to important questions about the link between resource utilization and adjustment. Even before the resources are examined for effectiveness, it is important to determine which types of resources spouses are seeking and accessing, and which of types of resources are connected to their post-deployment health and well-being. Are spouses who access military-provided resources throughout the deployment cycle less likely to experience post-deployment adjustment stress? Are certain types of resources more strongly related to the reduction of mental health problems, as opposed to relational distress, such as poor marital satisfaction? Answers to these questions are essential for the government, the military, and the civilian provider community to understand, as they will guide the application of funds towards those resources that are most strongly associated with positive adjustment and thereby reduce fiscal waste. Answers to these questions can also help focus resource-awareness campaigns towards the use of resources that appear to moderate the link between deployment-related distress and post-deployment psychological and relational health.

Family Stress Theory: The ABC-X Model

Research that is clearly driven by theory is best situated to increase understanding of the complex relationships between deployment cycle stressors, use of military and civilian resources, and post-deployment adjustment of wives of active duty service members. Family Stress Theory is embedded within a social systems approach and is uniquely appropriate for understanding how families respond to stress (Price, Price, &

McKenny, 2010). As with any social system, families strive to maintain equilibrium and when this steady state is disrupted by change, families respond to stress based on their individual members' characteristics as well as the larger social context. Family Stress Theory has recently been linked to the literature on family resilience, and has been used to theorize which families will respond to stressful experiences with adaptation versus crisis (Patterson, 2002). Resilience is defined as an individual's or family's capacity to rebound from adversity with high functioning and strength (Walsh, 2006). Resilience is a concept also increasingly used by the military, as it expands the notion of "total force fitness" of service members as they cope with stressors of military service (Land, 2010). Another way resilience is conceptualized is by defining the outcome of a stressful experience as either successful adaptation or family crisis. Successful adaptation is characterized by high levels of functioning and growth in response to stressors, whereas family crisis is a state of disequilibrium, diminished functioning, and presence of negative outcomes resulting from stressors.

The seminal work by R. Hill (1949), entitled *Families Under Stress: Adjustment to the Crises of War Separation and Reunion*, was the first to describe the impacts of war on military families using what become known as the ABC-X model. The ABC-X model has been used by many researchers interested in the effects of deployment on the family system, for example parental deployment and ambiguous loss experienced by adolescents (Heubner, Mancini, Wilcox, Grass, & Grass, 2007), and has been extended and refined by others (McCubbin & Patterson, 1982). The original ABC-X model within Family Stress Theory is uniquely appropriate for the current study. Not only was this model

developed specifically for analysis of military family experiences, it is also supported by the military literature on resilience in the face of stress.

In general, the ABC-X model theorizes that families who experience stressful events will be vulnerable to negative outcomes, and that this relationship will be altered by accessing resources and making meaning of the event. As depicted in Figure 1, the ABC-X model includes the following components: stressor events (A) interact with family resources (B) and family perceptions of the events (C), which lead the family either to crisis or successful adaptation (X). Stressor events are situations encountered by the family that provoke some amount of change in the family system, and they can be either expected and normal or unpredictable and unique. Family resources are part of what buffers the impact of those events on the family's level of stress. Resources may be either internal to the family, such as a strong sense of family unity, or external to the family, such as social support. Family perceptions of the event also buffer the family from stress. Subjective definitions or meanings attributed to the event range from positive opportunities for growth to a negative sense of hopelessness.

The bidirectional interactions depicted among model components (see Figure 1) indicate their mutual influence, as well as the conceptual complexity that can be handled by the ABC-X model. In other words, researchers may use the model to understand how experiencing stressors influences resource utilization, as well as how accessing resources alters the experience of stressors. For example, Hill (2005) used ABC-X theory to test the bidirectional influences of work and family stressors on perceptions of work-family conflict among fathers and mothers. Additionally, research questions using the model may focus on any one of the specific pathways, or the entire model as a whole.

The current study tested one of the specific pathways of the ABC-X model: the role of resource utilization (B) as a moderator between experiencing a stressor event (A) and family crisis (X). Although a part of the overall model, the family's perception of the stressor was not part of the current research question and was not measured. In the current study, the stressor event was measured by deployment cycle stressors, including specific characteristics of deployment, deployment problems at home experienced by the spouse, and the service member's post-deployment adjustment problems. Family use of resources was measured by the utilization of various military and civilian resources during the deployment cycle. Finally, military spouses' successful adaptation to or family crisis stemming from deployment cycle stressors was operationalized by two indices of post-deployment adjustment, mental health and marital satisfaction. It is important to note that although the term 'adaptation' is part of the ABC-X model, the term 'adjustment' is more commonly used in research on military resilience (see, for example, Battaglia, 2012). These terms refer to the same process of change experienced by military families after the stressful experiences of deployment. Therefore, both terms are used throughout the current research, depending on whether the theory is being discussed (adaptation) or how the theory is operationalized within the present study (adjustment).
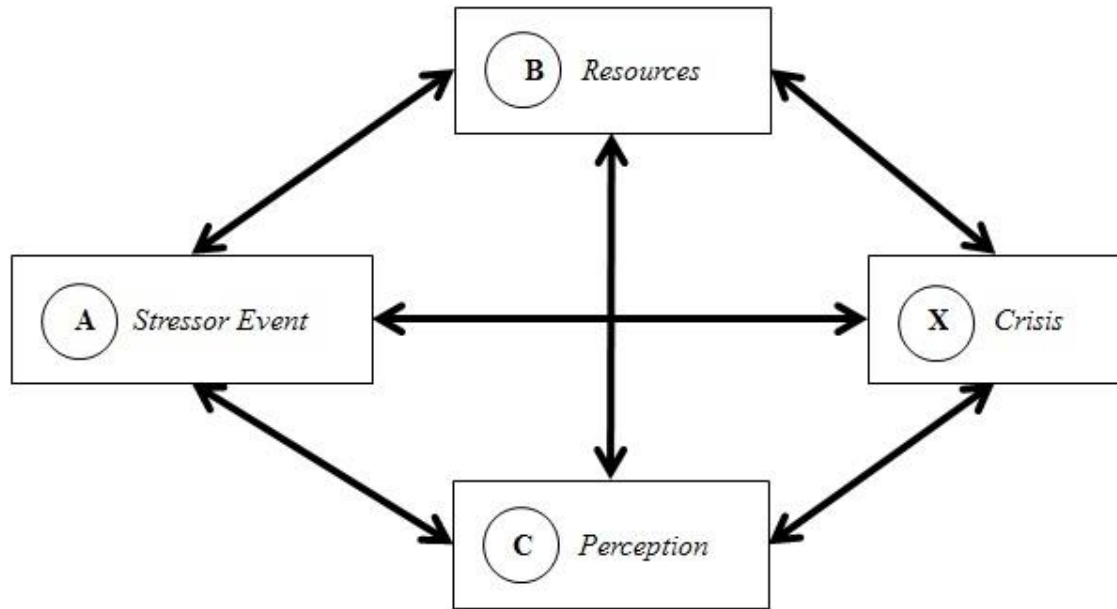
Figure 1. The original ABC-X Model (adapted from Hill, 1949).

Purpose of the Current Study

The purpose of the current study was to investigate the relationships between deployment cycle stressors, use of military and civilian resources, and post-deployment adjustment among spouses of active duty service members. Specifically, this study assessed the associations among deployment cycle stressors (number of deployments, deployment to a combat zone, deployment stressors at home, and service member post-deployment adjustment) and spouses' post-deployment adjustment (mental health and marital satisfaction). Additionally, this study examined the moderating effects of accessing military and civilian resources (information, social support, and counseling) on this relationship. Thus, the central hypothesis of this study was that as the use of military and civilian resources increases, the effect of deployment cycle stressors on spouse post-deployment adjustment would be weakened.

Few studies have specifically focused on the processes of post-deployment adjustment, although many studies about the impacts of deployment on military spouses have been conducted during this period of the deployment cycle (MacDermind Wadsworth, 2010). Additionally, much of the existing research used original data collection and resulted in relatively small and non-representative sample sizes, compared to the total population of active duty service members and their spouses. Those studies that did use existing data, such as medical or personnel records, were limited in the types of variables available for analysis and therefore were limited in the depth of their conclusions. The use of large, representative datasets that are specifically designed to answer theoretically driven questions about the impacts of military deployments on spouses is essential to investigate the complex interactions between resource utilization and post-deployment adjustment.

Thus, the current study used a large, nationally-representative dataset collected in 2010 by the DOD Defense Manpower Data Center (DMDC) called the Military Family Life Project (MFLP) (DMDC, 2010; DMDC 2011). The MFLP was designed to examine the multiple levels of influence of military life on the health and well-being of military spouses and includes detailed measures of deployment cycle stressors, use of military and civilian resources, and post-deployment adjustment. By examining associations between these variables within a Family Stress and Coping framework, it may be possible to identify the resources that are most related to healthy post-deployment adjustment despite recent stressful deployment cycle experiences.

CHAPTER 2: LITERATURE REVIEW

Post-Deployment Adjustment of Military Spouses

The latest Department of Defense data report that there are now fewer active duty service members than there are immediate military family members (DOD, 2011). With more than 53% of active duty military members who are married and almost 44% who have children, there are almost 2 million military family members. Both civilian organizations and the DOD have become increasingly concerned with the effects of recent sustained military operations on families, as evidenced through various programming, policy, and research initiatives. Powerfully, First Lady Michelle Obama has made strengthening military families one of her top priorities, and in 2011, together with Dr. Jill Biden, launched "Joining Forces" to bring attention and resources to meet the unique needs of military service members and their spouses. The offices of the First Lady and Dr. Biden, together with representatives from the offices of each Cabinet Secretary, also published "Strengthening our Military Families," a report that clearly articulates the Presidential priority of improving the resilience of the Armed Forces by improving the quality of life for military families (White House, 2011). The report states that service members are able to maintain the highest state of readiness when their families are strong and thriving, and specifically recognizes the role of civilian spouses' psychological and physical health as fundamental components of service members' fitness.

A growing body of evidence suggests that the health and well-being of active duty service members is significantly influenced by the health and well-being of their spouses and marriages, and that relationship is bidirectional (de Burgh, White, Fear, & Iversen,

2011; Kelley & Jouriles, 2011; Lewis, Lamson, & Leseuer, 2012). A review of the

literature published between 2001 and 2010 clearly demonstrates that spouses of military

service members experience challenges during periods of deployment and that many also

experience risk for mental health problems (de Burgh et al., 2011). Not only are spouses

at risk through their service member husbands' psychological distress, but they are also at

risk for negative outcomes through their own experiences of military life and the

deployment cycle. Factors that increase spouses' risk for negative outcomes include the

length of deployments of the military husband, the mental health of the service member

when he returns, and the circumstances of the deployment for the wife at home, such as

whether she is caring for children and/or unemployed.

Service members who return to combat deployments with high-conflict

relationships are more likely to experience poor mental and physical health, potentially

jeopardizing their missions. Thus, a notion of "total force fitness" has been introduced by

the DOD as focusing not only on the health and well-being of service members

throughout the deployment cycle, but also on the health and well-being of their spouses,

marriages, and family members (Battaglia & Macedonia, 2012; Land, 2010). Health and

well-being of service members is now assessed holistically across eight dimensions,

including physical, behavioral, social, environmental, medical, nutritional, spiritual, and

psychological. The military is increasingly focused on enhancing the resilience of its

service members and notably, the military family is recognized as a central component of

the service member's total force fitness success.

Amid the current climate of support for military family resilience, spouses of

active duty service members continue to carry a large psychological burden due to

deployments during the recent conflicts in the Middle East (Galovski & Lyons, 2004). In addition to fear and anxiety about the safety of their deployed husbands, military wives also cope with the challenges of being single parents while they are away, marital strain due to decreased communication and increased stress on the relationship, and adjustment problems when their husbands come home from deployment and reintegrate into family life. Furthermore, spouses whose military partners have been diagnosed with severe psychopathology are at risk for secondary traumatization, which may occur through the sharing of traumatic combat experiences, or through interpersonal violence or aggression experienced during the period following deployment (Galovski & Lyons, 2004; Price & Stevens, 2011). Several recent studies focusing on spouses whose husbands have recently returned from deployment offer insights into important indices of health and well-being, including mental health and marital satisfaction.

Mental Health

Many spouses of service members experience mental health problems that range from clinical diagnoses to what is known as generalized adjustment stress (Padden et al., 2011). Some symptoms of general psychological distress overlap with those of other clinical disorders, including loss of interest in activities, feeling dissatisfied, and having difficulty sleeping. Other examples of adjustment stress include feeling tense or high strung, loneliness, sexual frustration, and general fears about the reintegration process (Allen et al., 2011).

For 130 spouses of both deployed and non-deployed Army service members, perceived stress was significantly correlated with somatization complaints, including worse menstrual cramps, headaches, and back pain (Burton, Farley, & Rhea, 2009). Of

940 spouses of active duty service members, 16.9% reported moderate to severe

emotional problems and 21.7% reported that the stress or emotional problems negatively

impacted the quality of their life (Eaton et al., 2008). Among a sample of 190 wives of

service members with posttraumatic stress disorder, the severity of the spouses' self-

reported distress was not affected by their attributions of the source of their symptoms,

whether stemming from their husbands' military experience or from events in their own

lives (Renshaw et al., 2011). This result suggests that military spouses' experience of

generalized stress can be considered global, and is not necessarily connected to a

particular stressor.

Although the body of literature examining adjustment stress among spouses of

active duty service members is important to consider, other literature suggests that

specific mental health problems are also associated to poor adjustment of spouses during

the deployment cycle. The rates of diagnosable mental health problems, particularly

depression and anxiety, among wives of active duty military service members are

alarming and contribute to the risk for family stress and deployment cycle adjustment

problems.

Depression is a persistent and potentially long-term psychological impairment

that significantly affects the quality of life of spouses of active duty service members

(Verdeli et al, 2011). The Diagnostic and Statistical Manual of Mental Disorders (DSM-

V) provides clear diagnostic definitions for Major Depressive Disorder, which include

markedly diminished pleasure in daily activities, depressed mood, and diminished ability

to concentrate, among other symptoms (APA, 2013). The diagnosis denotes clinically

significant impairment in social, occupational, or relational functioning and individuals

with depression are frequently tearful, irritable, hopeless, and intensely sad. Episodes of the disorder often occur after severe psychosocial or environmental stressors. The twelve-month prevalence of Major Depressive Disorder in community samples is approximately 7%, with 18-29 year olds at 3 times the risk than individuals 60 years or older and women at 1.5 to 3 times higher risk than males.

In a study of medical record data from 250,626 wives of active duty Army soldiers between 2003 and 2006, 42.8% had a diagnosis of depression during the study period using clinical codes of the International Classification of Diseases 9th Revision, the mental health diagnostic criteria used by the Defense Medical Surveillance System (Mansfield et al., 2010). After controlling for number of previous deployments and history of mental health diagnosis, the authors found that the number of excess cases of depression was 24.4 per 1,000 wives whose husbands had deployed for 1-11 months, and 39.3 excess cases of depression when the deployment was longer than 11 months. In a sample of 295 spouses of service members deployed to Iraq or Afghanistan, researchers asked about global perceptions of stress, such as feeling overwhelmed or lonely, and they administered the patient Health Questionnaire 9, which is a depression screening measure that assesses the nine diagnostic criteria for clinical depression (Warner et al., 2009). Among the spouses, high levels of perceived global stress predicted both the presence and severity of depression. Furthermore, spouses who met the criteria for depression also endorsed agreement with barriers to seeking mental health care at higher rates than those who were not depressed. Barriers to seeking care included fears that family and friends would view them differently, that they would be seen as weak, or that their own mental health treatment would have a negative impact on their service member spouse's career.

The authors concluded that although some symptoms of depression may inhibit help-seeking in general, it is alarming that depressed spouses who are in particular need of mental health care are also the least likely to seek that care.

The stress of the deployment cycle commonly results in anxiety among spouses of active duty service members (Galvoski & Lyons, 2004). The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) provides clear diagnostic definitions for Generalized Anxiety Disorder, which include excessive anxiety and worry, restlessness, difficulty concentrating, and disturbed sleep, among other symptoms (APA, 2013). Individuals with anxiety have trouble controlling their worries and find it difficult to keep anxious thoughts from interfering with attention to other tasks, leading to clinically significant impairment in social, occupational, or relational functioning. They often worry about everyday circumstances to an intensity or frequency that is out of proportion to the actual impact of the feared event. The twelve-month prevalence of Generalized Anxiety Disorder in community samples is approximately 3%. Females are twice as likely as males to be diagnosed with anxiety, and the prevalence of diagnosis peaks in middle age and declines as individuals age.

The same study that examined medical record data for diagnoses of depression for 250,626 wives of active duty Army soldiers between 2003 and 2006 also examined diagnoses of anxiety (Mansfield et al., 2010). Using the clinical codes of the International Classification of Diseases 9th Revision, which provides the mental health diagnostic criteria used by the Defense Medical Surveillance System, 24.4% of wives had a diagnosis of anxiety during the study period. After controlling for number of previous deployments and history of mental health diagnosis, the authors found that the number of

excess cases of anxiety was 15.7 per 1,000 wives whose husbands had deployed for 1-11 months, and 18.7 excess cases of anxiety when the deployment was longer than 11 months. Although anxiety diagnoses did not occur as often as those for depression among this sample, both findings translate to thousands of excess cases of mental health disorders for spouses who endure the deployments of their military husbands. In a study of 163 at-home civilian wives of either an Army or Marine Corps active duty service member, levels of anxiety were measured through the Brief Symptom Inventory, and were found to be significantly elevated compared to community norms (Lester et al., 2010). Levels of anxiety were significantly higher for groups of spouses whose husbands were currently deployed compared to those whose husbands had recently returned, suggesting some remission of anxiety symptoms when the stressor of deployment is removed. However, a similar pattern was not observed for depression symptoms, suggesting that depression among spouses of active duty service members often persists into the post-deployment stage while anxiety is less likely to persist.

Marital Satisfaction

Although the current study was focused on marital satisfaction among still married military couples, a rising risk for divorce is often cited as a critical consequence of recent stressful deployments and is important to examine. In response to growing concern about unhealthy marriages among military couples, the RAND Corporation published *Families Under Stress*, a monograph that reviews and assesses existing theory and data on marriage and divorce among military couples (Karney & Crown, 2007). Through an extensive empirical review and an assessment of marriage trends using military service personnel records, this seminal research describes a complex relationship

between military service and marital dissolution. Results from more than 6 million

military members who served in the Armed Forces between 1996 and 2005 indicate that

rates of marriage are comparable across services and that marriage rates among the

military exceed rates within a comparable civilian population.

Comparing the rate of divorce among military and civilian couples is complex;

while each group experiences the same risk from common stressors such as mental health

problems or substance abuse, current military couples uniquely experience the stressors

of wartime deployments. However, contrary to popular belief, marital dissolution among

military couples is not increasing sharply due to the high intensity conflicts since 2001.

With the exception of the active duty Air Force, experiencing a deployment while

married has either no effect or a significantly beneficial effect on subsequent risk of

divorce. The authors explain this counterintuitive finding by citing current incentives in

the military for married couples. These incentives promote marriage sustainment,

including free, high-quality healthcare for spouses, increased housing allowances for

married couples, and job placement assistance for spouses who relocate with their

husbands. The authors note that while marital dissatisfaction and marital dissolution often

occur together, as couples who divorce tend to be highly unsatisfied, they are not the

same construct. Marital dissolution is the process of ending a formed marriage for a vast

array of reasons that may have little to do with the personally satisfying nature of the

relationship itself. Marital satisfaction is based on perceptions of the relationship quality

and functions independently of whether or not the relationship remains intact. Thus, it is

important to explore other trends in the literature that examine the marital experiences of

military couples—military marriages may be negatively affected by wartime deployment in nuanced ways, ways that do not necessarily result in divorce.

Indeed, a growing body of literature consistently cites poor marital quality and low marital satisfaction among active duty military couples who experience deployment (Galovski & Lyons, 2004; Sheppard et al., 2010). Deployment causes disruptions in communication, sexual intimacy, and role negotiation, and these relational problems can extend into the period of reunion after the deployed service member returns home (Baptist et al., 2011). A study of 697 Army soldiers found that almost 20% of the service members reported high levels of marital distress when not deployed, and that lower ranked, younger marriages were at highest risk for low marital satisfaction (Anderson et al., 2011). Low marital satisfaction is also related to other negative mental health outcomes for spouses of active duty service members, including depression, trauma symptoms, and caregiver stress (Allen et al., 2010; Nelson Goff, Crow, Reisbig, & Hamilton, 2007; Renshaw et al., 2008). Researchers have hypothesized that spouses develop interpersonal symptoms in response to their husbands' deployment trauma through a variety of mechanisms, including the wife's own predisposing factors such as age and aspects of couple functioning such as satisfaction (Nelson Goff & Smith, 2005). Together, these findings expand examination of military marriage outcomes beyond divorce to indicators of quality. It is essential that more research evaluate and untangle the factors that contribute to a military couple's vulnerability to experience adverse negative marital outcomes and how they might be resilient in the face of the demands of military life.

Deployment Cycle Stressors

Military Life and the Deployment Cycle

The term 'service member' broadly encompasses several distinct characteristics of military service. The seven uniformed services include the United States Army, United States Marine Corps, United States Navy, United States Air Force, United States Coast Guard, United States Public Health Service Commissioned Corps, and the National Oceanic and Atmospheric Administration Commissioned Corps. Of these seven, five uniformed services make up the United States Armed Forces, and include the Army, Navy, Air Force, and Marine Corps, which are part of the Department of Defense, and the Coast Guard, which is part of the Department of Homeland Security. Title 14 states that the Coast Guard is part of the military at all times, and that during a declared state of war it may be directed to operate as part of the Navy. Each branch of the Armed Forces operates reserve components, which may be activated during times of war. The National Guard is a reserve military force for both the Army and the Air Force composed of state National Guard militia units, which operates under Title 32 and may be mobilized during times of war or national emergency through Title 10.

Service members are considered to be active duty when they are members of the five branches of the Armed Forces, or when their reserve component of the branches of the National Guard is activated during times of war. As the focus of the current study is on members of the Armed Forces under the jurisdiction of the Department of Defense (Army, Navy, Marine Corps, and Air Force), it will not focus specifically on activated reserve component members or those in the National Guard. Active duty service members in the Armed Forces hold either enlisted or commissioned officer rank, and

each branch maintains a separate rank structure and nomenclature. Enlisted service members are hired under short-term renewable contracts, generally less educated than commissioned officers, and must complete the full term of their service before leaving the military. Commissioned service members, often called officers, are appointed by the President of the United States, usually have a college or advanced degree, and may retire or obtain rank promotions as they serve their commission. Across branches, enlisted ranks are numbered from E1 to E9 and commissioned officers are numbered O1 to O10, with lower numbers indicating lower rank (DOD, 2010a).

There is great diversity in the experiences of military service by active duty service members. Depending on the time period of service and the service member's training and expertise, service members may be stationed in the United States or abroad, and may experience a variety of duty stations and locations. Some service members are assigned to a military installation or base, while others work in DOD facilities or offices. Typically, service members are assigned to a position at a specific duty station for three years, after which time they are reassigned to a new position at either the same location or are moved to a new duty station. Moves to a new duty station are called permanent change of station (PCS), whereas temporary placements for training or short assignments are called temporary duty (TDY). Although deployment is considered a mandatory part of military service, not all service members are deployed during their years in the military. Furthermore, deployments that do occur vary in purpose (e.g. training, peacekeeping, or combat) and in level of risk to the service member (e.g. remote location, high insurgency area). They also vary in length, with most current deployments lasting between 6 and 12 months (Shaughnessy, 2011).

Deployment was first conceptualized as a cycle by Logan (1987), and its progression was further refined by others into five distinct phases, including pre-deployment, deployment, sustainment, re-deployment, and post-deployment (Pincus et al., 2001). Each stage is characterized by different roles and experiences for service members and their families, and each presents emotional and behavioral adjustment challenges and shifts in routines and responsibilities of each member of a military couple (MacDermid Wadsworth, 2010). This cycle is helpful for conceptualizing the complex outcomes of military deployments for spouses, especially as the recent conflicts in Iraq and Afghanistan are generally characterized by an acceleration of deployment rotations, decreased post-deployment time at home, and frequent deployment extensions. Broadly conceptualizing deployment as a complex process that begins before the service member leaves home and continues when he returns allows consideration of the multiple impacts deployment has on service members and their spouses.

Pre-deployment is the stage between notification and departure, during which time the service member and his or her family is readying for the upcoming mission (Pincus et al., 2001). The service member has received orders to be deployed oversees and is often required to complete additional training for the mission. The family members are also preparing for the deployment by making additional arrangements for all manner of household responsibilities, including finances and child care, and mentally and emotionally preparing for the extended absence of the service member. Especially when service members are deployed with a unit, the spouse is connected to the spouses of other deployed service members and the group readies for deployment together.

Deployment, sustainment, and re-deployment are the stages between departure and return, during which time the service member is away from family and often working in a stressful environment (Pincus et al., 2001). Family members at home are adjusting to new roles and responsibilities and often rely on extended networks of military and social supports. Often, communication between the service member and the family is available through internet messages and secure telephones, but is not always consistent. At times during the sustained deployment, there may be periods of no contact between the family and the service member. Spouses often rely on communication with spouses of other service members in the unit for information and support. Often these lines of communication are formalized through participation in a Family Readiness Group (FRG). Towards the end of the tour of duty, the service member prepares for re-deployment back home, and both the service member and his family prepare for reunion. Most times the initial deployment orders include a return date, although sometimes this date is postponed during the deployment and sometimes the family knows only generally when to expect the service member's return and not a specific date. The end of these deployment phases is filled with intense anticipation for the service member's re-deployment home, excitement to be reunited, and some apprehension about how the family's reunited life will be different than before the deployment.

Post-deployment is the stage during which the service member returns home to the family and community (Pincus et al., 2001). The period of immediate reunion is often filled with intense and conflicting emotions, including excitement to be reunited as a family, relief that the service member has returned safely, and anxiety about how each other have grown and changed during the period of separation. In the post-deployment

phase, service members and family members adjust to the service member's reintegration to family life, often through the re-negotiation of roles and family responsibilities. Additionally, service members may be coping with post-deployment health and mental health challenges, and the family may also begin preparing for the next deployment. In previous wartimes, post-deployment was the terminal phase of the deployment cycle and the service member transitioned into civilian life. However, the current operational tempo of military operations now often requires service members to be deployed again soon after reunion, making the post-deployment phase of reintegration also a time of transition to another pre-deployment phase.

Deployment Characteristics

Deployment is a complex experience for both service members and their spouses, and it is characterized by a diverse array of experiences and consequences. Although very little research focuses on the positive impacts of deployment, it should be noted that a deployment may not solely introduce distress and pathology into a service member's life (Newby et al., 2005). Positive consequences include making additional income and paying off debts, self-improvement and strengthened camaraderie with unit members, travel to a new country and exposure to a new culture, and a sense of personal satisfaction for making a difference in the lives of others. However, while almost half (47%) of the 951 Army soldiers surveyed by Newby and colleagues reported both positive and negative consequences, more than 60% reported negative deployment experiences. These included time away from family and friends and missed important events, strains on marital or romantic relationships, and psychological and emotional problems. In a review of measures for studying deployment-related experiences of

military service members, deployment is characterized as distressing not only through combat exposure, but also through managing prisoners of war, witnessing the destruction of homes, and handling human remains (King, King, Vogt, Knight, & Samper, 2006). Furthermore, deployments are often characterized by intense environmental stressors, such as potentially extreme climate, long shifts and irregular hours, and difficult living conditions. Certain characteristics of deployment carry a particularly high risk for negative post-deployment experiences, including whether or not the current deployment is the first experience or is one of multiple deployments and whether or not the deployment is to a combat zone.

Number of deployments. In their review of the literature on the impacts of deployment on military families, Sheppard and colleagues (2010) recommend that more research investigate the impacts of multiple versus single deployments. Given the stress and disruption associated with deployment, they argue that the cumulative effects of multiple deployments may be especially harmful. Indeed, some research already suggests that multiple deployments place service members at risk for post-deployment distress (Phillips et al., 2010). Total number of service members' deployments emerged as a confounder of the relationship between deployment of the service member and mental health diagnosis of his civilian spouse, although the authors did not elaborate on the direction of this effect (Mansfield et al., 2010). Among spouses of service members, the experience of multiple deployments has been linked with increases in emotional disengagement with their husbands (Baptist et al., 2011), coping with increases in child behavior problems (Barker & Berry, 2009), and mental health diagnoses (Eaton et al., 2008).

Deployment to a combat zone. Recent deployment to a combat zone, most

notably those to Iraq or Afghanistan, is consistently cited in the literature as one of the

most predictive risk factors for distress during and post-deployment (Cozza, 2005;

Galovski & Lyons, 2004). Hoge and colleagues (2004) surveyed 3,671 of service

members from four combat infantry units (three Army and one Marine Corps) three to

four months after their return from Iraq or Afghanistan about their current symptoms of

depression, anxiety, and PSTD. A direct, significant linear relationship was observed

between the number of firefights in which the soldier had been engaged and the

prevalence of post-deployment PTSD. Another population-based study of 238,938 Army

and Marine service members recently deployed to combat in Iraq or Afghanistan found

that those who screened positive for a mental health diagnosis related to combat exposure

were significantly more likely to leave military service one year after the deployment

(Hoge et al., 2006). Among a sample of 339 service members who deployed to Iraq or

Afghanistan, combat exposure was significantly associated with self-report of PTSD

symptoms, substance abuse, and depression (Baker et al., 2009). Deployment to a combat

zone is also significantly associated with spouses' level of stress (Allen et al., 2011).

Spouses of service members who were deployed to combat zones reported both

generalized psychological distress, such as difficultly sleeping and feeling tense, and

trauma symptoms, such as intrusive memories and nightmares (Renshaw et al., 2011).

Deployment challenges at home. As previously mentioned in the discussion

of the deployment cycle, sustained deployment can be a complex and stressful period for

the spouse at home (Pincus et al., 2001; MacDermind Wadsworth, 2010). Among spouses

of a deployed service member, wives report a variety of stressors including separation

from their husbands, loneliness, parenting alone, and their husbands missing milestones

in the children's lives (Joseph & Afifi, 2010). Among a sample of 295 female spouses

participating in a Family Readiness Group at the time of a deployment to Iraq or

Afghanistan, 96.3% reported worrying about the safety of their deployed spouses, 89.9%

reported feeling lonely, 61.4% reported problems communicating with their deployed

spouses, 52.9% reported difficulty balancing work and family obligations, and 46.4%

reported challenges managing and maintaining the family finances (Warner et al., 2009).

Relational maintenance during deployment is one of the most difficult aspects of

sustained deployment (Merolla, 2010). A qualitative study of 34 wives of deployed

service members revealed that the spouses struggled with maintaining connection to their

husbands. Although many of the spouses used communication with their deployed

husbands via phone, email, or video messages, they also shared that these

communications were restricted in their timing or content. Another study of

communication patterns during deployment revealed that military wives (n=105) often

engaged in protective buffering, or shielding the service member from family stressors

while deployed (Joseph & Afifi, 2010). Protective buffering was associated with a variety

of negative outcomes for the spouses, including less marital satisfaction and more health

problems such as headaches, feeling down, and feeling exhausted. Conversely, when

controlling for the amount of communication, the more wives disclosed to their husbands

the more satisfied they were with their marriage. A qualitative study of 18 female spouses

of an active duty service member recently deployed to Iraq or Afghanistan reveals similar

findings: although communicating with the deployed spouse helped wives manage the

stress of deployment, they also reported difficulties with less sexual activity during the

deployment, finding new ways to assume roles and responsibilities as a single parent, and coping with the anxiety about their husbands' safety (Baptist et al., 2011). In the civilian population, marital noncohabitation (such as that experienced during a military deployment) is related to a significantly higher probability of marital dissolution (Rindfuss & Stephen, 1990).

Service member post-deployment adjustment. Deployment has far-reaching effects on military families, and the post-deployment adjustment of service members is not only important for their own health, but also for the health of their wives. In recent years, heavy alcohol and prescription drug use, depression, and sleep disorders have increased among military service members returning from deployment (NIDA, 2011). In a representative sample of almost 700,000 active duty service members who experienced deployment to Iraq or Afghanistan between 2001 and 2006 (25% of the total active duty population during that time span), 28.5% had a substance use disorder diagnosis (Shen et al., 2012). While the overall rate of major depressive disorder was lower than that of substance use (9.9%), a diagnosis of major depression was more likely to be accompanied by other comorbid conditions, including substance use disorder (25%) and PTSD (18%). Between 2005 and 2007, the percentage of all individuals on active duty in the US military who had attended mental health treatment visits and received mental health diagnoses increased across all branches (Hyman et al., 2012). Tragically, the same study found that suicide rates have also been steadily increasing. In both 2005 and 2007, the presence of a mental health diagnosis was consistently associated with suicide risk for service members across all branches, and in 2007 all service members who deployed to Iraq or Afghanistan had associated elevated suicide risk. It is important to note that

deployment was only one risk factor identified by this study for elevated suicide risk, and other factors such as changes in marital status or rank were also predictive.

Generally, spouses of persons who suffer a decline in health over time report significantly worse outcomes, including poor marital quality, unbalanced division of labor, and increase in behavior problems such as moodiness and anger (Booth & Johnson, 1994). Relevant to the current study, service members who struggle with post-deployment adjustment stress often have spouses who also report parallel negative experiences, indicating a strong interpersonal connection between service members' post-deployment adjustment and their spouses' adjustment (Price & Stevens, 2011). In a study of 434 Army couples, a husband's recent deployment was related to his report of elevated PTSD symptoms, and his PTSD symptoms were significantly associated with lower marital satisfaction, negative communication patterns, and increased caregiver stress for his civilian wife (Allen et al., 2010). Another study of 45 female spouses of active duty Army soldiers who recently returned from a deployment to Iraq or Afghanistan found that soldiers' trauma symptoms, particularly sexual and sleep problems, predicted lower marital satisfaction of the spouses (Nelson Goff et al., 2007). Similarly, in another study of spouses of soldiers who recently returned from a 12 month deployment to Iraq (n=49), wives were more likely to report depression and low marital satisfaction when they also perceived their husbands to be experiencing posttraumatic stress symptoms (Renshaw et al., 2008). Interestingly, in this study spouses' perception of their husbands' posttraumatic distress was more strongly related to their own report of psychological symptoms and marital satisfaction than was the husbands' report of their own distress, indicating that spouses' perceptions of their husbands' adjustment are critically related to

their personal adjustment. Importantly, spouses have been found to hold more accurate perceptions of the problems experienced by their service member husbands when compared to the service member's own view and that of a mental health clinician, especially for behavioral problems such as anger and alcohol use (Biddle et al., 2002).

Use of Military and Civilian Resources

The number of resources and services for military families provided by civilian organizations and the military are extensive and expanding (Meredith et al., 2011). In 2004, the DOD reported to the House Appropriations Committee about Army, Navy, Marine Corps, and Air Force post-deployment efforts to support service members and their families (DOD, 2004). The report detailed that each branch provides its own versions of comprehensive support programming and policies for families experiencing deployment, and it detailed the specific components of more than 35 programs. A small study of 18 family members of wounded military service members recently returned from deployment investigated the use of various military-provided resources during the injury recovery period (DOD, 2011b). Family members, including parents, spouses, and siblings of the service members, reported accessing an array of services, including case managers and care coordinators, Military OneSource, the National Resource Directory, and the Military Family Assistance Center. They also reported that these services were helpful: the majority of family members (72%) reported being either very satisfied or satisfied with the overall level of support from the military.

Although many spouses of active duty service members obtain support from resources provided by the military, many also access resources from civilian organizations (Blaisure, Saathoff-Wells, Pereira, MacDermid Wadsworth, & Dombro,

2012). For military families who live far from DOD installations and may have limited access to military-provided services, civilian supports are especially important for providing resources. Some of these organizations are national resources that may have been developed with military consultation but that are operated by civilians, such as the Seasame Workshop's *Talk, Listen, Connect: Deployments, Homecomings, Changes* series (Seasame Workshop, 2008). This series includes three episodes of Sesame Street, a magazine for parents and caregivers, online worksheets for children, and links to other military and civilian resources. The National Military Family Association (NMFA) is a civilian nonprofit organization and advocacy group for issues facing military families (NMFA, 2013). It funds educational scholarships for military spouses, holds Operation Purple summer camps for military children, and often testifies before Congress on behalf of military family needs. Examples of more local-level community resources for military families include state health/mental health associations, county social services (e.g., housing, employment assistance, health departments), extension offices of land grant universities, college and university student clubs, faith-based groups, and neighborhood associations. In one community service guide, 25 of the nearly 60 listed programs and services were provided by the military itself through the DOD, local military installations, Veterans Affairs, or specific branches of the Armed Forces, while the rest were provided by civilian organizations (Montgomery County, n.d.).

The types of resources available to military families are diverse, and may be grouped into three categories of support: information, social support, and counseling. These types of resources, which have largely not been studied for how their utilization is related to resilience or distress among military families, are an important, yet currently

absent link between the experience of military spouses' deployment and post-deployment adjustment.

Information

The military is dedicated to the provision of information to its service members and families, particularly during the deployment cycle (DOD, n.d.; Military OneSource, 2013). Units serve as the primary source of information about service members, and information is passed through the chain of command from the branch of service, to the larger battalion, to the individual units, to each service member and his family. During the pre-deployment phase, service members are required and spouses are encouraged to attend information briefings about the deployment orders and support for preparing at home (DOD, n.d.). These briefings cover preparing personal affairs, such as obtaining life insurance, and developing a family care plan for the medical, legal, and logistical needs of military children. They also cover preparing legal affairs, such as power of attorney, writing a living will, and assembling all important legal family documents (marriage certificates, birth certificates, and military records). The military also conducts briefings around the period of return from deployment, which include information about reunion planning, adjustment expectations and support, and post-deployment health assessments.

Additionally, each military installation in the country includes a Deployment/ Mobilization Office that provides information, planning resources, and connections to other important readiness offices, such as the Family Support Office (DOD, n.d.). This office provides a wide array of military family readiness services, including relocation assistance, employment and spouse education opportunities, family life education, new

parent support programs, and deployment/reunion adjustment support. Units can request

Keeping It Together Binders from Military OneSource for their service members'

families, which consolidate information across a range of programs, hotlines, and

websites. A 368 page Military Deployment Guide is downloadable for free from Military

OneSource, and includes helpful information and planning worksheets for all phases of

the deployment cycle (DOD, n.d.). Many community mental health associations are also

focusing efforts on providing county- or state-level information for military families.

Information about available services may be published online, in community resource

guides, or distributed at local resource fairs or schools. University Extension offices also

provide information to military families, for example through 4-H clubs and financial

support seminars. These types of civilian community resources may be particularly

important for military families who live far away from a military installation (DOD, n.d.).

Many psychoeducational resources on deployment cycle stressors and experiences

are also available online, through the websites of Military OneSource, the National

Resource Directory, the National Military Families Association, and countless civilian

organizations that promote military family well-being. These websites present timely

information about the issues that military families face, as well as opportunities for

connection with other military families through social media and local chapters. Other

online resources are available in downloadable, topic-specific handouts and pamphlets,

for example the *Courage to Care* and *Resources for Recovery* campaigns (Uniformed

Services University of the Health Sciences [USUHS], 2013). These resource guides are

available from the Center for Traumatic Stress, whose authors are leading experts in the

fields of military family health and psychological well-being, and are primarily written

for the military family audience. Information is also available to military spouses through stand-alone websites that are found through general internet searches. One example of such an informational website developed by the Defense Centers of Excellence, afterdeployment.org, has been empirically reviewed (Bush, Bosmajian, Fairall, McCann, & Ciulla, 2011). The authors analyzed this website's content, including the breadth of covered topic areas and self-assessments, its usability and practicality through hypothetical individuals' access of the website, and its reach, including media efforts to market the website. They conclude that the website meets its goal to provide a comprehensive knowledge hub for service members and their families on a variety of relevant post-deployment issues. Finally, military spouses may have access to the growing empirical literature published by military and civilian researchers in peer-reviewed journals or that has been translated to the lay audience in magazines or information guides.

Social Support

Social support is argued to be a powerful buffer against psychological distress for spouses throughout the deployment cycle (Joseph & Afifi, 2010; Merolla, 2010). It is well established that social support has a positive relationship with health and well-being by reducing stress and promoting self-care (Chronister, Frain, Chou, & Cardoso, 2008). Wives of active duty service members are connected to both civilian and military social networks that may provide material assistance, emotional support, and a sense of community.

Social support is often obtained through participation in formal, structured activities. Spouses may find solace in organized support groups that are sponsored both

by their husbands' specific branch of service and those that provide services to all branches of the Armed Forces, including Family Readiness Groups, Hearts-Apart, and groups sponsored by the United Service Organizations (USO) (Burton et al., 2009). Family Readiness Groups (FRGs) are established for every military unit and membership is automatic but voluntary for service members and spouses (Operation READY, 2013). The FRG's mission is to assist commanders in maintaining and enhancing service member, family, and community resiliency and stability. FRGs accomplish this mission by building friendly support networks and by holding education seminars on topics relevant to family readiness. Importantly, FRGs promote awareness of installation and community resources. Hearts-Apart is a support group sponsored by all four Armed Forces branches that provides an opportunity for spouses and their children to gather and talk, regardless of branch or rank (Hearts-Apart, 2013). The USO also provides a variety of support services, including support groups, free internet and e-mail access, libraries and reading rooms, and game rooms (USO, 2013). It often sponsors a variety of recreational activities, including bingo nights, video game tournaments, holiday parties, and pot-luck dinners, which are intended to inspire community and fun-filled distraction from the stressors of military life.

Despite the wide variety of available formal support programs available to military families, much of the research about how social support is related to adjustment for military spouses is focused on more informal types of social support. Examples of informal social support include that which spouses receive when they talk to friends within and outside the military community, and the assistance they may receive by relying on parents, siblings, and neighbors to help manage the stress of deployments. In

one study, the relationship between military husbands' absence and spouses' levels of

general distress was found to be buffered by the wives' perceived levels of social support

from other wives in the same unit (Rosen & Moghadam, 1990). Another study that

conducted qualitative interviews with 34 wives of combat veterans found that social

support also provides an informal mechanism for information transmission and learning

(Buchannan, Kemppainen, Smith, MacKain, & Cox, 2011). The majority of spouses in

this study reported obtaining information about PTSD from family members, friends, and

other spouses of active duty military members, rather than from formal training or

informational briefings. Overall feelings of support from friends both within and outside

the military community were found to be associated with civilian spouses' marital

satisfaction when their husbands were deployed (Joseph & Afifi, 2010). Many civilian

spouses are members of faith-based groups, which may provide an additional network of

social support outside the military community (DOD, n.d.). In summary, it is clear that

military spouses benefit from accessing both formal and informal types of social support

from military and civilian organizations and from personal relationships with others.

Counseling

Many of the major challenges faced by military families can be addressed in

counseling, including adjustments at each phase of the deployment cycle, struggles with

mental health problems such as combat stress or depression, family violence against

spouses or children, alcohol and drug related problems including those related to pain

management, marriage enrichment and relationship problems, and financial concerns

(Hall, 2008). Military families may seek counseling through a wide variety of sources,

including civilian professionals in their communities as well as counselors provided by

the service member's branch or the military at-large. Technology has greatly enhanced access to counseling services, both through increased ability to search the internet for available resources and through the reduction of stigma that comes with internet anonymity (Bush et al., 2011). Military OneSource, the main DOD online resource hub for military families, provides face-to-face counseling, telephonic counseling, online counseling, and health and wellness coaching services for spouses of active duty service members (Military OneSource, 2013). Family members are provided twelve free sessions, and the use of any type of counseling service by a spouse can be kept confidential from the service member. However, counseling services through Military OneSource are not intended to treat major mental health disorders, substance abuse problems, or issues of abuse; rather, they are only to be utilized for non-medical, generalized adjustment problems, such as stress management, communication skills, and problem solving techniques. Military chaplains and civilian clergy may also be sources of therapeutic support for spouses of active duty service members; these two groups of counselors protect the confidentiality of what is discussed in sessions from unit commanders.

Clinical treatment considerations are emerging in the literature, but provide scant conclusive evidence of a relationship between utilizing military-provided counseling services and wives' post-deployment adjustment. Sherman, Zanoti, and Jones (2005), psychologists employed by the Oklahoma City Veterans Affairs Medical Center, argue that couples therapy regarding PSTD in the service member should focus on the relational implications of each PTSD symptom cluster (re-experiencing symptoms, avoidance, and increased arousal). Although the authors provide a clinical case example,

their framework has not been empirically tested. Cognitive-Behavioral Conjoint Therapy for Posttraumatic Stress Disorder (CBCT for PTSD) has been found to significantly reduce PTSD symptoms in male combat veterans of OIF/OEF, and to improve relationship satisfaction for the veterans and their female spouses (Shumm, Fredman, Monson, & Chard, 2013). Although the sample of six couples is too small to be generalizable to the larger population of military couples, this study suggests that couple therapy treatments are a promising strategy to reduce distress among previously deployed service members and their wives. Other evidence-based treatments for PTSD in service members, such as prolonged exposure therapy or cognitive processing therapy, are designed for treatment of the person who has the mental health disorder or trauma experience, and the protocols evaluated for effectiveness do not include the spouse (Meyers et al., 2013).

Individual and Family Characteristics and Post-Deployment Adjustment

Post-deployment adjustment for spouses of active duty service members is affected by more than just deployment cycle stressors and military-provided resources. A number of additional individual and family characteristics are also important to account for in models of post-deployment adjustment, including a spouse's age, race/ethnicity, education level, employment status, the number of years the couple has been married, the family's perceived financial condition, the service member's military branch and rank, and the time since the most recent deployment.

Spouse Age

Younger service members and younger spouses, compared to older, have been found to experience more anxiety and stress during deployment (McNulty, 2005) and are

at a greater risk for mental health diagnosis during post-deployment (Mansfield et al., 2010), particularly for a diagnosis of depression (Warner et al., 2009). Younger spouses are more likely to be married to a deployed service member, and thus may be more likely to experience the stressors of deployment compared to older spouses of nondeployed service members (Mansfield et al., 2010). However, older spouses are more likely than younger spouses to endorse the help-seeking barrier of concern that their mental health record would cause harm to their service member husbands' careers (Warner et al., 2009). The age of the female spouse during a particular deployment cycle seems to affect her post-deployment adjustment in complex ways.

Spouse Race/Ethnicity

Evidence of an ethnic health disparity in post-deployment distress among service members is emerging in the literature; yet few studies have examined psychological or health outcomes among ethnic minority military families (MacDermind Wadsworth, 2010; Nayback, 2008). Although traditionally defined as ethnic 'inequalities' in health outcomes, the term ethnic health 'disparity' now carries a distinct quality of injustice (Carter-Pokras & Baquet, 2002). Despite equal access to free, high-quality health care services, African American service members are more likely than White service members to develop PTSD symptoms after experiencing a traumatic event (Murdoch, van Ryn, Hodges, & Cowper, 2005). Paradoxically, Murdoch and colleagues also found African American service members less likely than White service members to receive a service-connected disability rating for a PTSD diagnosis, even when controlling for PTSD symptom severity and functionality. Furthermore, when denied these disability benefits, African American service members are more likely to be in poverty than White service

members who are also denied benefits. The consequences of the ethnic health disparity in post-deployment distress also include higher morbidity rates, increased behavioral risk factors, and greater burden of PTSD symptoms (Nayback, 2008).

The extent to which this emerging ethnic health disparity among service members also affects the adjustment of their spouses has rarely been studied. Often comparisons could not be made due to insufficient sample sizes overall or between ethnic groups, or missing data on race/ethnicity (Allen et al., 2011; Mansfield et al., 2010; Renshaw et al., 2008; Warner et al., 2009). Only one study could be identified that explicitly examined ethnic group differences in marital adjustment among military spouses (Westhuis, Fafara, & Ouellette, 2006). However, because the majority of the sample of 4,464 Army military spouses was White (75%), the findings of the aggregate group closely reflect the findings of the White sub-sample and meaningful group comparisons could not be made. Given that African American service members are more likely to experience psychological distress after exposure to a traumatic event during combat than White service members (Murdoch et al., 2005; Nayback, 2008), it is important to consider the potential for group differences among minority and White spouses of active duty service members.

Spouse Education Level

Lower levels of education have been found to significantly negatively affect the health and well-being of service members during deployment (McNulty, 2005). Spouses with more years of education were significantly more likely to endorse health-promoting behaviors during deployment separation, such as exercising regularly, eating a healthy diet, and getting regular check-ups with a primary care physician (Padden et al., 2011). Spouses with more education may also be more likely to seek information or already

know about available resources for support in their communities and military installations.

Spouse Employment Status

Spouse employment is recognized as an important quality-of-life issue for military families (White House, 2011). Indeed, combining the military lifestyle, characterized by frequent moves and temporary single-parenthood during deployments, with a career is a daunting challenge for military spouses (Hall, 2008; Hosek, Asch, Fair, Martin, & Mattock, 2002). Often the requirements for licensure and certification differ from state to state, and many spouses of active duty service members feel they are overeducated and underemployed compared to their civilian peers (Hosek, et al., 2002). Furthermore, military spouses who work and experience a deployment must balance job demands and family demands without the help of a partner.

Years Married

Evidence is clear that newly married service members are at increased risk for post-deployment distress compared to service members who have been married for more years (McNulty, 2005). Among spouses of active duty service members, a solid marital foundation, measured by the length of the marriage prior to separation of deployment, predicts the most positive post-deployment outcomes (Galovski & Lyons, 2004).

Motherhood

The presence of children at home is significantly associated with increases in stress and depression for partners of currently deployed service members (Warner et al., 2009), and particularly for spouses who are also pregnant (Haas, Pazdernik, & Olsen, 2005). Spouses of deployed service members who have children carry additional burdens

of motherhood, including parenting alone and managing child behavior problems (Barker & Berry, 2009). During deployment, young children are likely to exhibit behavioral problems such as disobedience, prolonged crying, and clinginess (Barker & Berry, 2009), while older children and teenagers are likely to exhibit problems such as decreased academic performance, emotional disturbances, and anger (Sheppard, Malatras, & Israel, 2010). Across developmental age groups, these internalizing and externalizing behaviors are significantly associated with increases in mothers' deployment-related stress (Allen et al., 2011).

Perceived Family Financial Condition

Lower income and economic strain are significantly associated with spouses' stress regarding deployment, including their marital satisfaction, sense of post-deployment adjustment, and lack of social support (Allen et al., 2011). Interestingly, the authors found that perception of financial status was more predictive than actual income levels, suggesting that a spouse's subjective report of her family's financial condition may be an important indicator of risk for other negative post-deployment outcomes.

Service Member Branch

Associations between risk of post-deployment distress and branch of military service are complex (Hyman et al., 2012; Shen et al., 2012). Membership in a particular branch suggests different characteristics of deployment experiences, which are then associated with differences in likelihood of post-deployment distress. For example, service members in the Army and Marine Corps are more likely to be deployed to Iraq and Afghanistan, and the length of their deployments tend to be longer than 180 days. By contrast, Navy and Air Force members are less likely to be deployed to these recent

conflict areas, and often have tour lengths of less than 120 days. Thus it is not surprising that Marine Corps members are more likely, while Navy and Air Force service members are less likely, to require hospitalization for combat-related traumatic brain injury compared to rates among Army service members (Heltemes, Dougherty, MacGregor, & Galarneau, 2011). Similarly, compared with Navy service members recently deployed to Iraq or Afghanistan, members of the Army and Marine Corps were more than twice as likely to screen positive for PTSD (Baker et al., 2009). Together, these differences in levels of post-deployment distress observed between branches may be the result of differences in deployment experiences, such as combat exposure or injury and length of deployment, not because of service branch in and of itself.

Service Member Pay Grade/Rank

Higher rank of a service member is associated with a number of military life satisfaction dimensions (Burrell, Adams, Durand, & Castro, 2006). In this study, 346 spouses of higher ranked service members, as compared to those whose spouses had lower ranks, reported greater overall satisfaction with military life and better psychological well-being, while they also reported more negative impacts of military duty related moves and separations from the service member husband. Prevalence of clinical posttraumatic distress symptoms are also strongly influenced by the rank of the active duty service member for both the service member himself as well as for his civilian spouse; lower ranks indicate greater risk (Lester et al., 2010; Phillips et al., 2010). Enlisted active duty service members reported significantly more posttraumatic distress than active duty officers and a similar, but a statistically nonsignificant, pattern was observed between spouses of enlisted and officer service members. Enlisted service

members are also more likely to require hospitalization for combat-related traumatic brain injury compared with officers (Heltemes et al., 2011).

Time since Most Recent Return from Deployment

Within the post-deployment phase of the deployment cycle described previously, several additional sub-stages are often described by military couples themselves (Rotter & Boveja, 1999). The immediate return of the service member is marked by a honeymoon period in which emotional affect is intensely positive. This period is followed by a period of conflict associated with renegotiation of roles and expectations. Especially considering the recent high tempo of deployment, the conflict resolution stage often bleeds into pre-deployment stage of the next deployment. Army soldiers report a fourfold increase in interpersonal conflict three to six months after returning home from deployment, compared to their immediate return (Miliken, Auchterlonie, & Hoge, 2007). A similar finding was observed for 220 service members who had recently deployed: the length of time that service members had been home was negatively associated with relationship satisfaction, even when controlling for depression symptoms and relationship uncertainty (Knobloch & Theiss, 2011). In the first study to examine the electrical brain activity of a civilian spouse during post-deployment, researchers found a significant correlation between increased right hemisphere activity and the length of time since the service member has returned home from deployment (Werner-Wilson et al., 2011). Right hemisphere brain activity is associated with depression symptoms and a tendency to withdraw emotionally, leading the authors to conclude that the longer the service member remains home the more spouses disengage from their husbands. This finding that spouses' disengagement well into the post-deployment stage leads to negative outcomes

for couples complements other findings that disruptive attachment is associated with late onset of PTSD symptoms (Basham, 2008). Together, these findings of delayed onset of relational distress are intensified by a complex pattern of post-deployment distress among service members, many of whom do not exhibit symptoms of psychological distress in predictable trends (Grieger et al., 2006). Thus, time since most recent deployment may be an important factor in the relationship between deployment cycle stressors and post-deployment adjustment of military wives.

Family Stress Theory: The ABC-X Model

Research investigating the complex relationships between deployment cycle stressors, use of military and civilian resources, and post-deployment adjustment for wives of active duty service members must be understood within an appropriate theoretical framework. The experiences of military family members may be uniquely understood within Family Stress Theory, which grew out of a social systems approach to family stress and adaptation (Price, Price, & McKenry, 2010). The tenets of systems theory apply to family stress, including viewing systems as more than the sum of their parts. In other words, any collection of family members is not only made up of individuals, but also of aggregated relationships, shared experiences, and a shared community of cultural norms. Within family systems theory, as families develop over time they will experience both normative and nonnormative life events, some of which will induce changes that will produce a family stress response. Change exerts pressure on family systems by disrupting their steady state of equilibrium; however, change does not always result in family crisis. Family Stress Theory posits that the impacts of change are dependent on the family's coping ability and perception of the situation. A family's level

of risk for distress or resilience in the face of stressors may be observed by studying both individual responses to the event and the greater external pressures exerted by the family's unique environment. These tenets of Family Stress Theory are uniquely able to account conceptually for how military families and their individual members will adapt to the normative, but often stressful, events of the deployment cycle.

Family Stress Theory has been integrated with concepts of family resilience (Patterson, 2002). Family resilience is conceptualized as the capacity of a family to thrive in the face of adversity and hardship, as well as the processes through which protective factors prevent poor outcomes. Imbedded within this conceptualization is the idea of risk, or the expectation that based on certain experiences or unmet needs, a family will be unable to cope with the demands of their stressful situation and move into a state of disequilibrium or crisis. Family crisis is defined as the negative outcomes associated with a decrease in family functioning. Resilient outcomes are dependent not only on the family's internal relational processes, but also on the opportunities for support available from their ecological context. Family Stress Theory tenets help to formulate these definitions, by providing a framework in which families balance the demands of change with capabilities to adapt. Together, the concepts of family stress and family resilience are concordant with the military's notion of "total force fitness" described earlier. By expanding the definition of service members' health to include their experiences with and among family members, the military is extending its assessment of health more holistically (Battaglia & Macedonia, 2012; Land, 2010). The six dimensions of total force fitness, including physical, behavioral, social, environmental, medical, nutritional, spiritual, and psychological, comprise each military family's constellation of risk and

resilience factors, in which researchers can understand the complex relationships between the experience of stress, use of resources and post-deployment adjustment.

A brief review of other theoretical literature used to hypothesize about the health and well-being of military families is relevant to the current study as it provides support for the concepts of Family Stress Theory. Karney and Bradbury's (1995) Vulnerability-Adaptation-Stress model represents how stressor events, internal vulnerabilities, and adaptive processes of a marriage mutually influence each other to influence marital quality and stability over time. This model builds directly on the strengths of Family Stress Theory by specifying the mechanisms that moderate the relationship between stressful events and marital outcomes. In their Couple Adaptation to Traumatic Stress Model, Nelson Goff and Smith (2005) also illustrate a systemic view of stress. Focusing narrowly on couples' experience of traumatic events, this model accounts for both individual risk factors and resources (such as age and coping styles) and couple functioning factors and resources (such as intimacy and marital roles). Family Stress Theory also accounts for these various systems influences and both models offer insights into the complex interactions of these two levels on couples' macro-experience of traumatic events. These two other models provide a helpful theoretical background for the present study. Within this context, Family Stress Theory provides its own model of how military families will respond to the often stressful events of the deployment cycle: the ABC-X model.

The ABC-X Model was first described by Hill in 1949 as an attempt to understand the effects of separation and reunion during World War II on military families (Hill, 1949; Price et al., 2010). Although the original ABC-X model has been expanded

refined by various researchers (see, for example, McCubbin & Patterson, 1982), its initial conception has withstood rigorous testing and is still the foundational basis for studying family stress and coping (Price et al., 2010). Overall, this model theorizes that families experiencing more stressful events will be more vulnerable to family crisis, and that this effect will be moderated by families' levels of resources and perceptions of the events themselves. Therefore, in any given circumstance, the extent to which stressor events (A) lead to successful adaptation or crisis and poor outcomes (X) is dependent on accessing concrete resources (B) and the perceptions and meanings given to the event (C) by family members (see Figure 1 in the previous section).

Stressor events (A) are those experiences that provoke some degree of change in the family system (Price et al., 2010). A stressor event is an occurrence that either changes or does not change the family's level of functioning. Based on both the magnitude of the event and other moderating factors to be described, stressors may or may not lead to family crisis. Stressors may be normative, in that they are common and expected based on a family's context or environment and are considered normal, or non-normative, in that they are relatively uncommon, unexpected, and occur based on some unique situation that is unlikely to have been predicted. Both normative and non-normative stressor events have also been described along other dimensions, such as whether they occurred suddenly or with gradual onset and whether the stressor is a short- or long-term problem. Whether any given stressor event will lead to family crisis is determined, in part, by the family's access to and utilization of resources.

Resources (B) available to and used by a family moderate the relationship between stressors and family outcomes (Price et al., 2010). Resources may be individual

traits of an individual family member, abilities of the family system to access support, or characteristics of a family's community that can be used to meet the demands of the stressor event and cope with the changes it produces. Some resources are internal to the family system, such as the level of family cohesion or sense of unity. These types of non-material resources may be measured through family self-report or behavioral observation. Other resources exist external to the family system and must be discovered, accessed, and utilized by the family effectively in order to reduce distress. Examples of these more concrete resources include social support, accessing information to aid decision making, and relying on interpersonal relationships with others.

In addition to accessing resources, a family's perceptions of the stressor event (C) also moderate its effect on family outcomes (Price et al., 2010). Different families' subjective definitions of the same stressor event fall on a broad spectrum of meaning, from optimism and a positive sense of opportunity for growth to hopelessness and a negative sense that the situation is unmanageable. Additional factors that influence a family's perception of a stressor event include spirituality, values and beliefs, and culture and ethnicity. These factors change a family's world view and orientation to various stressor events. For example, families with a mastery orientation are more likely to perceive a stressor event as a problem they are capable of solving, whereas those with a fatalistic orientation are more likely to perceive the stressor as out of their control. Understanding whether a family embraces or dreads the changes brought about by stressor events is important to predict whether the family will successfully adapt or move into crisis.

The X factor of the ABC-X model is the family outcome: does the family successfully adapt in the face of adversity to overcome challenges, or does the family experience such acute change that they experience severe distress and crisis? When a family is in crisis, family members are no longer able to function at optimal physical or psychological levels and experience high levels of distress. As discussed previously, stressors are not inherently bad for families, but only become problematic when the family's functioning becomes disrupted or individual members display negative physical or emotional symptoms. Although 'stress' and 'crisis' are terms that have been used interchangeably to describe poor outcomes, there is an important distinction between the two: stress is measured continuously and is experienced on a continuum of degrees, while crisis is dichotomous and describes a state of extreme, system-wide disruption (Price et al., 2010). Researchers should be clear that the X within the ABC-X model is conceptualized as a state of crisis, and measurement of dependent variables for their given studies should be consistent with that conceptualization.

Thus, the ABC-X model hypothesizes a linear relationship between stressor events and outcomes, moderated by family resources and perceptions of the event. In the context of the current study, each variable may be mapped onto the ABC-X model as depicted in Figure 2. The stressor event (A) is the military family's experience of the most recent deployment cycle, including the characteristics of that deployment, the number of deployment problems experienced at home by the spouse, and the service member's post-deployment adjustment problems after his return. The concrete resources (B) accessed and utilized by the spouse during the deployment cycle include information provided by both the military and civilian sources, social support from friends and

family, and counseling provided by different types of professionals. The X factor describes either the successful adaptation to or family crisis stemming from experiencing deployment cycle stressors and is operationalized by two indices of post-deployment adjustment of active duty military spouses. These two terms, 'adaptation' and 'adjustment' refer to the same process of change experienced by military families after the stressful experiences of deployment. While the ABC-X model language uses the term 'adaptation,' the term 'adjustment' is more commonly found in research on military family resilience (see, for example, Battaglie, 2012). Therefore, both terms are used throughout the current research, depending on whether the theory is being discussed (adaptation) or how the theory is operationalized within the present study (adjustment).

In the current study, spouses' post-deployment adjustment is measured continuously as degrees of stress along two dimensions of functioning: individual (mental health) and relational (marital satisfaction). Perceptions of the stressor event (C) are not measured in the present study. Therefore, the ABC-X model describes the central hypothesis of the current study: the expected negative relationship between deployment cycle stressors and post-deployment adjustment will be moderated by accessing various military and civilian resources, accounting for each spouses' individual and family characteristics that may change her relative level of risk for distress.

In summary, understanding of post-deployment adjustment of spouses of active duty service members requires an understanding of how the stressful events of the deployment cycle are moderated by accessing various military and civilian resources. Family Stress and Coping Theory's ABC-X model, initially developed to theorize about the stressors of wartime deployment, provides a comprehensive theoretical structure in

which to examine the complex interactions between deployment cycle stressors and

military and civilian resources on post-deployment adjustment of female military

spouses.
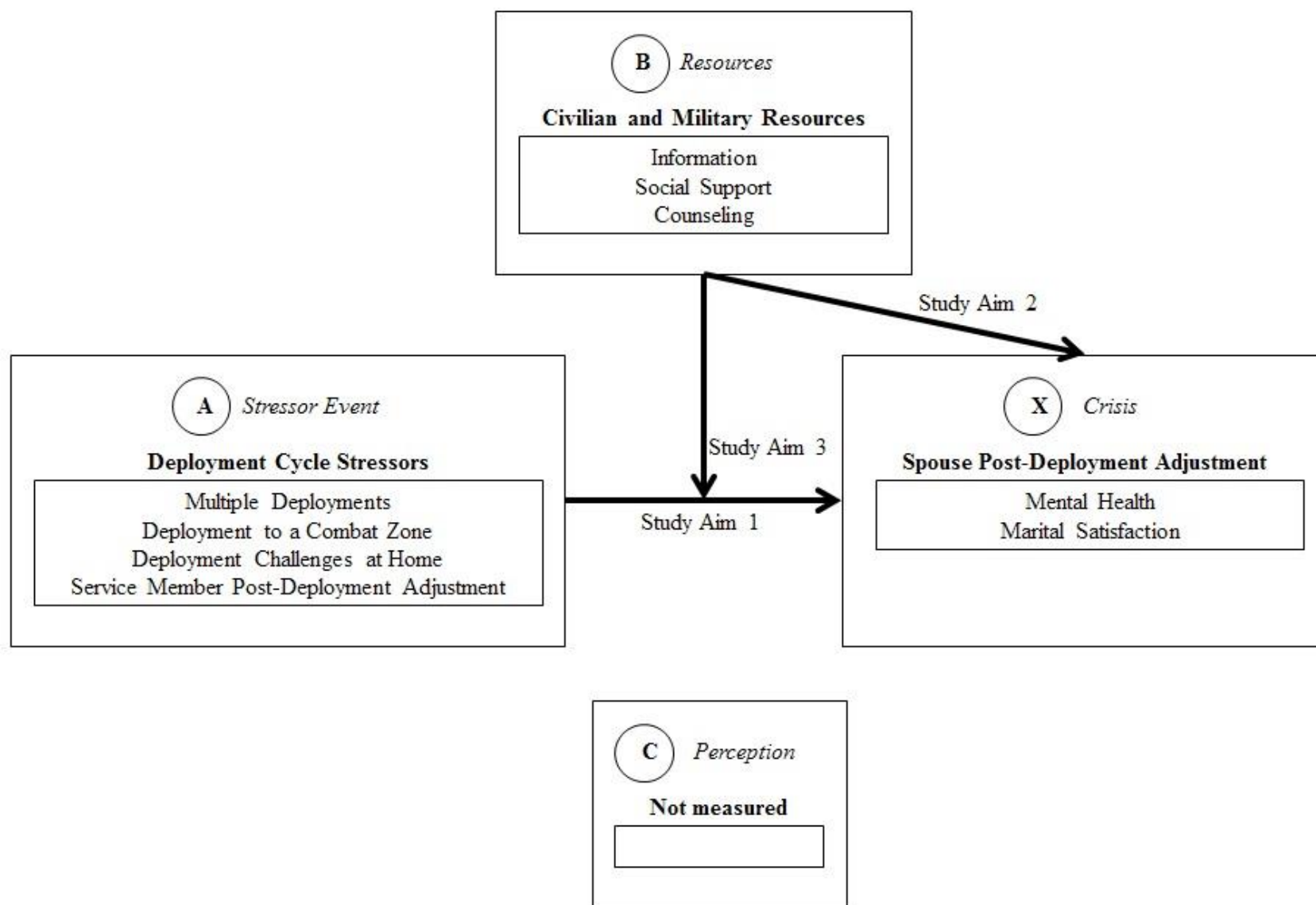
Figure 2. Current study variables within the ABC-X model.

Purpose of the Current Study

The ABC-X model examines the interactions between encountering stressors, accessing resources, and experiencing outcomes, over the course of time (Price et al., 2010). Although the current study is cross-sectional, in that data were collected from spouses at one point in time, the variables used to assess the dimensions of deployment cycle stressors, use of military and civilian resources, and post-deployment adjustment reflect the entire experience of a deployment at multiple points in time. The effects of accessing the three types of military and civilian resources will also be examined collectively, adjusting for use of the other resources in the model. By examining these associations between variables that represent experiences of the complete deployment cycle, it may be possible to identify the combination of resources that are most strongly related to healthy post-deployment adjustment despite experiencing stressful recent deployment experiences. These associations may also inform the development and implementation of targeted individual- and military community-based intervention programs across the deployment cycle.

Thus, the current study investigated the relationships between deployment cycle stressors (number of deployments, deployment to a combat zone, deployment challenges at home, and service member post-deployment adjustment) and use of military and civilian resources (information, social support, and counseling) on post-deployment adjustment (mental health and marital satisfaction) of wives of active duty service members. That is, this study assessed the associations between deployment cycle stressors and post-deployment adjustment, and it assessed the potential moderating effect of use of military and civilian resources on the latter relationship. As Baron and Kenny

(1986) note, a study of moderation hypothesizes "an interaction between a focal independent variable and a factor that specifies the appropriate conditions for its operation" (p. 1174). In this sense, it is hypothesized that the use of specific resources changes the direction and/or strength of the relationships between deployment cycle stressors and post-deployment adjustment. Thus, this study had the following aims (see Figure 2 for a graphic depiction of the aims within the ABC-X framework):

- Aim A: Determine the main effects of deployment cycle stressors on two indices of spouse post-deployment adjustment.

- Aim B: Determine the main effects of use of military and civilian resources on two indices of spouse post-deployment adjustment.

- Aim C: Determine the moderating effects of use of resources on the relationships between deployment cycle stressors and spouse post-deployment adjustment.

Overall, based on the above aims, it was hypothesized that more deployment cycle stressors (multiple deployments, deployment to a combat zone, multiple deployment challenges at home, poor service member post-deployment adjustment) would be associated with worse post-deployment adjustment for spouses (higher levels of mental health problems and lower marital satisfaction). It was also hypothesized that the use of more military and/or civilian resources (information, social support, and counseling) would be associated with better post-deployment adjustment for spouses (lower levels of mental health problems and higher marital satisfaction). Further, it was hypothesized that the interactions between many deployment cycle stressors and use of many civilian and/or military resources would significantly weaken the relationships between deployment cycle stressors and spouse post-deployment adjustment.

Using nationally-representative data from the 2010 Military Family Life Project (MFLP), the associations between deployment cycle stressors, use of military and civilian resources, and post-deployment adjustment were explored. Adjusted associations (controlling for spouse age, spouse race/ethnicity, education level, spouse employment status, years married, perceived family financial condition, service member branch, service member rank, and time since most recent deployment) were examined. All analyses included sample weights that were included in the dataset to account for the complex cluster design and to yield nationally-representative estimates.

Table 1 provides specific hypotheses for each study aim to answer the question of whether accessing military and civilian resources moderates the relationship between deployment cycle stressors and post-deployment adjustment for spouses of recently deployed active duty service members.

Table 1.

Research Question, Aims, and Hypotheses

Research Question
Does accessing civilian and/or military resources moderate the relationship between deployment cycle stressors and spouse post-deployment adjustment?

Research Aims	Hypotheses
A: Determine the main effects of deployment cycle stressors on spouse post-deployment adjustment, specifically mental health problems and marital satisfaction.	1) Spouses who report higher levels of deployment cycle stressors will report higher levels of mental health problems than spouses who experience lower levels of deployment cycle stressors. 1a) Spouses who report a higher number of deployments will report higher levels of mental health problems. 1b) Spouses for whom the most recent deployment was to a combat zone will report higher levels of mental health problems. 1c) Spouses who report higher levels of deployment challenges experienced at home will report higher levels of mental health problems. 1d) Spouses who report higher levels of service members' post-deployment adjustment problems will report higher levels of mental health problems. 2) Spouses who report higher levels of deployment cycle stressors will report lower marital satisfaction than spouses who experience lower levels of deployment cycle stressors. 2a) Spouses who report a higher number of deployments will report lower marital satisfaction. 2b) Spouses for whom the most recent deployment was to a combat zone will report lower marital satisfaction. 2c) Spouses who report higher levels of deployment challenges experienced at home will report lower marital satisfaction. 2d) Spouses who report higher levels of service members' post-deployment adjustment problems will report lower marital satisfaction.

B: Determine the main effects of use of military and civilian resources on spouse post-deployment adjustment, specifically mental health problems and marital satisfaction.	3) Spouses who access more types of military and civilian resources will report lower levels of mental health problems than spouses access fewer resources.
	    3a) Spouses who access more types of information resources will report lower levels of mental health problems.
	    3b) Spouses who access more types of social support resources will report lower levels of mental health problems.
	    3c) Spouses who access more types of counseling resources will report lower levels of mental health problems.
	
	4) Spouses who access more types of military and civilian resources will report higher marital satisfaction than spouses access fewer resources.
	    4a) Spouses who access more types of information resources will report higher marital satisfaction.
	    4b) Spouses who access more types of social support resources will report higher marital satisfaction
	    4c) Spouses who access more types of counseling resources will report higher marital satisfaction.

C: Determine the moderating effects of use of military and civilian resources on the relationships between deployment cycle stressors and spouse post-deployment adjustment, specifically mental health problems and marital satisfaction.	5) Higher reported use of military and civilian resources will weaken the relationship between deployment cycle stressors and spouse mental health problems.
	    5a) Higher reported use of information resources will weaken the relationship between number of deployments and spouse mental health problems.
	    5b) Higher reported use of social support resources will weaken the relationship between number of deployments and spouse mental health problems.
	    5c) Higher reported use of counseling resources will weaken the relationship between number of deployments and spouse mental health problems.
	    5d) Higher reported use of information resources will weaken the relationship between whether the recent deployment was to a combat zone and spouse mental health problems.
	    5e) Higher reported use of social support resources will weaken the relationship between whether the recent deployment was to a combat zone and spouse mental health problems.
	    5f) Higher reported use of counseling resources will weaken the relationship between whether the recent deployment was to a combat zone and spouse

mental health problems.

5g) Higher reported use of information resources will weaken the relationship between number of deployment challenges experienced at home and spouse mental health problems.

5h) Higher reported use of social support resources will weaken the relationship between number of deployment challenges experienced at home and spouse mental health problems.

5i) Higher reported use of counseling resources will weaken the relationship between number of deployment challenges experienced at home and spouse mental health problems.

5j) Higher reported use of information resources will weaken the relationship between number of service members' post-deployment adjustment problems and spouse mental health problems.

5k) Higher reported use of social support resources will weaken the relationship between number of service members' post-deployment adjustment problems and spouse mental health problems.

5l) Higher reported use of counseling resources will weaken the relationship between number of service members' post-deployment adjustment problems and spouse mental health problems.

6) Higher reported use of military and civilian resources will weaken the relationship between deployment cycle stressors and low marital satisfaction.

6a) Higher reported use of information resources will weaken the relationship between number of deployments and low marital satisfaction.

6b) Higher reported use of social support resources will weaken the relationship between number of deployments and low marital satisfaction.

6c) Higher reported use of counseling resources will weaken the relationship between number of deployments and low marital satisfaction.

6d) Higher reported use of information resources will weaken the relationship between whether the recent deployment was to a combat zone and low marital satisfaction.

6e) Higher reported use of social support resources will weaken the relationship between whether the recent deployment was to a combat zone and low marital

	satisfaction. 6f) Higher reported use of counseling resources will weaken the relationship between whether the recent deployment was to a combat zone and low marital satisfaction. 6g) Higher reported use of information resources will weaken the relationship between number of deployment problems experienced at home and low marital satisfaction. 6h) Higher reported use of social support resources will weaken the relationship between number of deployment problems experienced at home and low marital satisfaction. 6i) Higher reported use of counseling resources will weaken the relationship between number of deployment problems experienced at home and low marital satisfaction. 6j) Higher reported use of information resources will weaken the relationship between number of service members' post-deployment adjustment problems and low marital satisfaction. 6k) Higher reported use of social support resources will weaken the relationship between number of service members' post-deployment adjustment problems and low marital satisfaction. 6l) Higher reported use of counseling resources will weaken the relationship between number of service members' post-deployment adjustment problems and low marital satisfaction.

CHAPTER 3: METHODS

Data

Description of the Data

Data for this study were drawn from the 2010 Military Family Life Project (2010 MFLP), which was conducted by the Defense Manpower Data Center (DMDC) on behalf of the Office of the Under Secretary of Defense for Personnel and Readiness (DMDC, 2010; DMDC, 2011). The 2010 MFLP survey program was conducted under the leadership of Timothy Elig, Director of the Human Resources Strategic Assessment Program (HRSAP), and with the policy contributions of Cathy Flynn and Yuko Whitestone, Directors of Military Community and Family Policy (MCFP). DMDC's Survey Technology Branch is responsible for the distribution of datasets outside of DMDC (including the 2010 MFLP survey) and for the maintenance of records on compliance with the Privacy Act and 32 CFR 219. The Basic Survey File (MFLP1001B.7BDAT) was used for the current study, which provides basic access to data from the survey and includes the maximum amount of participant information while meeting requirements for participant and non-participant anonymity.

The 2010 MFLP is currently the largest, most comprehensive survey of Active Duty spouses ever undertaken. The 2010 MFLP data are appropriate for use in the current study because they are timely and address a wide range of issues facing military spouses. As such, this dataset can be used to examine how spouses experience a recent post-deployment phase, whether they access military-provided resources, and their post-deployment adjustment in terms of psychological and relational health.

Survey Design

The 2010 MFLP utilized both web-based and paper surveys to assess the attitudes and opinions of Active Duty spouses on a wide range of quality of life issues. The survey covered ten topic areas, including background information; permanent change of station moves; education and employment; the military spouse's family; health and well-being; financial well-being; life in the military; service member's deployments; the effect of deployments on children; and reunion and reintegration. Eligibility criteria were used to determine the target population: spouses must have been currently married to an active duty member of the Army, Navy, Marine Corps, and Air Force; spouses must be civilians and not also service members themselves; and the service members must have been enlisted (E1-E9) or officers (O1-O6) and on active duty for at least six months at the time of the survey.

Data were collected between May 10, 2010 and August 25, 2010 via web-based and mailed paper surveys. Each eligible sample member received no more than six original mailings: a notification letter, a reminder letter with a brochure, a reminder letter with a paper survey, and three other reminder letters. In addition to the mailed letters, up to 10 e-mail messages were sent to those sample members with a valid e-mail address: an announcement and nine reminders. Service members of sampled spouses who had not completed a survey were also sent two e-mails to remind their spouses to participate.

The web survey was hosted on the DMDC secure website, which stated the source of the survey's certification by the Under Secretary of Defense for Personnel and Readiness and required spouses to enter a personal ticket number to continue. The 'Welcome' page displayed a brief description of the MFLP and provided access to

Frequently Asked Questions. From the 'Welcome' page, participants were forced to view the "Privacy Act Statement & Informed Consent Information." If spouses agreed to enter the survey, they clicked 'Continue' to begin. Each survey question was displayed on its own web page, and for each question participants could return to the previous page, move forward to the next page, clear their responses, or save and exit the survey. Respondents answered questions in a variety of formats, including radio buttons, check boxes, choosing from drop-down list, or text and numeric entry. In addition to the navigation features, the survey featured smart skips; based on previous answers, the respondents were only shown questions applicable to their situation. The final page of the survey had the option to submit the survey or to return to the previous page. If respondents chose to save and return to the survey later, upon returning to the survey their personal ticket number was required, and the opening page brought them to the item from which they exited. Paper surveys were mailed on May 28, 2010 to those spouses who did not respond via the initial web-based invitation and included a reminder letter and a return envelope.

DMDC used several data files to develop the sampling frame, construct strata, and determine sample size and allocation. These files included the September 2009 *Active Duty Master Edit File,* September 2009 *Family Database,* September 2009 *Active Duty Pay File,* September 2009 *Basic Allowance for Housing Population File,* and December 2009 *Defense Enrollment Eligibility Reporting System File.* Using the specified definition of the population (three criteria described above) resulted in a sampling frame with 670,719 eligible members. Service member stratification variables and sampling weights were developed based on population subgroups of particular interest to military policy officials: branch, pay group, child age, deployment, and race/ethnicity. The sample size

was larger than would be required to make accurate and stable estimates for spouses in each of the reporting categories and it was increased to ensure an adequate number of spouses were available for future waves of the MFLP.

A non-proportional stratified, single-stage random sample of 101,812 participants was selected from the original sampling frame. Sample members were lost from the sample for three main reasons: ineligibility based on inclusion criteria, inability to be located by DMDC, and nonresponse. A total of 7,014 sample members were lost due to classification as ineligible, either through checks in the master files or via self-report, and a total of 8,207 sample members were lost due to missing, incomplete, or out-of-date addresses. Losses attributable to either ineligibility or inability to be located resulted in a sample that was 85.1% of the originally drawn sample. Nonrespondants included sample members who asked to have their names removed from the survey mailing list and 55,993 sample members who did not return a survey. At the conclusion of survey fielding, 28,552 eligible, locatable sample members had returned usable surveys. The overall weighted response rate was 29.9% for the 2010 MFLP survey.

Participants

Completed 2010 MFLP surveys, defined as valid responses to the three eligibility questions and to 50% or more of the survey questions asked of all participants, were received from 28,552 respondents. These civilian spouses were currently married to Active Duty members of the Army, Navy, Marine Corps, and Air Force, excluding National Guard and Reserve members in active duty programs. In the current study, participants' data were weighted to compensate for the unequal selection and differential response rates of the population subgroups. That is, DMDC has calculated an analytic

weight for each sample participant, post-stratified to population totals so that weighted sample estimates reflect population values. Therefore, the use of DMDC weights account for the complex sampling method and stratification of the 2010 MFLP in order to produce associations which are nationally representative with respect to service branch, pay grade, child age, deployment, and race/ethnicity.

Analytic Sample

The current study was focused on female spouses of male Active Duty service members; therefore, male spouses were omitted from the sample. Additionally, because this study examined the characteristics of a recent deployment and the resulting adjustment experiences during the post-deployment phase, only those wives whose service member husbands had been deployed in the last 24 months, but who are not currently deployed, were included in the analytic sample. Of the 28,701 eligible female spouses in the dataset, 9,496 met the inclusion criteria for the present study.

Sample Description

Table 2 contains a description of the sample demographics, both unweighted and weighted using DMDC sample weights.

Unweighted Sample Demographics

The largest group of spouses were aged 26 to 30 years old, with almost equal groups younger than and older than 30. The majority of the sample self-identified as White (75.37%) and due to insufficient numbers of minorities in the sample, all non-white groups were collapsed (24.63%). Almost 10% of the sample had a high school diploma or some high school education, while approximately 73% had some college credit or had obtained an Associate's or Bachelor's degree. Approximately 40% of the

spouses were employed, while 13.66% were unemployed and 45.81% were not in the labor market (unemployed but not looking for work). The largest group of spouses (28.20%) had been married 3 years to less than 6 years and the majority of the sample did not report perceived financial difficulty (69.19%). The spouses were married to almost equal numbers of Army (21.41%), Navy (23.74%), and Marine Corps (23.58%) service members. Slightly more spouses were married to Air Force (31.26%) service members and there were almost equal groups between spouses married to enlisted service members (44.7%) versus officers (52.3%). On average, service members had returned home from deployment within the previous year ($M = 10.47$ months, $SD = 7.06$).

Weighted Sample Demographics

The weighted sample demographics account for the over or under sampling of certain groups; weighted values indicate the approximate numbers, percents, and means of the population from which the sample was drawn. Overall, the study sample closely resembles the larger population of active duty military spouses (within approximately 1%), except along several characteristics. The study sample underrepresents spouses aged 21 to 25 years old by almost 3% and overrepresents Whites by almost 5%. Spouses in each of the education levels and each of the perceived financial conditions are either over or underrepresented compared to the study population. The study sample includes fewer unemployed spouses by almost 2% and fewer spouses married 6 years to less than 10 years by almost 2%. Army and Air Force couples are overrepresented by approximately 20% and 10% respectively, while Marine Corps couples are underrepresented by 10%. Finally, spouses married to service members within each of the rank categories are either over- or underrepresented compared to the study population. Notably, the study's

unweighted sample includes larger percentages of officers' wives than the larger MFLP

population of spouses.

Table 2.

Sample demographic characteristics (n=9,496)

	Unweighted		Weighted	
Categorical Variables and Levels	n	%	n	%
Age				
20 years old or younger	177	1.87	3,835.94	1.89
21 to 25 years old	1,809	19.09	44,339.72	21.87
26 to 30 years old	2,697	28.46	57,373.69	28.30
31 to 35 years old	1,984	20.93	41,433.11	20.43
36 to 40 years old	1,496	15.78	30,520.67	15.05
41 years old or older	1,315	13.87	25,254.26	12.46
Race/Ethnicity				
White	7,127	75.37	142,836.50	70.57
Black	517	5.47	14,826.00	7.32
Hispanic	947	10.01	24,302.76	12.01
American Indian or Alaska Native	47	0.50	1,117.99	0.55
Asian	506	5.35	11,465.97	5.66
Native Hawaiian or other Pacific Islander	47	0.50	1,466.36	0.72
Two or more races	265	2.80	6,389.08	3.16
Race/Ethnicity Recoded				
White	7,127	75.37	142,836.50	70.57
Non-white	2,329	24.63	59,568.16	29.43
Education Level				
12 years or less of school (no diploma)	122	1.29	4,189.89	2.07
High school graduate (diploma or equivalent)	804	8.49	25,456.50	12.57
Some college credit but less than 1 year	904	9.54	28,798.24	14.22
1 or more years of college but no degree	1,665	17.58	46,003.29	22.72
Associate's degree	1,030	10.88	27,816.89	13.74
Bachelor's degree	3,318	35.03	51,106.53	25.24
Master's, doctoral, or professional school degree	1,628	17.19	19,147.59	9.45
Employment Status				
Employed	3,830	40.53	79,170.84	39.18
Unemployed	1,291	13.66	31,466.11	15.57
Not in labor force	4,329	45.81	91,427.62	45.25
Years Married				
Less than 1 year	128	1.35	2,605.26	1.28
1 year to less than 3 years	1,813	19.10	37,843.33	18.63
3 years to less than 6 years	2,670	28.20	58,920.68	29.01
6 years to less than 10 years	1,917	20.20	43,610.92	21.47
10 years to less than 15 years	1,483	15.63	30,815.21	15.17

Categorical Variables and Levels	Unweighted		Weighted	
	n	%	n	%
15 years or more	1,479	15.58	29,317.74	14.43
Perceived Financial Condition				
Very comfortable and secure	2,739	28.95	38,382.11	18.97
Able to make ends meet without much difficulty	3,807	40.24	77,768.75	38.44
Occasionally have some difficulty making ends meet	1,875	19.82	50,820.93	25.12
Tough to make ends meet but keeping our heads above water	846	8.94	28,867.16	14.27
In over our heads	194	2.05	6,494.32	3.21
Service Member Branch				
Army	2,033	21.41	83,163.46	40.92
Navy	2,254	23.74	49,016.18	24.12
Marine Corps	2,239	23.58	27,581.94	13.57
Air Force	2,968	31.26	43,469.05	21.39
Service Member Rank				
E1-E4	1,992	20.98	51,367.75	25.28
E5-E6	1,752	18.45	78,940.12	38.84
E7-E9	785	8.27	35,296.45	17.37
O1-O3	3,015	31.75	19,415.73	9.55
O4-O6	1,951	20.55	18,205.48	8.96
Continuous Variable	*M*	*SD*	*M*	*SD*
Time since Most Recent Deployment (months)	10.47	7.06	10.52	9.81

Omitted Motherhood Variable

As an investigation of Table 2 shows, a logical demographic variable appears to have been omitted. As presented in the literature review, motherhood affects deployment-related adjustment for spouses of active duty service members (Warner et al., 2009; Allen et al., 2010; Barker & Berry, 2009). Unfortunately, the MFLP dataset provided by DMDC did not include sufficient information about the number of children present in the household or their ages. Specifically, due to coding for these variables, it is impossible to determine which spouses skipped the questions on children and which spouses were childless. Thus, the present study is not able to account for the effect of motherhood on experience of deployment-related stressors and post-deployment adjustment.

Variables

Independent Variables: Deployment Cycle Stressors

Four indicators of deployment cycle stressors were used: number of deployments, deployment to a combat zone, deployment challenges at home, and service member post-deployment adjustment problems.

Number of deployments. The number of deployments was determined by a DMDC tabulated variable, constructed from two original survey questions: *"During your spouse's active duty career, has he/she been deployed for more than 30 consecutive days?"* and *"During your spouse's active duty career, how many times has he/she been deployed for more than 30 consecutive days?"* Original responses to this variable were coded as 1 – "Never been deployed," 2 – "One time," 3 – "Two times," 4 – "Three times," and 5 – "Four or more times." The first response category (1, "Never been deployed") is not applicable to the analytic sample, who were selected based on a recent but not current deployment experience. Of the remaining response categories, responses were recoded as 1 – "One time," 2 – "Two times," 3 – "Three times," and 4 – "Four or more times." The variable was used as categorical.

Deployment to a combat zone. Whether or not the service member's most recent deployment was to a combat zone was determined by responses to the question: *"When your spouse most recently returned home from a deployment, was he/she returning from a combat zone (e.g., an area where he/she drew imminent danger pay or hostile fire pay)?"* Original responses to this variable were coded as 1 – "Yes, from Iraq/Afghanistan," 2 – "Yes, from a combat zone other than Iraq/Afghanistan," and 3 – "No." These responses were recoded as a binary variable: "Not a recent combat

deployment" (0) and "Yes, a recent combat deployment" (1). This variable was used as dichotomous.

Deployment challenges at home. The level of deployment challenges at home was assessed by responses to the question: *"During your spouse's most recent deployment, to what extent were each of the following a problem for you?"* Of the thirteen original response items, nine were used in the present analysis: *"my job or education demands," "managing expenses and bills," "home/car repairs/maintenance or yard work," "safety of my family in our community," "health problems in the family," "technical difficulties communicating with my spouse," "managing child care/child schedules," "being a 'single' parent,"* and *"no time for recreation, fitness, or entertainment activities."* The four omitted response items (*"emotional problems in the family," "difficulty maintaining emotional connection with spouse," "marital problems,"* and *"loneliness"*) were removed due to their conceptual overlap with the dependent variables of mental health and marital satisfaction. Responses for each item were coded to range from 1 "Not at all" to 5 "Very large extent " and the overall score was summed to range from 9 to 45, where higher scores represent having high levels of deployment challenges at home and low scores represent low levels of deployment challenges at home. Cronbach's alpha for this variable is 0.82 and the unweighted mean is 18.29 (SD=7.26). This variable was centered on the unweighted mean, which reduces the risk of multicollinearity and aids interpretation of the results, due to the original scale not having a zero point. Analytic values ranged from -9.29 to 26.71; a score of 0 indicates the sample mean, positive values indicate scores higher than the sample mean, negative values indicate scores less than the sample mean. This variable was used as continuous.

Service member post-deployment adjustment problems. The service member's post-deployment adjustment was assessed by the spouse's responses to the question: *"After your spouse most recently returned home from a deployment, to what extent did your spouse seem to…"* Eight response items were provided: *"be more emotionally distant (e.g., less talkative, less affectionate, less interested in social life),"* *"appreciate life more,"* *"get angry faster,"* *"appreciate family and friends more,"* *"drink more alcohol,"* *"have more confidence,"* *"take more risks with his/her safety,"* and *"have trouble sleeping."* Responses were coded to range from 1 "Not at all" to 5 "Very large extent." Valid responses with positive valence (i.e., "Appreciate life more") were reverse scored, then all valid responses were summed to range from 8 to 40. High scores represent having high levels of post-deployment adjustment problems, and low scores represent low levels of post-deployment adjustment problems. Cronbach's alpha for this variable is 0.66 and the unweighted mean is 19.29 (SD=5.13). This variable was also centered on the unweighted mean, to reduce the risk of multicollinearity and to aid interpretation of the results. Analytic values ranged from -11.29 to 20.71; a score of 0 indicates the sample mean, positive values indicate scores higher than the sample mean, negative values indicate scores less than the sample mean. This variable was used as continuous.

Moderator Variables: Use of Military and Civilian Resources

Spouses' utilization of military and civilian resources was determined by responses to the question, *"During your spouse's most recent deployment cycle (prior to, during, or post-deployment), did you use…"* The following list of resources has been grouped into three categories for the current study:

Information. Military and civilian resources in the information category included

four items: *"informational briefings," "reunion planning information or classes,"*

"information via Military OneSource," and *"services to help with money management*

while apart." Responses were coded as No (0) or Yes (1) for each item; valid responses

were summed based on non-missing responses and range from 0 to 4. High scores

represent a high level of information resource utilization and low scores represent a low

level of information resource utilization. This variable was used as continuous, since it

has properties of an interval scale.

Social support. Military and civilian resources in the social support category

included four items: *"Family Readiness Group/Ombudsperson," "military spouse*

support group," "information and support provided by my spouse's unit," and "*military-*

sponsored recreation and entertainment activities." Responses were coded as No (0) or

Yes (1) for each item; valid responses were summed based on non-missing responses and

range from 0 to 4. High scores represent a high level of social support resource utilization

and low scores represent a low level of social support resource utilization. This variable

was used as continuous, since it has properties of an interval scale.

Counseling. Military and civilian resources in the counseling category included

three items: *"In-person counseling," "Telephonic/Web-based counseling,"* and

"Services/support from military chaplain/civilian religious leader." Responses were

coded as No (0) or Yes (1) for each item; valid responses were summed based on non-

missing responses to range from 0 to 3. High scores represent a high level of counseling

resource utilization, and low scores represent having a low level of counseling resource

utilization. This variable was used as continuous, since it has properties of an interval scale.

Dependent Variables: Spouse Post-Deployment Adjustment

Mental health problems. The level of a spouse's mental health problems was determined by an index of four original survey items. Responses to the question, *"Over the last two weeks, how often have you been bothered by any of the following problems?"* included four sub-response items: *"little interest or pleasure in doing things," "feeling down, depressed, or hopeless," "feeling nervous, anxious, or on edge,"* and *"not being able to stop or control worrying."* These items were answered on a scale ranging from 0 – "Not at all" to 3 – "Nearly every day." Valid responses for all four questions were summed based on non-missing responses; scores range from 0 to 12, with higher scores indicating high levels of mental health problems and lower scores indicating low levels of mental health problems. Cronbach's alpha for this variable is 0.87 and the unweighted mean is 2.26 (SD = 2.80). This variable was used as continuous.

Marital satisfaction. Spouses' marital satisfaction was based on responses to the question, *"Taking things altogether, how satisfied are you with your marriage right now?"* Original responses ranged from 1 "Very dissatisfied" to 5 "Very satisfied." During model selection procedures, it was determined that the martial satisfaction variable is not usable as either continuous or as a multi-level categorical variable as evidenced by the distribution of responses. See the Model Selection section for an explanation of the distribution and how it was handled for purposes of analysis. The relevant point here is that the original responses were recoded to a binary variable: 0 "Less Satisfied" (includes original responses 1, 2, 3 and 4) and 1 "More Satisfied"

(includes original response 5). Again, more information about this decision is provided in the Model Selection section of this chapter.

Controls: Individual and Family Characteristics

Spouse age. The spouse's age was based on responses to the question, *"What age were you on your last birthday?"* DMDC collapsed original, numeric responses into recoded categories to protect participant anonymity: 1 – "20 years old or younger," 2 – "21 to 25 years old," 3 – "26 to 30 years old," 4 – "31 to 35 years old," 5 – "36 to 40 years old," and 6 – "41 years old or older." This variable was used as categorical.

Spouse race/ethnicity. Spouse's race/ethnicity was based on responses to two questions: *"Are you Spanish/Hispanic/Latino?"* and *"What is your race?"* Original responses were combined by the DMDC to be reported in accordance with the Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity (1997): 1 – "White," 2 – "Black," 3 – "Hispanic," 4 – "American Indian or Alaska Native," 5 – "Asian," 6 – "Native Hawaiian or other Pacific Islander," and 7 – "Two or more races." Due to low numbers of participants in non-white categories (see Table 2), responses were recoded to 0 – "White" and 1 – "Non-White." This variable was used as categorical.

Spouse education level. Spouses' education level was based on responses to the question, *"What is the highest degree or level of school that you have completed?"* Responses were coded as 1 – "12 years or less of school (no diploma)," 2 – "High school graduate (diploma or equivalent)," 3 – "Some college credit but less than 1 year," 4 – "1 or more years of college but no degree," 5 – "Associate's degree," 6 – "Bachelor's degree," and 7 – "Master's, doctoral, or professional school degree." This variable was used as categorical.

Spouse employment status. Spouse employment status was determined by a DMDC tabulated variable, constructed from three original survey questions: *"Last week, did you do any work for pay or profit?" "Last week, were you temporarily absent from a job or business?"* and *"Have you been looking for work during the last four weeks?"* Spouses who answered yes to working for pay, or answered no to working for pay and yes to being temporarily absent, were coded as 1 – "Employed." Spouses who answered no to working for pay, no to being temporarily absent, and yes to looking for work were coded as 2 – "Unemployed." Spouses who answered no to working for pay, no to being temporarily absent, and no to looking for work were coded as 3 – "Not in labor force." This variable was used as categorical.

Years married. The number of years a spouse has been married was based on responses to the question, *"How many years have you been married?"* DMDC collapsed original, numeric responses into recoded categories: 1 – "Less than one year," 2 – "1 year to less than 3 years," 3 – "3 years to less than 6 years," 4 – "6 years to less than 10 years," 5 – "10 years to less than 15 years," and 6 – "15 years or more." This variable was used as categorical.

Perceived family financial condition. Spouses' perceived family financial condition was based on responses to the question, *"Which best describes the financial condition of you and your spouse?"* Responses were coded as 1 – "Very comfortable and secure," 2 – "Able to make ends meet without much difficulty," 3 – "Occasionally have some difficulty making ends meet," 4 – "Tough to make ends meet but keeping our heads above water," and 5 – "In over our heads." This variable was used as categorical.

Service member branch. The branch of the spouse's service member husband was provided by the DMDC. Values were coded as 1 – "Army," 2 – "Navy," 3 – "Marine Corps," and 4 – "Air Force." This variable was used as categorical.

Service member pay grade/rank. The pay grade/rank of the spouse's service member husband was provided by the DMDC. Values were coded as 1 – "E1-E4," 2 – "E5-E6," 3 – "E7-E9," 4 – "O1-O3," and 5 – "O4-O6." This variable was used as categorical.

Time since most recent return from deployment. The amount of time since the most recent deployment was determined by a DMDC tabulated variable, constructed from responses to several original questions whereby participants indicated the dates of the most recent deployment and return. Responses ranged from 1 (including a return of less than one month) to 24 months (the maximum valid response for the current study, based on selection criteria previously described). This variable was used as continuous.

Bivariate Relationships

Before proceeding with tests of the main study aims, several analyses were conducted to check the relationships between variables and to test model assumptions. Mental health problems and marital satisfaction scores are significantly, but not strongly, correlated ($r = -.39$, $p < .001$), suggesting that each dependent variable measures a discrete index of adjustment as the two variables only share 15% of the variance. Multicollinearity among the 16 independent, control, and moderator variables was assessed by obtaining Variance Inflation Factors (VIFs). For variables of interest, a conservative upper limit for VIFs is 2.5; VIFs above this value are considered problematic, corresponding to an R^2 of 0.60 with the other variables (Allison, 2012).

VIFs for the four independent variables ranged from 1.04 to 1.30 and they ranged from 1.11 to 1.78 for the three moderator variables, indicating very low risk of multicollinearity among the variables. VIFs for 8 of the control variables were below the acceptable limit (ranging from 1.06 to 2.47); the VIF for age was 2.64. However, high VIFs for control variables, when VIFs are low for variables of interest, are not problematic (Allison, 2012).

Model Selection

Model selection procedures were conducted for each dependent variable separately, as study aims were tested for each separately.

Mental Health Problems

The dependent variable of mental health problems was measured as an index of four survey questions, with responses ranging from 0 to 12. Several tests were run to ensure that the three assumptions of an ordinary least squares (OLS) regression model using a continuous dependent variable were met: normality, homoscedasticity, and independence (Cohen, Cohen, West, & Aiken, 2003). The assumption of independence is satisfied through the use of DMDC sampling weights, which standardize responses such that they approximate a randomly drawn sample.

Descriptive statistics for the mental health problems variable illustrate the nonnormal distribution of responses, ranging from 0 to 12: Mean=2.26 (SD=2.80), Median=1.00, Mode = 0.00. The violation of normality is also depicted by a frequency plot (see Figure 3), which clearly illustrates a right-skew in responses, with the majority of the sample reporting very low levels of mental health problems.
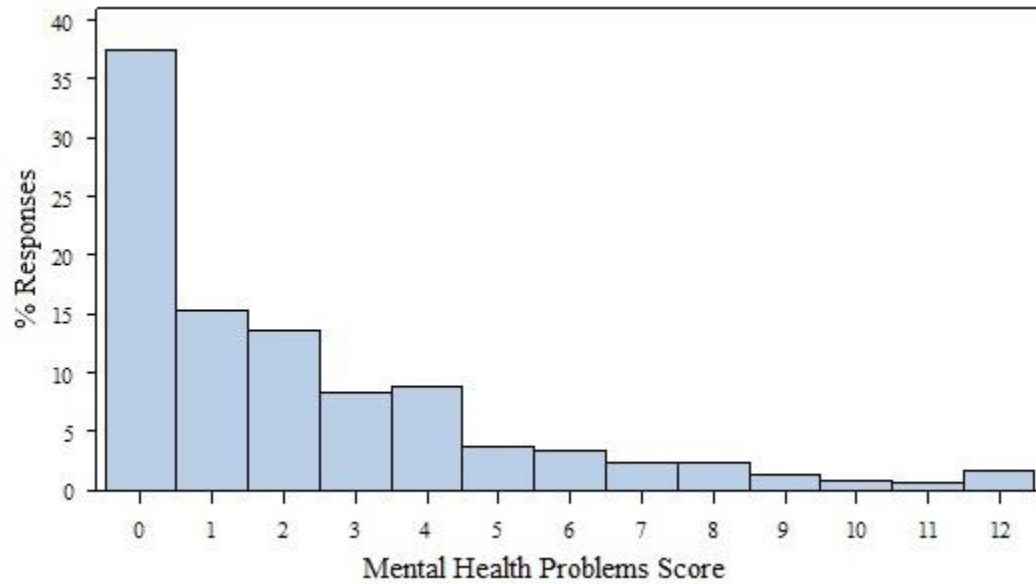
Figure 3. Frequency plot for mental health problems.

Normality was also tested by plotting a graph of the residuals, or the difference between a respondent's actual dependent variable score and the predicted score from an OLS model. This residual plot is presented as Figure 4, and includes an overlay of a normal curve with the same mean and standard deviation as the data to highlight nonnormality of residuals. As can be seen, the plotted residuals do not fall within the normal curve.
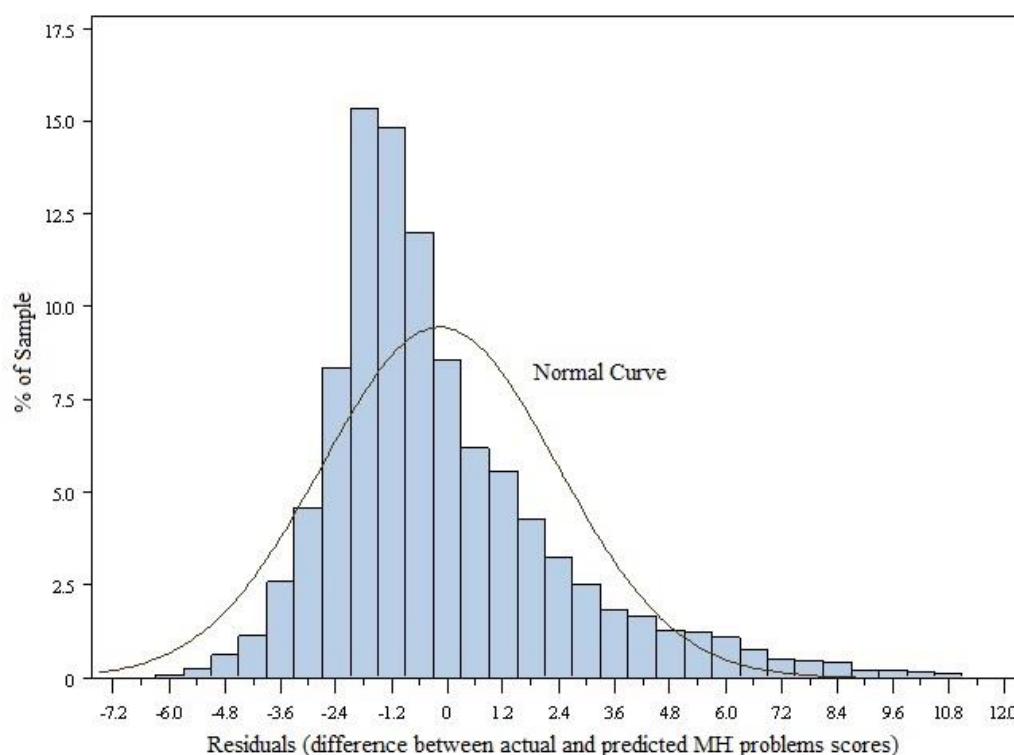
Figure 4. Residual plot with overlay of normal curve for mental health problems.

Violations of the normality assumption are not necessarily problematic for large

sample sizes, as this study includes (Cohen et al., 2003). However, nonnormal residuals

are often an important indication of misspecification of the regression model; in this case,

an indication that OLS regression may not be appropriate for the data.

The homoscedasticity assumption of OLS regression states that for any value of

the independent variable X, the variability of the residuals around the predicted Y value

for that value of X is constant (Cohen et al., 2003). However, when the variance of

residuals around the regression line changes as the value of X changes, the data represent

heteroscedasticity and significance tests and confidence intervals will be incorrect.

Homoscedasticity is tested by plotting the residuals versus the predicted Y values. If the

data were homoscedastic, the plot would show an even spread of points around the lowess line at the mean of the residuals (0 line). The plot of the residuals and predicted values for mental health problems is provided as Figure 5, which clearly shows that the data violate the homoscedasticity assumption. The points on the graph are not randomly spread around the lowess line, but are instead clustered in a distinct pattern. This indicates that the variance of residuals changes as values of the independent variables change and that the data are heteroscedastic.
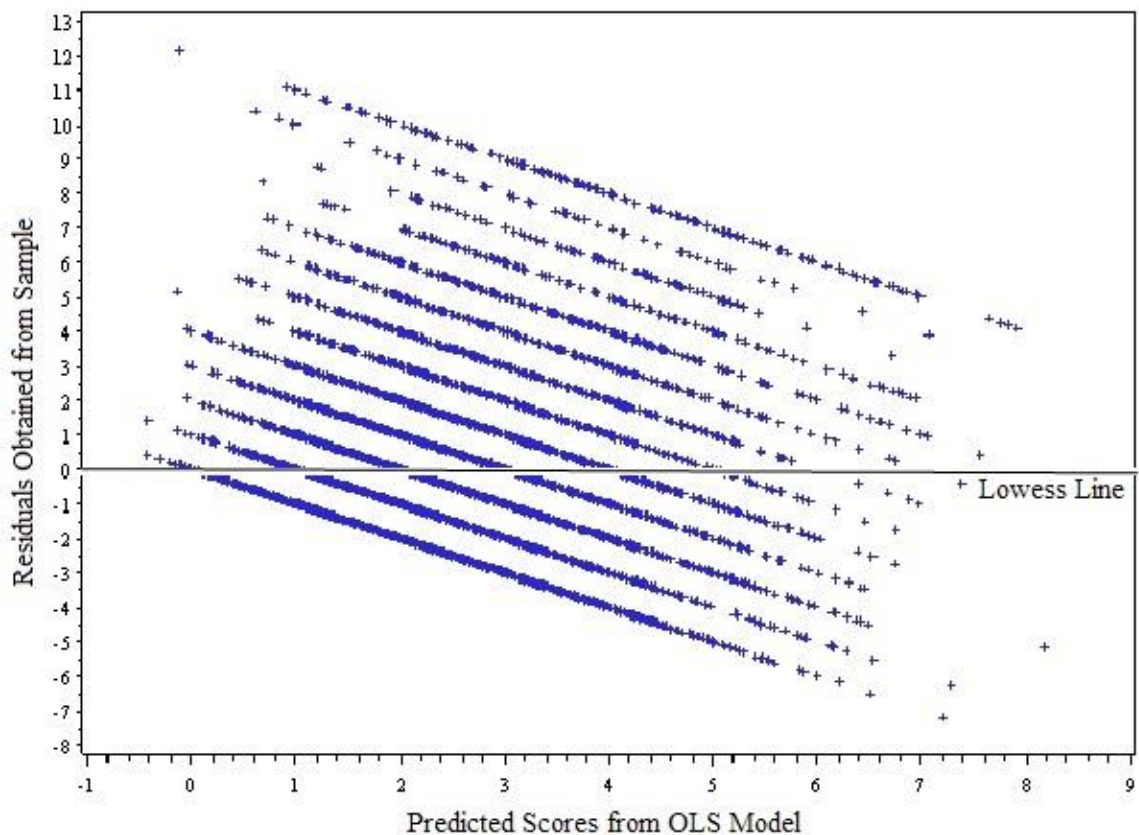
Figure 5. Homoscedasticity plot with lowess line for mental health problems.

The diagnostic procedures described above provide conclusive evidence that standard OLS regression is not the appropriate distribution for the current study data, as it does not have normally distributed residuals that exhibit homoscedasticity. Instead of behaving as continuous, the mental health problems variable behaves as a count variable where the phenomenon of interest is a rare occurrence among the sample (as previously depicted in Figure 3). Beyond violations of assumptions, the use of OLS regression on count data is also inappropriate because the OLS model will predict scores below zero, which are impossible with count data.

Poisson regression is an appropriate and well-known analysis method for count data, as it uses independent variables to predict the number of events that occur in a specific time period (Cohen et al., 2003). Poisson regression, the most basic of count data models, uses the probability distribution (as opposed to a normal or t distribution used by other regression models). It is also the most restrictive in terms of assumptions and, for the Poisson probability distribution, the mean and the variance are equal. In the current study, the mean of the mental health problems variable does not equal the variance (2.26 $\neq$ 7.83). This common condition of count data is called overdispersion and is addressed through the use of an alternative to Poisson regression: the negative binomial regression model.

Negative binomial regression allows for greater variance among the residuals than is permitted by Poisson regression, thus accounting for overdispersion (Cohen et al., 2003). The negative binomial model uses two distribution models, the Poisson probability distribution plus the gamma distribution (the mixture of this second distribution accounts for the extra variance, over what is accounted for by the Poisson

model). In summary, the mental health problems dependent variable behaves as a count variable, but does not meet the assumptions of Poisson regression. Thus, negative binomial regression was selected as the final analysis model to ensure proper adherence to model assumptions and appropriate estimation of predicted mental health problems.

Marital Satisfaction

Since the original variable measuring marital satisfaction used a Likert-type scale ranging from 1 to 5, several tests were run to ensure that the three assumptions of an ordinary least squares (OLS) regression model using a continuous dependent variable were met: normality, homoscedasticity, and independence (Cohen et al., 2003). As with the mental health problems variable, the assumption of independence is satisfied through the use of DMDC sampling weights, which standardize responses such that they approximate a randomly drawn sample.

Descriptive statistics for the marital satisfaction variable illustrate the nonnormal distribution of responses, ranging from 1 to 5: Mean=4.35 (SD=0.94), Median=5.00, Mode = 5.00. The violation of normality is also depicted in the frequency plot (see Figure 6), which clearly illustrates a left-skew in responses, with the majority of the sample reporting very high levels of marital satisfaction.
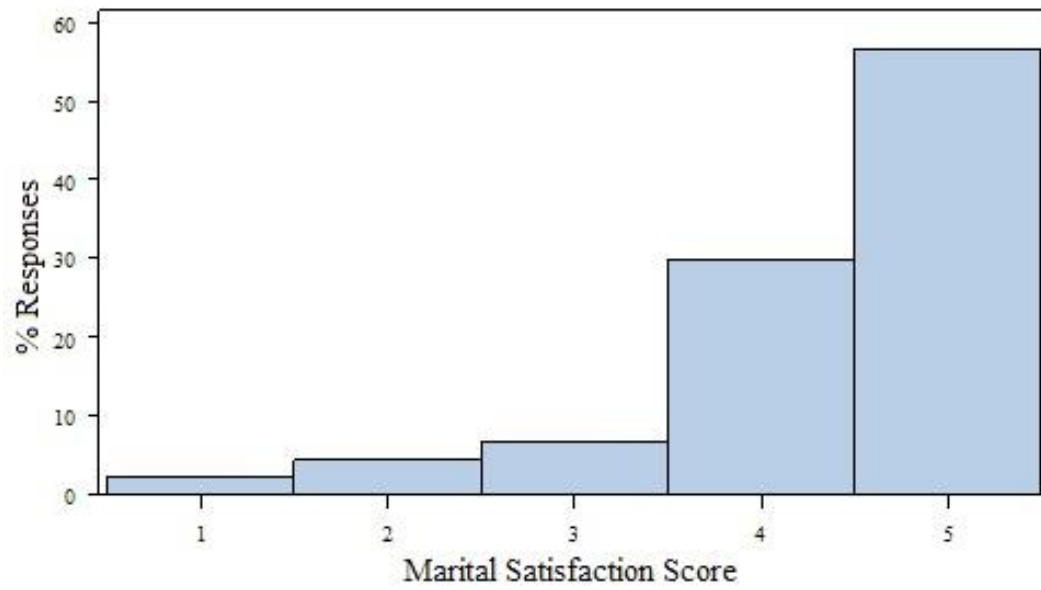
*Figure 6.* Frequency plot for marital satisfaction

Normality is also tested by plotting a graph of the residuals, or the difference between a respondent's actual dependent variable score and the predicted score from an OLS model. This residual plot is presented as Figure 7, and includes an overlay of a normal curve with the same mean and standard deviation as the data to highlight nonnormality of residuals. As can be seen, the plotted residuals do not fall within the normal curve.
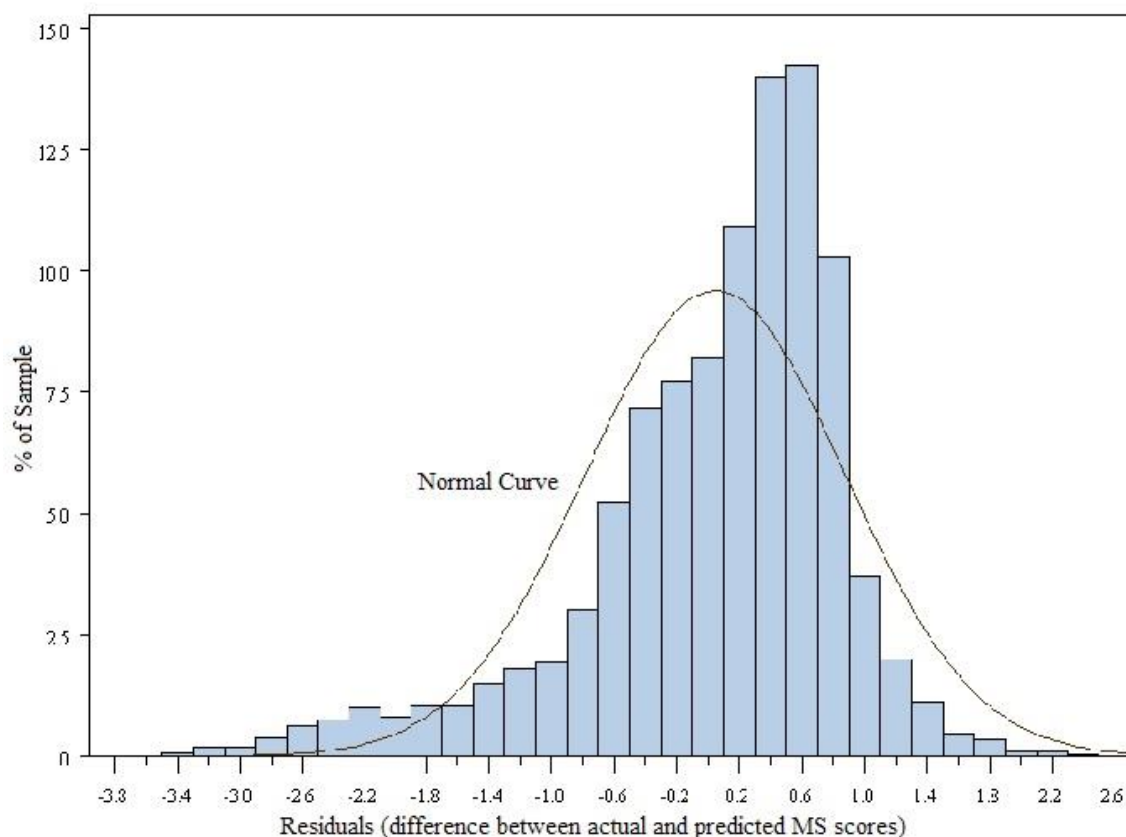
Figure 7. Residual plot with overlay of normal curve for marital satisfaction

Again, violations of the normality assumption are not necessarily problematic for large sample sizes, but nonnormal residuals are an indication that OLS regression may not be appropriate for the data (Cohen et al., 2003). Next, the homoscedasticity assumption was tested by plotting the residuals versus the predicted Y values. If the data were homoscedastic, the plot would show an even spread of points around the lowess line at the mean of the residuals (0 line). The plot of the residuals and predicted values for marital satisfaction scores is provided as Figure 8, which clearly shows that the data violate the homoscedasticity assumption. The points on the graph are not randomly spread around the lowess line, but are instead clustered in a distinct pattern. This

indicates that the variance of residuals changes as values of the independent variables change and that the data are heteroscedastic (Cohen et al., 2003).
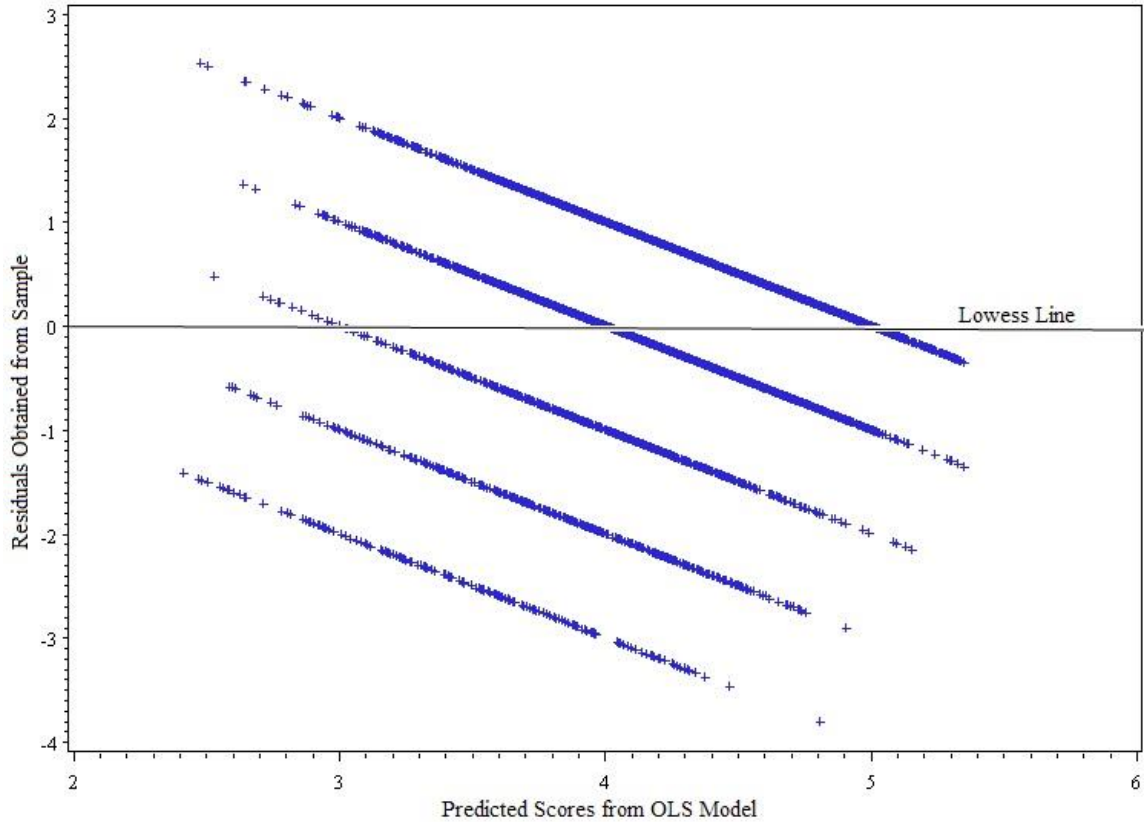
Figure 8. Homoscedasticity plot with lowess line for marital satisfaction

The diagnostic procedures described above provide conclusive evidence that standard OLS regression is not the appropriate distribution for the current study data for marital satisfaction, as it does not have normally distributed residuals that exhibit homoscedasticity. Instead of behaving as continuous, the marital satisfaction variable behaves as categorical. Interpreting marital satisfaction as a count variable is not appropriate, as the skew of the data is 'backwards' (the phenomenon of interest is not rare, but rather highly likely, as depicted in Figure 6).

Ordinal regression is an appropriate analysis method for categorical data with more than two categories, as it predicts the odds of a participants' movement from category to category on a dependent variable (Cohen et al., 2003). The ordinal regression model is a form of logistic regression, but includes a unique assumption. The proportional odds assumption of this model states that these odds of transition from category to category are equal across the continuum of given values of the independent variables. This critical assumption of ordinal regression is evaluated by a Score test, which compares the fit of a model in which a single slope is applied to the whole continuum (thus satisfying the proportional odds assumption) versus an unconstrained model that allows different slopes for different cases. The null hypothesis of a Score test is that the assumption holds (thus, if the test is significant, the ordinal regression model is not appropriate).

To test the proportional odds assumption for the current data, an ordinal regression model was run using marital satisfaction as a 5 category dependent variable and the four independent variables (multiple deployments, combat deployment, deployment problems at home, and service member post-deployment problems). The Score test was significant, thus this model did not satisfy the proportional odds assumption ($\chi_{18}^2 = 3,087.85$, $p < .001$). Another ordinal regression model was tested with marital satisfaction collapsed into 3 categories (where a new score of 1 = original responses 1, 2, and 3; 2 = original response 4; and 3 = original response 5). The Score test for this model was also significant, also failing to satisfy the proportional odds assumption ($\chi_6^2 = 1,262.21$, $p < .001$).

These results indicate that the marital satisfaction variable is not usable as a multi-level categorical variable (since it fails the critical assumption of ordinal regression) and must be used as dichotomous. In other words, these findings suggest that spouses did not answer the marital satisfaction question sensitively among original categories; rather, spouses used any response less than 5 on the scale to indicate a less-than-satisfactory marriage, even though the original response descriptions would suggest a more sensitive distinction. Therefore, marital satisfaction was recoded as a binary, two category variable as described in the above section of this chapter, where 0 = "Less satisfied" (original scale scores of 1-4) and 1 = "More satisfied" (original scale score of 5).

Dichotomous dependent variables are modeled using the binomial distribution and tested using multiple logistic regression when there is more than one independent variable (Cohen et al., 2003). Multiple logistic regression uses the binomial distribution (as opposed to a normal or *t* distribution of other regression models) and expresses the relationship between predictors and predicted probability. In summary, the marital satisfaction dependent variable behaves as a categorical variable, but does not meet the assumption of ordinal regression with multi-level categories. Thus, marital satisfaction was dichotomized and multiple logistic regression was selected as the final analysis model to ensure proper adherence to model assumptions and appropriate estimation of predicted marital satisfaction.

CHAPTER 4: RESULTS

This study aimed to determine if accessing military or civilian resources moderates the relationship between deployment cycle stressors and post-deployment adjustment for spouses of active duty service members. It was hypothesized that spouses who experience higher levels of deployment cycle stressors, such as multiple deployments, combat deployments, more deployment challenges at home, and more service member post-deployment adjustment problems, would suffer higher levels of mental health problems and lower marital satisfaction than spouses who did not experience the same levels of deployment stressors. It was also hypothesized that spouses who utilize more types of military and civilian resources, such as information, social support, and counseling, would report lower levels of mental health problems and higher marital satisfaction than spouses who utilized fewer of the same types of resources. Furthermore, based on the ABC-X model, accessing military and civilian resources was hypothesized to moderate the relationships between deployment cycle stressors and mental health problems and marital satisfaction, such that the relationships are weaker at higher levels of resource utilization Two types of regression analyses, negative binomial regression and multiple logistic regression, were run to determine if accessing information, social support, or counseling resources would moderate the relationship between deployment cycle stressors and spouses' levels of mental health problems and marital satisfaction, as the ABC-X model predicts. The spouses' post-deployment adjustment was considered separately for mental health problems and marital satisfaction. Specifically, the overall hypotheses tested in this study were:

1) Spouses who report higher levels of deployment cycle stressors will report higher levels of mental health problems than spouses who experience lower levels of deployment cycle stressors.

2) Spouses who report higher levels of deployment cycle stressors will report lower marital satisfaction than spouses who experience lower levels of deployment cycle stressors.

3) Spouses who access more military and civilian resources will report lower levels of mental health problems than spouses who access fewer resources.

4) Spouses who access more military and civilian resources will report higher marital satisfaction than spouses who access fewer resources.

5) Higher reported use of military and civilian resources will weaken the relationship between deployment cycle stressors and spouse mental health problems.

6) Higher reported use of military and civilian resources will weaken the relationship between deployment cycle stressors and low marital satisfaction.

Descriptives of Study Variables

Table 3 contains unweighted and weighted descriptive statistics for each of the study variables.

Unweighted Descriptives of Study Variables

As described in Table 3, almost one quarter (23.06%) of spouses in the sample had recently experienced the first deployment of their husbands, while almost one fifth (19.72%) recently experienced their second deployment, and more than half (57.22%) of the spouses had experienced three or more previous deployments. The majority (72.39) of the spouses' husbands had not recently been deployed to a combat zone. On a scale of 9

to 45, spouses reported an average of 18.29 (SD=7.26) challenges at home during the

most recent deployment. On a scale of 8 to 40, the mean of their service member

husbands' post-deployment adjustment problems score was 19.29 (SD=5.13). Spouses

reported accessing an average of 0.75 (SD=0.98) types of information resources, 1.21

(SD=1.31) types of social support resources, and 0.23 (SD=0.52) types of counseling

resources. Although not reported in Table 3, overall resources utilization among the

sample was low. The majority of spouses did not access any information, social support,

or counseling resources during the last deployment cycle (55%, 43%, and 81% accessed

zero types of resources, respectively). On average, spouses reported low levels of mental

health problems (M=2.26, SD=2.80). Since mental health problems will be used as a

count variable, the median (1.0) and semi-interquartile range (the distance between the

first and third quartiles [SIR]; 4.0) are more appropriate indicators of participants'

responses than the mean and standard deviation. Spouses also reported high levels of

marital satisfaction (M=4.35, SD=0.04), and the median (5.0) and SIR (1.0) also indicate

the skewedness of responses. For both variables, these descriptives suggest overall

positive adjustment during the post-deployment phase.

Weighted Descriptives of Study Variables

Comparison of the unweighted and weighted descriptive statistics indicates how

closely the study sample resembles the larger population of active duty military spouses.

As can be seen in Table 3, the study sample closely resembles the larger population of

active duty military spouses (within approximately 1%) on all study variables except

recent deployment to a combat zone. The study sample overrepresents recent combat

deployments by almost 2% and underrepresents non-combat zone deployments by almost

2%. The median and SIR for marital satisfaction are identical between the unweighted and weighted samples; the weighted sample of spouses scored one point higher on the median of mental health problems than the unweighted sample, suggesting that the study sample reported slightly lower mental health problems scores than represented in the full dataset of spouses.

Table 3.

Descriptive statistics of study variables (n=9,496)

		Unweighted		Weighted	
Deployment Cycle Stressors (Independent Variables)		n	%	n	%
Number of Deployments					
1 previous deployment		2,172	23.06	45,105.67	22.40
2 previous deployments		1,857	19.72	39,869.41	19.80
3 previous deployments		1,395	14.81	31,440.31	15.61
4 or more previous deployments		3,994	42.41	84,987.89	42.20
Recent Deployment to Combat					
Yes, to a combat zone		2,600	27.61	51,977.40	25.81
No, to a non-combat zone		6,818	72.39	149,399.90	74.19
	Range	*M*	*SD*	*M*	*SD*
Deployment Problems at Home	9-45	18.29	7.26	19.10	11.07
Service Member Post-Deployment Adjustment	8-40	19.29	5.13	20.08	8.06
Military and Civilian Resource Utilization (Moderators)	Range	*M*	*SD*	*M*	*SD*
Information	0-4	0.75	0.98	0.76	1.44
Social Support	0-4	1.21	1.31	1.16	1.80
Counseling	0-3	0.23	0.52	0.24	0.79
Spouse Post-Deployment Adjustment (Dependent Variables)	Range	*M*	*SD*	*M*	*SD*
Mental Health Problems	0-12	2.26	2.80	2.62	4.39
Marital Satisfaction	1-5	4.35	0.94	4.22	1.49

Model Construction

As discussed in the previous section on model selection, two different types of regression were identified for each of the study dependent variables. Since mental health problems behaves as a count variable, but does not meet the assumptions of the Poisson model, negative binomial regression was used to test whether resource utilization moderates the relationship between deployment cycle stressors and spouses' level of post-deployment mental health problems. Marital satisfaction was dichotomized, thus multiple logistic regression was used to test the same study question for the second indicator of post-deployment adjustment. To test the study hypotheses for each dependent variable, both types of regressions were run using hierarchical sequential steps. Both models were built in the following manner:

Step 1: The first step was to add all 9 control variables (spouse age, spouse race/ethnicity, spouse education level, spouse employment status, years married, perceived financial condition, service member branch, service member rank, and time since most recent deployment) to the model to account for their influence on spouse post-deployment adjustment. Spouse race/ethnicity was dichotomized, time since most recent deployment was used continuously, and the rest of the control variables were categorical.

Step 2: Deployment cycle stressors were added to the model in Step 2. Number of deployments was added with one deployment experience as the referent category, and combat deployment was entered as dichotomous. Deployment challenges at home and service member post-deployment adjustment problems (both mean centered) were added as continuous. Deployment cycle stressors are the "A" in the ABC-X model.

Step 3: In Step 3, military and civilian resources (information, social support, and counseling) were added to the model. Each resource was entered as continuous. These resources are the "B" in the ABC-X model and are an important part of the theory.

Step 4: Step 4 is the pivotal step of the model, as it is the step in which interaction terms are included. These interaction terms of deployment cycle stressors and resources are the key to testing the hypothesized moderation of the relationship between deployment cycle stressors and spouses' post-deployment adjustment. Each interaction term is the product of each type of deployment cycle stressor and each type of resource. Thus, for each model, twelve interaction terms were included.

If a significant interaction was found, the direction of the interaction was examined by plotting the variables of interest in that step of the model (Aiken & West, 1991; Dawson, 2013). Rather than plotting the effects of high and low resource utilization on axes that have been split into high/low values for the independent variable (as is typically done for ANOVA interactions), the interaction plots were constructed by allowing all continuous variables to remain continuous on the graph. This method provides a more representative depiction of the actual relationship for each level of the moderator, instead of potentially dampening the effect by averaging over several categories. Since each of the three moderators in the current study have fewer than 4 levels, plotting a line for each enhances the interpretation of the interaction effect.

It is important to note that although each interaction plot only depicts three variables (the independent, dependent, and moderator of that particular interaction), many more variables were included in each model step. Again, unlike plotting ANOVA interactions, regression models typically include many variables, each of which have

their own coefficients and each of which is affecting the dependent variable at the same time as the independent and moderator variables of interest. In order to isolate the effect of the three variables of interest, these plots assume that all other variables in the model have values of 0. Thus, these plots are just one 'snapshot' of all possible depictions of the interaction—the graph would change slightly for each possible value of each possible predictor. The assumption that that all other variables in the model are equal to 0 is somewhat arbitrary, but conventional since it depicts the interaction that is 'independent' of the other variables in the model.

It is also important to note that two deployment cycle stressors, deployment challenges at home and service member post-deployment adjustment problems, were mean centered in both the mental health problems and marital satisfaction models to aid in interpretation of results. Note also that reported findings for each step are based on the model at that step. For non-normally distributed dependent variables, as this study has, overall model fit statistics are largely unavailable. Thus, presentation of the change in findings as each step is added is important to determine the effects of each step on the model. Again, all analyses were conducted using DMDC calculated weights for each participant to account for the complex sampling method and stratification of the 2010 MFLP; use of the sampling weights produces nationally representative associations.

<div align="center">**Findings**</div>

Mental Health Problems

The mental health problems variable behaves as a count variable, with a distribution heavily skewed toward '0' responses. The data did not meet the assumptions of a Poisson regression model, thus negative binomial regression was selected as the

appropriate analysis method. The test statistic obtained for each variable in a negative binomial model is a Wald Type III χ^2 (as opposed to the *t* statistic obtained by standard OLS regression) (Cohen et al., 2003). Unstandardized *β*s are preferred for negative binomial regression (as opposed to standardized *β*s presented for OLS regression). The OLS interpretation of standardized *β*s (that for a one standard deviation change in X, Y is predicted to change by *β* standard deviations) is not applicable to non-continuous dependent variables. The change statistic that compares each subsequent step to the previous one in a negative binomial model is the change in −2 Log Likelihood, or the deviance value (as opposed to ΔR^2 or ΔF^2 obtained by OLS hierarchical sequential regression). Lower values of −2 Log Likelihood indicate model improvement, thus it is desirable for each subsequent step to produce a smaller value than the previous step. The difference between the two steps is tested for significance by comparing it to the critical −2 Log Likelihood value (where degrees of freedom indicate the number of variables newly added to the model in that step). If the difference is significant, it means that the additional variables in that step are important beyond the effect of chance of adding more variables to a model.

Model 1 includes mental health problems as the dependent variable (where higher scores indicate higher levels of mental health problems), as well as all control variables, deployment cycle stressors, military and civilian resources, and interaction terms with these variables. Findings from each step are presented in Tables 4 and 5. Models using sampling weights remove individuals who have missing values on any variable in the model, resulting in different *n*s for each step. Overall model fit statistics are not available

for negative binomial regression (Cohen et al., 2003); however the test of the hypotheses

for this study is not on the overall model, but on the individual steps as described below.

In Step 1 for Model 1, only the control variables are included. The −2 Log

Likelihood, or deviance, for this step is 37,777.24. Compared to the deviance of a model

with no covariates (40,039.58), this step is significant (Δdeviance = 2,262.34, $p < .001$).

As overall factors, education level, employment status, years married, perceived financial

condition, and service member branch are significantly associated with spousal mental

health scores in Step 1. Spouses who have been married for 15 years or more are more

likely to experience lower levels of mental health problems than spouses who have been

married for less than 1 year. Spouses who perceive their family financial condition to be

any level worse than very comfortable and secure are more likely to experience higher

levels of mental health problems than spouses who do feel very financially comfortable

and secure. Finally, Navy, Marine Corps, and Air Force spouses are more likely to

experience lower levels of mental health problems than Army spouses. Category level

comparisons for education level and employment status were not significant, indicating

an overall effect for these control variables but no significant differences between each

categorical level compared to the referent group. Reports of overall effects for control

variables (for each step of the model) are provided in Table 4. Unstandardized βs for each

category of each control variable (for each step of the model) are provided in Table 5.

In Step 2 for Model 1, deployment cycle stressors are added to the model. The

deviance for this step is 34,164.64 and the change from Step 1 is significant (Δdeviance =

3,612.6-, $p < .001$). Results for each deployment cycle stressor indicate a large significant

effect for deployment challenges at home ($\chi_1^2 = 203.86$, $p < .001$) and for service

member post-deployment adjustment problems ($\chi_1^2 = 151.34$, $p < .001$). The unstandardized coefficient for deployment challenges at home ($\beta = 0.03$, $SE = 0.00$, $p < .001$) indicates that more deployment challenges at home are associated with higher levels of mental health problems. The unstandardized coefficient for service member post-deployment adjustment problems ($\beta = 0.04$, $SE = 0.00$, $p < .001$) also indicates that more service member post-deployment adjustment problems are associated with higher levels of mental health problems. Number of deployments and combat deployments were not significantly associated with spousal mental health problems. Thus, hypothesis 1 is partially supported (specifically, 1c and 1d), which predicted that spouses who experience higher levels of deployment cycle stressors will also report higher levels of mental health problems than spouses who experience lower levels of deployment cycle stressors. Overall effects (Wald Type III χ^2) and unstandardized βs for Step 2 variables are provided in Table 4; unstandardized βs for Step 2 controls are provided in Table 5.

In Step 3 for Model 1, military and civilian resources are added to the model. The deviance for this step is 33,912.13 and the change from Step 2 is significant (Δdeviance = 252.51, $p < .001$). Results for each resource indicate a significant effect for accessing social support resources ($\chi_1^2 = 6.13$, $p = .01$) and for accessing counseling resources ($\chi_1^2 = 4.73$, $p < .001$). The unstandardized coefficient for social support ($\beta = -0.04$, $SE = 0.02$, $p = .01$) indicates that accessing more social support resources is significantly associated with lower levels of mental health problems. The unstandardized regression coefficient for counseling ($\beta = 0.15$, $SE = 0.03$, $p < .001$) indicates that the effect is in the unexpected direction; accessing more counseling resources is significantly associated with higher levels of mental health problems. Information resources were not

significantly associated with mental health problems. Thus, hypothesis 3 is partially

supported (specifically, 3b), which predicted that spouses who utilize more types of

military and civilian resources will also report lower levels of mental health problems

than spouses utilize fewer resources. Hypothesis 3c was found to be supported in the

opposite direction than predicted. Overall effects (Wald Type III χ^2) and unstandardized

βs for Step 3 variables are provided in Table 4; unstandardized βs for Step 3 controls are

provided in Table 5.

   In Step 4 for Model 1, the twelve interaction terms for each type of deployment

cycle stressor and each type of resource were added to the model. The deviance for this

step is 33,652.59 and the change from Step 3 is significant (Δdeviance = 259.53, $p <$

.001). Only two interactions within this model were significant, partially supporting

hypothesis 5 (specifically, 5g and 5i), which predicted resource utilization will moderate

the relationship between deployment cycle stressors and post-deployment mental health

problems. Overall effects (Wald Type III χ^2) and unstandardized βs for Step 4 variables

are provided in Table 4; unstandardized βs for Step 4 controls are provided in Table 5.

   The interaction between deployment challenges at home and accessing

information resources is significant (χ_1^2 = 8.42, p = .004). The unstandardized

coefficient (β = −0.01, SE = 0.00, p = .004) indicates that spouses who use more types of

information resources, even as they experience high levels of deployment challenges at

home, have lower levels of mental health problems than spouses who do not access

information resources. A graph of this interaction is provided in Figure 9 below.

Although the information moderator was used as a continuous variable in the model, the

plot is presented discretely (levels 0, 1, 2, 3, 4) for ease of visualization.

Figure 9. Mental health problems: Interaction between deployment challenges at home and accessing information resources.

Note: Interaction plots with as many variables as Model 1 are difficult to interpret; this plot suggests the basic trend for spouses who access more information resources, and is specifically depicting the interaction for spouses with a score of 0 on all other independent, moderator, and control variables in the model.

The placement of the lines of the graph indicate the lack of a significant main effect for accessing information resources. Specifically, the main effect is not significant because, on average, the lines are very close together, indicating no significant difference between the levels of information resource utilization. However, the significant interaction effect can be seen in the slope of the lines, rather than their placement. As the number of deployment challenges at home increases, the slope of the "0" line is significantly more steep than the "4" line. For spouses who have low levels of deployment challenges at home, accessing more types of information resources has no

effect on the level of mental health problems. Yet for spouses who have high levels of

deployment challenges at home, accessing fewer information resources is associated with

higher levels of mental health problems compared to spouses who access many

information resources. Thus, the impact of accessing more types of information resources

on mental health problems is significant for spouses who are experiencing many

deployment challenges at home.

The interaction between deployment challenges at home and accessing counseling

resources is also significant ($\chi_1^2 = 3.86$, $p = .049$). The unstandardized coefficient ($\beta =$

-0.01, $SE = 0.00$, $p = .049$) indicates that spouses who use more types of counseling

resources, even as they experience high levels of deployment challenges at home, have

lower levels of mental health problems. In other words, although the main effect linking

more types of counseling resources with higher levels of mental health problems is

present, the experience of fewer deployment challenges at home weakens this

relationship. A graph of this interaction is provided in Figure 10 below. Although the

counseling moderator was used as a continuous variable in the model, the plot is

presented discretely (levels 0, 1, 2, 3) for ease of visualization.
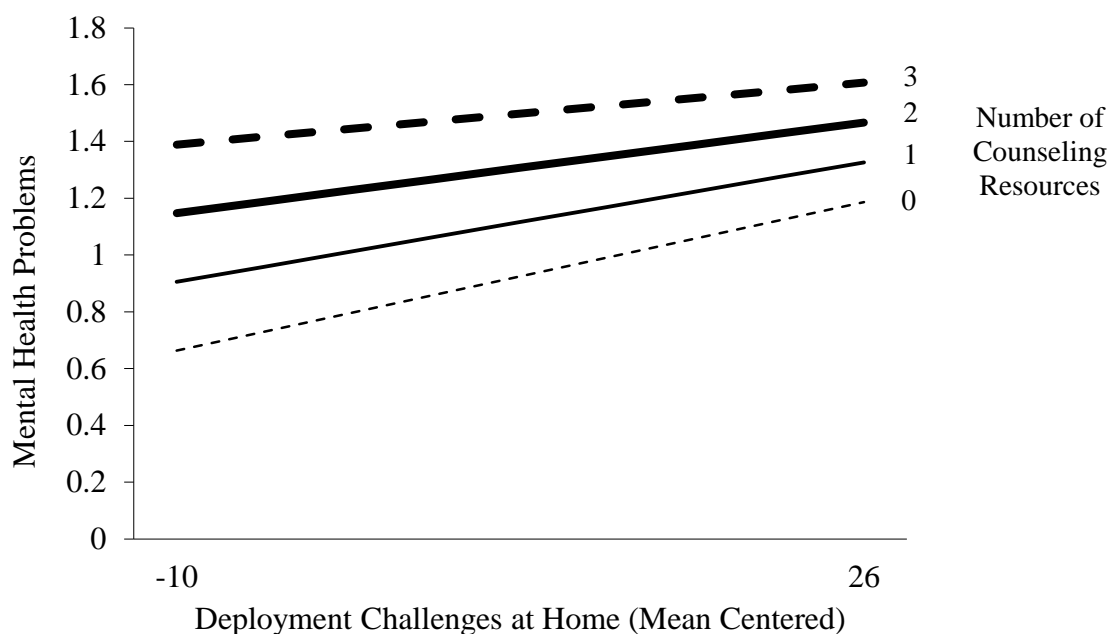
Figure 10. Mental health problems: Interaction between deployment challenges at home and accessing counseling resources.

Note: Interaction plots with as many variables as Model 1 are difficult to interpret; this plot suggests the basic trend for spouses who access more counseling resources, and is specifically depicting the interaction for spouses with a score of 0 on all other independent, moderator, and control variables in the model.

The placement of the lines of the graph suggest the direction of the strong main effect for accessing counseling resources, namely that the more types of counseling resources spouses access, the higher their level of mental health problems. This main effect can be seen in the clear distance between each of the lines. The interaction effect can be seen in the slope of the lines, rather than their placement. The "0" line is significantly more steep than the "3" line; in other words, as the number of deployment challenges at home increases, the "3" line is less affected than the "0" line. Thus, spouses

who access more types of counseling resources tend to have higher levels of mental

health problems, but they are also not as negatively affected by higher levels of

deployment challenges at home, compared to spouses who do not access counseling

resources.

Table 4.

Mental Health Problems Model 1: Findings from a Hierarchical Negative Binomial Regression Model

	Step 1 n=9,107		Step 2 n=8,433		Step 3 n=8,383		Step 4 n=8,383	
	Wald Type III χ^2	*B*	Wald Type III χ^2	*B*	Wald Type III χ^2	*B*	Wald Type III χ^2	*B*
Controls								
Age	3.18	†	12.01*	†	14.65**	†	16.95**	†
Race	0.28	†	0.42	†	0.91	†	1.15	†
Education	28.24***	†	33.08***	†	29.88***	†	27.10***	†
Employment	6.78*	†	5.88	†	6.92*	†	7.25*	†
Years Married	15.41**	†	19.83**	†	18.43**	†	23.64***	†
Perceived Financial Condition	402.71***	†	93.40***	†	85.15***	†	86.31***	†
Service Member Branch	51.27***	†	22.91***	†	26.43***	†	27.02***	†
Service Member Rank	1.20	†	0.61	†	0.56	†	0.52	†
Time since Most Recent Dep.	0.55	†	0.14	†	0.09	†	0.26	†
Independent Variables								
Number of Deployments			5.44		2.58		1.72	
1 previous (ref)				--		--		--
2 previous				0.03		0.03		0.01
3 previous				−0.06		−0.05		−0.06
4 previous				−0.05		−0.04		−0.06
Combat Zone			2.91		2.61		0.98	
Yes, to combat zone (ref)				--		--		--
No, to non-combat zone				−0.07		−0.06		−0.05
Dep. Challenges at Home			203.86***	0.03***	193.49***	0.03***	138.76***	0.04***
Service Member Post-dep. Adjustment			151.34***	0.04***	143.81***	0.04***	53.86***	0.04***
Moderators								
Information					0.73	−0.02	1.28	−0.01
Social Support					6.13*	−0.04*	0.03	−0.01
Counseling					4.73*	−0.15***	3.87*	0.19*

	Step 1 n=9,107		Step 2 n=8,433		Step 3 n=8,383		Step 4 n=8,383	
	Wald Type III χ^2	B	Wald Type III χ^2	B	Wald Type III χ^2	B	Wald Type III χ^2	B
Interactions								
Number of Deployments x Information							1.37	0.02
Number of Deployments x Social Support							0.26	−0.01
Number of Deployments x Counseling							0.39	−0.02
Combat Zone x Information							0.04	0.01
Combat Zone x Social Support							0.91	−0.04
Combat Zone x Counseling							0.18	0.03
Deployment Challenges at Home x Information							8.42**	−0.01**
Deployment Challenges at Home x Social Support							3.52	0.00
Deployment Challenges at Home x Counseling							3.86*	0.01*
Service Member Post-dep. Adjustment x Information							0.81	0.00
Service Member Post-dep. Adjustment x Social Support							1.73	0.00
Service Member Post-dep. Adjustment x Counseling							0.58	−0.00

Note: *$p<.05$, **$p<.01$, ***$p<.001$;

Note: † Unstandardized βs for all levels of all categorical and continuous control variables for Model 1 Steps 1-4 are provided in Table 5;

Note: The test statistic obtained for each variable in a negative binomial model is a Wald Type III χ^2 (as opposed to the t statistic obtained by standard OLS regression) and the change statistic that compares each subsequent step to the previous one in a negative binomial model is the change in −2 Log Likelihood (as opposed to ΔR^2 or ΔF^2 obtained by OLS hierarchical sequential regression).

Table 5.

Mental Health Problems Model 1: Unstandardized βs for Control Variables

	Step 1 n=9,107	Step 2 n=8,433	Step 3 n=8,383	Step 4 n=8,383
	β	β	β	β
Age				
20 years old or younger (ref)	--	--	--	--
21 to 25 years old	0.01	−0.03	−0.03	−0.03
26 to 30 years old	0.08	0.07	0.08	0.09
31 to 35 years old	0.10	0.07	0.07	0.08
36 to 40 years old	0.20	0.19	0.20	0.21
41 years old or older	0.13	0.19	0.20	0.22
Race				
White (ref)	--	--	--	--
Non-white	−0.02	−0.03	−0.04	−0.04
Education				
No diploma (ref)	--	--	--	--
High school graduate	0.05	0.08	0.09	0.13
<1 year of college	0.07	0.04	0.05	0.09
Some college	0.05	0.02	0.03	0.08
Associate's degree	0.07	0.04	0.05	0.08
Bachelor's degree	−0.08	−0.13	−0.12	−0.08
Graduate degree	−0.08	−0.24	−0.22	−0.19
Employment				
Employed (ref)	--	--	--	--
Unemployed	0.03	0.11	0.12*	0.12*
Not in labor force	−0.08	0.01	0.02	0.02
Years Married				
<1 year (ref)	--	--	--	--
1 year to <3 years	−0.03	−0.19	−0.18	−0.19
3 years to <6 years	−0.14	−0.30	−0.29	−0.30
6 years to <10 years	−0.18	−0.37*	−0.36*	−0.37*
10 years to <15 years	−0.24	−0.41*	−0.40*	−0.42*
15 years or more	−0.32*	−0.50**	−0.50**	−0.50**
Perceived Financial Condition				
Very comfortable (ref)	--	--	--	--
Able to make ends meet	0.23***	0.12*	0.13*	0.13*
Some difficulty making ends meet	0.59***	0.34***	0.34***	0.34***
Keeping heads above water	0.93***	0.52***	0.53***	0.53***
In over our heads	1.27***	0.63***	0.63***	0.63***
Service Member Branch				
Army (ref)	--	--	--	--
Navy	−0.14***	−0.05	−0.05	−0.06
Marine Corps	−0.15***	−0.02	−0.01	−0.01
Air Force	−0.32***	−0.21***	−0.23***	−0.23***
Service Member Rank				
E1-E4 (ref)	--	--	--	--
E5-E6	0.01	−0.02	−0.02	−0.02

	Step 1 $n=9{,}107$	Step 2 $n=8{,}433$	Step 3 $n=8{,}383$	Step 4 $n=8{,}383$
	β	β	β	β
E7-E9	−0.02	−0.02	−0.01	−0.01
O1-O3	−0.01	−0.02	−0.02	−0.01
O4-O6	0.04	0.02	0.02	0.02
Time since Most Recent Deployment (months)	−0.00	−0.00	−0.00	−0.00

Note: *p<.05, **p<.01, ***p<.001;

Marital Satisfaction

The marital satisfaction variable was dichotomized, with 1 = "higher marital satisfaction" and 0 = "lower marital satisfaction." Thus, multiple logistic regression was selected as the appropriate analysis method. The test statistic obtained for each variable in a logistic regression model is a Wald Type III χ^2 (as opposed to the t statistic obtained by standard OLS regression) (Cohen et al., 2003). Unstandardized βs are preferred for negative binomial regression (as opposed to standardized βs presented for OLS regression). The OLS interpretation of standardized βs (that for a one standard deviation change in X, Y is predicted to change by β standard deviations) is not applicable to non-continuous dependent variables. The change statistic that compares each subsequent step to the previous one in a logistic regression model is the change in −2 Log Likelihood, or the deviance value (as opposed to ΔR^2 or ΔF^2 obtained by normal hierarchical sequential regression). Lower values of −2 Log Likelihood indicate model improvement, thus it is desirable for each subsequent step to produce a smaller value than the previous step. The difference between the two steps is tested for significance by comparing it to the critical −2 Log Likelihood value (where degrees of freedom indicate the number of variables newly added to the model in that step). If the difference is significant, it means that the additional variables in that step are important beyond the effect of chance of adding more variables to a model.

Model 2 includes marital satisfaction as the dependent variable (where higher scores indicate higher marital satisfaction), as well as all control variables, deployment cycle stressors, military and civilian resources, and interaction terms with these variables. Findings from each step are presented in Tables 6 and 7. Models using sampling weights

remove individuals who have missing values on any variable in the model, resulting in different ns for each step. Overall model fit statistics for multiple logistic regression models include percent concordant, Somer's D, and c (as opposed to F or R^2 for regular regression) (Cohen et al., 2003). The percent concordant describes the extent to which that step predicted the dependent variable scores correctly, and higher percentages indicate better fit. Somer's D, ranging from −1 to 1, is the reduction in errors made by the step compared to chance and values further from 0 indicate better model fit. C, ranging from 0.5 to 1, is the area under the receiver operator curve (ROC) and values closer to 1 indicate better model fit. All three indices of model fit are presented for each model step, as described below.

In Step 1 for Model 2, only the control variables are included. The −2 Log Likelihood, or deviance, for this step is 250, 690.38. Compared to the deviance of a model with no covariates (265, 776.29), this step is significant (Δdeviance = 15, 085.91, $p < .001$). This step also has good model fit, indicated by 65.7 percent concordant, Somers' D = 0.32, and c = 0.66. As overall factors, race/ethnicity, employment status, years married, perceived financial condition, and service member branch were significantly associated with marital satisfaction in Step 1. Non-white spouses are less likely to experience high marital satisfaction scores than white spouses. Spouses who are unemployed and not looking for work are more likely to experience high marital satisfaction scores than spouses who are employed. Spouses who have been married for 6 years to less than 10 years are less likely to experience high marital satisfaction scores than spouses who have been married less than 1 year. Spouses who perceive their family financial condition to be any worse than very comfortable and secure are less likely to

experience high marital satisfaction scores compared to those who do feel very

financially comfortable and secure. Finally, spouses married to Navy, Marine Corps, or

Air Force service members are more likely to experience high marital satisfaction scores

than spouses married to Army service members. Reports of overall effects for control

variables (for each step of the model) are provided in Table 6. Unstandardized βs for each

category of each control variable (for each step of the model) are provided in Table 7.

In Step 2 for Model 2, deployment cycle stressors are added to the model. The

deviance for this step is 210, 277.52 and the change from Step 1 is significant (Δdeviance

= 40, 412.86, $p < .001$). This step also has good model fit, indicated by 74.0 percent

concordant, Somers' D = 0.48, and c = 0.74. Results for each deployment cycle stressor

indicate a large significant effect for deployment challenges at home ($\chi_1^2 = 7.59$, $p =$

.005) and for service member post-deployment adjustment ($\chi_1^2 = 339.25$, $p < .001$). The

unstandardized coefficient for deployment challenges at home ($\beta = -0.01$, $SE = 0.01$, $p =$

.005) indicates that higher numbers of deployment challenges at home are associated with

lower post-deployment marital satisfaction. The unstandardized coefficient for service

member post-deployment adjustment ($\beta = -0.14$, $SE = 0.01$, $p < .001$) also indicates that

more service member post-deployment adjustment problems are associated with lower

post-deployment marital satisfaction. Number of deployments and combat deployments

were not significantly associated with marital satisfaction. Thus, hypothesis 2 is partially

supported (specifically, 2c and 2d), which predicted that spouses who experience more

deployment cycle stressors will also report lower marital satisfaction than spouses who

experience lower levels of deployment cycle stressors. Overall effects (Wald Type III χ^2)

and unstandardized βs for Step 2 variables are provided in Table 6; unstandardized βs for Step 2 controls are provided in Table 7.

In Step 3 for Model 2, military and civilian resources are added to the model. The deviance for this step is 208, 347.85 and the change from Step 2 is significant (Δdeviance = 1,929.67, $p < .001$). This step also has good model fit, indicated by 74% concordant, Somers' D = 0.48, and c = 0.74. It should be noted that although the change from Step 2 was significant, indicating that overall the model in Step 3 fits the data better than the model in Step 2, none of the predictors of interest (accessing information, social support, or counseling resources) were significant in Step 3. One reason for this discrepancy is that while the individual resource predictors did not reach significance, they affected the significance levels of other variables previously in the model (see for example the change in significance for deployment challenges at home). It should also be noted that the effect for accessing information resources approached significance ($\chi_1^2 = 3.06$, $p = 0.08$). Nonetheless, hypothesis 4 is not supported, which predicted that spouses who utilize more types of military and civilian resources will also report higher marital satisfaction than spouses who utilize fewer resources. Overall effects (Wald Type III χ^2) and unstandardized βs for Step 3 variables are provided in Table 6; unstandardized βs for Step 3 controls are provided in Table 7.

In Step 4 for Model 1, the twelve interaction terms for each type of deployment cycle stressor and each type of resource were added to the model. The deviance for this step is 207, 628.52 and the change from Step 3 is significant (Δdeviance = 719.33, $p < .001$). This step also has good model fit, indicated by 74% concordant, Somers' D = 0.48, and c = 0.74. Again, although these statistics indicate good model fit for Step 4, none of

the interactions within this model were significant. Thus, hypothesis 6 is not supported, which predicted that resource utilization will moderate the relationship between deployment cycle stressors and post-deployment marital satisfaction. Overall effects (Wald Type III χ^2) and unstandardized βs for Step 4 variables are provided in Table 6; unstandardized βs for Step 4 controls are provided in Table 7.

Table 6.

Marital Satisfaction Model 2: Findings from a Hierarchical Multiple Logistic Regression Model

	Step 1 n=8,990		Step 2 n=8,323		Step 3 n=8,274		Step 4 n=8,274	
	Wald Type III χ^2	β	Wald Type III χ^2	β	Wald Type III χ^2	β	Wald Type III χ^2	β
Controls								
Age	6.18	†	4.62	†	5.12	†	4.85	†
Race	8.17**	†	13.29***	†	12.22***	†	11.22***	†
Education	2.38	†	3.47	†	3.39	†	3.87	†
Employment	36.58***	†	15.20***	†	13.77***	†	13.90***	†
Years Married	16.04**	†	18.23**	†	21.52***	†	20.85***	†
Perceived Financial Condition	171.13***	†	65.14***	†	62.57***	†	62.48***	†
Service Member Branch	26.00***	†	5.62	†	7.33	†	7.43	†
Service Member Rank	1.90	†	5.57	†	5.79	†	5.79	†
Time since Most Recent Dep.	0.01	†	1.89	†	1.91	†	2.12	†
Independent Variables								
Number of Deployments			0.83		0.82		1.07	
1 previous (ref)				--		--		--
2 previous				−0.07		−0.02		0.13
3 previous				−0.10		−0.04		−0.02
4 previous				−0.04		0.01		0.02
Combat Zone			2.40		1.58		0.79	
Yes, to combat zone (ref)				--		--		--
No, to non-combat zone				0.12		0.10		0.09
Dep. Challenges at Home			7.59**		6.52*		2.97	
Service Member Post-dep. Adjustment			339.25***		337.06***		147.34***	
Moderators								
Information					3.06	0.08	0.85	0.12
Social Support					0.13	0.01	0.32	0.06
Counseling					0.42	−0.04	0.01	0.02

	Step 1 n=8,990		Step 2 n=8,323		Step 3 n=8,274		Step 4 n=8,274	
	Wald Type III χ^2	β	Wald Type III χ^2	β	Wald Type III χ^2	β	Wald Type III χ^2	β
Interactions								
Number of Deployments x Information							0.38	−0.02
Number of Deployments x Social Support							3.60	−0.04
Number of Deployments x Counseling							0.61	−0.02
Combat Zone x Information							0.04	−0.02
Combat Zone x Social Support							0.21	0.04
Combat Zone x Counseling							0.34	−0.09
Deployment Challenges at Home x Information							0.00	0.00
Deployment Challenges at Home x Social Support							0.84	−0.00
Deployment Challenges at Home x Counseling							1.84	0.01
Service Member Post-dep. Adjustment x Information							0.17	−0.00
Service Member Post-dep. Adjustment x Social Support							2.95	−0.01
Service Member Post-dep. Adjustment x Counseling							0.00	0.00

Note: *p<.05, **p<.01, ***p<.001;

Note: † Unstandardized βs for all levels of all categorical and continuous control variables for Model 2 Steps 1-4 are provided in Table 7;

Note: The test statistic obtained for each variable in a multiple logistic regression model is a Wald Type III χ^2 (as opposed to the *t* statistic obtained by standard OLS regression) and the change statistic that compares each subsequent step to the previous one in a multiple logistic regression model is the change in −2 Log Likelihood (as opposed to ΔR^2 or ΔF^2 obtained by OLS hierarchical sequential regression).

Table 7.

Marital Satisfaction Model 2: Unstandardized βs for Control Variables

	Step 1 n=8,990	Step 2 n=8,323	Step 3 n=8,274	Step 4 n=8,274
	β	β	β	β
Age				
20 years old or younger (ref)	--	--	--	--
21 to 25 years old	0.21	0.12	0.10	0.08
26 to 30 years old	0.10	−0.05	−0.06	−0.07
31 to 35 years old	−0.06	−0.15	−0.20	−0.20
36 to 40 years old	−0.04	−0.10	−0.15	−0.15
41 years old or older	−0.03	−0.10	−0.13	−0.12
Race				
White (ref)	--	--	--	--
Non-white	−0.20**	−0.29***	−0.28***	−0.27***
Education				
No diploma (ref)	--	--	--	--
High school graduate	0.11	0.02	0.02	0.01
<1 year of college	−0.13	0.02	0.04	0.02
Some college	−0.15	0.01	−0.00	−0.00
Associate's degree	−0.02	0.20	0.20	0.21
Bachelor's degree	−0.05	0.12	0.11	0.11
Graduate degree	−0.12	0.13	0.13	0.12
Employment				
Employed (ref)	--	--	--	--
Unemployed	0.05	0.03	0.03	0.02
Not in labor force	0.40***	0.29***	0.27***	0.27***
Years Married				
<1 year (ref)	--	--	--	--
1 year to <3 years	−0.19	−0.10	−0.10	−0.11
3 years to <6 years	−0.37	−0.30	−0.33	−0.32
6 years to <10 years	−0.57*	−0.55	−0.60*	−0.61*
10 years to <15 years	−0.37	−0.32	−0.35	−0.35
15 years or more	−0.26	−0.17	−0.18	−0.21
Perceived Financial Condition				
Very comfortable (ref)	--	--	--	--
Able to make ends meet	−0.58***	−0.55***	−0.56***	−0.56***
Some difficulty making ends meet	−0.95***	−0.69***	−0.59***	−0.69***
Keeping heads above water	−1.38***	−1.01***	−0.98***	−0.98***
In over our heads	−2.02***	−1.17***	−1.14***	−1.15***
Service Member Branch				
Army (ref)	--	--	--	--
Navy	0.31***	0.16	0.16	0.16
Marine Corps	0.22**	0.10	0.07	0.07
Air Force	0.39***	0.21*	0.25**	0.25**
Service Member Rank				
E1-E4 (ref)	--	--	--	--
E5-E6	0.08	0.18	0.20	0.20

	Step 1 $n=8,990$	Step 2 $n=8,323$	Step 3 $n=8,274$	Step 4 $n=8,274$
	β	β	β	β
E7-E9	0.04	−0.08	0.00	0.00
O1-O3	0.11	0.07	0.08	0.08
O4-O6	0.04	−0.04	−0.01	−0.01
Time since Most Recent Deployment (months)	−0.00	0.01	0.01	0.01

Note: *p<.05, **p<.01, ***p<.001;

Post-Hoc Analyses

As described previously, Step 3 and Step 4 of Model 2 for marital satisfaction did not produce any significant findings for the moderating effects of military or civilian resource utilization on the relationship between deployment cycle stressors and post-deployment adjustment. Three post-hoc multiple logistic regression models were run for each type of resource independently, in order to examine whether each moderator alone in a model might be significantly associated with marital satisfaction. Although not directly related to the aims of the study, which investigate the relationships of multiple types of resource utilization across the deployment cycle, these post-hoc analyses were run as an exploratory follow-up to the non-significant findings.

No changes in the significance of either the moderator or its four interaction terms were observed for accessing information resources or for accessing counseling resources. However, when social support was entered in a model as the only moderator with the other independent and control variables, one significant interaction was observed. As can be seen in Table 8, the interaction between service member post-deployment adjustment and accessing social support is significant ($\chi_1^2 = 6.63$, $p = .01$). Overall effects (Wald Type III χ^2) and unstandardized βs for the post-hoc analysis variables are provided in Table 8; unstandardized βs for post-hoc analysis controls are provided in Table 9.

The unstandardized regression coefficient ($\beta = -0.02$, $SE = 0.01$, $p = .010$) indicates that as spouses access more types of social support resources, the relationship between service member post-deployment adjustment problems and lower marital satisfaction is affected, controlling for all other variables in the model. When a service member is experiencing high levels of post-deployment adjustment problems, accessing

more social support resources does not significantly impact the spouse's marital satisfaction. However, when the service member is experiencing low levels of post-deployment adjustment problems, accessing more social support resources does significantly increase the odds of greater marital satisfaction, compared to not accessing social support.

A graph of this interaction is provided in Figure 11 below. Although the social support moderator was used as a continuous variable in the model, the plot is presented discretely (levels 0, 1, 2, 3, 4) for ease of visualization.
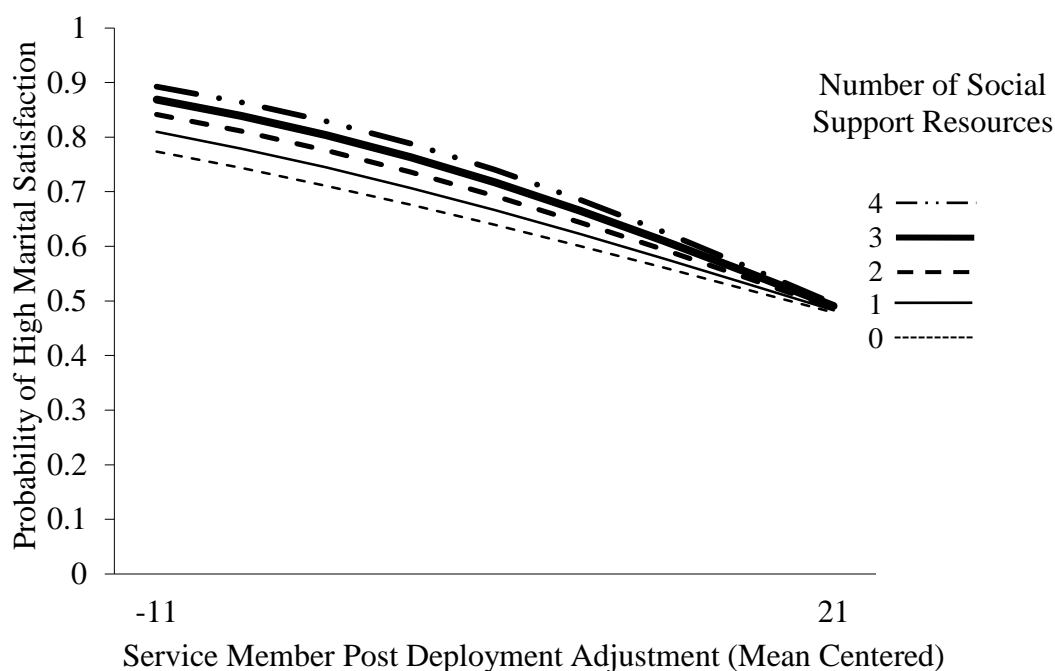
Figure 11. Marital satisfaction: Post-hoc interaction between service member post-deployment adjustment problems and accessing social support resources.

Note: Interaction plots with as many variables as the Post-hoc Model are difficult to interpret; this plot suggests the basic trend for spouses who access more social support

resources, and is specifically depicting the interaction for spouses with a score of 0 on all other independent, moderator, and control variables in the model.

The interaction can be observed in the slope of the lines on the graph. At high levels of service member post-deployment adjustment problems the lines are converged at one point, indicating no difference in the impact of social support resources on marital satisfaction. As the level of service member post-deployment adjustment problems diminishes, the slope of like "4" becomes significantly steeper than the slope of line "0," indicating a significant difference in the impact of social support resources on marital satisfaction. Thus, when the service member is experiencing low levels of post-deployment adjustment problems, accessing more social support resources is related to greater marital satisfaction, compared to not accessing social support.

Table 8.

Marital Satisfaction Post-Hoc Model: Findings for Accessing Social Support Resources

	Post-Hoc Model $n=8,631$	
	Wald Type III χ^2	β
Controls		
Age	5.14	†
Race	11.38***	†
Education	4.09	†
Employment	13.55**	†
Years Married	20.62***	†
Perceived Financial Condition	61.62***	†
Service Member Branch	6.35	†
Service Member Rank	5.88	†
Time since Most Recent Deployment.	2.36	†
Independent Variables		
Number of Deployments	1.34	
1 previous (ref)		--
2 previous		0.13
3 previous		−0.04
4 previous		0.02
Combat Zone	0.70	
Yes, to combat zone (ref)		--
No, to non-combat zone		0.08
Deployment Challenges at Home	2.43	−0.01
Service Member Post-deployment Adjustment	161.60***	−0.13***
Moderator		
Social Support	2.13	0.12
Interactions		
Number of Deployments x Social Support	5.09	−0.06
Combat Zone x Social Support	0.56	0.01
Deployment Challenges at Home x Social Support	0.53	−0.00
Service Member Post-Deployment Adjustment x Social Support	6.63**	−0.02**

Note: *$p<.05$, **p<.01, ***p<.001;

Note: † Unstandardized βs for all levels of all categorical and continuous control variables for the Post-Hoc Model are provided in Table 9;

Note: The test statistic obtained for each variable in a multiple logistic regression model is a Wald Type III χ^2 (as opposed to the *t* statistic obtained by standard OLS regression).

Table 9.

Marital Satisfaction Post-Hoc Model: Unstandardized βs for Control Variables

	Post-Hoc Model *n*=8,631
	β
Age	
20 years old or younger (ref)	--
21 to 25 years old	0.10
26 to 30 years old	−0.06
31 to 35 years old	−0.20
36 to 40 years old	−0.15
41 years old or older	−0.12
Race	
White (ref)	--
Non-white	−0.27***
Education	
No diploma (ref)	--
High school graduate	0.02
<1 year of college	0.03
Some college	0.00
Associate's degree	0.23
Bachelor's degree	0.12
Graduate degree	0.13
Employment	
Employed (ref)	--
Unemployed	0.02
Not in labor force	0.27***
Years Married	
<1 year (ref)	--
1 year to <3 years	−0.10
3 years to <6 years	−0.32
6 years to <10 years	−0.60*
10 years to <15 years	−0.35
15 years or more	−0.20
Perceived Financial Condition	
Very comfortable (ref)	--
Able to make ends meet	−0.55***
Some difficulty making ends meet	−0.68***
Keeping heads above water	−0.97***
In over our heads	−1.14***
Service Member Branch	
Army (ref)	--
Navy	0.14
Marine Corps	0.08
Air Force	0.23*

	Post-Hoc Model $n=8,631$
	β
Service Member Rank	
E1-E4 (ref)	--
E5-E6	0.20
E7-E9	0.00
O1-O3	0.08
O4-O6	−0.02
Time since Most Recent Deployment (months)	0.01

Note: *$p<.05$, **p<.01, ***p<.001;

CHAPTER 5: DISCUSSION

The current study was designed to better understand the deployment cycle experiences of active duty military wives. Addressing a gap in the literature, this study was the first to explicitly investigate whether accessing resources that are meant to alleviate deployment-related stress indeed make a difference for the well-being of female spouses of recently deployed service members. Thus, the central research question focused on whether or not accessing resources could moderate the link between deployment-related stressors and spouses' psychological and relational adjustment. Family Stress Theory and the ABC-X model were used to hypothesize about the relationships between deployment cycle stressors, military and civilian resources, and post-deployment adjustment for spouses of active duty service members.

Any discussion of study findings and implications must first take into consideration the uniqueness of the present sample: this was a group of almost 10,000 spouses who reported unexpectedly low levels of mental health problems and unexpectedly high levels of marital satisfaction. Both the unweighted and weighted means for these two indices of post-deployment adjustment indicate overall high well-being, suggesting that the larger group of spouses within the Military Family Life Project from which the study sample was selected also reported highly positive outcomes. Furthermore, the present sample reported having accessed very low levels of resource utilization, with the majority of the sample reporting having accessed none of the types of information, social support, or counseling resources during the most recent deployment cycle. With the overall high well-being and low level of resource utilization of the sample in mind, study findings about spouses' mental health problems and marital satisfaction

for each of the three study aims must be interpreted cautiously. Recognizing these important limitations, study findings have implications for theory, future empirical research, and policy and practice. The first section will briefly summarize and elaborate upon findings for each study aim, and is followed by a broader discussion of the overall implications of the notable study findings.

<div align="center">**Summary of Findings**</div>

Table 10 (found within Appendix A) provides the study aims and significantly supported hypotheses for each aim.

Aim A

The first study aim was to determine the effects of deployment cycle stressors on two indices of spouse post-deployment adjustment. Findings for both mental health problems and marital satisfaction indicated that the number of deployments was not significantly related to post-deployment adjustment: whether the most recent deployment of her husband was his first or his fourth had no relationship with either her levels post-deployment mental health problems or marital satisfaction. Additionally, whether the deployment was to a combat zone or not was also not associated with either mental health problems or marital satisfaction for the spouse.

However, the number of deployment challenges experienced at home was significantly associated with both spouses' mental health and marital satisfaction. Specifically, when the number of at-home deployment challenges was high, wives experienced more mental health problems and lower marital satisfaction. It is not surprising that spouses reported higher levels of mental health problems and lower marital satisfaction when during the deployment they had difficulty managing household

expenses, health problems in the family, child care schedules, and job and education demands. These challenges may have turned a spouse's focus away from her own mental health and relational well-being, instead focusing her energy and attention on problem-solving what was happening at home during the deployment. The finding may also be interpreted in the other direction; namely, that spouses who experience high levels of mental health problems and lower marital satisfaction during the post-deployment phase are more likely to report higher levels of deployment challenges while their husbands were on deployment. It is not surprising that spouses who are struggling during the post-deployment phase with depression or anxiety symptoms, or marital problems, may more negatively rate their experience of the deployment itself.

In either direction, these results support previous literature that finds deployment to be a complex and stressful period for spouses at home (MacDermind Wadsworth, 2012). Facing challenges at home, such as parenting alone (Joseph & Afifi, 2010), managing the family finances or balancing work and family demands (Warner et al., 2009), seem to increase the likelihood of stress accumulating during the deployment into the post-deployment period. For some spouses in the study, the at-home experience of deployment had occurred several months to more than a year prior to answering questions about her current well-being, yet both her level of mental health problems and her marital satisfaction were associated with her post-deployment adjustment regardless of when the deployment had occurred within the last two years.

The level of service members' post-deployment adjustment problems was also significantly associated with spouses' mental health problems and marital satisfaction. Specifically, spouses who reported that their husbands were experiencing many post-

deployment adjustment problems also reported more mental health problems and lower marital satisfaction. Wives may have difficulty coping with behavioral health problems in their husbands, for example when they adjust to being home from deployment by drinking more alcohol, engaging in risky behavior, or being more emotionally distant. Wives may also experience poor well-being from their own unmet psychologically or relational needs or experience caregiver burden, a construct used to describe the difficulties associated with caring for someone with intense, often chronic physical or mental health problems, such as when service members return from deployment with substance abuse disorders (Shen et al., 2012), sleep disorders (NIDA, 2011), and physical injuries (Belmont et al., 2010; Heltemes et al., 2011). This association may also be interpreted in the opposite direction. Perhaps through their negative perception of their own psychological state and their relationship, wives are more likely to rate higher levels of adjustment problems in their husbands. Beyond perception bias, it is also possible that wives with mental health problems and low marital satisfaction contribute to worse post-deployment adjustment experiences for service members. Service members may respond to distress in their spouse and experience more difficultly adjusting to the return home to their families. In either direction, it is not surprising that the post-deployment adjustment of the female spouses is related to their reports of the adjustment of their service member husbands.

These findings support previous literature on the link between service members' post-deployment mental health and spouses' post-deployment well-being (de Burgh et al., 2011; Lewis et al., 2012). This research establishes a strong connection between service members' adjustment and that of their spouses, especially in terms of their mental health

(Renshaw et al., 2008) and marital satisfaction (Allen et al., 2010; Nelson Goff et al., 2007; Price & Stevens, 2011). Although the immediate period of reunion is usually marked by excitement and relief, as the post-deployment phase continues couples must begin to renegotiate relationships roles and reestablish a sexual connection (Pincus et al., 2001). Whether the cause of her distress is through her husband's or through her own experiences of the deployment, together their post-deployment experiences tend to parallel each other. Indeed, other research has found that the attributions of the source of mental health symptoms is not related to the severity of spouses' distress (Renshaw et al, 2011). When the service member has a negative experience of post-deployment marked by many problems identifiable by his wife, she is likely to have a parallel negative experience both psychologically and relationally.

Together, the effects of these findings provide strong evidence that challenges at home during the deployment and challenges with her husband's adjustment after the deployment are significantly related to her post-deployment psychological and relational well-being. Therefore, for the spouse of a recently deployed service member, it seems that understanding what is going on "internally" for her at home while he is gone and understanding her perceptions of how he is doing when he returns home are more important than knowing the more "external" characteristics of the deployment itself. This is one of the three notable findings from the present study, and will be further elaborated upon in the following discussion section.

Aim B

The second study aim was to determine the relationship between utilizing military and civilian resources and the two indices of spouse post-deployment adjustment. Two

resources were found to be significantly associated with spouses' post-deployment mental health. As expected, accessing more types of social support was related to lower levels of mental health problems. This finding aligns with previous research that finds social support to be a powerful buffer against psychological distress for spouses throughout the deployment cycle (Joseph & Afifi, 2010). Participating in Family Readiness Groups or military spouse support groups, talking with other spouses from the same unit, and enjoying recreation and entertainment activities with other military families, all help to foster a sense of support from the military. The more types of social support that spouses access, the more opportunities they have to interact with a variety of military families or civilian friends and neighbors, increasing the likelihood they will find others with whom they connect and trust. Social support from other military spouses in particular helps foster a sense of connectedness to those who share the common experience of deployment, either at the same time as the spouse or in the past. When the service member has a negative experience of post-deployment marked by many problems identifiable by his wife, she is likely to have a parallel negative experience both psychologically and relationally. Although building social support among military families is a central and important component of many service branches and units, it has rarely been studied for its relationship to spouses' adjustment. The present finding connecting social support resource utilization with better mental health adds to this growing literature on the buffering effect of social support during the post-deployment phase.

The other resource found to be related to spouses' mental health was accessing more types of counseling, yet the finding was in the unexpected direction. Accessing

counseling resources was associated with higher levels of mental health problems, and as the types of counseling spouses accessed increased, the worse spouses reported doing psychologically. While counter to the hypothesis, it makes sense that wives who are suffering more would access more types of counseling services to treat their mental health distress. Those who are experiencing persistent high levels of mental health problems are the ones who are more likely to access more types of counseling, either sequentially or at the same time, than those not experiencing such high levels of psychological distress.

While a positive experience from one type of social support resource, for example, might lead spouses to seek other types of social support to enhance the feeling of well-being it confers, accessing more and more types of counseling resources does not carry the same 'positive snowballing effect' for reducing mental health problems. That is, individuals who seek out one type of counseling, and then seek out another type, may not be building on the positive experience of the first type. For example, perhaps telephonic counseling did not help as much as the spouse had hoped, so she then sought in-person counseling from a civilian therapist or military chaplain. Explained another way, accessing fewer types of counseling resources is associated with lower levels of mental health problems. Spouses with very low or no levels of mental health problems are unlikely to seek counseling. If the first counseling resource provided resolution for spouse's level of distress, she is unlikely to seek out another type of counseling. Again, it is important to remember that the present finding cannot speak to the effectiveness of these counseling resources, only to their utilization.

It is also possible that this finding, accessing more counseling being associated with poorer mental health, conveys good news about ready access to counseling resources and reductions in stigma to utilize them. Other research has found that depressed spouses are more likely to report experiencing barriers to help-seeking than non-depressed spouses, such as being viewed differently by family members or being seen as weak (Warner et al., 2009). Yet in the current sample, wives who experience poorer mental health are the ones seeking more types of counseling, perhaps suggesting that they are willing to continue trying different types of counseling to relieve their distress despite the potential barriers to care.

None of the types of resources examined in the present study were significantly related to spouses' post-deployment marital satisfaction as main effects. The differences in the relationships between accessing resources and the two indices of post-deployment adjustment are another of the notable study findings, and are discussed in greater depth in the next chapter section.

Aim C

The third aim of the study was to determine the moderating effects of resource utilization on the relationships between deployment cycle stressors and spouses' post-deployment adjustment. Similarly to Aim B, accessing resources affected the relationships between deployment cycle experiences and post-deployment mental health problems, and to a much lesser extent was related to improvements in marital satisfaction.

Accessing resources was found to moderate the relationships between deployment cycle characteristics and mental health problems in two cases. Accessing more types of

information resources significantly moderated the relationship between experiencing deployment challenges at home and levels of post-deployment mental health problems. At high levels of at-home challenges during the deployment, accessing more types of information resources buffers spouses against higher levels of mental health problems compared with accessing fewer types of information resources. This finding suggests that attending briefings, going to reunion planning classes, exploring Military OneSource, and seeking information about money management, can make a positive difference for post-deployment mental health when experiencing challenges at home during the deployment. Utilizing and absorbing information may lead to knowing more about what to expect during the deployment cycle, being informed about warning signs of distress, learning about ways to bond again as a family, or finding out about upcoming recreational activities, camps for military children, or retreats for herself or her whole family.

The interaction between deployment challenges at home and accessing counseling resources was also significant for mental health. This finding suggests that spouses who experience more at-home deployment challenges also report higher levels of mental health problems, but that accessing more types of counseling resources dampens this relationship. That is, at-home deployment stressors are less strongly tied to mental health problems for those who access more types of counseling resources. And although the measurement of counseling does not include its effectiveness or spouses' report of reduction in symptoms, this finding suggests that utilizing counseling stabilizes spouses' mental health even as the number of post-deployment problems increases.

Together, these interactions for mental health problems suggest that accessing information or counseling resources during the deployment cycle may translate into a

greater sense of preparedness for military life and the hardships of deployment. The framework of family resilience suggests that resource utilization helps stressed families to manage their challenges through overcoming barriers to success and to "bounce forward" and adapt to changing life circumstances (Walsh, 2003, p. 165). Both information and counseling resources have the capacity to provide these types of supports. Increases in knowledge through information resources may lead to a greater sense of confidence for spouses in their ability to handle current challenges or to anticipate and prepare for potential future problems. Information may also increase awareness of other resources to access or to seek in future deployment cycle stages. Counseling often teaches clients new skills and coping strategies, and may also provide a confidential place to process the challenges of deployment without fear of social isolation from other military spouses or unit leadership. Thus, accessing these resources in the face of deployment challenges at home helps to offset the negative effects of mental health distress. The remaining six hypothesized relationships between other deployment cycle characteristics, accessing information or counseling resources, and mental health were not supported. Social support utilization was not found to be a significant moderator of the relationships between any of the deployment cycle stressors and post-deployment mental health problems. Given the previous literature on the positive role of social support within the military and general civilian populations, and the significant finding for social support within Aim B, this non-finding is the third notable one from the present study and is further discussed in the next section.

Although none of the twelve originally hypothesized interactions were significant for marital satisfaction, post-hoc analyses were conducted to further explore the potential

moderating role of resource utilization on the relationship between deployment cycle experiences and post-deployment marital satisfaction for each resource individually. Interestingly, one post-hoc interaction was found to be significant: accessing social support significantly moderated the relationship between service member post-deployment adjustment problems and spouses' post-deployment marital satisfaction. Accessing more types of social support improved spouses' marital satisfaction when service members were experiencing less post-deployment adjustment problems compared to when service members were struggling with many post-deployment problems. In other words, at high levels of service member post-deployment adjustment problems, whether or not a spouse accesses social support makes no difference for her level of marital satisfaction. However, as the number of post-deployment problems he experiences goes down, spouses who access more types of social support have higher marital satisfaction than spouses who do not access social support.

This post-hoc finding is complex and somewhat unexpected. The interaction indicates that social support matters more for spouses' marital satisfaction when service members are doing better, not doing worse, during reintegration. A possible explanation for this finding is that when a spouse socializes and receives support from friends or other military spouses, perhaps through talking with them about how her husband is adjusting to being home from deployment or about how her marriage is doing now that he is home, social support is only helpful when he is not doing that badly. Seeking social support in times of low service member distress is helpful in terms of her marital satisfaction. However, when the intensity of many post-deployment problems experienced by the service member increases, through behaviors such as heavy alcohol drinking, having

trouble sleeping, and taking risks with his safety, the support provided by social networks or groups of military spouses may be overwhelmed by his distress. Thus, there may be a limit to the benefits on marital satisfaction that social support can give when service members are having a difficult time adjusting during the post-deployment phase.

Although previous research has found social support to provide solace from the stressors of deployments (Burton et al., 2009; Joseph & Afifi, 2010; Merolla, 2010) and despite an extensive literature on the benefits of social support for a wide variety of outcomes among the civilian population, the findings of the present study largely do not provide support for the positive effects of utilizing social support. Together, the lack of significant findings for interactions between social support and mental health problems, as well as the one post-hoc interaction for social support and marital satisfaction, suggests that social support operates differently for the present sample of military wives. As mentioned above, this is the third notable finding of the present study and is further discussed below.

Important Considerations of the Present Sample

Before discussing the three notable findings of the present study, it is important to acknowledge that the spouses of the present sample represent a distinct group of the larger population of active duty military wives. Overall, this study finds that spouses are doing well psychologically and relationally despite the recent stressors of deployment. Contrary to a growing body of research that warns of the negative outcomes for spouses whose husbands deploy (Galovski & Lyons, 2004; Eaton et al., 2008; Mansfield et al., 2010; Warner et al., 2009), it appears that some spouses may be more resilient to deployment cycle adjustments than previously described. Research on resilience of

service members is expanding on the notion of "total force fitness," which extends the dimensions of service member well-being to include relationships with his family members (Battaglia & Macedonia, 2012; Land, 2010). Journals such as *American Psychologist* (2011, volume 66, number 1) and *Clinical Child and Family Psychology Review* (2013, volume 16) are focusing special issues on the determinants of resilience in military families and relationships, lessons learned from evaluations of military programs that seek to foster resilience and well-being, and theoretical contributions to a more comprehensive definition of military family health. The current research fits within this more strengths-based orientation to military families, an orientation that may be better suited to promote positive and adaptive behaviors and highlight programs and services that are found to be effective at reducing risk for distress during the deployment cycle.

Yet within this strengths-based orientation, it is interesting that the highly resilient group of active duty spouses reported very low levels of resource utilization. Other research has found that lower levels of perceived stress are associated with increases in likelihood of health-seeking behaviors such as exercise, social engagement, and preventative healthcare (Padden et al., 2011). However, rather than connecting high levels of post-deployment functioning to high levels of resource utilization as expected, this study included a group of well-adjusted spouses of whom 55% accessed zero types of information resources, 43% accessed zero types of social support resources, and 81% zero types of counseling resources. Unlike other studies of active duty spouses and resource utilization (for example, Warner et al., 2009), this study did not assess spouses' sense of perceived barriers to accessing resources. Thus, it is impossible to speculate

about whether common barriers to help-seeking were present, such as stigma, lack of knowledge, or difficulty finding time to participate.

Several characteristics of the sample may help to contextualize the high functioning and low resource utilization reported in the present study. First, the majority of the spouses were highly educated, with approximately 63% having an associate's degree or higher. The majority of the sample (69%) also reported stable perceived financial conditions of either very comfortable and secure or able to make ends meet without much difficulty. Highly educated, financially secure spouses have been found to report significantly lower levels of deployment-related stress (Allen et al., 2011) and significantly higher levels of self-care behaviors during a deployment separation (Padden et al., 2011).

Additionally, the sample was comprised of almost equal groups of wives of Army (21%), Navy (24%), Marine Corps (24%), and Air Force (31%) service members. Previous researchers studying spouses of active duty service members have tended to narrow their samples to one service branch; for example, a study of relationships between recent deployment, posttraumatic stress, and marital functioning within a sample of exclusively Army couples (Allen et al., 2010). Membership in the Army or Marine Corps is associated with longer deployments and more deployment-related hospitalizations, while Navy or Air Force membership is associated with deployments to non-combat areas and fewer positive screens for posttraumatic stress disorder (Hyman et al., 2012; Shen et al., 2012). Thus, inclusion of wives from all four active duty branches may have dampened the likelihood of observing deployment-related distress that is more likely to be reported by spouses of service members from certain active duty branches.

Furthermore, the study sample was almost equally split by service member rank into wives of enlisted service members (48%) versus wives of officers (52%). Compared to the larger population of MFLP respondents, the study sample overrepresented officers wives by almost 34%. Lower ranked military service members are at greater risk for deployment to combat zones, sustainment of deployment-related injury, and diagnosis of posttraumatic stress disorder than officers, leading to increased risk for deployment-related stressors for enlisted wives (Lester et al., 2010; Phillips et al., 2010). Wives of officers also report greater overall satisfaction with military life and better psychological well-being than wives of enlisted service members (Burrell et al., 2006).

Together, these characteristics of the study sample make it unique among other studies of active duty spouses' risk for deployment cycle stressors. Furthermore, other characteristics often linked to worse deployment cycle outcomes for military families were not included in the present study. Service members who are wounded during deployment present serious adjustment challenges for their families, especially since advances in medical technology have increased the combat injury survival rate (Gawande, 2004). All types of physical injuries, from blast wounds to amputations to burns, can place strain on military spouses, particularly if the injury affects the service members' family participation (Cozza, Chun, & Polo, 2005). Unfortunately, the present sample included too few female spouses of wounded active duty service members to include an analysis of the associations between deployment-related injury and post-deployment adjustment. Spouses of active duty service members who are also mothers have been found to experience increased levels of deployment cycle stressors related to her number of children (MacDermid Wadsworth, 2010; Sheppard, Malatras, & Isreal,

2010). Beyond the number of children at home, their internalizing and externalizing behaviors resulting from their own deployment-related distress are also related to mothers' levels of stress regarding deployment (Allen et al., 2011). As discussed previously, the DMDC provided dataset did not include sufficient information about the number of children living at home, making investigation of the influence of motherhood and deployment cycle stressors also impossible.

Notable Findings

Given these characteristics of the present sample, and considering the spouses' overall high level of post-deployment adjustment, the results of the study suggest three important findings for researchers, policy makers, and practitioners concerned with the health and well-being of military spouses of active duty service members. Across the study aims and large number of analyses conducted, three findings emerge as the most notable: 1) certain characteristics of the deployment cycle are more meaningful than others in terms of spouses' post-deployment adjustment, 2) there are important differences in the way accessing resources is related to spouses' mental health and marital satisfaction, and 3) social support resource utilization does not appear to serve the buffering function for this sample of military wives that is commonly found in other social support research.

Deployment Cycle Stressors that Matter

Across study aims, certain characteristics of the deployment cycle are more meaningful than others in terms of spouses' post-deployment adjustment. Findings indicate that it is the spouse's personal, at-home experience of the deployment, rather than the external characteristics of the deployment itself, that matter for her post-

deployment adjustment. For the spouses in the current study, the at-home experiences of deployment and how service members are adjusting to their return are the deployment characteristics that matter for their mental health and marital satisfaction. Unlike findings of previous research, the more 'external' characteristics of how many times deployment has occurred and whether the more recent deployment was into combat were not related to her post-deployment adjustment. Number of deployments have been linked to increases in mental health diagnoses for spouses (Eaton et al., 2008) and emotional disengagement between partners (Baptist et al., 2011), and combat deployments are one of the most consistently cited risk factors for post-deployment challenges in both service members (Cozza, 2005; Baker et al, 2009) and spouses (Allen et al., 2011; Renshaw et al., 2011). One explanation for the divergence in findings may be that these external deployment characteristics impact outcomes for the service member himself much more than his wife. Spouses' perceptions of their husbands' post-deployment adjustment were measured in the present study but not through self-report by the service member, and were used in analyses as an independent variable rather than an outcome. Additionally, the present study did not assess the relationships between deployment cycle stressors. For example, the number of previous deployments may be related to spouses' perceptions of service members' post-deployment adjustment. Thus 'external' characteristics of deployment may impact her post-deployment adjustment indirectly through her experience of his reintegration. Another explanation for the lack of significant relationships for 'external' deployment cycle characteristics may be that an accumulation of multiple, prolonged deployments to combat zones is more likely to be related to spouses' risk, yet this combined deployment characteristic was also not assessed by the

present dataset. It is unknown how many of the previously experienced deployments were to combat zones, the duration of the most recent or previous deployments, or whether they were extended longer than originally anticipated in the deployment orders.

It is also possible that this finding reflects the changing nature of U.S. military operations. The data were collected over the summer of 2010 and spouses were asked to report about their husbands' deployments since 2008. This period was a time when troops were being withdrawn from Iraq in large numbers but were surging into Afghanistan. Service members were also deployed during this period to other parts of the world for a vast variety of duties, including to staff military installations in Germany or South Korea, to assist with humanitarian efforts in Georgia, or to deter pirating in Somalia. The present study lumped all recent deployments into one category and assumed all deployments would be associated with various levels of deployment cycle stressors. Indeed, previous research has identified positive consequences from deployments (Newby et al., 2005), and not all deployments to high risk places result in stressors for the service member. The unique challenges and experiences of each of these deployment locations and job duties, as well as how long the service member was away from home, were not captured in this study and are likely important aspects of the relationship between deployment cycle experiences and post-deployment adjustment.

Still, a vast and growing body of literature has found that multiple deployments and combat deployments matter for spouses' mental health or marital satisfaction. For the present sample, these deployment characteristics never gained significance in any model—rather, her experience of deployment challenges at home and her perception of her husband's adjustment to deployment when he returned mattered for her mental health

and marital satisfaction. It may be that these are the deployment characteristics that are significantly related to her post-deployment adjustment because these are the characteristics over which she potentially has some control. A civilian spouse does not decide where her husband is deployed or how many times he has to leave. She must simply cope and accept these facts—and whether or not she adjusts to deployment successfully or with great disruption, the facts are still the reality of the deployment experience.

For this sample of spouses, whether or not service members were sent in to combat may not matter. Especially in Iraq and Afghanistan, service members deployed to high conflict areas on non-combat deployments still experience heavy fighting, traumatic casualties, or combat exposure. Thus, spouses may be worried about safety no matter the nature of their husbands' deployment. Additionally, although multiple deployments might be considered as cumulative stressors, with each subsequent deployment adding to the stressors and contributing to pile-up, it may also be that the more times her husband leaves, the more a spouse is habituated to his leaving. She might more easily fall back in to the role of waiting for him to return, meanwhile living her life as best she can while he is deployed. Or, during previous deployments she may have developed coping skills to manage her emotions or habits that help her to manage the household that she can rely on again during subsequent separations. In other words, it may be that deployment becomes a more normative event in her life and thus a subsequent deployment does not necessarily disrupt her functioning.

Instead of these more 'external' deployment characteristics, it is when spouses directly experience challenges, either in what is happening at home during the

deployment or what is happening at home in terms of their husbands' post-deployment adjustment behaviors. These are the deployment stressors that may more directly affect female spouses' quality of life and day-to-day experiences. For example, not having adequate child care during a deployment is going to be stressful for a civilian spouse no matter where her husband was sent or how many times he has been deployed previously. Relief that her husband is home safely from deployment may evaporate when she realizes that he is drinking heavily or not connecting with her or the children. According to study findings, these are the deployment stressors that will either overwhelm spouses when experienced at very high levels, or contribute to an "easier" post-deployment adjustment experience if they are under control.

Differences between Mental Health and Marital Satisfaction

The second notable finding from this study is that military and civilian provided resources seem to be more strongly associated with active duty spouses' mental health than with marital satisfaction. Despite the fact that the spouses in the current study reported very positive psychological and relational well-being, resource utilization significantly altered their post-deployment mental health but not their marital satisfaction. Two resources, social support and counseling, were related to significant changes in mental health, although in somewhat more complex ways than hypothesized. And two significant interactions between deployment cycle characteristics, accessing information or counseling resources, and post-deployment mental health were also observed. Although a spouse's marital satisfaction was found to be negatively impacted by certain characteristics of the deployment, specifically the number of deployment problems at home and the service member's post-deployment adjustment, none of the types of

resources examined in the main analyses of the present study were related to improvements in marital satisfaction. These findings pose an interesting question about why might differences exist for these two measures of well-being. Possible explanations include both measurement issues and response patterns, but may also reveal something uniquely different in an interpersonal process (mental health) and an intrapersonal process (marital satisfaction).

Looking first at measurement issues, mental health problems were measured by four questions about feeling depressed or nervous, having uncontrollable worry, or finding little pleasure in doing things. Marital satisfaction was measured by one question about satisfaction with the marriage as a whole. Thus, the metal health measure may have been more nuanced, with richness from the four items contributing to more variation in responses than assessing a single item relational state. It is again important to note that, on average, spouses reported very low levels of mental health problems and very high levels of marital satisfaction. Although both means indicate high levels of reported well-being, there was slightly greater variability in spouses' reports of mental health than marital satisfaction as evidenced by the standard deviations ($M = 2.26$, $SD = 2.80$ vs. $M = 4.35$, $SD = 0.04$, respectively). Again, the greater variability may have been due to the measurement of mental health problems as an index of four questions, as opposed to the one question that measured marital satisfaction. Furthermore, marital satisfaction was rated so overwhelmingly positive that the five original answer choices were collapsed into just two for regression analyses: any rating less than the maximum (5) level of satisfaction was grouped together as 'less satisfied.' Clearly, the vast majority of spouses rated their marriages as satisfactory and perhaps this lack of variability in responses

contributed to the lack of association between marital satisfaction and resource utilization.

A second measurement issue may be that the relational experience of marital satisfaction or dissatisfaction is related to attainment of relational resources, rather than the types of personal resources assessed in the present study. All of the types of the military and civilian resources assessed were individually focused, particularly the types of information resources (e.g., seeking information from Military OneSource websites or attending a reunion planning class). Asking spouses specifically about accessing couples' counseling, in addition to asking about personal counseling, may have added nuance to the associations between resource utilization and relational well-being. Although a family systems perspective of therapy provides strategies through which couple relationship problems may be effectively addressed through individual counseling, having both spouses is often preferred due to its explicitly relational focus (Sprenkle, Davis, & Lebow, 2009). Furthermore, not all mental health professionals have been trained to use systems theory in their work. Thus other types of resources accessed, particularly ones in which the service member also participates either in person for the pre- and post-deployment phases or remotely for the deployment separation, may be more likely to be associated with spouses' post-deployment marital adjustment.

Another way measurement may have affected the results stems from not knowing exactly when a spouse accessed a particular military or civilian resource. Resource utilization was measured by the number of resource types that were accessed throughout any phase of the most recent deployment cycle. Significant findings for mental health problems suggests that utilizing these resources at any point during the deployment cycle

is related to spouses' levels of post-deployment mental health problems. However, the specific timing of resource utilization may be more important for her post-deployment marital satisfaction, as the more global assessment of resource access was not significant. For example, accessing resources during deployment while the service member is absent may not address the types of relationship characteristics that influence marital satisfaction, such as sexual intimacy, communication, and partnership. Although a resource might provide a needed service, it may fall short of addressing her appraisal of the marriage simply because he is not home. Since resource utilization was measured globally throughout the recent deployment cycle, it is not possible to untangle whether accessing resources specifically in the pre- or post-deployment phase might have significantly impacted her post-deployment marital satisfaction.

Yet, it is also possible that the types of personally obtained resources examined in the present study still may not be related to her post-deployment marital satisfaction during these phases. In the pre-deployment phase, personal resource utilization on the part of the spouse may fall short because there may not be negative changes in the marital satisfaction to remedy. For example, the couple may be occupied with preparing for separation and may exhibit hope for how their marriage will continue to thrive despite the pending separation. In the post-deployment phase, personal resource utilization may fall short because this period is often marked by the service member experiencing many adjustment problems himself—a situation that may overpower any support received from a military or civilian resource. Thus, specific inquiry into the deployment cycle phase during which a resource was accessed is a potentially important factor to consider among the relationships between resource utilization and marital satisfaction.

Similar to the dependent variables, measurement issues for the moderators may have also contributed to the differences in associations between resources and post-deployment adjustment. Overall, spouses reported very low levels of resource utilization and yet there was great variability in spouses' level of access as evidenced by the standard deviations (information: $M = 0.75$, $SD = 0.98$; social support: $M = 1.21$, $SD = 1.31$; counseling: $M = 0.23$, $SD = 0.52$). For each resource, the standard deviation is greater than the mean, indicating a very high level of variability throughout the sample. Perhaps there would be differences observed between the subgroups of spouses who accessed zero types of each resource and those who accessed more than one type. For psychological health, the relationships between resource utilization and mental health problems were robust enough to be observed from the group as a whole. However, again, associations for marital satisfaction may require more nuanced measurement of both the dependent variable itself and the types of resources accessed by the group who actually accessed them.

In summary, mental health was operationalized as an index of the spouses' internal psychological state while marital satisfaction was operationalized as a global indicator of interpersonal relationship quality. Significant findings for mental health problems, and not for marital satisfaction, may mean that information, social support, and counseling resources address those more interpersonal psychological states than the intrapersonal, relational dynamics between the couple. In this way, the personal experience of either psychological well-being or distress during a deployment cycle was found to be related to attainment of individually focused resources. More nuanced

measurement of relational resources, such as couples counseling, may be related to the experience of either marital satisfaction or dissatisfaction during a deployment cycle.

Role of Accessing Social Support Resources for Military Wives

The third notable finding from the present study is that social support resource utilization did not seem to serve the buffering function for this sample of military wives that has been found with other populations. In their seminal paper on social support and stress, Cohen and Wills (1985) determine that the positive association between social support and well-being is due, in part, to process of social support buffering individuals from the potentially negative effects of stressors. Since then, social support has been found to moderate the relationship between stress and well-being in a wide range of circumstances. For example, social support increased the self-esteem among lesbians despite anxiety around sexual identity disclosure (Jordan & Deluty, 1998), enhances positive adjustment to a breast cancer diagnosis through healthy coping strategies (Holland & Holahan, 2003) and buffers women from negative outcomes when they experience physical and/or emotional dating violence (Richards & Branch, 2013).

Accessing social support resources was only found to be significant in two analyses within the present study: there was a significant main effect for accessing more types of social support resources and lower levels of mental health problems and there was a significant post-hoc interaction whereby accessing more types of social support resources was related to higher marital satisfaction for spouses whose husbands were not experiencing high levels of post-deployment adjustment problems. Both the overall lack of significant findings for social support and that it did not serve a buffering or protective function are notable, given the larger literature on the benefits of social support within

civilian communities and the growing literature of its benefits for military spouses in particular.

Social support is a vital resource for families, as these networks provide practical assistance, emotional support, and a sense of solidarity (Walsh, 2006) and there is widespread consensus that social support has a positive relationship to health and well-being (Chronister, Frain, Chou, & Cardoso, 2008). Belonging to a group of people who care about the well-being of its members prevents isolation, enhances companionship, and provides the context for resilience. These properties of social support reduce stress and emotional problems while influencing health-promotion and self-care.

The construct of social support is broad and may refer to specific characteristics of social networks or perceptions of the impact social relationships have on personal needs and well-being (Procidano & Heller, 1983). These distinctions are important but often overlap: perception of received support depends on the availability of supportive resources within an individual's environment, and whether the support resource functions as intended (by providing emotional comfort versus material aid, for example) is dependent on the perceptions of whether support was provided appropriately. Although the present study focused on the structural characteristics of military spouses' social support utilization, by measuring the types of social support they accessed during the most recent deployment cycle, social support is also conceptualized within the literature in terms of individuals' perceptions of that support. Meta-analyses on the role of social support for a variety of health and well-being outcomes such as post-traumatic growth (Prati & Pietrantoni, 2009), disability rehabilitation (Chronister at el., 2008), and work-family conflict (Kossek, Pichler, Bodner, & Hammer, 2011) all investigated both

structural characteristics of social support as well as participants' perceptions of social support resources.

Both structural characteristics and perceived social support have been found to be powerful buffers against deployment cycle stressors in the growing literature on social support for military spouses. Perceptions of support from friends both within and outside the military community are associated with higher marital satisfaction (Joseph & Afifi, 2010). A small, exploratory study of military marriage maintenance during deployment found that both informal social network support and military-sponsored groups helped civilian spouses feel comforted and hopeful about surviving the deployment separation (Merolla, 2010). Many spouses report appreciation for the sense of camaraderie and sharing of common experiences that participating in Family Readiness Groups (FRGs) or military-sponsored support groups provide (Burton et al., 2009).

However, overall these benefits of social support were not observed in the present study. One explanation for the lack of significant findings for the role of accessing social support resources may stem from the measurement of the social support variable. Four types of resource utilization were operationalized as social support resources: seeking a Family Readiness Group/Ombudsperson, a military spouse support group, information and support provided by [the service member's] unit, and military-sponsored recreation and entertainment activities. This index of social support includes only structured activities and not perceptions of that support, and all of the four types refer to military-provided services and resources rather than civilian social support or a sense of support from the military community at-large.

The present study also did not assess social support in terms of less-structured social interactions, such as friendships with civilians, support received from neighbors or extended family members, or relationships with fellow members of their faith communities. Indeed, previous research that has found informal social support to be a buffer from deployment-related stress, such as "chatting" with friends and family (Merolla, 2010, pg. 16). These less-organized types of social interactions tend to occur organically within individuals' existing networks of friends and family, and may often include a large number of civilians rather than fellow military spouses. With more military families of all branches living off-base within civilian neighborhoods, informal community networks play an important role in supporting the well-being of military families (Bowen, Martin, Mancini, & Nelson, 2000). Social capital conferred by relationships with work associates, civilian friends and neighbors, and extended family members is accessed on a daily basis and may be felt as more emotionally present than military-provided, structured support activities that occur less frequently.

Social support resources available to military spouses have also been conceptualized as more global perceptions of support from the military community at-large, for example by assessing the extent to which a spouse feels she can "rely" on others in her military community (Joseph & Afifi, 2010, pg. 419). Global perceptions of social support have been found to be significantly related to military spouses' reduced levels of conflict about a new pregnancy during their husbands' deployments, especially when the spouses' support networks are located on-base as opposed to within civilian communities (Weis, Lederman, Lilly, & Schaffer, 2008). These important but more subtle forms of global social support were not included in the present study, yet are likely

integral to spouses' psychological and relational health by providing a supportive context for the experiences of military family life.

In summary, the present study was unable to determine the nuanced relationships between accessing different types of social support and psychological and relational adjustment suggested by previous research. Overall, social support, as it was measured in the present study, does not have strong associations with buffering spouses from deployment cycle stressors. This finding notably differs from the broader literature on positive effects of social support and the growing literature on its beneficial role for military spouses.

Family Stress Theory and the ABC-X Model

Further discussion of the three notable study findings is helped by a reexamination of the theory used to guide the present study. The ABC-X model (Hill, 1949; Price et al., 2010) provided a comprehensive theoretical structure in which to examine the interactions between study variables. Although no previous literature has specifically tested this model for similar research questions, the tenets of Family Stress Theory within which the ABC-X model is situated align with research about military families in general. For example, change often exerts pressure on military family systems and may result in distress (MacDermid Wadsworth, 2010).

According to the ABC-X model as it was operationalized in the present study (see Figure 2 for a review), the extent to which stressful events (A) lead to post-deployment adjustment (X) is dependent on accessing concrete resources (B). First, the relationship between deployment cycle stressors (A) and post-deployment adjustment (X) was found to be supported, but only for certain types of stressors. Findings indicated that

deployment cycle stressors not directly experienced by the spouse herself, such as whether her husband was sent to a combat zone, did not significantly relate to her mental health or marital satisfaction. Her personal experience of the deployment, however, was related to her post-deployment adjustment. Although the ABC-X model describes stressor events across several dimensions, including whether the stressor is internal versus external or transitory versus chronic, the model does not predict which types of stressor events will be more or less related to distress (Price et al., 2010). Rather, the model posits that stressor events are not inherently crisis producing in and of themselves. It is through resource utilization (and perceptions of the stressor event, although not measured in the present study) that individuals and families respond and adapt.

Accessing concrete resources (B) in the ABC-X model had mixed success in the present study, depending on the post-deployment adjustment (X) factor used in the model and the type of (B) resource. Overall very few significant main effects or interactions for accessing information, social support, or counseling resources were found in the present study. It should be reiterated that the spouses in the current study reported very low levels of post-deployment adjustment distress, and the ABC-X model was designed to account for effects of stressors that are sufficient to induce family crisis. Overall, the spouses in the present study did not report post-deployment psychological or marital functioning that registered within the range of crisis. Furthermore, the ABC-X model conceptualizes each type of resource as functioning the same way within the model structure and does not guide predictions on why one type of resource may be more significantly related to certain adaptation versus crisis outcomes than other types. As discussed previously for the social support resources in particular, there may be a meaningful difference between

structured support activities that are formalized within military or civilian communities and informal social support relationships or global perceptions of support (Heubner, Mancini, Bowen, & Orthner, 2009).

For the (X) factor of mental health problems, all three pathways predicted by the model were found to have some support. Between stressors (A) and adjustment (X), certain characteristics of deployment cycle stressors were associated with higher levels of mental health problems. Between resources (B) and adjustment (X), accessing social support resources was associated with lower levels of mental health problems and accessing counseling resources was associated with higher levels of mental health problems (this finding was in the unexpected direction and was not predicted from the model). Finally, the assumption of the ABC-X model that resources are instrumental in alleviating the negative impacts of stressors on family outcomes (Blaisure et al., 2012), was also supported. Accessing information resources moderated the relationship between deployment challenges at home and post-deployment mental health such that mental health was improved through resource utilization and accessing counseling resources diminished the negative effects of deployment challenges at home on post-deployment mental health.

For the (X) factor of marital satisfaction, the pathways hypothesized within the ABC-X model did not receive as much support as for mental health problems. Only the pathway between certain characteristics of deployment cycle stressors (A) was found to be related to post-deployment marital satisfaction (X), and one post-hoc interaction was found to be significant (although it was obtained through analyses not previously indicated by the research question). Thus, study findings from both Aims B and C

suggest that the adjustment index of mental health problems is operating differently within the ABC-X model than the index of marital satisfaction.

It is important to note that the current study did not operationalize all components of the ABC-X model—namely, perceptions or subjective interpretations of the stressor event were not measured by the MFLP dataset. In a study examining military lifestyle stressors, spouses' perceptions of periodic separations were more important for determining their psychological well-being than were the actual number of separations experienced (Burell et al., 2006). Although the exclusion of (C) in the present analyses did not seem to diminish the model's usefulness for the mental health dependent variable, it is possible that accounting for spouses' perceptions of the deployment stressors might alter the current findings for marital satisfaction.

Research using the ABC-X model has found that females are more likely to perceive stressor events in terms of implications for their relationships than for their individuality (Price & McKenny, 2000). Spouses who experience deployment also experience important changes in their gendered identities within their marriages, through shifts in relationship roles as wives and potentially as mothers if the couple has children (Pincus et al., 2001). It is possible that measurement of this 'relationship-orientation' through female spouses' perceptions of the recent deployment would have been associated with the relational adjustment index of marital satisfaction, as the (B) resources were associated with the individual adjustment index of mental health problems. Spouses who perceive these changes during the deployment cycle as positive and or as opportunities for growth may also report higher marital satisfaction. The (C) perceptions are included in the model on 'equal footing' with (B) resources, suggesting

that they are equally important when testing family stress theory. In order to fully examine the hypothesized relationships within the ABC-X model for both individual and relational indices of post-deployment outcomes, research studies should be designed to operationalize all model components within study datasets.

One of the most important contributions to the family stress theoretical literature is the contribution by McCubbin and Patterson (1982) in developing the Double ABC-X model. Their refined Double ABC-X model explicitly accounts for the accumulation of stressors over time, a phenomenon often faced by military families. For example, in addition to testing the impact of an initial stressor (A), the 'Double A' refers to pileup of unresolved aspects of that initial stressor, changes experienced by family external to that stressor, and consequences of the family's initial efforts to cope (successfully or unsuccessfully) with that stressor. In the current study, an incomplete form of the ABC-X model (missing operationalization of (C) perceptions) was sufficient to identify significant relationships between deployment stressors, resource utilization, and post-deployment levels of mental health problems. However, the model as it was able to be used within the secondary dataset was not sufficient to identify significant relationships for post-deployment marital satisfaction.

The Double ABC-X model has been used to inform research on deployment's changes to the family system, specifically parental deployment and relationship conflict among military youth (Huebner et al., 2007). The authors found that the pile-up of stressors associated with all stages of the deployment cycle was related to adolescents' reports of changes in the family routines, roles and responsibilities of each family member, and attachment relationships. The accumulation of stress over time, and

measured explicitly through the Double ABC-X model, was an important link in that study's findings of relationship changes. In the context of the present study, it may be that the unmeasured accumulation of stressors or the unmeasured consequences of initial efforts to cope with those stressors are more important for the relational outcome of marital satisfaction than the individual outcome of mental health. Relationship dynamics between couples are complex, and spouses are impacted by deployment in myriad ways. Whereas the association between accessing resources and mental health symptoms may be more global and able to be identified with the original ABC-X model, the association between accessing resources and marital satisfaction may be more nuanced and might benefit from use of the Double ABC-X model to assess stressor pile-up and previous attempts to cope with marital changes. A different study design that collects data at different points in time on stressor experiences, resources and perceptions, and adjustment outcomes may be more nuanced in its ability to predict the effects of deployment cycle experiences on spouses' post-deployment adjustment through the utilization of military and civilian provided resources.

Finally, the present findings suggest that the type of (X) outcome is important to the effectiveness of the theory. The ABC-X model seemed to work better for an individual state like mental health than for a relational state like marital satisfaction, evidenced by the lack of significant findings hypothesized by the model for marital satisfaction. Perhaps marital satisfaction would be better placed in the model as a different component. For example, marital satisfaction could be reoperationalized within the model as a (B) resource, rather than an (X) adjustment outcome. Resources need not be only defined as eternal supports accessed by the family, but are also defined as

psychological traits, characteristics, and abilities of the family that can be used to meet

the demands of the stressor (Price & McKenny, 2000). Spouses who report high levels of

marital satisfaction, as the overwhelming majority of the present sample did, may feel

buffered from the negative effects of deployment on their mental health by the strength of

their marriage. Other theories, such as the Couple Adaptation to Traumatic Stress Model,

hypothesize that wives' perception of marital functioning is a mechanism through which

spouses develop symptoms in response to their husbands' trauma reactions (Nelson Goff

& Smith, 2005). Although mental health and marital satisfaction were not too strongly

correlated for use as separate dependent variables in the present study, other research has

demonstrated a link between low marital satisfaction and negative mental health

outcomes (Allen et al., 2010; Nelson Goff et al, 2007).

Overall, the partial ABC-X model used in the present study did not provide

sufficient nuance amongst its predicted relationships between deployment cycle stressors,

military and civilian resources utilization, and post-deployment adjustment. Additional

use of the ABC-X model should test for differences between and within subgroups of

military spouses, differences between 'external' and 'personal' types of stressor events,

perceptions of the stressor events, and differences between formal and informal social

support resources and the perceptions of those resources' effectiveness. The ABC-X

model could be enhanced through the use of the Double ABC-X model, which increases

the number of variables within the predicted model and includes the role of change over

time. Or perhaps other theories more specifically developed to theorize about relational

outcomes, such as the Couple Adaptation to Traumatic Stress model, are more

appropriate for testing the influence of deployment cycle stressors on marital satisfaction, as opposed to using the same model to predict psychological and marital well-being.

Study Limitations

Although the current study was strengthened by its use of a large sample of spouses that was largely representative of the greater population of military spouses, the study had several limitations.

First, the study design was cross-sectional rather than longitudinal. Longitudinal research is especially important for examination of deployment cycle experiences and outcomes because deployment is a process that occurs over time. The inclusion of time since most recent deployment as a control variable was made as an attempt to account for the influence of time, yet this variable was not found to be significant in either model of mental health or marital satisfaction. Additionally, inclusion of deployment characteristics from two stages (challenges at home during the deployment and post-deployment service member adjustment) as independent variables and the inclusion of resource utilization at any deployment stage were made as an attempt to capture the full deployment cycle experience over time. Still, all data were collected at one point in time during the post-deployment phase, so all variables of other stage experiences were assessed retrospectively. Longitudinal research would also be able to answer questions about causality and assess the time ordering of outcomes. For example, does poorer mental health lead spouses to seek more counseling resources or does accessing more types of counseling lead to higher endorsement of mental health symptoms? Are there particular periods during the deployment cycle when resource utilization makes the most difference, and are there different periods for psychological versus relational adjustment

outcomes? The cross-sectional nature of the present study was unable to address these types of important questions.

Another limitation of the current study was found in the secondary nature of the dataset. As previously discussed, the dataset did not include variables that could operationalize all components of the guiding ABC-X model. Namely, while the stressor (A) was operationalized as four characteristics of deployment cycle stressors, the accessed resources (B) were operationalized as three types of military and civilian resources, and the crisis (X) was operationalized as spouses' post-deployment mental health problems and marital satisfaction, the perception (C) of the model was not measured. The perception (C) of the ABC-X model includes the individual's or family's subjective assessments of the stressor (A) and is an important part of the theory. Subjective assessments of the stressor could range from a positive view that the deployment provides an opportunity for family growth to a negative view that it is overwhelming or too challenging. The MFLP dataset did not include questions that asked spouses to rate their perceptions of the most recent deployment or the meaning of the event in their lives. This missing dimension of the ABC-X model, and its implication in the process of adaptation to stressful circumstances, is an important limitation of the current study.

Furthermore, the secondary dataset was not able to account for other important contextual factors, such as the potential effect of motherhood on the relationships between deployment cycle experiences and post-deployment adjustment. As previously discussed, previous research has shown that the presence of more than one child at home is significantly associated with increases in stress and depression for partners of currently

deployed service members (Warner et al., 2009), and particularly for spouses who are pregnant (Haas, Pazdernik, & Olsen, 2005). Furthermore, spouses who have children that exhibit behavior problems due to deployment of their fathers are more likely to report deployment-related stressors than spouses whose children are not having difficulty adjusting (Allen et al., 2010). However, the present study was unable to examine the influence of motherhood on spouses' post-deployment adjustment. Due to MFLP coding for variables related to the presence of children in the home, it was impossible to determine which spouses skipped the questions on children and which spouses were childless. In addition, several of the at home deployment challenges were related to the presence of children in the military family (for example, problems with child care or managing child schedules). Childless spouses would not have reported these types of problems, due to the fact that they do not have children. This subgroup of non-endorsed stressors is confounded within the present study with responses from mothers who did not experience deployment challenges related to their children. With almost 40% of military service members married with children, there are over 1 million children living with a civilian mother and active duty father (DOD, 2011a). It is essential that future research address this limitation of the present study.

Additional study limitations pertain to response recall bias and sampling. Spouses in the present study answered questions about deployment cycle experiences that may have occurred as many as 24 months in the past. Thus, it is possible that the spouses' recall of deployment experiences was faulty due to misremembering or biases due to current experiences altering the memory of deployment. Because of self-selection into the Military Family Life Project, it is also possible that wives who had worse post-

deployment adjustment chose not to participate. The experiences of poor mental health and lower marital satisfaction may be related to a feeling of failure, or not wanting to answer questions about how poorly they are doing. Perceptions of stigma have been found to be especially salient for psychologically distressed spouses (Warner et al., 2009) and may have prevented those in great distress from answering the survey. Spouses' willingness to respond to the questionnaire may also have stemmed from its association to and dissemination from the DOD itself. Those satisfied with the level of support from the military may be more likely than those who blame the military for their current troubles to participate in a survey sponsored by the Pentagon. Of those who did choose to participate, responses may have been biased toward a favorable depiction of military life while answering questions posed by the military itself. Although the survey design and documentation assured participants of their confidentiality, some may have feared that their answers could be linked to their husbands' military record or potentially harm his career. The approximately 57% of the originally drawn sample who requested their name to be removed from the survey mailing list or who did not return a completed survey may have included individuals affected by stigma, or those experiencing the most distress. Thus, it is possible that a very important segment of military spouses—those who are struggling and not adjusting well to post-deployment—are not reflected in these data or their findings.

Another concern related to sampling is the absence of a comparison group of spouses. The research question of the present study was somewhat narrowly focused on the experiences of female wives of active duty service members deployed within the last two years. Thus, the current sample of spouses was not compared to a similar group that

had not recently experienced a deployment. Furthermore, an examination of differences between male spouses of female service members or of dual military couples was not possible due to dataset restrictions; only data on female spouses of male service members was provided for use in the current study. In addition, the experiences of female spouses of National Guard or Reserve service members that may also be different than those of female spouses of active duty service members were not able to be examined, due to the exclusive MFLP focus on active duty military families. All of these different types of military families deserve greater understanding of their unique experiences and comparison across types of families may highlight those with the most need for intervention.

Recognition of these limitations is important when considering the findings of this study, and they should be addressed when planning future research on the post-deployment adjustment of active duty military spouses.

Recommendations for Future Research, Policy, and Practice

The findings from the current study help to inform future empirical research, DOD and community policy, and the clinical practice of service providers. Future research should first seek to address to limitations of the present study, most importantly its cross-sectional design and sample of well-adjusted spouses. One recommendation would be to expand the measurement of psychological health beyond symptoms of anxiety and depression. For example, future research could expand measurement to include somatic complaints, difficulties sleeping, or overall feeling of stress, each of which have been found to be associated with post-deployment adjustment (Allen et al., 2011; Burton et al., 2009; Lewis et al., 2012). Furthermore, use of diagnostic assessments

for disorders such as posttraumatic stress, depression, or anxiety would allow for ease of comparison across multiple studies and samples. Likewise, the operationalization of relational health could be expanded beyond marital satisfaction to include measures of sexual intimacy, communication, caregiver burden, or level of conflict. These marriage characteristics have been found to be important indicators of other deployment-related outcomes (Baptist et al., 2011; Merolla, 2010; Renshaw et al., 2008). More research is also needed to further understand the role of deployment cycle stressors and military and civilian resource utilization on the post-deployment adjustment index of marital satisfaction, as study findings suggest that relational health may be impacted differently by these deployment cycle challenges and utilization of resources than other dimensions of spousal adjustment, such as mental health problems.

Another avenue for future research should be an examination of a similar research question for different individual and family characteristics of spouses of active duty service members, particularly the influence of motherhood. Although not a focus of the present study, findings suggest that several of the included control variables are significant factors in the models for mental health problems and marital satisfaction. Accounting for these individual and family characteristics is important, as each has been found to be related to deployment cycle adjustment outcomes among military families. Other factors not addressed in the present study have also been found to be important, such as whether or not the family lives on or off a military base (Sheppard et al., 2010) or how many times the family has moved to a new duty station (Burrell et al., 2006). Yet the present research did not focus on the specific ways in which different subgroups of spouses may differ in their post-deployment adjustment relationships with deployment

cycle stressors and resource utilization. In other words, certain groups of spouses may report greater levels of resource access (perhaps, for example, spouses who live on a military base compared to those who live off-base) or may report higher levels of deployment challenges at home (perhaps, for example, spouses with less education or those who are looking for work). Future research should examine differences within the larger group of civilian military spouses to determine if there are particularly vulnerable or particularly resilient subgroups of active duty service member wives, as well as investigate the differences among experiences of National Guard/Reserve spouses.

Future research should also focus on assessing resources not just on their utilization, but also on their demonstrated effectiveness to reduce or minimize the impacts of deployment related stressors on psychological and relational health. Different types of evaluations of resource effectiveness may be needed based on the type of resource itself. For example, counselors might administer to their clients pre- and post-therapy assessments that measure different aspects of psychological or relational health, such as marital quality, family coping strategies, or global perceptions of stress. These types of questionnaires would measure differences in certain indices of adjustment after participating in counseling that go beyond self-reported perceived helpfulness. Although informal social support encounters may be difficult to measure with the same pre- and post- model, spouses who participate in recreation activities or social events sponsored by the military or community groups could be asked to rate their sense of connectedness, resilience, and support. Spouses who access information resources may be asked to rate the extent to which the resource provided them with new information, whether the information was helpful and what they were seeking, and whether the resource was easy

to navigate. Measuring effectiveness of resources beyond utilization, in terms of demonstrated gains in relationship satisfaction, mental health, and resilience, health symptoms, relationship satisfaction, or a sense of resilience, is an important next step in understanding the impacts of resources on the relationships between deployment cycle stressors and post-deployment adjustment.

DOD and community policies may also be informed by findings from this study and future research. Policies are sets of rules or principles that guide decision-making and fiscal allocation. Recent DOD policies have begun to mandate a family-focused system of care (DOD, 2010b) and promote the resilience of the whole military family, not just the service member himself or herself (DOD, 2012). A recent White House report also clearly articulates the Presidential priority of improving the resilience of the military by improving the quality of life for military families (White House, 2011). Individual branches of the military are also increasingly updating existing policies on service members' health to include a focus on the health of their families, such as Army Regulation 600-63 that establishes the Army Health Promotion Program (Department of the Army, 2010). This program's mission to enhance the well-being of both service members and their families is supported by the current findings that deployment cycle experiences of both the service member and his spouse are related to military spouses' adjustment. Civilian communities may also establish policies that support military families, for example the many school boards who have enabled children of a recently deployed service member living in their county to attend school in the district of their deployment guardian, whether or not that guardian lives in the same district as the service member (see Wake County, North Carolina, 2008, for a representative example).

All of these current policies may be broadened by the current research findings, which indicate that spouses do better in terms of their post-deployment adjustment when their experiences of the deployment and its aftermath are shaped by utilizing military and civilian resources. Policies like the one that established the Army Health Promotion Program could be strengthened by specifically citing the benefits for spouses' mental health when they access more types of counseling resources in the face of at-home deployment challenges. They could also require that each branch of the military or DOD at-large continue to provide wide access to multiple types of counseling resources, both in terms of delivery modality (web-based and in person counseling) and treatment orientation (individual and couples therapy). Policies could also direct more funding to increase awareness of the many types of counseling currently available and increase their visibility both on military installations and among civilian community service agencies. Easier access to multiple types of counseling might increase the likelihood that spouses choose to utilize it, thereby buffering them from psychological distress from the challenges of deployment.

Another way that current policy could be enhanced by the present findings is that resource providers could be mandated by policies to monitor how many clients accessed services during a particular period. Monitoring resource access only in terms of number of individuals per week or per month maintains the confidentiality of resource users. For example, policies could stipulate that program continuation, in terms of future funding allocation from DOD or community-based sources, could be determined by utilization data. In this way, new policies at either the military or civilian community levels could help focus funding for those programs that are actually being utilized by military

families. Additionally, as mentioned in the recommendations for future research, resources should be evaluated not just for utilization but for effectiveness. While policies could mandate programs to administer standardized measures of effectiveness of services, evaluation research may be conducted either inside or outside the program or resource itself.

Providing resources to military spouses is an important charge of both military and civilian communities and standardized methods of evaluating services, their utilization, and their effectiveness, are critical to their success. In this era of shrinking budgets and increased funding competition for programs and services, those that can demonstrate high demand and a clear impact on the well-being of military families should receive the most support. The limited findings from the present study regarding the impacts of resource utilization demonstrate a clear need to increase the knowledge base of how these resources operate in terms of post-deployment adjustment and who is choosing to utilize them versus who is avoiding their access. There is still much to be learned about the role of military and civilian provided resources, and policy statements from DOD and civilian service-providing organizations are able to set clear agendas for their further investigation.

Findings from the present study demonstrate that some characteristics of deployment are stressful for military spouses and are related to increases in their mental health problems and decreases in their marital satisfaction. Although military and civilian programs and services cannot directly affect how many times a service member is deployed or whether it is to a combat zone, when utilized resources are likely to be able to intervene around the problems experienced at home during deployment and during the

adjustment period of return. Findings from the current study are good news for resource

providers, as accessing some types of resources was found to improve post-deployment

adjustment, particularly in terms of mental health. When considered with prior research

that finds clear links between the health of spouses and the health of service members

(Carter et al., 2011; Knobloch & Theiss, 2011), it is critical that future DOD policy

continue to focus attention on the whole military family.

For example, DOD policy could mandate inclusion of the "Total Force Fitness"

model, which includes a focus on relational and social health, into programming and

services provided by the military or by civilian organizations that receive public monies.

Current study findings suggest that spouses' personal experiences of the deployment,

such as the challenges faced at home, are more important for her post-deployment mental

health than the characteristics of deployment that are not directly experienced, such as

whether the most recent deployment was to a combat zone. These findings have

important implications for DOD policy because they suggest a focusing of resource

provision on the specific characteristics of deployment that make a difference for

spouses.

The clinical practices of service providers and program administrators may also

be informed by the current research. Again, the present study found that accessing more

types of counseling resources buffered spouses from the negative effects of high levels of

at-home deployment challenges on post-deployment mental heath. Main goals of

counseling for military spouses during a deployment cycle may be to provide a safe and

confidential place to process deployment-related changes, teach stress-management

techniques and communication skills, and to normalize challenges faced during

deployment to reduce stigma. Further, the more exposure a spouse has to counseling though different delivery modalities (e.g., web-based, in person, or with a faith-based provider), the more her mental health is protected from the stressors of deployment.

In addition to these clinical interventions, clinicians can help clients to focus on the aspects of deployment that have been found in the present study to be related to their post-deployment health. For example, problem-solving the challenges faced by a spouse during the deployment may be more effective at reducing her mental health problems than focusing on how many times she has experienced deployment before. Supporting her when her husband experiences many post-deployment adjustment problems should also be a focus of counseling sessions, particularly since it is when the service member is experiencing high levels of adjustment problems that social support no longer weakens the relationship between deployment cycle stressors and marital satisfaction. Increasing spouses' sense of support, confidence, and personal control in the face of these types of deployment characteristics are clearly an important addition to counseling practice, especially since social support resources lose their effectiveness at reducing distress at high levels of reintegration problems experienced by service member husbands.

Perhaps most importantly, the current findings provide some evidence that accessing resources, especially in the face of deployment cycle challenges, makes a difference for spouses' post-deployment adjustment. Mental health professionals, community providers, and military leadership should be strongly encouraged to promote all three types of resource utilization, which were found in the current study to be related either independently or within an interaction to post-deployment mental health. Current public-service campaigns are mostly focused on the help-seeking of service members

themselves, such as the *Real Warriors Campaign* (2013) slogan of "Real warriors. Real battles. Real strength. Reaching out makes a real difference." These posters feature photographs of service members in combat situations, struggling with mental health problems, and connecting positively with other service members. Although campaigns such as this one do acknowledge the health and well-being of family members as well as service members, their posters and social media images should be broadened to explicitly target military spouses as wives, mothers, caregivers, and women who also deserve help and support. Resources that provide information, such as websites or flyers, can promote the notion that how things are going at home for a spouse is important for her post-deployment adjustment. Thus, expanding the visibility of the benefits from accessing these resources is important and the new marketing message is clear: resource utilization throughout the deployment cycle helps military spouses adjust during the post-deployment phase.

Conclusion

In conclusion, the research described in this study provides preliminary insight into the complex relationships between deployment cycle stressors, civilian and military resource utilization, and post-deployment adjustment for spouses of active duty service members. Study findings suggest that a spouse's at-home experience of the deployment and reports of her husband's post-deployment adjustment are associated with her mental health and marital satisfaction. When a spouse has a difficult at-home experience of the deployment marked by many problems, she experiences better mental health when she accesses more types of information or counseling resources than when she does not access these types of resources. Post-hoc analyses suggest that accessing social support

resources when her husband is not experiencing high levels of post-deployment adjustment problems is related to greater marital satisfaction, although when he experiences very poor post-deployment adjustment accessing social support no longer makes a difference.

Empirical research should seek to employ longitudinal methods that go beyond associations, and should continue to focus on the potentially different determinants of unique adjustment outcomes. Future research should also fully examine the components of the ABC-X model as they relate to the relationships between deployment cycle stressors and military family outcomes. Findings from this study and future research may help to inform DOD and community policy, for example by expanding current mandates to promote family-focused care and support the resilience of the whole military family. Clinicians and program administrators may enhance their practice by helping clients focus on the aspects of deployment over which they have some personal control, and resource-providing services would be strengthened by deeper investigation of the types of resources available to military families and the effectiveness of those resources in preventing or mitigating deployment-related distress. An ultimate goal of our nation should be to support and strengthen the families of our military service members—a better understanding their deployment cycle experiences will aid researchers and practitioners in developing more timely, targeted resources and services that promote healthy, resilient adjustment.

APPENDIX A

Table 10.

Significant findings from originally hypothesized aims

Research Question	
Does accessing civilian and/or military resources moderate the relationship between deployment cycle stressors and spouse post-deployment adjustment?	
Research Aims	Hypotheses
A: Determine the main effects of deployment cycle stressors on spouse post-deployment adjustment, specifically mental health problems and marital satisfaction.	1) Spouses who report higher levels of deployment cycle stressors will report higher levels of mental health problems than spouses who experience lower levels of deployment cycle stressors. **Partially supported.** 　　1c) Spouses who report higher levels of deployment challenges experienced at home will report higher levels of mental health problems. **Predicted direction.** 　　1d) Spouses who report higher levels of service members' post-deployment adjustment problems will report higher levels of mental health problems. **Predicted direction.** 2) Spouses who report higher levels of deployment cycle stressors will report lower marital satisfaction than spouses who experience lower levels of deployment cycle stressors. **Partially supported.** 　　2c) Spouses who report higher levels of deployment challenges experienced at home will report lower marital satisfaction. **Predicted direction.** 　　2d) Spouses who report higher levels of service members' post-deployment adjustment problems will report lower marital satisfaction. **Predicted direction.**
B: Determine the main effects of use of military and civilian resources on spouse post-deployment adjustment, specifically mental health problems and marital satisfaction.	3) Spouses who access more types of military and civilian resources will report lower levels of mental health problems than spouses access fewer resources. **Partially supported.** 　　3b) Spouses who access more types of social support resources will report lower levels of mental health problems. **Predicted direction.**

	3c) Spouses who access more types of counseling resources will report lower levels of mental health problems. **Opposite direction than predicted.**
C: Determine the moderating effects of use of military and civilian resources on the relationships between deployment cycle stressors and spouse post-deployment adjustment, specifically mental health problems and marital satisfaction.	5) Higher reported use of military and civilian resources will weaken the relationship between deployment cycle stressors and spouse mental health problems. **Partially supported.** 5g) Higher reported use of social support resources will weaken the relationship between number of deployment challenges experienced at home and spouse mental health problems. **Predicted direction.** 5i) Higher reported use of counseling resources will weaken the relationship between number of deployment challenges experienced at home and spouse mental health problems. **Opposite direction than predicted.**

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