



# VCU

Virginia Commonwealth University  
**VCU Scholars Compass**

---

Theses and Dissertations

Graduate School

---

2010

## The Impact of Deployment and Psychological Well-Being on Family Relationships: A Secondary Analysis of Air Force Community Assessment Data

Keita Franklin  
*Virginia Commonwealth University*

Follow this and additional works at: <https://scholarscompass.vcu.edu/etd>



Part of the [Social Work Commons](#)

© The Author

---

Downloaded from

<https://scholarscompass.vcu.edu/etd/2316>

This Dissertation is brought to you for free and open access by the Graduate School at VCU Scholars Compass. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of VCU Scholars Compass. For more information, please contact [libcompass@vcu.edu](mailto:libcompass@vcu.edu).

The Impact of Deployment and Psychological Well-Being on Family Relationships: A  
Secondary Analysis of Air Force Community Assessment Data

A dissertation submitted in partial fulfillment of the requirements for the degree of PhD at  
Virginia Commonwealth University.

by

Keita Franklin

PhD, Virginia Commonwealth University, Richmond, VA 2010

MSW, University of Maryland, Baltimore, MD 2000

BA, Psychology, Elms College, Chicopee, MA 1994

Dissertation Chair: Holly Matto, PhD Associate Professor,  
School of Social Work

Virginia Commonwealth University  
Richmond, Virginia  
November 2010

## Table of Contents

List of Tables .....	vi
List of Figures .....	viii
Abstract .....	x
Chapter 1. Introduction .....	1
Statement of the Problem.....	1
History and Culture.....	5
Deployment Tempo (OPSTEMPO) .....	8
Uniqueness of the Current War Effort .....	9
Rationale for the Present Study.....	12
Risk and Protective Factors .....	14
Chapter 2. Literature Review .....	20
Air Force Mission and Propensity for Deployment .....	21
Air Force Population.....	24
Deployment Stressors .....	26
Predeployment .....	28
Deployment.....	28
Reintegration and Reunion .....	31
Combat Stress .....	34
Deployment Impact on the Military Family .....	40
Deployment Impact on Spouses and Marital Relationships .....	43

Military Children .....	46
Theory .....	48
Chapter 3. Methodology .....	55
Secondary Data .....	55
AFCA Dataset .....	58
Methods .....	59
Sampling procedures.....	59
Data preparation.....	60
AFCA Survey .....	62
Demographic variables .....	62
Posttraumatic stress symptoms .....	63
Deployment related questions.....	63
Depressive symptoms .....	64
Family relationships.....	64
Social support .....	65
Proposed Analysis Procedures.....	66
Hypotheses.....	67
Hypothesis 1 .....	67
Hypothesis 2. ....	68
Hypothesis 3. ....	68
Hypothesis 4. ....	69
Conclusion .....	70
Chapter 4. Results .....	72
Descriptive Demographic Analysis .....	73
Prescreening and Data Assumptions.....	75

Hypothesis 1 .....	79
Regression 1.....	81
Regression 2.....	83
Hypothesis 2 .....	84
Regression 1.....	84
Regression 2.....	87
Hypothesis 3 .....	88
Regression 1.....	88
Regression 2.....	91
Regression 3.....	93
Hypothesis 4 .....	96
Mediation 1.....	97
Mediation 2.....	101
Mediation 3.....	101
Mediation 4.....	104
Mediation 5.....	105
Mediation 6.....	108
Mediation 7.....	109
Mediation 8.....	10912
Conclusion .....	114
Chapter 5.....	116
Introduction.....	116
Study Goals and Objectives.....	117
Review of Study Findings.....	118
Study Limitations.....	121

Implications for Policy.....	123
Implications for Social Work Practice .....	125
Implications for Current and Future Research.....	127
Implications for the Social Work Profession .....	128
Conclusion .....	130
References.....	132
Appendix.....	149

## List of Tables

Table	Page
1. Service Branch Comparision .....	37
2. Numbers and Percentages of Airmen Within Each Category .....	76
3. Additional Descriptive Statistics.....	77
4. Cronbach's Alpha of Each Measure .....	79
5. Pearson Correlations for variables Examined in Hypothesis 1 .....	82
6. Results of Regression 1 for Hypothesis 1 .....	83
7. Results of Regression 2 for Hypothesis 1 .....	84
8. Pearson Correlations for Variables Examined in Hypothesis 2 .....	86
9. Results of Regression 1 for Hypothesis 2 .....	88
10. Results of Regression 2 for Hypothesis 2 .....	89
11. Pearson Correlations for Variables Examined in Hypothesis 3 .....	90
12. Results of Regression 1 for Hypothesis 3 .....	91
13. Results of Regression 2 for Hypothesis 3 .....	93
14. Results of Regression 3 for Hypothesis 3 .....	94
15. Results of Regression 4 for Hypothesis 3 .....	95
16. Results of Mediations 1 and 2.....	99
17. Results of Mediations 3 and 4.....	103
18. Results of Mediations 5 and 6.....	107

	vii
19. Results of Mediations 7 and 8.....	111



## List of Figures

Figure	Page
1. Cycle of development. ....	27
2. Continuum approach to posttraumatic stress symptomology. ....	38
3. Conceptual model. ....	49
4. Bio-Psychosocial Theory. ....	50
5. Correlations between the variables examined in Mediation 1. ....	100
6. Correlations between the variables examined in Mediation 2. ....	102
7. Correlations between the variables examined in Mediation 3. ....	105
8. Correlations between the variables examined in Mediation 4. ....	106
9. Correlations between the variables examined in Mediation 5. ....	108
10. Correlations between the variables examined in Mediation 6. ....	109
11. Correlations between the variables examined in Mediation 7. ....	112
12. Correlations between the variables examined in Mediation 8. ....	113
13. Hypothesis 1, regression 1. ....	150
14. Hypothesis 1, regression 2. ....	151
15. Hypothesis 2, regression 1. ....	152
16. Hypothesis 2, regression 2. ....	153
17. Hypothesis 3, regression 1. ....	154
18. Hypothesis 3, regression 2. ....	155
19. Hypothesis 3, regression 3. ....	156

20.	Hypothesis 3, regression 4. ....	157
21.	Hypothesis 4, regression 1. ....	158
22.	Hypothesis 4, regression 2. ....	159
23.	Hypothesis 4, regression 3. ....	160
24.	Hypothesis 4, regression 4. ....	161
25.	Hypothesis 4, regression 5. ....	162
26.	Hypothesis 4, regression 6. ....	163
27.	Hypothesis 4, regression 7. ....	164
28.	Hypothesis 4, regression 8. ....	165

## **Abstract**

### **THE IMPACT OF DEPLOYMENT AND PSYCHOLOGICAL WELL-BEING ON FAMILY RELATIONSHIPS: A SECONDARY ANALYSIS OF AIR FORCE COMMUNITY ASSESSMENT DATA**

By Keita Franklin

A dissertation submitted in partial fulfillment of the requirements for the degree of PhD at Virginia Commonwealth University.

Virginia Commonwealth University, 2010

Dissertation Chair, Holly, Matto, PhD Associate Professor, School of Social Work

Airmen serving in the U.S. Air Force have made significant contributions to the overall war efforts in Afghanistan and Iraq. Deployment, combat exposure, and subsequent combat-related mental health issues can have effects that extended beyond the airmen to the family. The primary aim of this study was to determine the path through which such effects occur within the context of risk and protective factors. The risk factors identified in this study were: deployment length and frequency and psychological symptomology. The construct of social support was also examined as an identified protective factor. This study examined the relationships between all of these variables using regression, moderation and mediation. Method: Secondary data were obtained from the Air Force Community Assessment, a large-scale, anonymous survey fielded in the spring of 2008 from a stratified random sample of active duty airmen. Results: Long and repeated deployments slightly increased the likelihood of the presence of both posttraumatic and

depressive symptoms (.6% of variance explained in the variable deployment length and .5% in variable deployment frequency,  $p < .001$ ). Furthermore, as psychological symptoms increase, there is a decrease in the quality of family relationships (7.2% of the variance explained in variable spousal relationships and 9.7% of the variance explained in the variable parent-child relationships, both statistically significant at  $p < .001$ ). Social support was found to have a slightly moderating effect on the relationship between the deployment factors and both spousal and parent-child relationships (2.3% of the variance explained in both spousal and parent-child relationships, statistically significant at  $p < .001$ ). Finally, this study examined the roll of psychological symptomology as a mediator between the variables deployment length/frequency and family relationships (spousal and parent-child). Findings demonstrate the strongest support for psychological symptomology (posttraumatic stress and depressive) as a mediator for the relationship between deployment length and spousal relationships. Findings were less conclusive and did not point toward mediation, for the relationship between deployment frequency and spousal relationships mediated by either type of psychological symptomology; i.e. posttraumatic stress or depressive. In addition, psychological symptomology did not mediate the relationship between both deployment length and frequency and parent-child relationships. This is, in part, a notable finding because “deployment frequency” has been a significant hallmark of the OIF and OEF conflicts; much emphasis has been placed on both deployment length and deployment frequency in the context of the current OIF and OEF war efforts. The current data demonstrate more implications for deployment length compared to frequency when predicting outcomes related to family relationships.



## **Chapter 1. Introduction**

### **Statement of the Problem**

America's military forces have been in a constant state of war since the terrorist attacks associated with 9/11. Servicemen and women have deployed to and redeployed from combat zones in Afghanistan and Iraq, leaving and then returning to families and children often, with little time in between tours of duty to reintegrate with families and communities effectively (Morris & Age, 2009). The current conflicts in Iraq and Afghanistan have taken a toll on service members and the military community as a whole. To date, (November, 2009) the war effort associated with Operation Iraqi Freedom (OIF) has resulted in 4320 hostile-related deaths and 31,430 physical wounds. Operation Enduring Freedom (OEF), initially a smaller war involving fewer forces, has resulted in 759 hostile-related deaths and 3,442 physically wounded service members (Department of Defense, 2009). Beyond physical wounds, many of America's service members have returned from combat with psychological and social struggles as well. Mental-health issues (e.g., depression, anxiety, posttraumatic stress disorder) substance abuse issues, and increased rates of suicide are all greater than they were before the OIF/OEF conflicts.

A study that aimed to examine the mental health prevalence rates after return from deployment found that 19.1% of Army soldiers returning from OIF had a mental health problem (Hoge, Auchterlonie, & Milliken, 2006). A close approximation of this figure is consistently found in the literature, as a RAND study cited 18% of those that return from deployment have

symptoms of either PTSD or depression (Tanielian & Jaycox, 2008). The incidents of suicide across all service branches have also increased to alarming rates since beginning of OIF, OEF conflicts, higher than the national civilian average (11 per hundred thousand). Comparatively, the Army and the Marines have suffered the highest increases in suicides, compared to the other service branches, yet the rates across the Air Force and Navy are also of concern.

In the Army, in 2008, the rate of suicide was higher than it has been in the last 27 years and the Army community has seen consistent increases in the rates of suicide since 2004 (Williamson & Mulhall, 2009). There were 140 completed suicides in the Army during 2008, a rate of 20.2 per 100,000 soldiers. In that same year, there were 38 suicides in the Air Force, a rate of 11.5 per 100,000 airmen (“Suicide Rates Remain High,” 2009). The military service branches have also seen an increase in the propensity to abuse alcohol, with rates as high as 12% showing up on officially post deployment health assessment forms (Milliken, Auchterlonie, & Hoge, 2007). Within the Air Force and specific to the junior enlisted ranks, E1–E4 (18–25 years) this figure has recently dropped from 20.4% in 2006 to 13.8% in 2008, still higher than the overall average across all services and all age demographics (Spera, Franklin, Uekawa, Szoc, & Kunz, Thomas, Cambridge, 2010).

Behavioral health related concerns such as those discussed above, have implications across family systems. The issues facing today’s military service members and their families after deployment have become so complex that in 2007 President Bush appointed a commission (referred to as the Dole–Shalala Commission) to help identify the issues and develop recommendations for improving care to this population. An interesting finding that surfaced as a result of this commission, is that while many service members were returning with mental health

diagnosis (similar to that found in the RAND report) there were also large numbers of returnees reporting lower level or ‘symptoms’ of mental health to a health care provider, 56% of the active duty population (Dole & Shalala, 2007). In some cases, these symptoms, not full diagnostic criteria (e.g. sleeplessness, chronic fatigue, anxiety) can be as troublesome as the full diagnosis.

Interpersonal struggles within marriages and between service members and their children are also an issue for veterans returning from combat. In some cases, these issues stem from the aforementioned mental health problems. For example, it has been reported that service members that return with depression or PTSD are “5 times more likely to have a problem with family re-adjustment” compared to veterans without these struggles. (Sayers, Farrow, Ross, & Oslin, 2009, p. 2). According to the Iraq and Afghanistan Veterans for America, an Advocacy Agency in Washington DC, the annual divorce rate for female marines, 9.2% is almost three times the national average (Williamson & Mulhall, 2009). Clearly, rearing children in this environment has implications for both the child and the parent-child relationship. Sayers et al. reported a correlation between parental combat related PTSD and children acting “afraid or not acting warm” toward their service member parent (RR = 5.5, 95% CI = 1.5 to 18.9; Sayers et al., 2009, p. 5).

In a broad sense, the difficulties facing today’s combat returnees are largely structured around reintegration (a term used in the military to describe the task of “reuniting” with family and community, after a period of separation resulting from a deployment) and the extent of combat-related posttraumatic stress symptomology. Day-to-day operations in combat zones in both Iraq and Afghanistan have been described as an “incubator for posttraumatic stress disorder” (Greenburg & Roy, 2007, p. 888). One critical reason cited for this situation is that, in



both the Iraq and Afghanistan conflicts, there is not a delineated “front line” or “safe zone” for war fighters. Additionally, U.S. forces have had the unique situation of having fluctuating missions during the same deployment. Consequently, on some days, a service member may be performing front line “battle” duties (combat), and other days, that same service member may be tasked with peacekeeping or relationship-building duties (stability operations).

This dynamic, constantly shifting war environment makes it difficult to distinguish enemy from civilian noncombatant and creates role ambiguity that undoubtedly causes additional stress for service members, both in the deployed zone and within the context of the family after their return from the deployment. This shifting role between combatant and peacekeeper also produces stressors on service members and their families who are not as extensively experienced as those in prior wars (Hogue, 2008). Furthermore, maintaining a heightened operations tempo over such a long duration also creates stressors for service members and their families. While research related to the well-being of war returnees and their families continues to emerge, the full range of consequences related to family well-being that arise from maintaining a constant state of war will likely not be revealed until many years after the war has ended. Important constructs impact this area of study. Concepts such as military history and culture, (Segal & Wechsler-Segal, 2005) the uniqueness of the current wars (Manske, 2006; Tanielian & Jaycox, 2008), and the propensity for the development (and degree) of combat-related posttraumatic stress, as well as key risk and protective factors, add to the knowledge related to how the current war efforts affect personal and family well-being (Franklin, 2009).

Long term separations resulting from serving in combat zones can often be traumatic for service members and their families (Franklin, 2009). Consequently, this population group is at

particular risk for experiencing sub-clinical-threshold posttraumatic stress symptomology or, in worse cases, full-blown combat-related posttraumatic stress disorder (Smith et al., 2009; Stoltzfoos, 2008). Although prevalence rates fluctuate, 12–25% of those who have deployed to OIF/OEF return from combat with any number of mental-health problems (Tanielian & Jaycox, 2008), some studies cite the actual prevalence rates for PTSD as being 5–10% (National Center for PTSD, 2009) while others report rates as high as 17% (Hoge et al., 2004). One reason for the variance with regard to prevalence rates is the notion that some studies report clinical confirmed cases of PTSD, while others report estimates derived from survey data. Another important confounding factor has to do with stigma. As research related to the stigma attached to receiving mental-health care in the military setting emerges, it becomes clear that determining true prevalence, particularly for posttraumatic stress disorder, will be difficult to ascertain.

## **History and Culture**

The military as an institution of professionals is a relatively new concept. Throughout U.S. history, citizens were typically conscripted into service during times of war. After the war, the military was downsized to pre-war levels or lower. Most draftees during war times did not see themselves as “military professionals,” but rather patriots serving their nation during a time of war. However, downsizing following the Vietnam war left the military as a “hollow force” and policy makers decided, in the 1970s, to establish an all volunteer, professional military force (*Hearings Before the House*, 1998). With this new vision came the investment in professional education for service members and, eventually, an infrastructure of support for family members. Concepts such as “quality of life,” “retention rates,” and “family readiness” all became embedded in the American military culture as military leaders recognized the important role of

the family in meeting the mission, particularly during times of war (Segal & Wechsler-Segal, 2005).

With regard to “retention rates,” according to one scholar, after the draft ended in 1973, “the need to keep older, mostly married troops happy enough to re-enlist meant that military wives became too numerous and too vocal to ignore” (Freedberg, 2005, p. 1). Today, across all service branches, more than half of personnel are married and 40 percent have children (Freedberg, 2005). During 1968, at the height of the Vietnam war, fewer of the active duty force were married service members. Consequently, the notion of caring for or considering the impact of war on military families was less of a focus for military leaders. More recently, the Army even adopted a motto, “recruit a soldier, retain a family” (Pete Geren, *Secretary of the Army Statement*, 2007), which highlights the changing and important role of the military family. The Air Force has also focused on the link between retention and quality of life for families through the regularly scheduled Community Assessment surveys provided to spouses that aim to keep a pulse on the issues impacting families. The Navy has also researched this issue and determined “if a military member’s spouse is not happy with the military lifestyle, then that member may be more likely to leave the military” (Zellman, Gates, Moini, & Suttorp, 2009). Across all service branches, constructs such as military ‘readiness’ and organizational commitment are consistently linked with perceived policy support for families, primarily implemented through family friendly work practices.

A recent RAND study titled *Working Around the Military: Challenges to Military Spouse Employment and Education*, conducted in 2007, has highlighted the link between spousal employment and military retention, when spouses are able to find meaningful employment, there

is an increase in the quality of life for military families thus impacting retention. (Harrell, Lim, Castaneda, & Golinelli, 2007). Specific to the Air Force, CMsgt Roy, the Chief Master Sergeant of the Air Force, at a recent hearing to the House Armed Service Subcommittee on Military Personnel titled “The Oversight of Family Support Programs,” appropriately describes the Air Force support to families and the link between family wellness and retention,

Airmen make a decision to remain on duty based on many factors, one of which is the quality of support they and their families receive. This underscores the fact that caring for families has a direct impact on mission readiness. When we take care of Air Force families, Airmen are freer from distractions and better able to focus on the mission.

*(Department of the Air Force, 2009)*

The devotion of resources to develop studies on such topics as the link between military families and recruitment or retention rates shows that military leaders across all service branches have a keen understanding of the implications of home-front problems on military readiness.

Today’s military professionals share a common ethos of personal sacrifice, which is codified in the individual service branches as “Service Before Self.” During times of war and specifically the current OIF/OEF conflicts, persisting in this personal sacrifice can become particularly difficult, not only for the service members but for the families that serve as well. Therefore, important questions emerge; how does maintaining this sacrifice impact the stress level of service members and their families serving in today’s political climate; how does the associated stress accompanied with the “profession of arms” impact the basic structure of the family unit? For example, ability to function, cope, solve problems, work together as a unit and more broadly the relationships that exist within the context of the family.

## **Deployment Tempo (OPSTEMPO)**

Across all components, active and reserve, a major source of stress for today's military population is the high deployment tempo associated with the OIF/OEF conflicts. Over 1.8 million service members have maintained a high level of operations tempo in both Iraq and Afghanistan since the conflicts began (Tanielian & Jaycox, 2008). Although the numbers continually fluctuate, in 2009 it was generally reported that over one-third of those have served multiple deployments. During a snap shot in time, in the Army alone, 200,000 active-duty soldiers have withstood multiple deployments, symbolizing the current repeat nature of the Iraq and Afghanistan deployments (*Secretary of the Army Statement*, 2007). Due to constant shift in military personnel (e.g., retirements, separations from the service), capturing accurate figures related to phenomenon of prevalence of repeat deployments is a difficult task. Since 2002, the average length of combat deployment has varied across all four service branches. Fluctuations between 6 and 18 months are common (Forman, 2007). Policy makers in each of the military services have closely monitored the amount of time that service members spend away from their families in combat in an attempt to strike a balance between the demand and the resource requirements while preserving the unity of the family as much as possible. For example, the Marine Corps has aimed to limit the length of deployment to 8 months (Basham, 2007). Army deployments have extended as long as 18 months (Forman, 2007). Typically, Air Force deployments have ranged between 4 and 6 months, depending on the career field (Forman, 2007). Complicating matters related to the length of deployment across all service branches is the expected length of deployment (time planned in the combat zone, away from the family) and the actual length of deployment (actual time served in a deployed environment). Some combat

tours are extended, and the uncertainties associated with today's political climate result in extensions and unpredictable deployments for service members and their families.

Although length of deployment is an important issue, the frequency with which service members have deployed as part of the OIF/OEF contingencies is also of concern. Multiple deployments with little time in between can result in increased fatigue, anxiety and stress for the service member and the family. According to the National Military Family Association (<http://www.militaryfamily.org/>), some service members and their families report that they did not have adequate time in between deployment to effectively reintegrate. Research has pointed toward a correlation between repeat deployments and increased rates of mental health problems (Mental Health Advisory Team V, 2008). Determining just how often, or how many times a service member has deployed since the onset of the OIF/OEF contingencies is difficult to establish, as the military population is a transient one and many factors go into understanding the nature of each deployment. Much of the research that details the true frequency of deployment across all service branches and the impact of back-to-back tours is still emerging.

### **Uniqueness of the Current War Effort**

Demographically, during the height of the war the average age of an active-duty member serving in the Iraq and Afghanistan conflicts is 27 years (reserve and active components combined). Sixty percent of those who have deployed are married, and over 50% have children. During a snapshot in time, in 2007, 700,000 children had a parent deployed as part of the Iraq or Afghanistan conflicts (Veterans for America, 2009). There are more than 1.2 million military children with parents serving on active duty in the United States (Department of Defense Task Force on Mental Health, 2007). This figure does not include the countless other National Guard

and Reserve families who often live in dispersed locations around the U.S. and are demographically older than their active-duty counterparts and are often married with children. Women comprise 12% of those who have deployed. Comparatively, since the OIF, OEF contingencies began, 160,000 female service members have deployed, compared to 41,000 during Gulf War effort (Corbett, 2007). The high rate of women deploying and working in direct-combat zones is a hallmark distinction that sets the Iraq and Afghanistan conflicts apart from prior wars in history (Himmelfarb, Yaeger, & Mintz, 2006). Since the draft ended in 1973, the overall rates of women serving in the military has increased from 2% to 15% (Franklin, 2009).

When compared to other wars in our nation's history, there are many other characteristics that set the OIF/OEF conflicts apart. First, due to the emergency life saving knowledge and skills of military medics and front line service members the quality and evacuation speed of modern-day battlefield medical care and the associated advances in medical technology, service men and women are returning from combat and surviving with traumatic injuries that might have resulted in death during previous wars (Tanielian & Jaycox, 2008). This unique characteristic, although highly desirable, results in an increase in the rates of survival from traumatic injuries and subsequent family-level struggles in caring for the long-term physical and emotional needs of these combat veterans. OIF/OEF conflicts are also distinct in the length of "on-the-ground" war fighting. Already having lasted longer than World War II, the current conflicts have just exceeded 8 years of combat, without a solid plan for an end in sight. The length of combat operations coupled with the current size of the U.S. military has led to an increase in the overall length of deployment tours and the requirement for repeat deployments often with very little

“dwell-time” between deployments. These distinctive characteristics of OIF/OEF, taken together, provide insight into the complex experiences and the many challenges confronting service members and their families.

Broad studies from the Vietnam era have examined the long-term physical and emotional impact of war for returnees and their families (Beckham, Lytle, & Feldman, 1996; Caselli & Motta, 1995; MacDonald, Chamberlain, Long, & Flett, 1999; Riggs, Byrne, Weathers, & Litz, 1998; Ruscio, Weathers, King, & King, 2002; Samper, Taft, King, & King, 2004). Where as the Vietnam War was clearly different from the conflicts of today, an important issue emerges related to the needs of veterans and how to appropriately help families reintegrate after separations. Indeed, such experiences have spill-over effects for the entire family system (Jordan et al., 1992).

A review of the literature related to the impact of the deployment (a clear stressor) on the family produces a wealth of information. Most research in this area until recently has been retrospective studies conducted with Vietnam era veterans. These studies, coupled with early OIF/OEF studies, as well as international work in this area, point toward problems with interpersonal relationships, relationship satisfaction, spouses’ ability to cope during deployment, and behavioral and mental health problems in children, as well as an overall diminished quality of parent-child relationships (Beckham et al., 1996; Caselli & Motta, 1995; King & King, 2002; Lamberg, 2004; MacDonald et al., 1999; Riggs et al., 1998; Ruscio et al., 2002; Samper et al., 2004; Spera, 2009). More recent studies compiled as part of a Department of Defense task force charged with examining the mental health needs of military families highlight a number of issues, including caregiver burden (stressors on military spouses), reintegration stress, and



children's reactions to war (Rosen, 1993; Sayers et al., 2009; Seal, Bertenthal, Miner, Sen, & Marmar, 2007; Sherman, et al. 2008).

### **Rationale for the Present Study**

Although all the military branches of service have worked together in the Iraq and Afghanistan conflicts, the U.S. Air Force has a unique and distinctive role among the U.S. armed forces. The current study proposes to examine the Air Force population through a secondary data set made available by the Headquarters, United States Air Force, Family Advocacy Program. This data set provides an opportunity to examine the unique role of the Air Force in the current OIF/OEF conflicts. The mission of the US Air Force is to “deliver sovereign options for the defense of the United States of American and its global interests—to fly and fight in the Air, Space and Cyberspace” (*Air Force Press Release*, 2009). As compared to the land components of the U.S. armed forces (i.e., U.S. Army and Marine Corps), the U.S. Air Force relies more on “stand-off” attack (air-delivered munitions) capabilities as opposed to “direct” attack (assault forces) capabilities to accomplish its mission. However, because the Air Force shares the same battle space as the Army and the Marines in the current conflicts, the stressors associated with combat operations, whether air or ground, are similar.

Additionally, advances in battlefield technology, a hallmark distinction of the current war effort has placed airmen in ‘virtual’ war environments that are also extremely stressful. One example, Airmen assigned to the 214th Reconnaissance Group, located in Tucson Arizona work with computer systems and satellite’s that control unmanned military aircraft, to monitor, target and kill enemies in Iraq and Afghanistan. Scholarly research on this subject has yet to emerge, therefore it may be soon to truly understand the totality of the impact of launching a virtual

attack from the safety of a U.S. Air Force Base. Thus far, print media such as the Air Force Times and CNN News Briefs, have tried to highlight the unique stressors attached to working in a virtual war zone. Typical stressors associated with long work shifts are coupled with more complex stressors associated with tracking an enemy, dropping a bomb, watching the impact of that bomb, and then on the same day, leaving and joining the physical world of family and community (“Ghosts in the Machine,” 2008; “Remote Warfare,” 2009). Indeed, airmen that provide support or pilot an unmanned military aircraft are engaged in a unique occupation that is changing our understanding of battle space.

Consistently, both air and ground units deployed to Iraq are subjected to explosive devices. Like the Army and Marines, the day-to-day operations necessary to maintain such a high operations tempo require the Air Force to leverage a wide range of skills, from support staff, engineers, and security to the flight crews themselves. The perseverance and dedication to the mission take a toll, not only on the airmen who serve but on their families as well.

Given the increased rates of combat related posttraumatic stress symptoms, and complicating factors for the family, an aim of this research proposal is to gain an understanding of the extent of posttraumatic stress symptomology and how subclinical thresholds or “partial symptoms” affect the relationships between Air Force airmen and their families.

Deploying and serving in a harsh and or dangerous combat zone can be a traumatic experience typified by a number of factors that occur as “everyday events” within the combat zone. These events include constant fear for one’s safety, sounds of explosives, the threat of a suicide bomber, the ubiquity of sniper fire, lack of privacy, and having to maintain a constant state of alertness. Understanding the full scope of the term *combat-experience* or *exposure*

appropriately frames the experiences facing today's service members and their families. Specifically, what is combat exposure? What does it mean to serve "in combat"? *Direct combat exposure* can be defined as "engaging an enemy on the ground with weapons while being exposed to hostile fire and a high probability of direct physical contact with enemy troops" (Henderson, 2006, p. 5). For many, this type of an environment undoubtedly produces a heightened awareness of safety, for oneself and for one's comrades in arms. Daily or frequent exposure to IED's and mortars, seeing wounded troops, being shot at, shooting others, or being directly involved in a sniper engagement or a convoy accident are all examples of direct-combat exposure. Examples of other more indirect yet still traumatic exposure include responding to the scene after a violent attack and providing support functions for the war effort (psychological first aide staff).

Whether direct or indirect, all exposure can potentially produce increased stress and subsequent combat-related posttraumatic stress symptoms. Typically, these symptoms occur within the context of pre-existing vulnerability and resilience factors. While research has highlighted the correlation between an increase in levels of combat exposure and PTSD (Southwick et al., 1995), as the current war efforts have continued and service members have been exposed and re-exposed to deployments in harsh and/or dangerous conditions, there is an increased emphasis on combat-related sub-clinical threshold posttraumatic symptomology (Hoge et al., 2004; Wang, Wilson, & Mason, 1996).

### **Risk and Protective Factors**

Combat exposure and subsequent combat-related posttraumatic stress clearly affect families. Determining the path or course through which such effects occur within the context of

risk and protective factors is a primary focus of this research proposal. For example, in focus groups conducted with wives of Israeli veterans with PTSD, one wife described how the hardships of combat exposure can spill over to the family members: “Some of the things passed on to the kids. . . I have also become like that [PTSD symptoms]. I hear a noise and it disturbs me. We live in an area full of airplanes passing overhead. I’ve been awakened a few times by an ‘explosion’ . . . We’ve been affected by his condition” (Dekel, 2004, p. 28). With regard to the high deployment tempo currently being experienced by OIF/OEF war returnees and their families, researchers have noted that “in many instances a traumatized soldier is greeting a traumatized family and neither is recognizing the other” (Hutchinson & Banks-Williams, 2006). The long term ramifications of this type of environment on families and, particularly, children are yet to be determined. Questions emerge from this research, specifically addressing what risk and protective factors predict outcomes related to the degree of relationship difficulty within a family after combat. What variables explain the varying degrees of familial interpersonal relationships for service members and families after deployment?

Combat exposure is not the only trauma affecting today’s service members. Frequent and unpredictable family separations can also produce anxiety and trauma for the service member and the family system. Reintegrating from war to the home environment can be difficult for even the most experienced service members and their family. There are four major tasks associated with reintegration: (a) redefining roles and expectations, (b) managing strong emotions, (c) re-establishing intimacy in relationships, and (d) creating a sense of shared meaning surrounding the deployment experience (Bowling & Sherman, 2008). Each of these “normal” tasks associated with reintegrating are complicated by combat-related posttraumatic

stress symptoms in the returning service member, as well as by mental-health struggles in the family, possibly as a result of the deployment separation (e.g., depression or behavioral problems in children). Even so, there are some families that “rise to occasion” and adapt successfully to this experience by learning new skills and growing stronger, closer, and more independent. However, other families struggle with typical developmental life-course issues that arise during and after deployment (Bowling & Sherman, 2008).

Key protective factors that have emerged thus far in the literature include a high level of community and social support, the use of active coping skills, flexible gender roles (within the family system), and the ability to “make meaning” out of the deployed experience (MacDermid, Samper, Schwarz, & Nishida, 2008; Tanielian & Jaycox, 2008). Although many of the protective factors related to military families struggling during a war-time environment continue to be researched, the construct of social support as applied to the military related literature can be traced back to spouses of the Vietnam era (Kulka et al., 1990; Stretch, 1985). In this context, *Social support* can be defined as “individuals feeling that they are valued and cared for” (Morris & Age, 2009, p. 697). Within the active-duty military culture, social support often occurs in a broader community context and includes military leaders, formal support agencies, family readiness groups, and informal spouses groups (Bowen, Mancini, Martin, Ware, & Nelson, 2003).

How repeat combat deployments over an extended period of time (as evident in the current war environment) and the subsequent combat-related posttraumatic stress symptomology affect the day-to-day relationships within the family is an under-researched area. As recent as 2009, the literature in this area has suggested that there is “little empirical research that has

focused on the family problems of veterans in the first year or two following their return from a major military conflict” (Sayers et al., 2009, p. 6). This current proposal seeks to begin to fill the gap in this important research area. Consequently, drawing attention to the impact of deployment and the subsequent combat-related stress symptomology for both the service member and the family is a clear first step toward helping military leaders, policy makers and clinical providers to identify risks and draw on protective characteristics within the military population. Broad studies have highlighted some of these issues specific to the Army (Cozza, 2005; Hoge, 2007; MacDermid et al., 2008). These studies and others conducted specifically with Air Force populations have examined the perceptions of airmen regarding their spouses’ ability to cope during deployment and adjust to Air Force family demands (Spera, 2009) finding that 35% of junior enlisted airmen and 30% of all airmen report that their spouse would have a serious time coping with a deployment. Yet constructs such as unit relationship quality and social support from community members were identified as protective factors that helped spouses adjust to the demands of being an Air Force family. This study is specific to the deployment experience itself and therefore does not focus on the reintegration period, post deployment.

Another study that aimed to uncover the unique needs of female Air Force active reserve and guard forces serving during a time of war, using data from 1993 (N = 525), highlights job and parental stressors as primary components that create work-family conflict and marital distress. These components also affected the mental health of this population (Vinokur, Pierce, & Buck, 1999). Nevertheless, further research that specifically targets the risk and protective factors embedded in the context of deployment and family within the Air Force has not been

conducted. Specifically targeting the Air Force population (non-help-seeking, active-duty population serving during an on-going war) could offer insight into how combat stressors (i.e., deployment, family separations, posttraumatic stress symptomology) affect family relationships.

In sum, the literature suggests that new studies might focus on a number of areas including; key deployment characteristics the impact on family relationships, both with spouses and children, identifying how those experiencing combat stress symptoms cope within the context of family relationships, and finally, how do these characteristics differ from the rest of the active-duty Air Force married population (those who are not currently suffering such extreme symptoms). There is also a need for specific research that targets the developmental outcomes of military children reared by service member parents serving in a constant state of war for almost a decade. This current research proposal will aim to examine the relations between key risk and protective factors, such as rank, length and frequency of deployment, social support and combat-related posttraumatic stress symptomology (IVs) and perceived family relationships with spouses and children (DVs).

Examining these relationships will help military leaders and helping professionals prepare for the future challenges of meeting the needs of war returnees and their families. More specifically, leaders and policy makers will be better equipped to make policy and practice decisions about such important issues as whether airmen and their families are offered the appropriate level of services to meet their needs, whether there are gaps in available services, whether there are opportunities for fine tuning the current service delivery model. An increased understanding about the impact of deployment on family relationships will help service providers understand populations at-risk of divorce, and/or of deteriorating parent-child relationships. This

information can then inform future practice in this arena. Collectively, these issues have funding implications as well, as policy makers must prepare for funding the future needs of military families.



## **Chapter 2. Literature Review**

The terms *risk* and *protective* factors are increasingly seen in the social work literature, particularly with regard to ecological work that aims to understand or predict child or more recently, family outcomes. Risk factors typically refer to influences that increase the likelihood of an adverse outcome or aggravate or participate in the maintenance of that outcome (Coie et al., 1993). Researchers often try to untangle the variables that impact particular problems in an attempt to better understand populations that may be considered at-risk. Risk factors are often conceptualized within the context of protective factors. Protective factors are internal or external influences that buffer against negative outcomes, or “mitigate the risks” (Fraser, 1997, p. 3). Within the military population, there are inherent risk and protective factors, e.g. age, length of service, length of marriage that increase the understanding of outcomes during times of high stress (wartime environment).

The purpose of this study is to understand the risk and protective factors associated with military deployments and how those factors impact family relationships within an Air Force active-duty population. For the purposes of this research proposal the risk and protective factors under examination include two key deployment stressors, length and frequency, a demographic factor, rank (a proxy for age), and a social support construct. This chapter presents a review of the literature across a number of areas, including Air Force historical and current relevant information; deployment stressors (frequency and length); psychological factors, (combat-related

posttraumatic stress symptomology and depressive symptoms); and the effect on military families, including military spouses, and children. Gaining an increased understanding of the risk and protective factors associated with deployment contributes to the knowledge base by helping delineate between positive and negative outcomes at the family and community level. Military leaders and policy makers with such information will be better equipped to make policy and practice decisions about preventive strategies to reduce risk (Schnurr & Green, 2004). Policy and practice level questions such as whether airmen and their families are offered the appropriate level of services to meet their needs, are there gaps in the available services, are there opportunities for fine tuning the service delivery model remain. In the short term, within the military sector, an increased understanding of risk factors contributes to mission readiness (a term used in the military to describe the ability of service members to perform the demands of their job). But in the long-term, gaining this understanding will also help to keep families together, prevent divorce and identify important constructs related to quality of parent-child relationships.

### **Air Force Mission and Propensity for Deployment**

The United States Air Force has its roots in the U.S. Army, where it was embedded as a combatant command, providing air support for missions associated with World War II. Service members who serve in the Air Force are referred to as 'airmen'. Although this term originated as a narrow term to describe a pilot, over the years it has morphed into a term used to describe both men and women who perform the full range of duties associated with aerospace power in the Air Force (Baier, 2010).

Historically, airmen who provided “air support missions” were essentially deployed for various lengths of time to meet the mission at hand. During World War II, the Army Air Corps, as it was known, was a relatively small command, consisting of 26,000 airmen responsible for 2000 planes. By 1939, at the beginning of World War II, the Air Force, still serving as a unit in the Army, grew in size to 80,000 aircraft and 2.4 million active duty members. The airpower capabilities carried out by the Army Air Corps were cited as having a substantial role in the outcome of World War II (*Air Force History*, n.d.). One military grand strategy historian described the role of the Air Force in World War II:

Everyone could see that without command of the air it was impossible for armies and navies to operate effectively; with command of the air one could not only achieve campaign victories but also deal heavy blows at the foes war time economy. (Kennedy, 1987, p. 353)

Recognizing the importance and potential of air power to modern day warfare, the U.S. Congress passed the National Security Act of 1947, which was signed into law by President Harry Truman on July 26, 1947 (*Air Force Fact Sheet*, n.d.). This act, a major reorganization of the U.S. defense infrastructure, created a separate and distinct department of the Air Force from the existing Army Air Corps.

Today, the U.S. Air Force continues to pride itself on “global reach, global power” (Rice, D. 1990, p.1). This effort requires resources, airmen, and technology to swiftly operate in an often-demanding yet rewarding environment that provides a full range of capabilities in air and space and on the global front. Due to changes in technology and shifting personnel needs, today’s Air Force is much smaller than the Air Force of the past, its role has remained of critical

importance from the Vietnam era through the Gulf conflicts, including the current OIF/OEF conflicts. Airmen clearly perform duties distinct from typical Army infantry soldiers, but the unique nature of the current war effort has required that Airmen train more intensively for direct enemy contact. Historically, the specialty skills associated with typical Air Force careers—pilots, aircrew maintainers, and support staff—are clearly different from the skills of infantry Army soldiers who serve in the front line of battle.

However, as the challenges associated with the current OIF/OEF conflicts have become more and more complex, airmen have prepared for and responded to direct enemy fire and daily attacks by small arms or indirect fire. Traditional, Army missions such as high-threat convoys and combat patrols have been supplemented by airmen since the onset of the OIF/OEF conflicts. In addition, there are certain specialty careers within the Air Force that, by the very nature of the work, consistently place them “outside the wire” of traditional Air Force bases. These specialties include para-rescue, combat control, tactical air control, and battlefield weather professionals (*Air Force Fact Sheet*, n.d.). The Air Force also maintains the preponderance of unmanned aerial vehicles (UAVs) utilized in direct combat in support of OIF/OEF conflicts. UAV’s are remote controlled piloted airplanes that have the capacity to carry missiles that are used in battle. The pilots that work with unmanned aerial vehicles are able to engage adversarial targets from thousands of miles away in the comfort of their secure home station base. However, little is known about how this technology, and the subsequent ability to immediately observe the damage caused by this type of combat impacts the mental health of airmen.

Despite the unique role of the Air Force in the current war effort and after close to a decade of a continuous state of war, much of the literature related to the impact of war on

families originates emanates from the Army. While some of the constructs that researchers have uncovered have relevance that cross all branches of the service, there remains a need to further understand the service specific issues. Without a doubt, the airmen serving in today's U.S. Air Force have made significant contributions to the overall war efforts in Afghanistan and Iraq. How these contributions have impacted their relationships within the family is under-researched area that deserves increased attention by scholars and researchers alike.

### **Air Force Population**

It is important to understand the demographic characteristics that make up today's Air Force population. According to the Air Force Personnel Center, as of October 5, 2009, the U.S. Air Force was comprised of 328,763 active duty airmen. These airmen serve at any one of the 101 Air Force bases around the world. Typically 21% of the current force is assigned overseas (including Alaska and Hawaii). The total overseas population includes 9,693 officers and 58,446 enlisted personnel. Of the total Air Force population, 65,496 are officers, and 263,351 are enlisted personnel. The average age of the officer force is 35; for enlisted airmen, the average age is 29. Of the total force, 38.9% are below the age of 26. Within the enlisted ranks, 45.2% are below the age of 26 as opposed to 13.91% percent of the officers. With regard to gender, 19.5% of the total Air Force population are women. The percentage of females serving in the active duty population is fairly similar across the officer and enlisted ranks, with 18.4% of the officers being women and 19.8% of the enlisted airmen being women. The total population of women in the Air Force is 64,062. A total of 59.3% of the current total force is married, including 71.2% of the officers and 56.3% of enlisted airmen. There are also a large number (32,788) of active duty airmen married to other active duty service members (airmen).

Air Force family members also serve along side airmen and make sacrifices related to the military lifestyle, these sacrifices increase during a war time environment. Demographically, there are more family members than airmen. Family members make up a total of 447,993 spouses and children. Due to varying types of family constitutions (e.g., divorce, separation) only 353,598 actually reside in an airman's household. There are 145,000 children between the ages of 6 and 18 who reside in Air Force family homes. Typically, these children attend between six and nine different elementary schools during their formative schooling years (*Department of the Air Force*, 2009). The total number of Air Force families with children ages zero to six is not published, however, a report that garnered this figure across all service branches suggests that 39% of military families have children that are ages zero to six years (Flake, 2007). The Table 1 depicts some of the demographic differences between the US Air Force and the other service branches.

Table 1

Service Branch Comparison

Service branch	Total size	Officer/enlisted	Average age	% Women serving
Air Force	336,317	66447/265,297	29	19.2
Army	568,169	94,336/469152	29	13.5
Marine Corps	201,623	21,530/180,093	25	6.4
Navy	329,622	52,681/272,367	29	15.5

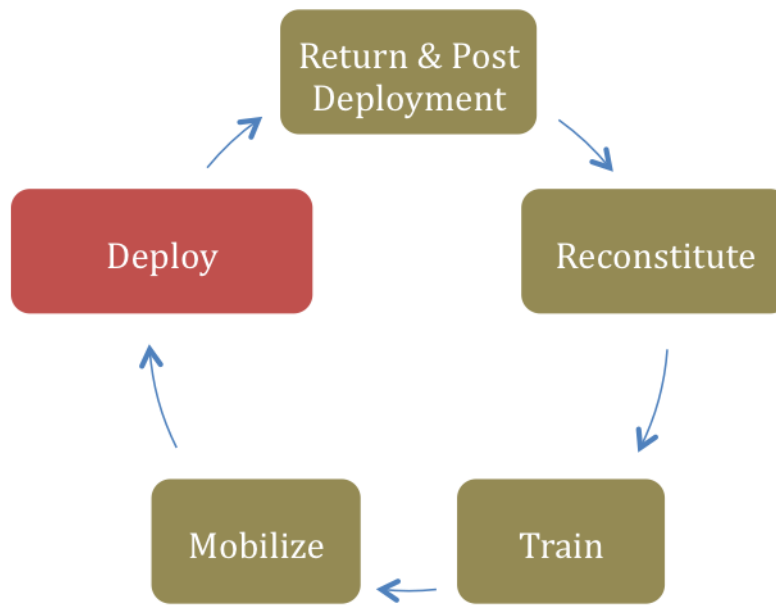
*Note.* Adapted from Defense Management Manpower Center and <http://www.womensmemorial.org/PDFs/StatsonWIM.pdf>.

## **Deployment Stressors**

This study focuses on two primary deployment stressors: (a) length of deployment and (b) frequency of deployment. In September 2009, there were 40,000 airmen deployed away from their families, with 32,000 of those serving in the direct OIF/OEF deployed zones and the “vast majority have served on multiple deployments, with no doubt more in their future” (Schwartz, 2009). In the pre-9/11 era and even as recently as the beginning of the OIF/OEF war efforts, airmen typically deployed up to four months and expected each deployment to be followed by sixteen months of “dwell time” back in the home environment, performing duties on the installation in support of the war effort. However, Air Force leaders quickly recognized that this schedule, referred to as the Air Expeditionary Force (AEF) schedule, was not sustainable during the increased war efforts. Airmen were required to deploy for six months or longer with less and less time in between tours of combat, particularly for certain career fields in high demand (e.g., security forces intelligence analyst, airfield operations units).

Air Force leaders worked to improve the predictability of the cycle of combat tours and to stabilize the tempo of the wartime environment. Even with a predictable cycle of deployment, airmen and, subsequently, their families have experienced stressors associated with a wartime environment. These stressors are viewed within the context of a “cycle of deployment” that includes pre-deployment, deployment, and post-deployment phases. A graphic depiction of the cycle of deployment is shown in Figure 1. A description of each phase follows.

Pre-deployment (mobilization and training periods), deployment, and then reconstitution (also referred to as reintegration or reunion) make up the cycle of deployment. Each stage can be defined in terms of a loose time frame and both the logistical and emotional characteristics that



*Figure 1. Cycle of development. Adapted from J. Martin, 2009.*

accompany it. There are challenges for both airmen and their family members across each stage of the deployment cycle. How well those challenges are handled often depends on a number of different factors. One military social science researcher offered a theory that provides three overarching factors that influence the outcomes for service members and families after deployment: (a) key features of the deployment experience (e.g., degree of combat exposure, length of combat tour), (b) pre-existing vulnerabilities within the context of pre-deployment life, and (c) key aspects of the post-deployment environment (e.g., social support, parental stressors) (Basham, 2007). This research proposal seeks to draw from this theory by further examining a few of the constructs conceptualized in this model, including length of combat tour, pre-existing vulnerabilities (e.g., age, rank, and family constitution) and social support.



## **Predeployment**

The predeployment stage is described as the period leading up to the actual deployment itself. This stage can be a particularly stressful time for airmen as there are many “predeployment” tasks that need to be completed. From a logistics standpoint, airmen and their families spend the predeployment time attempting to get affairs in order and tying up loose ends, professionally and personally. From an emotional standpoint, airmen often worry about how the deployment will impact their spouses and children. Complicating matters is the actual departure date. Despite the fact that airmen are often given a precise date when they are likely to deploy, that date often changes with little or no notice (Waynick, Frederick, & Scheider, 2005). Concerns about the stability of marriages and the ability of spouses to handle the extended absence are commonplace (Black, 1993; Logan, 1987; Pincus & Na, 1999). Recognizing the importance of taking care of the needs of families, during 2009, Air Force Family Support Centers provided 100,000 pre-deployment briefings to airmen and their families as a preventative measure to help equip them with information related to expectations across each stage of the cycle of deployment (*Department of the Air Force*, 2009). These briefings generally cover a wide array of topics, from preparing for deployment, single parenthood (e.g., communicating with children about deployment) financial issues, to preparing for reintegration.

## **Deployment**

Deployment can be defined as “the assignment of military personnel to temporary, unaccompanied duty away from the permanent duty station” (Stafford & Grady, 2003, p. 111). Another report developed prepared for the Family and Morale, Welfare and Recreation defines deployment as “discrete events in which Soldiers are sent with their unit (or as individuals

joining another unit) to a particular location to accomplish a specific military mission” (Booth et al., 2007). Today’s airmen typically deploy as part of an Air Expeditionary Force “tasking” that draws from certain Air Force Specialty Codes (an Air Force term for career or skill set). This generally means that the deployed airman integrate with a unit that is already “forward deployed.” Like their service counterparts, airmen are primarily deploying in support of operations in Iraq and Afghanistan.

While deployment itself is likely the highest stressor facing airmen and families today, research documents the complexities around this issue more broadly. For example, one study that examined family problems among recently returned military veterans cited the “most negative impact of deployment ... is associated with the exposure to trauma and the associated psychiatric symptoms” that emerge after deployment (Sayers et al., 2009, p. 2). Families must adjust to long-term separations that are unpredictable and difficult to manage. Much of the deployment centers on uncertainty for both airmen and their families. This uncertainty is often dealt with by maintaining close communication (whenever possible). Deployment itself can be taxing for the stay-behind parent and children for a number of different reasons. During the deployment, military spouses take on new responsibilities that were typically handled by the service member spouse. These responsibilities range from household maintenance and managing the family finances to becoming the sole parent for the children.

This reorganization of responsibilities and routines can become particularly stressful for spouses and children. For this reason, families remaining behind are offered a wide variety of services during the deployment phases to help ease the burden of maintaining the household responsibilities. Services ranging from “give parents a break” (after hours respite care) to classes

on financial stability and parenting assistance are typical. During 2009, over 22,000 Air Force spouses received deployment related briefings to help educate them on the expectations associated with each stage of deployment. Additionally, 15,000 family members attended communication and life-skills workshops offered across the entire Air Force during a 9-month period in 2009 (*Department of the Air Force*, 2009). From the emotional perspective, early on in the deployment, many families experience an extreme sense of uncertainty and loss (Huebner, Mancini, Wilcox, Grass, & Grass, 2007). The uncertainty can carry through the entire deployment because spouses and children are uncertain about the safety of their loved one, whether their service member will be emotionally and physically healthy when he or she returns, and whether the actual return date will occur as planned. After the initial shock of the deployment occurring and the loss brought on by family separation, families tend to rebound and adjust to the new responsibilities associated with the deployment. Some families even report the growth of strong bonds and abilities to overcome challenges during deployment (MacDermid et al., 2008). Thus far, social support is consistently identified in the literature as the primary buffer or protective factor that differentiates those who do well from those who struggle with challenges that occur during the deployment process. Within the military, social support is appropriately defined by Bowen et al. (2003) in a seminal article titled *Promoting the Adaptation of Military Families: An Empirical Test of a Community Practice Model*, “a social psychological variable that we define from a military/base perspective as reflecting the degree to which members feel positively attached to the Air Force/Military as an organization and view the base community as a source of support and connection to others” (p. 35). Conceptually it makes sense that families, who feel a sense of social support, are better prepared to deal with both

everyday life stress as well as the unique stressors associated with being a military family (e.g. deployment).

### **Reintegration and Reunion**

The reintegration phase, sometimes referred to as *reunion* begins when the airmen return to their families after the deployment. Typically, this stage is divided into different sections. The first, referred to as the *honeymoon* stage, is used to describe the joyous excitement experienced by airmen and their families upon immediate return from deployment. This stage can last from a few days to a number of weeks. During this stage, families immediately begin their work of renegotiating roles and responsibilities associated with family life. Reintegration also can be the most difficult stage of the deployment cycle for airmen and families. This stage is filled with tension because airmen, spouses, and children have all changed. Spouses have become more autonomous, and children have moved through additional developmental milestones. Children experience deployment differently, depending on their age and developmental level during the actual parental absence. Successfully navigating this stage of the deployment cycle requires patience and commitment on behalf of the airmen and the family.

Helping professionals have provided airmen and their families education on ways to manage this stage of the deployment cycle successfully. Factors such as positive communication, gaining an understanding of appropriate expectations, and taking time to become reacquainted with one another have all been identified in the literature as helping to ease the stressors associated with reintegration (Logan, 1987; Peeble-Klieger & Klieger, 1994; Pincus & Na, 1999). After completing a tour in the combat zone, one of the first tasks for service members is to reintegrate into the family and community. The reintegration process is unique for

every family and differs with every deployment (Di Nola, 2008). Naturally, this variance has implications for service providers and policy makers aiming to understand both the nature of deployment and the appropriate support services necessary to assist during stressful circumstances. Many service members step back into roles as mothers and fathers for children of all developmental ages and some with unique and special needs.

The ongoing nature of war and the propensity for repeat deployments make this process particularly challenging. Besides unpredictable return dates, there are concerns about deploying again and the degree of combat-related posttraumatic stress or trauma exposure experienced by the service member. Bowling and Sherman (2008) suggest that some service members struggle with reintegration; if they know that they are on target to deploy again within a relatively short period of time, they will not make the effort to engage with their family at an emotional level necessary to allow the full reintegration process to occur (Bowling & Sherman, 2008). The time in-between deployments, is referred to as “dwell time.” It is during dwell time, that service members and their families work toward reintegrating. The reintegration process is stressful for families, regardless of the amount of trauma or combat experienced by the service member. These experiences have been written about extensively in the literature before September 11th (Hillenbrand, 1976; Jensen, Lewis, & Xenakis, 1986; Kelley, Finkel, & Ashby, 2003).

Scholars have documented the complexities of military life during peace time: frequent moves, low pay, issues surrounding spouses’ disruption from employment goals, stressful work environments, high levels of social control on base, and myths surrounding perceived lack of confidentiality in accessing mental health care. During wartime environments these stressors are compounded by difficulties of single parenting brought on by extended parent absence (including

lack of adequate time to prepare for family separations), child behavioral issues, and increased rates of divorce. Historically, much of this research originated with families enlisted in the U.S. Navy, a service branch that traditionally dealt with many family-separation issues long before the recent war efforts associated with OIF/OEF. Navy sailors spend time on land and at sea for generally 3 to 4 month intervals. One study (Levai, Kaplan, Daly, & McIntosh, 1994) that drew a sample from a community that was heavily populated with Navy families found that, during the Persian Gulf Crisis, there were increased rates of Navy children's admission to area psychiatric hospitals. The children identified in this study were hospitalized for reasons related to major depression, oppositional defiant disorder, and attention deficit/hyperactivity disorder. Another study conducted with a help seeking population of 199 (mean age 32.7 years) OIF/OEF veterans found a wide degree of family difficulties during reintegration including; seventy-five percent reporting some type of family problem in the past week (family problem defined as "feeling like a guest in their own household" (40.7%), "children acting out of not being warm toward them" (25%) and being "unsure about their family role" (32.7%). Ultimately, this particular study, one of the first of its kind with OIF/OEF war returnees determined that depression and posttraumatic stress symptoms were both associated with "higher rates of family reintegration problems" (Sayers et al., 2009, p. 7)

Over the last 8 years, airmen and their families have had to adjust to ever-changing increases in operations tempo. This high operations tempo both in stateside war-related efforts and in the deployed zone has undoubtedly created stressors that influence relationships within the family and become difficult to overcome. The cycle of deployment provides a framework from which to better understand the stages and accompanying experiences and emotions of the

deployment process. Although the Air Force has aimed to provide an array of preventative services that equip airmen and their families with the skills necessary to deal with extended parent absence and repeat deployments, the length and uniqueness of the current war effort has provided new insight into the complex needs of airmen and families that continue to emerge. Demographically, as large numbers of airmen are married and subsequently have children, it becomes even more important to understand precisely how deployment stressors and the associated combat-related posttraumatic stress impacts the perceived relationships between airmen and their spouses and children. Air Force leaders have recognized the crucial importance of family well-being and the link between family well-being and future mission success (Bowling & Sherman, 2008; Schneider & Martin, 1995; Schwartz, 2009; van Vranken, Jellen, Knudson, Marlowe, & Segal, 1984).

### **Combat Stress**

It is important to note that many service members return from deployment, return without mental health issues or concerns. This is particularly true, within the Air Force. The RAND study titled *Invisible Wounds of War*, noted the healthy nature of the Air Force as a service branch. Additionally, some service members experience initial symptoms that dissipate on their own (Jaycox & Tanielian, 2008). Despite improvements to the Air Expeditionary Force (AEF) deployment structure that ultimately paved the way toward predictable deployments, the long-term consequences of deploying and performing the duties associated with a constant state of war can include exposure to trauma. This exposure at times causes combat-related stress symptoms that can become difficult to manage and, ultimately, impact the family relationships and the entire family system. High degrees of combat exposure during deployment have been

correlated with the onset of PTSD (Buydens-Branchey, Noumair, & Branchey, 1990; Sareen, 2009). Combat stress is not a new concept. Its roots can be traced back (at least) to the “shell shock” era of World War I (Mott, 1916; Southard, 1918). In World War II, the term combat neuroses was used to describe experiences of war returnees (Grinker & Spiegel, 1945). Within the *Diagnostic Statistical Manual* (DSM), in the first iteration (American Psychiatric Association, 1952), the diagnosis of “Gross Stress Reaction” was used to describe the “severe physical demands or extreme stress such as combat or in a civilian catastrophe” (p. 40) to describe problems associated with war returnees from World War II. A full 14 years later, the second edition of the DSM (American Psychiatric Association, 1966) transitioned from “Gross Stress Reaction” to “transient situational disturbance” in its attempt to describe or quantify the experiences of war returnees. Twelve years later, in 1980, the American Psychiatric Association’s DSM III introduced PTSD as it is known today. This classification system, primarily a clinical tool, also helps researchers, government officials, policymakers, clinicians, and the American public better categorize the experiences of war returnees.

According to the DSM IV-TR, PTSD is categorized as a number of clusters that originate as a result of exposure to trauma. Criterion 1A is described in the DSM as

development of characteristic symptoms following exposure to an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury



experienced by a family member or other close associate. (American Psychological Association, 2000).

Criterion 2A states that the “person’s response to the event must involve intense fear, helplessness, or horror (or in children, the response must involve disorganized or agitated behavior).” Criterion 2B involves the “re-experiencing cluster” and is described in the DSM as “the characteristic symptoms resulting from the exposure to the extreme trauma that include persistent re-experiencing of the traumatic event” (intrusive dreams). Criterion 2C involves the “avoidance cluster” and is described in the DSM as “persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness” (avoiding stimuli associated with the traumatic event, emotionally disengaged from the outside world). Finally, criterion 2D involves the “hyper arousal cluster” and is described in the DSM as “persistent symptoms of increased arousal.” Taken together, persons must have experienced a traumatic event and, subsequently, at least two symptoms that fall within the four clusters for a period of at least one month, and consistent with other anxiety disorders, the symptoms must interfere or “cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.” Qualifiers are often added to describe further the nature of the individuals who present with this set of diagnostic criteria: *acute*, *chronic*, or *delayed onset*.

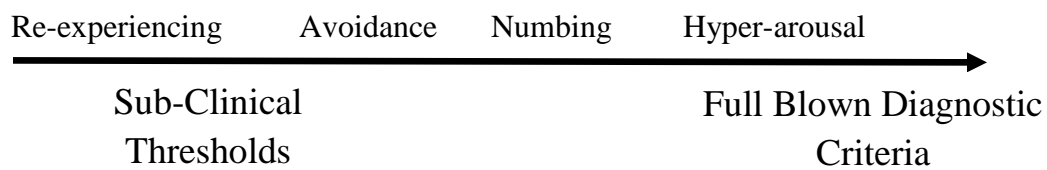
These current diagnostic criteria provide the baseline for much of the research conducted on Vietnam Veterans. In 1983, nine years after the Vietnam conflict came to an end, Congress mandated that the Veterans Administration conduct a study to examine the mental-health-related needs of returning veterans. This study, referred to as the National Vietnam Veterans Adjustment Study, provided knowledge related to the complex nature of war and its long-term

impact on service members and, in particular, their families. Key findings from numerous studies using data from the Vietnam Veterans Adjustment Study document the struggles of war returnees. Issues such as alcohol abuse, anger, PTSD, increased rates of divorce, and struggles affecting children are all well cited throughout the research (Galovski & Lyons, 2004; Hobfoll et al., 1991; Jaycox & Tanielian, 2008; Mmari, Roche, Sudhinaraset, & Blum, 2009). A limitation to many of these studies is that they were conducted retrospectively with veterans many years after the war came to an end.

More recent theoretical models have aimed to examine the connections between PTSD and physical well-being. The onset of PTSD has been isolated as an indicator for physical health issues after trauma exposure. In other words, of those who experience trauma, PTSD has been identified as the pathway that leads to negative health outcomes; those who do not develop PTSD have fewer negative health outcomes (Schnurr & Green, 2004). Trauma exposure, in the context of the current war, has direct consequences for the well-being of service members. Service members often return from combat with varying degrees of mental health issues. Since the onset of the current war, there has also been an increase in the rates of alcohol abuse and suicide (Kuehn, 2009) across all service branches. However, PTSD has emerged as the most prevalent consequence of trauma exposure during war (Tanielian & Jaycox, 2008).

Although the diagnostic criteria for PTSD require symptoms that fall within all four of the clusters identified in the DSM manual, individual clusters of symptoms (not meeting the diagnostic threshold) are also of concern, yet little consideration is given to those with fewer symptoms. Consequently, there is a need for some discussion that differentiates the degrees of combat-related posttraumatic stress symptomology. This discussion centers on the continuum

approach to recognizing symptoms. At one end of the continuum, there are enough diagnostic indicators to represent a full-blown diagnosis of PTSD. At the other end, there are fewer symptoms, not enough to meet the diagnostic threshold, yet still sufficient to cause concern for a number of life domains, including within the context of family. A graphic depiction of continuum approach to posttraumatic stress symptoms is displayed in Figure 2.



*Figure 2.* Continuum approach to posttraumatic stress symptomology.

Examining PTSD from a continuum approach draws attention to lower levels of symptoms or those at a sub-clinical threshold. Researchers have cited the difficulties in treating PTSD: “half of those treated retain the diagnosis at post-treatment and responders often report considerable residual symptomology” (Forbes, Lewis, Rarslow, Hawthorne & Creamer, 2008, p. 142). For this reason, it becomes critically important for researchers and practitioners alike to truly understand the factors that influence or impact treatment outcomes, for example, social support or family relationships. Early intervention also becomes important, particularly if practitioners are able to intervene at the family level before the full-blown diagnostic criteria are evident. Even in the event of a full diagnosis, “a critical component for the treatment of PTSD is early intervention” (Yarvis, 2004, p. 6). From a treatment perspective, other researchers have identified, through path analysis, complicating factors that impact the outcomes of PTSD, factors

such as anger and alcohol co-morbidity (Forbes et al., 2008). Consequently, considering these factors, it makes conceptual sense that early intervention should occur when the thresholds for PTSD are at the sub-clinical levels. This issue becomes particularly complex within the current context of multiple or repeat deployments. How to appropriately provide ‘early intervention’ services during an on-going war that often requires service members to swiftly prepare for repeat deployments is question that military helping professionals struggle with on a day-to-day basis.

Despite the attention drawn to PTSD as a result of the lengthy war efforts associated with OIF/OEF conflicts, little research has focused on chronic, sub-clinical thresholds as components of early intervention, particularly within the context of family. While there is research on the current debate from a treatment perspective, on the inherent struggles of diagnosis of PTSD as a “one-size-fits-all” mentality and the lack of attention on partial symptoms, at issue for this current research is how the sub-clinical levels or partial symptoms of posttraumatic stress impact the perceived relationships within the family. Gaining an increased understanding of how the risk and protective factors associated with varying degrees of combat-related posttraumatic stress (from sub-clinical levels through full-blown diagnostic criteria) impact perceived family relationships will help policy and practice level prevention and early intervention efforts across the Air Force.

Beyond posttraumatic stress symptoms, it has also been suggested that a considerable amount of service members experience depressive symptoms after deployment. Prevalence rates vary, with one study suggesting 14% met screening criteria for major depression (Jaycox & Tanielian, 2008). Complicating the issue is the fact that many times, depression and posttraumatic stress issues co-occur. Within the military sector, it is important to understand the

pathway through which depression occurs as service members that have exhibited signs of depression are at risk for serious psychologically based outcomes such as suicide. It is also clear, consistent with the civilian literature, that military service members suffering from depressive symptoms also have issues in both the work place and in their interpersonal relationships. For example, they are more likely to miss work, be less productive at work and report problems in their relationships with significant others to include spouses and children. Taken together, posttraumatic stress and depressive symptoms are two of the largest psychological factors impacting service members after deployment.

### **Deployment Impact on the Military Family**

Frequent and repeat deployments have become the norm for military families serving in a post 9/11 era. Indeed, deployments are the greatest source of stress for service members and their families. Additionally, exposure to trauma during combat can result in service members returning with such “invisible wounds” as varying degrees of posttraumatic stress symptomology (Jaycox & Tanielian, 2008). These invisible wounds can impact the relationships that exist within the family. Inevitably, the wartime experiences of service members affect both spouses and children and, more broadly, relationships within the context of the family. In fact, deployment-related experiences have been well documented in the literature within a number of different domains, including impact on service members, impact on spouses, and impact on children. For example, families of Vietnam veterans experienced higher rates of divorce compared to their nonveteran counterparts, and their marriages had higher rates of conflict (in some cases, increased rates of domestic violence). In addition, in their marriages, there was difficulty expressing emotion between partners, which inherently leads to difficulty with

interpersonal skills, increased levels of depression, problems with intimacy, and caregiver burden (Forbes et al., 2008; Jordan et al., 1992; Riggs et al., 1998).

Shifting the focus from Vietnam to the current war effort, there are similarities with regard to family-level variables. For example, military spouses of the OIF/OEF conflicts also report problems with communication and expressing emotion, which in extreme cases can lead to instances of domestic violence (Carroll, Rueger, Foy, & Donahoe, 1985). Clearly, there is an important link between trauma and interpersonal relationships. One study that examined this issue by collecting data from 45 male Army soldiers who had recently returned from OEF or OIF deployments and their spouses found a strong correlation between an increase in combat-related posttraumatic stress symptoms (sleep problems, emotional numbing) and lower marital relationship satisfaction. Like other researchers before them, the researchers determined that “trauma, specifically combat or military related traumatic experience, may be particularly detrimental to the marriage” (Goff, Crow, Reisbig, & Hamilton, 2007, p. 344). If war trauma is “detrimental to the marriage,” then it makes sense that these detrimental effects would extend beyond the marriage to the children. The study conducted by Goff et al. is one of a few that were conducted on the active duty population still serving during a war-time environment. Less is known about how deployments and the associated combat-related posttraumatic stress symptoms impact family relationships within the active duty population, those still serving during a current wartime conflict. Gaps also exist in the research on the long-term effects of the current war on the quality of relationships between service members and their children.

The ability of families to cope during stressful situations brought on by high operations tempo associated with the OIF/OEF conflicts is an area that deserves more attention. Despite the

fact that there are some research and program evaluations conducted within the U.S. Army and U.S. Navy populations, there is a scarcity of research available on Air Force deployments and the unique situation of being an Air Force family. Consequently, this literature review is drawn largely from research garnered from prior wars and other service branches. Starting by identifying the risk and protective factors associated with the overall impact of deployment on the relationship factors of active duty Air Force families will help Air Force leaders plan for the future programmatic needs across the full spectrum of family-based service delivery.

Family separation due to wartime deployment is a difficult stressor facing military families. During the deployment, spouses and children must adjust to an absent partner or parent and take on new responsibilities (e.g., household chores, managing budgets, power of attorney). Mmari et al. (2009) focused on examining this issue across all four services branches through the use of focus groups and the qualitative collection of “word” data from the lens of adolescents in military families. Participants were recruited from middle and high school populations and were living with an active-duty parent. Eleven focus groups were conducted with a total of 39 students. The resulting data were organized according to overarching themes that shed light on both the experiences and relationship factors that are impacted by deployment. One such identified theme centered on “adolescent health and well-being.” One adolescent described his anxiety over his father leaving for a deployment as

“like for this war, you are always thinking about it because you don’t want your father to be shot at or anything like that, but when my dad left, even before he left on the plane, I was crying like a little kid. I don’t like it when he has to leave our family and stuff like that.” (Mmari et al., 2009, p. 463)

Another theme of the Mmari et al. (2009) study centered on “changing family roles and responsibilities.” An adolescent described the additional responsibilities placed on him during the deployment itself: “And when they deploy you get like . . . I know in my house, my mom started making me do all the laundry and I had to help her do the dishes, like way more than I normally had to” (Mmari et al., 2009, p. 464). This theme emerged as one of the strongest issues for the adolescents who participated in the study: the idea that there is an enormous amount of stress related to roles and responsibilities and the shifting dynamics within these constructs through the cycle of deployment. Thus far, it is evident that there is large variance in how families cope during deployment, with some over-performing and others struggling to meet the demands of day-to-day life stressors.

### **Deployment Impact on Spouses and Marital Relationships**

Examining the military family as a system highlights the unique role and needs of military spouses across the life course of a military career. Just as the history of PTSD can be traced back to World War I era “shell shock,” the role of military spouses can be traced back to the Revolutionary War. During this war, 39 spouses, with the help of Esther Reed (the wife of an aide to George Washington), started the first military spouses “club,” referred to at the time as “the association.” Spouses were integral to the war efforts by performing such traditional duties as cooking, sewing, and nursing. These groups continued and their roles evolved over time, yet it was not until after the Gulf War that the U.S. Army formalized this process by mandating that all units have an established family support group. The other service branches have also adopted some form of a support structure for spouses. Many of the groups still serve the function of providing support structures for families with a deployed service member, they also provide a



forum for communication and support for the spouses themselves, during a time of critical need. While spouses historically have performed and will continue to perform support and volunteer duties associated with family support on many installations, they are also a vulnerable population group, often in need of care and support themselves.

A study conducted by the National Military Family Association (2005) examined the stress levels of spouses of service members across three “phases” of deployment: (a) notification of deployment, (b) actual departure of their spouse, and finally, (c) during the deployment itself. Sixty-two percent of those who responded reported the greatest stress during the deployment itself (National Military Family Association, 2005). It quickly becomes evident that spouses of today’s service members are viewed as serving “along side their service members” and the family support groups are “beneficial during the difficult times that military spouses must face” (Di Nola, 2008, p. 5).

Deployment stressors (e.g. length and frequency) and deployment experiences (e.g., trauma exposure) and subsequent impact of posttraumatic stress symptomology extend beyond the service member and are said to have “spill-over” effects for the family and, in particular, intimate relationships. A Vietnam era study highlights this phenomenon. Fifty male Vietnam veterans and their female partners participated in a study in which they were administered a number of relationship satisfaction type scales: the Dyadic Adjustment Scale (DAS), the Marital Status Inventory (MSI), the Relationship Problems Scale (RPS), the Fear of Intimacy Scale (FSI), and the PTSD Checklist–Military Version (PCL-M). According to this study, veterans with PTSD had higher levels of significant relationship distress and more difficulty with intimacy. Over 70% of the study participants had what the researchers referred to as “clinically

significant relationship difficulties” that required clinical interventions (Riggs et al., 1998, p. 97).

Another study that also examined relationship issues with Vietnam veterans diagnosed with PTSD, using a much larger sample of 1200 male veterans and their female partners, found similar results: “severe problems in marital and family adjustment . . . in parenting skills” (Jordan et al., 1992, p. 916). Finally, according to the Presidents Commission on Mental Health Report (1978), a report produced as a result of the Vietnam Veterans Adjustment Study, “38% of the marriages of Vietnam veterans dissolved within 6 months of the return of the veteran” (Galovski & Lyons, 2004, p. 479).

Another study, drawing on the “family context” of wellness as it applies to the current wartime environment, conducted an evaluation of the Army’s “Building Healthy Families Program.” The overarching goal of this program is to enhance service members’ relationships with their spouses and children while promoting healthy lifestyle choices and decreasing risk behaviors. The intervention consisted of a number of day-long educational sessions targeted toward service members and spouses on content that focused on adverse health behaviors (e.g., stress, exercise, communication). Ultimately, the program focused on “recognition of unhealthy behaviors and development of skills for self-wellness” (Niederhauser, Maddock, LeDoux, & Arnold, 2005, p. 228). The intervention group in this study displayed an overall reduction in stress across a number of areas, with the highest effect in the areas of stress, seatbelt use, and tobacco cessation. An interesting component of this study was that two-thirds of the study participants had more than one risk behavior; thus, the intervention had to target multiple areas

(Niederhauser, Maddock, LeDoux, & Arnold, 2005), and it became difficult to tease out which intervention helped with each specific risk factor.

From a risk protection standpoint, military spouses, like other population groups, present with varying degrees of characteristics that predispose or buffer against the stressors of military life (Niederhauser et al., 2005). Typical risk factors such age, length of marriage, pre-existing coping abilities, and levels of social support all impact outcomes that relate to military spouses (Rosen, Carpenter, & Moghadam, 1989). After deployment, if service members struggle with combat-related posttraumatic stress symptoms, spouses can also become at risk of developing secondary traumatic stress (Figley, 1993). This concept, first coined by Friedman, occurs when wives “become attuned to trauma cues in their environment and through normal learning processes, may come to mimic their husband’s reactions upon exposure to these cues (Galovski & Lyons, 2004, p. 485). This circular feedback loop of symptoms occurring between the service member and the spouse has clear implications for the family system and children in particular, in part because of the important role of spouses as systems of support for service members and communities.

### **Military Children**

Close to 60% of the current military forces are married with children. Furthermore, 40% of those have children under the age of 5. Demographically, the military is made up, in large part, of young families with young children. While the rates of active duty women—mothers—are currently growing and are higher than at any other time in our nation’s history, the U.S. military is in large part comprised of men, that is, fathers. When examining children’s reactions to the current OIF/OEF wartime environment, in a broad sense, what is really being examined is

the impact of “father absence” on children. There are some unique factors associated with the phenomenon of wartime “father absence.” For example, children with a deployed father have an increased level of concern related to the safe return of their family member as compared to their civilian counterparts, who are often less concerned with safety needs during times of parental absence.

As recently as the 1990s, the literature documents that there is little known about work-related father absence (Hiew, 1992, p. 207). In 1992, from an international perspective, one study examined how father absence impacted children of those in Canadian forces. This study cited the important interconnectedness of the health of service members and their spouses and children, as well as the importance of social support in the context of war deployments and military families. This study found that, ultimately, father absence was perceived as a loss of social support for spouses, which was then correlated to decreases in academic performance and increases in behavioral problems in children (Hiew, 1992). Interestingly, this study also indicated that the actual absence of the father (the deployment itself) was the most emotionally stressful time for children. This finding is interesting in the context of the current U.S. military cycle of deployment model that conceptualizes the experiences of service members and their families as a staged yet fluid model that includes experiences across each cycle of deployment: predeployment, deployment and re-deployment (reintegration). This research is also consistent with the research on spouses that site deployment as the most stressful time for those spouses (National Military Family Association, 2005). Other outcomes for children include depression, behavioral difficulties (Jensen, Martin, & Watanabe, 1996), and higher rates of irritability and impulsiveness (Hillenbrand, 1976).

As with families, children's reactions to war are largely variable and cannot be viewed outside the context of the family and individual development. Communities and outside influences, such as peer groups and even the media, impact the experiences of today's military children. One study indicated that exposure to media and a constant state of worry about their parent's safe return is a primary issue facing military children (Ryan-Wenger, 2001). Another study examining children's reactions to wartime father absence found that the emotional aftermath of the Persian Gulf War "may constitute a significant interference with children's development" (Jensen & Shaw, 1996 p. 84). Understanding how the entire deployment process—from predeployment to deployment and reintegration—impacts the ongoing development of children is an under-researched area. Recognizing that optimal child development depends on healthy parenting and the absence of key mental health symptoms (emotional numbing, depressive symptoms) provides some early insight.

## **Theory**

The literature review provided in this proposal draws from a larger conceptual model that graphically depicts the connections between the variables under examination. Conceptual models are often used in the social sciences to show the relationships between both abstract and concrete concepts. Models also help to organize information and facilitate the development of hypothesis (Frankel, Quill, & McDaniel, 2003; Turner, Gardner, & O'Neil, 2001). A graphic depiction of the conceptual model developed for this proposal is provided in Figure 3.

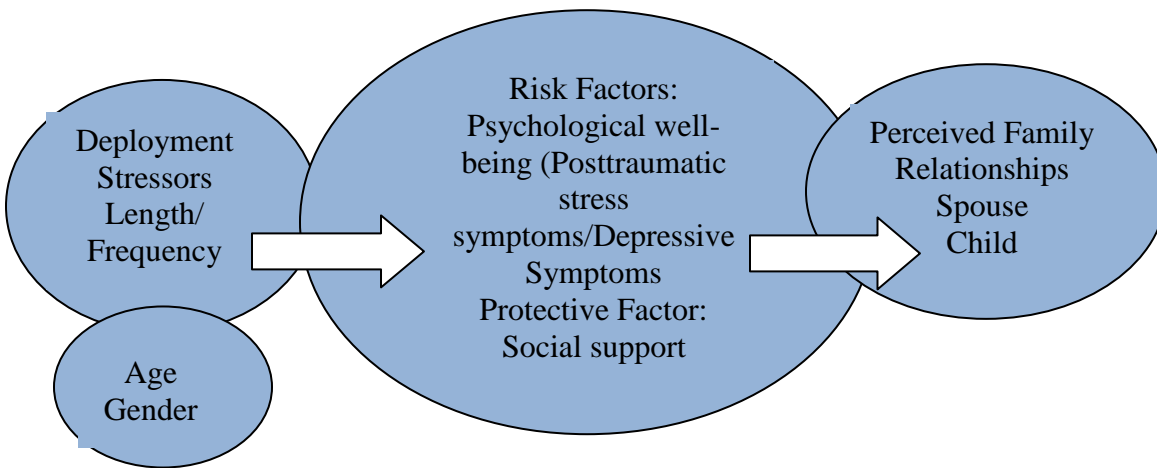
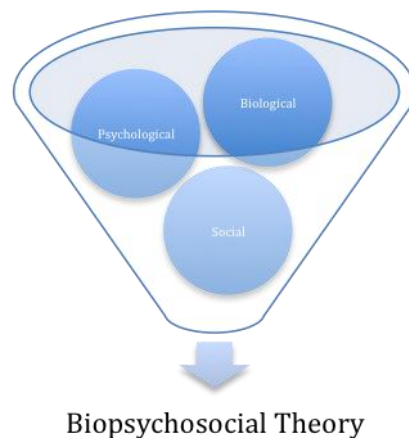


Figure 3. Conceptual model.

This conceptual model is built within the context of a theory. From a theoretical perspective, a macro or grand theory such as bio-psychosocial provides a framework for understanding the experiences of today’s airmen and their families. The bio-psychosocial theory has its roots in general systems theory (von Bertalanffy, 1968; Weiss, 1977) which proposes that “each system affect and is affected by the other systems” (Campbell & Rohrbaugh, 2006, p. 1). This theory is also closely linked to ecological theoretical perspectives that posit that the exchanges, sometimes referred to as the “interplay” between individuals genetic (biological) and environmental (social) contexts provide explanations for developmental outcomes (Fraser, 1997).

Historically, bio-psychosocial theory originated with a goal of understanding disease and treatment. Dr. George Engel, in 1977, pushed the theory into broad practice arenas with his seminal article entitled “The Need for a New Medical Model: A Challenge for Biomedicine.” The theory, initially referred to as *psychosocial*, describes the strong connections between an individuals’ psychological and social beings. Contextually, the predominant ideas of the time

were filled with either medical or psychological influences as stove-piped entities, with little recognition that the two constructs impacted one another. Later, as the field progressed, the theory gravitated toward the bio-psychosocial theory to describe the unique interplay between an individual's biological, psychological, and social components. The biological component included an emphasis on typical biological functioning (e.g., the immune system) while the psychological component included an emphasis on “developmental factors, motivation and personality” (Campbell & Rohrbaugh, 2006, p. 2). The social component includes “cultural, environmental and familial influences as well as the patient's experience of, illness” (Campbell & Rohrbaugh, 2006, p. 2). A graphic depiction of the bio-psychosocial is shown in Figure 4.



*Figure 4.* Bio-Psychosocial Theory.

For a number of reasons, the bio-psychosocial theory provides a comprehensive framework within which to understand the experiences of military families. Herman (1992), a recognized expert in the trauma arena suggests that the bio-psychosocial theory provides a framework for assessing trauma, to include military related trauma. Brown (2008), another trauma expert in her examination of issues surrounding cultural competence in trauma therapy also highlights the bio-psychosocial components of treating trauma, she describes trauma as, “uniquely configured and ordered by human identities, cultures, heritages, and networks of relationships” (p. 258). Indeed, military members and their families have been impacted by trauma over the course of our nations war history.

Within the Air Force, from an environmental (social) standpoint, airmen and their families are serving in a time of war. This social environment places many stressors on airmen, spouses, and children, both individually and as a family system. There are also psychological ramifications that stem from the social wartime environment. Airmen who serve in a constant state of high operations tempo, either in a deployed location or back on the local base in support of the war effort, are at risk for any number of psychological or mental health issues. This risk is well documented in the literature, as increased rates of combat-related posttraumatic stress, increased rates of alcohol issues, depression, and other anxiety related disorders have been observed.

Families also struggle with psychological issues as a result of the social context of a wartime environment. Families experience grief, loss, depression, fear, anxiety, and loneliness. There is much variance in the severity of these systems, particularly across the experiences of spouses and children. There are also biological consequences that arise within the context of



wartime environment. These biological influences have spill-over effects for both the social and psychological components of the family. A primary tenant underlying the bio-psychosocial theory is that the “outcome” or experiences of individuals or families are shaped by the combined synergy that comes from the biological, psychological, and social components. In other words, one component—for example, the biological—does not fully explain the experiences of airmen and their families. A strong example lies in the interconnectedness of combat-related posttraumatic stress. These experiences arise from trauma exposure that occurs in the social environment (war). Trauma exposure precipitates the psychological symptoms that arise, yet the symptoms also cross biological components.

Two separate studies have helped to explain this phenomenon, one using a civilian population, twin-based sample, and the other drawing on the experiences of OIF/OEF war returnees. The first study that highlighted this point synthesized available information on twin studies. The literature draws on the components of the bio-psychosocial model by highlighting that “PTSD with other disorders may be partly due to shared genetic and environmental influences” (Xian et al., 2000, p. 101). According to this study, there is a scarcity of research that truly evaluates the integration of “genes, brain, cognition, emotion, and the environment” (Xian et al., 2000, p. 101). Another way to look at the interconnectedness of the spheres of bio/psycho/social functioning is highlighted in a study that found that, of the OIF/OEF war returnees who were diagnosed with mild traumatic brain injury (mTBI), (biological), the outcome of “psychosocial functioning” was mediated by the relationship between TBI and PTSD. In other words, those war returnees that had a TBI and subsequently developed PTSD

fared worse in the area of psychosocial functioning (even 2 years following their return from deployment).

Ultimately these studies point toward an understanding of human problems as affecting many different spheres (biological, psychological, social) and resulting from the interaction (relationship between) of these different spheres with one another. There are clear advantages to understanding the problems associated with war returnees and their families through the bio-psychosocial lens, both from a practice standpoint within the field of social work and from a macro standpoint within the context of policy and research. (Pietrzak, Johnson, Goldstein, Maley, & Southwick, 2009). Due to interconnectedness of the bio-psychosocial spheres, in order to provide effective treatment practices in the years ahead, military helping service providers will need to turn to the holistic approaches inherent in the bio-psychosocial theory. Because traumatic experiences have become part of the military culture, policy makers will consistently be challenged with determining how to appropriately provide support and therapeutic services to service members and their families in the years ahead.

Continuing to unpack the risk and protective factors associated with deployment and more broadly, military lifestyle is an essential task. Thus far, it is clear that between 14% and 18% of the service members that deploy, experience some level of psychological problems after deployment. These problems impact family relationships. The Air Force as an institution may experience fewer of these symptoms, yet there are still many unknowns related to family relationships after deployment within the Air Force population. Regardless of the presence of psychological issues, reintegration is a difficult task that deserves more attention, particularly in the context of the current OIF/OEF conflicts. Examining the issues associated with current

conflicts through the lens of Air Force historical culture, current operations tempo, propensity for psychological distress and interpersonal problems within the larger family system provides the backdrop to further advance the knowledge base within this crucial arena.

### **Chapter 3. Methodology**

Chapter 3 provides a road map for the proposed analysis highlighting the objectives of this research proposal and providing a guide for addressing the overarching research questions:

1. What are the effects of deployment stressors, such as length and frequency, on subsequent family adaptation, specifically couple and parent-child relationships?
2. With regard to these deployment stressors (stated above) on couple and parent-child relationships, how do risk factors (psychological symptoms such as post traumatic stress or depressive symptoms) and protective factors (social support) influence these associations?

Investigating this issue will help researchers, policymakers, Air Force (AF) leaders, and family support social workers better understand why some AF members and their families experience positive outcomes from deployment whereas others struggle. Taking this a step further, the study findings may also assist in identifying preventive strategies that help families increase their ability to cope throughout the cycle of deployment. Identification of prevention strategies will ultimately need to be developed through a formal policy process involving AF leadership and appropriate resource allocations, however empirical research on this issue is a first step toward identifying the scope of the issue and associated intervention strategies.

#### **Secondary Data**

Secondary analysis of data from the 2008 Air Force Community Assessment (AFCA), a large and comprehensive survey that produced an enormous wealth of data, will be utilized to

address the research questions posed in this study. These data were collected and prepared for analysis by ICF International, a private research firm on contract with the Air Force. In deciding to use a secondary dataset, advantages and disadvantages must be weighed. Two advantages of using secondary data are; reduced cost from a data collection standpoint and access to a large sample representative of the population of interest (Sorensen et al., 1996). Proper use of secondary data research methods allows for maintenance of the same level of rigor as does using primary data research methods, therefore rigor need not be comprised by the use of secondary data.

Within the context of this specific study, there are a number of advantages specific to utilizing the 2008 AFCA dataset. This dataset is one of a select few sets of data that is anonymously collected data regarding the AF population. Collecting data on key mental health and family-related variables anonymously from this population is particularly important due to current (and long standing) stigma attached to seeking help for such issues within the military. Indeed, there is a general perception that active-duty members are reluctant to share personal or family problems for fear that doing so will negatively impact their career. Furthermore, the AFCA was sanctioned by the Air Force and conducted with a high degree of rigor.

The AFCA represents data collected from a representative sample across 81 of 101 total AF installations across the Continental United States (CONUS) and outside the Continental United States (OCONUS). The sampling strategy involved 81 bases, because a decision was made to sample only the installations that had more than 1000 Active Duty members assigned to the base and only 81 met this criteria. Specifically, the research consultants that collected the data worked with the AF leadership to develop a sampling strategy that included a goal of 1,667 samples per installation. Seventeen of the 81 bases had a population of less than 1,667 Active

Duty members, in which case all members were selected. A stratified sampling procedure was utilized with the remaining sixty-four bases. Four variables were developed and utilized as part of this stratified sampling procedure; gender, residence location (on base versus off base), deployment status (yes/no since September 11, 2001) and rank.

The research consultants that conducted this survey have a long history with this survey and consequently recognized that they needed to over-sample particular groups such as female officers on base who have not been deployed, this was done so that they could be estimated with similar precision as that of the larger groups. It would be nearly impossible for a student researcher to collect data on a sample of this size. Unlike other national secondary datasets, thus far very little, advanced research analysis has been conducted on the AFCA dataset, presenting a unique research opportunity. Moreover, an important construct of this study is the feasibility of use of a continuum approach to the examination of posttraumatic stress symptomology. The AFCA dataset will allow the examination of this construct by analysis of the responses to the posttraumatic stress-related questions in the survey.

A disadvantage of using secondary data is the researcher's inability to validate the quality of the processes used to collect the data. Additionally, depending on how the questions were designed, a researcher may need to make concessions with regard to their desired research plan, compared to primary data collection processes. Disadvantages specific to this secondary data analysis study include the fact that the data under examination provide only a "snapshot" in time of an active-duty AF population, a population that constantly changes, and that the data used for this particular analysis describe only the perceptions of the respondents and not the perceptions of their family members. It is important to note that the data to be analyzed in this proposed study were not originally collected for this purpose but rather these data were intended to (a)

provide installation (base-level) social service helping professionals with a detailed assessment of community-wide quality of life indicators and (b) provide AF leadership with detailed data regarding the risk and protective factors associated with the active-duty Air Force population at large. Although the data collected for the AFCA were not collected for the purposes of analyzing the components under consideration in this study, their collection and analysis nonetheless will adequately and appropriately support the objectives of this proposed study.

### **AFCA Dataset**

ICF International collaborated with the Air Force Personnel Center (AFPC) to obtain access to an AF sample with which to conduct the AFCA. ICF International collected the data by anonymously administering a web-based survey to active-duty members across 81 AF bases both within the continental United States and overseas. Maintaining anonymity within a military population is particularly important, as research indicates that military members are sensitive to the stigma attached to accessing mental health care within a military culture that perceives asking for help to be a sign of weakness. In one study, Clay et al. (2008) found that when service members were allowed to answer questions about their PTSD experiences anonymously, the response rate was higher than in studies in which their names were attached (via medical records) to their answers.

A web-based forum for answering questions anonymously has both advantages and disadvantages. As technology advances, web-based surveys are becoming more common and some researchers suggest that certain population demographics are more likely to take an on-line survey (Wright, 2005). Web based surveys allow researchers to quickly reach out to large numbers of potential respondents through email channels that provide links to surveys. This can result in a decreased cost attached to surveying large numbers of individuals. This type of

process can also save time with data collection. From a disadvantage stand-point, there are concerns with emailing survey participants, as email addresses may not be accurate and emails may be returned as “undeliverable.” Researchers need to develop a course of action for how to handle this glitch when it occurs. Web-based surveys, while they allow for some cost savings in the area of data collection, depending on the data collection survey utilized, can also be quite costly.

The AFCA survey included approximately 160 items concerning a range of community and well-being issues (Spera, 2009). According to the research consultants who developed and administered the AFCA survey, the measures and the individual items that composed the measures were drawn from previous versions of the AFCA (based on their demonstrated validity, reliability, and utility) and “extant instruments used to measure the perceptions of military members around community, family, and personnel issues” (Spera, 2009, p. 291).

## **Methods**

**Sampling procedures.** ICF International administered the AFCA to a random sample of 1,667 active-duty AF members stationed on bases with a population of more than 1,000 individuals, on 81 bases. In 7 of these 81 bases, all the members were selected into the sample because their base population was less than 1,667. To select participants from among the remaining 64 bases, a stratified method of sampling was used across the four variables of (a) gender, (b) base location, (c) historical deployment status, and (d) rank. Unique groups, such as female officers living on base who had not deployed, were oversampled.

Three different versions of the AFCA survey were administered to the three main populations (a) active-duty AF members, (b) their spouses, and (c) reservists. As this proposed study will examine the active-duty population only, the data collected from the 56,285 active-



duty members who participated in the survey will be analyzed. ICF International research consultants eliminated from the data base those survey respondents who had logged on to take the survey but did not answer more than the first few questions. Moreover, as one of the original goals of this survey effort was to categorize and interpret the data at the base level, the ICF consultants also eliminated those respondents who answered *other* in response to the question regarding base location. Elimination of these two subgroups yielded a sample of 46,719 active-duty AF members. The final response rate was 49%.

**Data preparation.** When the ICF International consultants performed SPSS missing values analysis to identify patterns of missing data, they found that approximately 25% of the data had at least one item randomly missing. As 25% is substantial, they addressed the missing data using SAS-callable IVEware to perform a process known as *multiple imputation*, which is typically comprised of the following two steps (Ragahunathan, Lepkowski, Van Hoewky, & Solenberger, 2001):

1. Generating multiple complete datasets in which missing values have been imputed by simulating values from a fitting probability distribution.
2. Analyzing the multiple imputed datasets and combining data from them to form overall conclusions for parameters of interest.

The consultants performed multiple imputations based on the following assumptions:

1. The data in the datasets are missing at random.
2. The datasets comprise continuous, binary, count, or mixed (semi-continuous) variables and categorical variable types.
3. Imputations are obtained by fitting a sequence of regression models and drawing values from the corresponding predictive distributions.

4. The types of regression used are linear, logistic, Poisson, generalized logistic, or a mixture thereof, depending on the type of imputed variable.

They then weighted the data “to reduce potential estimation bias due to unequal selection probabilities, non-response, and non-coverage” (ICF International, 2008) according to the three-step process of (a) base weighting, which accounts for overrepresented and underrepresented groups in the sample; (b) non-response adjustment, which compensates for eligible sample members who failed to respond to the survey; and (c) post-stratification adjustment, which aligns the sample distribution to the known population (ICF International, 2008). Ultimately, the goal of this process was to allow the results to be applicable to each base. A final data set, after multiple imputation and weighting was provided for analysis as part of this research proposal.

With regard to the above stated process, statistical literature suggests that missing data is a fairly common, particularly in large-scale surveys (Rubin, 1996). According to Rubin (1996), multiple imputation is most appropriate “in complex surveys that are used to create public-use data sets” (p. 473). The ultimate goal of multiple imputation is to provide statistically valid inferences that can be utilized by multiple researchers utilizing the data (public use or shared). Multiple imputation is a common and useful strategy for compensating for missing data, yet the literature on statistical research suggests two critiques or concerns with regard to utilizing multiple imputation. The first, is the notion of implementation. This involves difficulties with the actual software and with the user or researcher that critics believe add “unnecessary noise to the data.” The second critique involves the “validity of repeated imputation inferences when the multiple imputations are not proper” (Rubin, 1996, p. 479). It is important to recognize, that multiple imputation does not replace one missing value for another. It is a complex process that involves replaces a missing value with a “random sample of missing values, this process results

in valued statistical inferences that properly reflect the uncertainty due to missing values” (Yung, n.d., p. 1). Today’s use of available data base technology, while in some cases timely, results in a rigorous multiple imputation process.

### **AFCA Survey**

In conjunction with AF leaders, ICF International researchers developed the individual questions and surveys that together make up the AFCA survey, which is administered on a biannual basis using questions adopted and adjusted from prior year surveys. Selected AF members voluntarily and anonymously took the survey through accessing a Web-based secure link. A number of individual items and measures will be utilized in this proposed analysis to examine the variables of interest. They include: (a) key demographic information, (b) combat-related posttraumatic stress symptoms, (c) depressive symptoms scale, (d) social support, (e) spousal relationships and (f) parent-child relationships. These scales will be described in more detail below.

**Demographic variables.** The AFCA dataset also provides the researcher with an opportunity to examine various constructs of interest across key demographic groups to isolate certain demographic variables and conduct comparison analysis between different demographic groups. The following are the demographic-related questions of interest for this proposed study.

- Are you male or female?
- In which age category do you belong?
- What is your current marital status?
- How many years have you and your husband/wife been married to each other?
- What is your pay grade?
- How many children currently live in your home?

- How old is each child?

**Posttraumatic stress symptoms.** The posttraumatic stress measure used in the AFCA survey was adopted from the DOD Personal Deployment Health Assessment (PDHA), a four-question survey administered to all service members upon return from deployment to measure their extent of combat-related symptomology. This measure is utilized as a diagnostic ‘screener’ for PTSD and should be utilized as a sole determination of a diagnosis for PTSD. One research study that examined the validity of the PDHA with regard to diagnostic outcomes for PTSD found that across all service branches, “among those that returned from OIF and were screened in 2005, the PTSD screen was “positive” for approximately half of those who were clinically diagnosed with PTSD; in addition, a positive screen was associated with an eight-fold increased risk of a PTSD diagnosis and a three-fold increase in mental health clinic utilization” (Medical Surveillance Monthly Report, 2007).

The following are the posttraumatic stress-related questions on the survey:

Have you ever had any experience that was so frightening, horrible or upsetting that, in the past month, you: (yes or no)

- Have had nightmares about it or thought about when you did not want to?
- Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?
- Were constantly on guard, watchful or easily startled?
- Felt numb or detached from others, activities, or your surroundings?

**Deployment related questions.** There are a number of questions on the survey that describe the context of deployment from the perspective of airmen. These questions aim to gather information on the frequency, nature and impact of deployment and are listed below.

- Since September 11, 2001, have you ever deployed greater than 30 days?
- Of these deployments, how many were in support of OIF, OEF, Other?
- Have you deployed in the previous 24 months?
- Adding up all of your deployments, what is the total amount of time that you have been deployed since September 11, 2001?

**Depressive symptoms.** The Depressive Symptoms measure includes questions that are aimed at symptoms of depression on sleep, energy, mood and concentration. The measure comes from the CES-D, a well established measure of psychological well-being. A favorable score indicates a lack of depressive symptoms.

How many days during the past 7 days have you?

- Felt that you just couldn't get going?
- Felt sad?
- Had trouble getting to sleep or staying asleep?
- Felt that everything was an effort?
- Felt Lonely?
- Felt you couldn't shake the blues?
- Had trouble keeping your mind on what you were doing?

**Family relationships.** The survey contains two overarching sets of questions, those that pertain to perceptions of family adaptation related to both spouses and children. The spouses questions measure the individuals assessment of the strength and quality of his/her relationship with a significant other such as a spouse, boyfriend or girlfriend. The child questions measure the degree to which the individual finds satisfaction with their relationship with their children and their perception of difficulty in raising them. They appear as follows:

### Spousal Relationship Measure

- Please indicate the degree of happiness, all things considered, of your relationship.
- I have a warm and comfortable relationship with my partner.
- How rewarding is your relationship with your partner?
- In general, how satisfied are you with your relationship?

### Parent-Child Relationships

- All things considered, how much of the time is being a parent to your children an enjoyable experience?
- All things considered, how satisfied are you with your relationships with your child(ren)?
- Children can sometimes be described as difficult or easy to raise. How would you describe raising your child(ren) during the last 12 months?

**Social support.** The social support scale on the survey aims to examine community-level informal social support by asking the participants to respond to the following items:

#### People in my neighborhood:

- Know the names of their neighbors
- Sponsor events and celebrations where residents come together
- Reach out to welcome new residents and families
- Can be trusted
- Look out for one another
- Offer help or assistance to one another in times of need
- Talk to or visit with neighbors

Are your current location, are there friends, neighbors, co-workers or relatives (besides your spouse or significant other) outside your home who would:

- Lend you household tools or equipment
- Provide transportation if you needed it
- Give you information about available community agencies and resources
- Take care of your child(en) in an emergency

### **Proposed Analysis Procedures**

The proposed analysis for this study will begin with a series of pre-screening procedures to gain a better understanding of the dynamics inherent to this data set. A first step in pre-screening typically involves missing data analysis. As this issue was previously dealt with through multiple imputation, by the research consultants that collected and prepared the data for analysis, this is not an issue. Other pre-screening procedures that will be examined include outliers (box plots), linearity (scatter plots), multicollinearity (correlation matrix of IV's), and normality (normality plots).

After appropriate pre-screening practices, a series of reliability analyses of the measures under examination will be performed: (a) posttraumatic stress symptoms, (b) social support, (c) perceived spousal relationships, (d) depressive symptoms (e) perceived parent-child relationships. Reliability analysis will be an important step in understanding whether the set of questions consistently measures the construct they are intended to measure. Cronbachs Alpha will be utilized and is the most common measure of scale reliability. Ultimately, a score of .7 or .8 will be an acceptable value. Next, a descriptive analysis of the sample will be performed. Some of the information garnered from the descriptive analysis will be utilized as 'control' variables in subsequent analyses. Next, a series of bivariate measures of association will be

conducted to further examine the relationships between all variables in the study will be performed. It will be important to understand the degree of multicollinearity prior to moving forward with the proposed regression analyses.

The remaining analysis will consist of a series of ordinary least squares regressions (OLS) that also examine moderation and mediation effects. A series of models to examine the relationships among deployment stressors, psychological well-being, social support, and family relationships will be developed. OLS regression will be performed using these variables, based on the understanding that OLS regression is the appropriate multivariate statistical test because it is typically used to “examine patterns of relationships between a single outcome variable” (spouse relationships or parent-child relationships) “and a group of predictor variables” (Cohen & Cohen, 1983, p. 194). In addition, the proposed models include variables that are the appropriate level of measurement, consistent with assumptions set forth in OLS regression. In addition, OLS regression will allow for independent variables at different levels of measurement, consistent with the types of independent variables in these proposed analyses. The results of the OLS regression will identify the significance of the relationships between the independent and dependent variables. Ultimately, these types of analyses should demonstrate whether deployment stressors predict outcomes with regard to family relationships. The analyses results should also illustrate the role of psychological well-being and social support within the context of the above describe relationship.

## **Hypotheses**

The proposed analysis procedures will be performed to test the following hypotheses:

**Hypothesis 1.** As the length and frequency of deployment increases, there will be an increase in psychological symptoms, i.e., posttraumatic stress and depressive symptoms.



Proposed Analysis: Two separate OLS regression models, both controlling for rank and gender

Independent variables: Length of deployment, frequency of deployment

Dependent variables: posttraumatic stress symptoms, depressive symptoms

**Hypothesis 2.** As psychological symptoms increase; (posttraumatic stress and depressive), the perceived quality of family (spousal and child) relationships will decrease.

Proposed Analysis: Two separate OLS regression models, both controlling for rank and gender

Independent variables: posttraumatic stress symptoms and depressive symptoms

Dependent variables: spousal relationships and parent-child relationships

**Hypothesis 3.** The relationship between key deployment stressors (frequency and length) and perceived family relationships is moderated by perception of social support.

Proposed Analysis: Four separate logistic regression models controlling for rank and gender.

Independent variables: First model: an interaction variable that is created from length of deployment and social support.

Dependent variable: spousal relationships (re-create exact model with a substitution of parent-child relationships for the dependent variable).

Second model: an interaction variable that is created from frequency of deployment and social support

Dependent variable: Spousal relationships (re-create exact model with a substitution of parent-child relationships for the dependent variable).

**Hypothesis 4.** The relationship between key deployment stressors (frequency and length) and perceived quality of family (spouse and child) relationships is mediated by the presence of psychological symptoms, i.e., posttraumatic stress and depressive symptoms.

Proposed Analysis: Four separate logistic regression models controlling for rank and gender.

First model

Independent variables: Frequency of deployment, length of deployment posttraumatic stress symptoms (mediator)

Dependent variable: spousal relationships

Second model:

Independent variables: Frequency of deployment, length of deployment, depressive symptoms (mediator)

Dependent variable: spousal relationships

Third model:

Independent variables: Frequency of deployment, length of deployment posttraumatic stress symptoms (mediator)

Dependent variable: child relationships

Fourth model:

Independent variables: Frequency of deployment, length of deployment, depressive symptoms (mediator)

Dependent variable: child relationships

Classic Baron and Kenny (1986) steps to mediation will be utilized for the hypothesis four listed above. These four steps are outlined as a summary:

Step 1: Show that the initial variable is correlated with the outcome. Use Y (family relationships) as the criterion variable in a regression equation and X as a predictor (deployment stressors) (estimate and test path c, which is psychological symptoms). This step establishes that there is an effect that may be mediated.

Step 2: Show that the initial variable is correlated with the mediator. Use M as the criterion variable (psychological symptoms) in the regression equation and X as a predictor (deployment stressors) (estimate and test path a). This step involves treating the mediator as if it were an outcome variable.

Step 3: Show that the mediator affects the outcome variable. Use Y (family relationship) as the criterion variable in a regression equation and X and M as predictors (psychological well-being factors) (estimate and test path b).

Step 4: To establish that M (psychological factors) completely mediates the X–Y (deployment stressors and family relationships) relationship, the effect of X (deployment stressors) on Y (family relationships) controlling for M (psychological factors; Path C) should be zero. According to Baron and Kenny (1996), “the effects in both Steps 3 and 4 are estimated in the same equation.” (p. 1173). The last step does not always have to be met at ‘zero’ in which case we may have a situation of partial mediation (Dattalo, in press).

## **Conclusion**

Gaining access to the AFCA dataset provides a unique opportunity to investigate the risk (psychological well-being) and protective factors (social support) associated with deployment and their impact on families within a currently serving active duty population. Few researchers

have such an opportunity to undertake close examination of a military population during an on-going conflict. The timely nature of this research proposal will inform policy and practice professionals across a wide range of programmatic areas from mental health, to family support to quality of life to issues of relevance for Air Force leaders.

## **Chapter 4. Results**

The purpose of this research was to understand the risk and protective factors associated with active duty military, specifically USAF deployments and how these factors impact family relationships. The risk and protective factors that were focused on for this study involved two key deployment stressors, length and frequency of deployment as well as other important variables such as age and social support. This study used the 2008 Air Force Community Assessment data, a secondary data set to examine four overarching hypothesis:

Hypothesis 1: As the length and frequency of deployment increases, there will be an increase in psychological symptoms, i.e., posttraumatic stress and depressive symptoms.

Hypothesis 2: as psychological symptoms increase; (posttraumatic stress and depressive), the perceived quality of family (spousal and child) relationships will decrease.

Hypothesis 3: the relationship between key deployment stressors (frequency and length) and perceived family relationships is moderated by perception of social support.

Hypothesis 4: the relationship between key deployment stressors (frequency and length) and perceived quality of family (spouse and child) relationships is mediated by the presence of psychological symptoms, i.e., posttraumatic stress and depressive symptoms.

This chapter provides a detailed description of the results of these hypotheses. The chapter is divided into several sections, the first section provides a description of the sample characteristics, and the second section provides an overview of the data pre-screening procedures and variables involved in each of these hypotheses. The third section provides the results of each

hypothesis and the chapter ends with a summary of the most important findings stemming from the research questions.

### **Descriptive Demographic Analysis**

An important first step in gaining an understanding of the data was performing descriptive analysis on all of the variables under examination, as well as several other variables of interest across key demographic areas of the sample. The sample gender demographics of 78% male and 22% female closely reflects the total Air Force population of 80% male and 19.4% women. With regard to age, 4% of the sample was between 18 and 20, and 29% between 21-25 and 39% were between 26 and 35 and 3% was between 46 and 55 years. A total of 33% of the sample fell within the demographic ages identified by the literature to be determined most 'at-risk' for developing posttraumatic stress symptoms or other relevant mental health issues after deployment (Tanielian, T., & Jaycox, L. (2008). Age is often viewed as a proxy for rank, thus airmen that fall within the ages of 18-24 typically fall within the ranks of E1-E4. This study focuses on age as a control variable but draws inferences toward rank, as the constructs can be associated. Data available from the Air Force Personnel Center provides comparison demographic data to the AFCA data examined for this study. According to the Air Force Personnel data, the average age of enlisted airmen is 29 years old, whereas the average age of an officer is 35 years old. Of the total Air Force population, 38.9% are below the age of 26. Also, looking at the population at large, 45.2% of enlisted airmen are below the age of 26 and 13% of officers are below the age of 26. Although pay grade was not a variable under examination for this study, it is discussed here because it is sometimes conceptualized as a proxy for age. At the time of the data collection, 31.6% of the sample were at pay grades between E-1 to E-4, 37.3%

were E-5 to E-6, and 11.3% are E-7-E9, 11.5% of the respondents were O1-O-3 and, finally 8.3% were O-4 or higher.

As this study sought to examine issues related to family relationships, specifically, spousal and parent-child relationships, the participants were asked several questions regarding these relationships. Approximately one-third (35%) of the sample reported that they were currently engaged or in a serious relationship with someone. Sixty-four percent of the sample population was married (compared to the total Air Force, 59% are married). Nine percent of the sample were either divorced or legally separated. Ten percent of the sample reported living as a blended family. Comparatively, available demographics on the total Air Force report that active duty airmen support 449,153 family members with 352,881 family members residing in the household with the airmen. AFCA data also reveals that 7% of the sample has a family member living with them with special needs; typically, (5 percent) a special needs child (n=13,921).

Two primary factors that stem from deployment served as important constructs for this study: deployment length and deployment frequency. Regarding their deployment length (since September 11, 2001), 54% of the total sample had been deployed greater than 30 days, 23.2% between 30 days and 6 months, 16.7% between 7 and 12 months and 14% more than 13 months. Further analysis of these variables found that slightly less than one-third of the sample had in fact deployed during the past twenty four months. Of this group, (29.8% - according to the survey data, collected between April and July 2008), 36.3% were deployed in support of OIF contingencies and 36% were in support of OEF contingencies.

As ‘frequency of deployment’, particularly frequency of ‘repeat’ deployment has been cited as a hallmark of the current OIF and OEF contingencies, the participants were asked to report the frequency with which they had been deployed for OIF and OEF and “other”

deployments for more than 30 days. Of the deployments that were greater than 30 days, respondents provided the total number of OIF, OEF and ‘Other’ deployments. In response, 1.3% reported having been deployed twice, 19.9% three times, 14.8%, four times. And 7.9% five or more times, resulting in a mean frequency of four deployments with a standard deviation of 2.16. Tables 2 and 3 display the number and percentage of the participants that fell within each of the variables.

### **Prescreening and Data Assumptions**

Prior to testing the identified hypotheses, a series of prescreening procedures were conducted to assess these data for the assumptions of ordinary least squares (OLS) regression. A first step in pre-screening process typically involves missing data analysis. This step was not necessary because the research consultants who collected and prepared the data for analysis accounted for missing data by performing multiple imputation. The multiple imputation process underwent for this study is explained in more detail in chapter three. The consultants performed multiple imputation based on the following assumptions:

1. The data in the datasets are missing at random.
2. The datasets comprise continuous, binary, count, or mixed (semi-continuous) variables and categorical variable types.
3. Imputations are obtained by fitting a sequence of regression models and drawing values from the corresponding predictive distributions.
4. The types of regression used are linear, logistic, Poisson, generalized logistic, or a mixture thereof, depending on the type of imputed variable.



Table 2

*Numbers and Percentages of Airmen Within Each Category*

Category	<i>N</i>	Percentage
Total (not-weighted)	56,137	100
Age		
18 – 20	2430	4.3
21 – 25	13155	23.4
26 – 35	22074	39.3
36 – 45	16119	28.7
46 – 55	2256	4.0
Over 55	103	.2
Gender		
Male	38404	68.4
Female	17733	31.6
Marital status		
Married to active duty military member	8099	14.4
Married to reserve military member	765	1.4
Married to civilian	28598	50.9
Single/never married	11659	20.8
Single/Living with Significant Other	1531	2.7
Legal separated or filed for divorce	1060	1.9
Divorced or widowed	4425	7.9
Deployment variables		
Length of deployment		
30 days to 6 months	12809	16.7
7 – 12 months	9354	16.7
13 – 18 months	4467	8.0
19 – 24 months	1889	3.4
Greater than 24 months	1475	2.6
Since September 11, 2001 have you deployed greater than 30 days?		
Yes	29994	53.4
No	26143	46.6

Table 3

*Additional Descriptive Statistics*

Category	<i>N</i>	<i>M</i>	<i>SD</i>	Range
Frequency of deployment (greater than 30 days)				
In support of OIF	29994	2.00	1.010	5
In support of OEF	29994	1.99	1.030	5
In support of “Other”	29994	1.52	.948	5
Age	56137	3.05	.932	5

The ICF researchers, who collected the data and prepared it for analysis, also weighted the data. The weighting process is described in more detail in chapter three. Ultimately, the goal of weighting the data was to allow the results to be applicable to each Air Force base.

The survey tool was administered in such a way that it involved ‘skip patterns’ whereby if questions didn’t apply to certain population groups, they were not directed to those questions (e.g. those that reported they did not have children, did not answer the parent-child questions). Additional pre-screening procedures were conducted; an examination of outliers (box plots), linearity (scatter plots), multicollinearity (variance inflation factor and correlation matrix of IV’s), and normality (normality plots).

The assumption of linearity between the independent and dependent variables was examined by creating bivariate scatter plots in which the standardized predicted scores were plotted against the standardized residuals. No evidence of curvilinear patterns was suggested by the aforementioned bivariate scatter plots. As both displayed no curvilinear patterns, a linear relationship could be assumed. The assumption of homoscedasticity (whether the variability in scores for one variable is equal at all values of another variable) was also investigated by

examining the aforementioned scatter plots for each regression model. There was no evidence of severe heteroskedasticity. A visual inspection of all of the scatter plots depicted mild to moderate levels of heteroskedasticity across all regressions. Typically, the heteroskedasticity assumption should be met conducting OLS regression. However, Fox (1997) noted, "unequal error variance is worth correcting only when the problem is severe" (p. 306). The scatter plots examined in the regressions performed in Hypothesis 1 and 4 pointed toward mild heteroskedasticity. There were two regressions that resulted in moderate heteroskedasticity: the first regression performed in Hypothesis 2, examining the impact of posttraumatic stress and depressive symptoms on spousal relationships, and Hypothesis 3 regression 1, examining how social support moderates the relationship between length of deployment and spousal relationships. Appendix A provides a graphic view of all scatter plots examined in this study.

Multicollinearity was examined by conducting a number of tests; the tolerance, VIF, and bivariate correlations of the variables. Ultimately, the independent and control variables in the regression models met the assumptions of a tolerance measure greater than .20 and a VIF less than 4.0, for example, the tolerance for deployment frequency was .604 and the VIF was 1.656, Deployment length had a tolerance of .601 and a VIF of 1.664, the age variable had a tolerance of .982 and a VIF of 1.01 and gender had a tolerance of .982 and a VIF of 1.01. With regard to the psychological well being measures, posttraumatic stress symptoms had a tolerance of .769 and a VIF of 1.30, and depressive symptoms had a tolerance of .766 and a VIF of 1.30. The bivariate correlations also produced correlation scores that were low enough to determinate that multicollinearity was not an issue. The highest correlation score was with posttraumatic stress and depressive symptomology (both used in this study as independent variables), which produced a correlation of .48, this indicating that multicollinearity was not an issue.

To assess the reliability of the individual measures, the Cronbach's alpha of each was calculated. As shown in Table 4, the Cronbach's alpha coefficients of all the measures were satisfactory and within the expected bounds with only one exception. The parent-child measure is slightly lower than the expected range.

Table 4

*Cronbach's Alpha of Each Measure*

Measure	Total number of items	Cronbach's alpha
Posttraumatic stress symptomology	4	.786
Depressive symptomology	7	.842
Parent-child relationship	3	.693
Spousal relationship	4	.945
Social support	11	.923

## Hypothesis 1

Hypothesis 1 posited that as the length and frequency of deployment increases, the incidence of psychological symptomology, i.e. posttraumatic stress symptomology and depressive symptomology, also increases, controlling for age and gender. To determine length of deployment, the participants were asked, "Since September 11, 2001, have you been deployed greater than 30 days?" Those who answered in the positive direction were then asked, "Of those deployments, how many were in support of OIF, OEF, and "other" operations?" to which they responded by choosing an answer between *1 deployment* and *5+deployments*. To determine length of deployment, the participants were asked, "Adding up all of your deployments, what is

the total amount of time that you have been deployed since September 11, 2001?”, to which they responded by choosing among *30 days to 6 months*, *7 to 12 months*, *13 to 18 months*, *19 to 24 months*, and *greater than 24 months*. This construct measures the total time an airmen has been deployed since September 11, 2001, rather than the length of any one singular deployment.

Posttraumatic stress symptomology was measured by asking the participants to respond to the following item and then summing their answers to each of the four sub-items contained within it: Have you ever had any experience that was so frightening, horrible or upsetting in the past month that you (a) have had nightmares about it or thought about it when you did not want to;(b) tried hard not to think about it or went out of your way to avoid situations that reminded you of it;(c) were constantly on guard, watchful, or easily startled; and/or(d) felt numb or detached from others, activities, or your surroundings? The participants responded to each sub-item by answering either *yes*, coded as 1, or *no*, coded as 0,and the sub-item scores were subsequently summed to obtain a total score.

Depressive symptomology was measured through the use of the CES-D, an a brief inventory of a well established depression scale. by asking the participants to respond to the following item and then summing their answers to each of the seven sub-items contained within it: How many days during the past 7 days have you (a) felt that you couldn’t get going, (b) felt sad, (c) had trouble getting to or staying asleep, (d) felt that everything was an effort, (e) felt lonely, (f) felt you couldn’t shake the blues, and/or (g) had trouble keeping your mind on what you were doing? The participants selected an answer of (a) 0, (b) 1 to 2 days, (c) 3 to 4 days, or (d) 5 to 7 days for each sub-item, and the sub-item scores were subsequently summed to obtain a total score.

To determine and subsequently control for age, the participants were asked, “In which age category do you belong?” to which they responded by selecting (a) 18 to 20, (b) 21 to 25, (c) 26 to 35, (d) 36 to 45, (e) 46 to 55 and (f) over 55. The variable of age was treated as an interval level variable throughout this analysis.

**Regression 1.** Hypothesis 1 was tested by performing two multiple regressions using length and frequency of deployment as predictor variables while controlling for the variables of age and gender. After Pearson correlation coefficients were calculated for all pairs of variables, the first regression was performed to predict posttraumatic stress symptomology and the second to predict depressive symptomology. Table 5 displays the correlations between the independent and dependent variables, which were significant at  $p < .001$ . The correlations between the independent and dependent variables are small in magnitude, suggesting that the independent variables have little effect on the dependent variables. For example, the correlation between posttraumatic stress symptomology and length of deployment was  $r = .06$ , and the correlation between posttraumatic stress symptomology and frequency of deployment was  $r = .02$ . Both of these correlations are in the hypothesized direction, but are small in magnitude.

Likewise, both the correlation between depressive symptomology and length of deployment and the correlation between depressive symptomology and frequency of deployment were  $r = .03$ , and  $r = .63$  was found between frequency and length of deployment, respectively. The correlation between posttraumatic stress symptomology and depressive symptomology was ( $r = .48$ )

When the data were analyzed using multiple regression (frequency and length of deployment as the predictor variables and age and gender as the control variables), the overall model was significant,  $F(4, 149846) = 238.52, p < .001$ . The amount of variance in

Table 5

*Pearson Correlations for variables Examined in Hypothesis 1*

	Posttraumatic stress symptomology	Depressive symptomology	Deployment Length	Deployment frequency	Age
Posttraumatic stress Symptomology	--				
Depressive Symptomology	.48***	--			
Deployment length	.06***	.03***	--		
Deployment frequency	.02***	.03***	.63***	--	
Age	-.06***	-.09***	.12***	.12***	--
Gender	.05***	.06***	-.13***	-.11***	.07***

*Note.* Pair wise deletion was applied; thus, sample sizes ranged from 149,851 to 277,674. Gender was coded as 1 = male and 2 = female such that positive correlations indicate higher scores for females and negative correlations indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

posttraumatic stress symptomology explained by the identified predictors was .6%. As shown in Table 6, although all predictors—length of deployment, frequency of deployment, age, and gender—were significant, the standardized regression coefficients—length of deployment (Beta=.075) and frequency of deployment (Beta =.014)—were small. Despite this level of variance, the results support Hypothesis 1 because they indicate that posttraumatic stress symptomology is significantly and positively predicted by length and frequency of deployment when controlling for age and gender. One possible reason for the low level of variance explained by this model is that posttraumatic stress symptomology was measured using four

Table 6

*Results of Regression 1: Predicting posttraumatic stress from the independent variables of length and frequency of deployment, controlling for age and gender (N=149,851)*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Deployment length	0.054	0.002	.075***	.006
Deployment frequency	-0.005	0.001	-.014***	
Age	-0.032	0.003	-.031***	
Gender	0.094	0.006	.043***	

*Note.* The overall model was significant,  $F(4, 149846) = 238.52, p < .001$ . The constant for the model was 0.200. Gender was coded as 1 = male and 2 = female such that positive regression coefficients indicate higher posttraumatic stress scores for females and negative correlations indicate higher posttraumatic stress scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

items, a number that may have been insufficient to capture the full extent of posttraumatic stress symptomology.

**Regression 2.** The same procedures were utilized to determine whether depressive symptomology could be predicted by length and frequency of deployment while controlling for age and gender. The variable of depressive symptomology was regressed on the two predictor variables (length and frequency of deployment) using the two control variables (age and gender). Although the overall model was found to be significant,  $F(4, 149846) = 205.07, p < .001$ , the amount of variance in depressive symptomology explained by the predictors was .5%, as shown in Table 7. Although all four predictors were found to be significant, the standardized regression coefficients—deployment (Beta = .034) and deployment frequency (Beta = .018) were small.



Table 7

*Results of Regression 2: Predicting depressive symptoms from the independent variables of length and frequency of deployment, controlling for age and gender (N=149,851)*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Deployment length	0.110	0.011	.034***	.005
Deployment frequency	0.030	0.006	.018***	
Age	-0.186	0.012	-.041***	
Gender	0.489	0.025	.050***	

*Note.* The overall model was found to be significant,  $F(4, 149846) = 205.07, p < .001$ . The constant for the model was 9.64. Gender was coded as 1 = male and 2 = female such that positive regression coefficients indicate higher depressive symptomology scores for females and negative correlations indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

These results provide support for Hypothesis 1 is supported in that depressive symptomology is significantly and positively predicted by both the length and frequency of deployment when controlling for age and gender, although the magnitude of the predictions is small. One explanation for the small level of variance explained by this model is that although seven items were used to measure depressive symptomology, participants were asked about depressive symptomology within only the past 7 days, thus capturing only one very brief period in their lives.

## **Hypothesis 2**

**Regression 1.** Hypothesis 2 posited that as psychological symptomology (posttraumatic stress and depressive symptomology) increases, the perceived quality of family (spousal and

parent-child) relationships decreases, controlling for age and gender. The same measures of posttraumatic stress and depressive symptomology and the same age and gender variables that had been used to test Hypothesis 1 were used to test Hypothesis 2. The variable of spousal relationship variable was measured by asking the participants to respond to four items. To respond to the first item, which asked, "Please indicate the degree of happiness, all things considered, of your relationship," the participants used a seven-point likert-type scale that ranged from 0 (*extremely unhappy*) to 7 (*could not possibly be any happier*). To respond to the second, third, and fourth items, which asked, "I have a warm and comfortable relationship with my partner," "How rewarding is your relationship with your partner?", and "In general, how satisfied are you with your relationship," respectively, the participants used a likert-type scale that ranged from 0 (*not at all*) to 6 (*absolutely and completely true*). The Cronbach's alpha for this set of questions was .945.

The variable representing parent-child relationship was measured by asking the participants to respond to three items. To respond to the first item, which asked, "All things considered, how much of the time is being a parent to your children an enjoyable experience?", the participants used a six-point likert-type scale that ranged from 0 (*almost never*) to 6 (*almost always*). To respond to the second item, which asked, "All things considered, how satisfied are you with your relationship with your children?", they used a six-point likert-type scale that ranged from 0 (*very dissatisfied*) to 6 (*very satisfied*). To respond to the third item, which asked, "Children are sometimes described as difficult or easy to raise. How would you describe raising your children during the past 12 months?," they used a six-point likert-type scale that ranged from 0 (*very difficult*) to 6 (*very easy*). The Cronbach's Alpha for this set of questions was .69.

Hypothesis 2 was tested by performing two regressions using posttraumatic stress symptomology and depressive symptomology as predictor variables. The first regression was performed to predict spousal relationships and the second to predict parent-child relationships, with both regressions controlling for age and gender. As a preliminary step, Pearson correlations were computed between all pairs of variables, which are shown in Table 8.

Table 8

*Pearson Correlations for Variables Examined in Hypothesis 2*

	Posttraumatic stress symptomology	Depressive	Spousal relation- ship	Parent- child relationship	Age	Gender
Posttraumatic stress Symptomology	--	.48***	-.13***	-.12***	-.06***	-.05***
Depressive symptomology	.48***	--	-.25***	-.23***	-.08***	-.06***
Spousal relationship	-.13***	-.25***	--	.26***	.01***	.01***
Parent-child relationship	-.12***	-.23***		--		
Age	-.06***	-.09***	-.06***	-.04***	--	-.11***
Gender	.52***	.06***	.02***	-.07***	-.11***	--

*Note.* Pairwise deletion was applied; thus, sample sizes ranged from 127,922 to 277,674. Gender was coded as 1 = male and 2 = female such that positive correlations indicate higher scores for females and negative correlations indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

All the correlations were significant at  $p < .001$ . However, the correlations between the independent variables (posttraumatic stress and depressive symptomology) and the dependent variables were appropriately in the negative direction, providing initial support for Hypothesis 2. For example, the correlation between posttraumatic stress symptomology and spousal relationship was  $-.13$  and between posttraumatic stress symptomology and parent-child relationship was  $-.12$ . And between depressive symptomology and spousal relationship correlation was  $-.25$ , and between depressive symptomology and parent-child relationship it was  $-.23$ .

To determine whether spousal relationships could be predicted by posttraumatic stress and depressive symptomology while controlling for age and gender, the variable of spousal relationships was regressed on the two predictor and the two control variables. The model was significant,  $F(4, 218104) = 2187.032$ ,  $p < .001$ , and explained 7.2 % of the variance in spousal relationships. The standardized regression coefficients were  $-.015$  for posttraumatic stress symptomology and  $-.225$  for depressive symptomology, as shown in Table 9.

**Regression 2.** To determine whether parent-child relationship could be predicted by posttraumatic stress and depressive symptomology while controlling for age and gender, the variable of parent-child relationship was regressed on the two predictor and two control variables. The model was significant,  $F(4, 135,584) = 2187.03$ ,  $p < .001$ , and to explain 9.7 % of the variance in the variable of parent-child relationship. Table 10 displays the regression coefficients. The standardized regression coefficients for posttraumatic stress symptomology and depressive symptomology were  $-.025$  and  $-.226$  respectively. The regression results provide support for Hypothesis 2 by showing that as psychological symptomology (posttraumatic stress

Table 9

*Results of Regression 1: Predicting the perceived quality of spousal relationships from the independent variables of psychological symptomology (posttraumatic stress and depressive symptomology), controlling for age and gender N = 218,109*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Posttraumatic stress symptomology	-0.110	0.017	-.015***	.072
Depressive symptomology	-0.407	0.004	-.255***	
Age	0.532	0.014	-.082***	
Gender	0.489	0.030	.026	

*Note.* The overall model was significant,  $F(4, 218104) = 4252.59$ ,  $p < .001$ . The constant for the model was 27.54. Gender was coded as 1 = male and 2 = female such that positive regression coefficients indicate higher depressive symptomology scores for females and negative correlations indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

and depressive symptomology) increases, the perceived quality of family (spousal and child) relationships decreases, controlling for age and gender.

### Hypothesis 3

**Regression 1.** Hypothesis 3 posited that the relationship between key deployment stressors (frequency and length) and perceived quality of family (spousal and parent-child) relationships is moderated by the perception of social support, controlling for age and gender. Hypothesis 3 was tested by performing four multiple regressions using length and frequency of deployment and social support as predictor variables. The first two regressions were performed

Table 10

*Results of Regression 2: Predicting parent-child relationships from the independent variables of psychological symptomology (posttraumatic stress and depressive symptomology), controlling for age and gender N=127,922*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Posttraumatic stress symptomology	-0.075	0.009	-.026***	.061
Depressive symptomology	-0.190	0.002	-.295***	
Age	-0.205	0.008	-.045***	
Gender	0.263	0.016	.069	

*Note.* The overall model was significant,  $F(4, 127922) = 3455.3, p < .001$ . Gender was coded as 1 = male and 2 = female such that positive regression coefficients indicate higher depressive symptomology scores for females and negative correlations indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

to predict spousal relationships and the second two to predict parent-child relationships controlling for age and gender, and computing interactions (product term) between length of deployment and social support or frequency of deployment and social support (product of both). As a preliminary step, Pearson correlations were computed between all pairs of variables examined in the testing of Hypothesis 3, which are shown in Table 11. All correlations were significant at  $p < .001$  except for the correlation between social support and deployment frequency, which was not significant. To determine whether the relationship between deployment length and perceived family (spousal and parent-child) relationships were moderated by the subject's perception of social support, the variable of spousal relationship was regressed on the variables of (a) deployment length, (b) deployment frequency, (c) social support, (d) the

Table 11

*Pearson Correlations for Variables Examined in Hypothesis 3*

	Spousal	Parent-Child	Deployment length	Deployment frequency	Social support	Age
Spousal relationship	--					
Parent-child relationship	.26***	--				
Deployment length	-.03***	.02***	--			
Deployment frequency	-.04***	.04***	.63***	--		
Social support	.14***	.13***	-.02***	.00	--	
Age	-.06***	.04***	.12***	.12***	.10***	--
Gender	.02***	.05***	-.13***	-.11***	-.02***	-.07***

*Note.* Pairwise deletion was applied; thus, sample sizes ranged from 82,355 to 277,674. Gender was coded as 0 = male and 1 = female such that positive correlations indicate higher scores for females and negative correlations indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

interaction between deployment length and social support, (e) age, and (f) gender. As specified by Aiken and West (1991), all continuous variables were mean centered before being used in the regression and before the interaction term was computed. The process of mean centering, involves converting each score “to deviation scores so that each variable has a mean of zero” (Tabachnick and Fidell, p.157), thus decreasing the likelihood of multicollinearity. Gender was coded as 0 = male and 1 = female.

The overall model was significant,  $F(6, 121744) = 478.63, p < .001$ , and the amount of variance in spousal relationship explained by the predictors was 2.30%. Table 12 displays the

Table 12

*Results of Regression 1: Examining the relationship between deployment length and perceived spousal relationships, moderated by the perception of social support, controlling for age and gender N = 121,751*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Deployment length	-0.009	0.019	-.002	.023
Deployment frequency	-0.094	0.010	-.035***	
Social support	0.070	0.001	.145***	
Support × length	-0.004	0.001	-.009***	
Age	-0.380	0.021	-.051***	
Gender	-0.040	0.046	-.003	

*Note.* The overall model was significant,  $F(6, 121744) = 478.63, p < .001$ . The constant for the model was 22.15. Gender was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher spousal support scores for females and negative correlations indicate higher scores for males. All other predictors were mean centered.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

regression coefficients. The interaction term created by social support and deployment length was significant (Beta = -.009,  $p \leq .001$ ), the results of the first regression provide support for Hypothesis 3 by supporting social support as a moderator of the relationship between deployment length and spousal relationship, although the magnitude of the predictor is small.

**Regression 2.** To determine whether the relationship between deployment frequency and perceived spousal relationship is moderated by perception of social support, the variable of



spousal relationship was regressed on (a) deployment length, (b) deployment frequency, (c) social support, (d) the interaction between deployment frequency and social support, (e) age, and (f) gender. As specified by Aiken and West (1991), all variables were mean centered before being used in the regression and before creating the interaction term. Gender was coded as 0 = male and 1 = female.

The overall model was significant,  $F(6, 121744) = 479.06, p < .001$ , the amount of variance in spousal relationship explained by the predictors was 2.30%. Table 13 displays the regression coefficients. The interaction term created by social support and deployment frequency was significant (Beta = .010,  $p < .001$ ). The results of this regression provide support that social support is a moderator of the relationship between deployment frequency and spousal relationship, although the magnitude of the predictor is extremely small.

**Regression 3.** To determine whether the relationship between key deployment length and perceived parent-child relationships is moderated by perception of social support, the variable of parent-child relationship was regressed on (a) deployment length, (b) deployment frequency, (c) social support, (d) the interaction between deployment length and social support, (e) age, and (f) gender. As specified by Aiken and West (1991), all continuous variables were mean centered before being used in the regression and before computing the interaction term. Gender was coded as 0 = male and 1 = female.

Although the overall model was significant,  $F(6, 82348) = 319.80, p < .001$ , the amount of variance in parent-child relationship explained by the predictors was 2.30%. Table 14 displays the regression coefficients. Because the interaction between social support and deployment length was significant (Beta = .010,  $p = .01$ ), the results of Regression 3 show that social

Table 13

*Results of Regression 2: Examining the relationship between deployment frequency and perceived spousal relationships, moderated by the perception of social support, controlling for age and gender N=121,751*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Deployment length	-0.006	0.018	-.001	.023
Deployment frequency	-0.092	0.019	-.034***	
Social Support	0.070	0.010	.144***	
Social support × frequency	.002	.001	.010***	
Age	-0.378	0.021	-.051***	
Gender	-0.410	0.046	-.003	

*Note.* The overall model was significant,  $F(6, 121744) = 479.06$ ,  $p < .001$ . The constant for the model was 21.15. Gender was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher spousal support scores for females and negative correlations indicate higher scores for males. All other predictors were mean centered.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

support is a moderator of the relationship between deployment length and parent-child relationship, although the magnitude of the predictor is small.

#### **Regression 4**

To determine whether the relationship between deployment frequency and perceived parent-child relationship is moderated by perception of social support, the variable of parent-child relationship was regressed on the variables of (a) deployment length, (b) deployment frequency, (c) social support, (d) the interaction between deployment frequency and social

Table 14

*Results of Regression 3: Examining the relationship between deployment frequency and parent-child relationships, moderated by the perception of social support, controlling for age and gender N=82,355*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Deployment length	0.014	0.009	0.007	.023
Deployment frequency	-0.032	0.005	-.031***	
Social support	0.026	0.001	.136***	
Support × length	0.002	0.001	.010*	
Age	-0.169	0.011	-.054***	
Gender	0.295	0.022	.047***	

*Note.* The overall model was significant,  $F(6, 82348) = 319.80, p < .001$ . The constant for the model was 15.35. Gender was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher spousal support scores for females and negative correlations indicate higher scores for males. All other predictors were mean centered.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

support, (e) age, and (f) gender. Again, all variables were mean centered before being used in the regression and before computing the interaction term. Gender was coded as 0 = male and 1 = female.

Although the overall model was significant,  $F(6, 82348) = 324.485, p < .001$ , the amount of variance in the perceived parent-child relationships explained by the predictors was 2.30%.

Table 15 displays the regression coefficients. Because the interaction between social support and deployment length was significant (Beta = .021,  $p \leq .001$ ), the regression results provide support

Table 15

*Results of Regression 4: Examining the relationship between deployment length and parent-child relationships, moderated by the perception of social support, controlling for age and gender N= 82,355*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Deployment length	0.015	0.009	0.007	.023
Deployment frequency	-0.032	0.005	-.031***	
Social support	0.026	0.001	.136***	
Support × frequency	0.002	0.000	.021***	
Age	-0.168	0.011	-.054***	
Gender	0.296	0.022	.047***	

*Note.* The overall model was significant,  $F(6, 82348) = 324.485$ ,  $p < .001$ . The constant for the model was 15.35. Gender was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher spousal support scores for females and negative correlations indicate higher scores for males. All other predictors were mean centered.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

that social support is a moderator of the relationship between deployment frequency and parent-child relationship, although the magnitude of the predictor is extremely small.

In summary, the results of all four regressions support Hypothesis 3 in the hypothesized direction. The four regression results support that the following factors explain the same percentage (2.3%) of variance: (a) length of deployment as moderated by social support and regressed on both parent-child and spousal relationship, (b) length of deployment moderated by social support and regressed on both parent-child and spousal relationship.

## Hypothesis 4

Hypothesis 4 proposed that the relationship between key deployment factors (frequency and length) and perceived quality of family (spouse and parent-child) relationships is mediated by the presence of psychological symptomology (posttraumatic stress and depressive symptomology) controlling for age and gender. Hypothesis 4 was tested by computing the following eight tests of mediation.

Mediation 1: X = deployment length, M = posttraumatic stress symptomology, Y = spousal relationship, controlling for age, gender, and deployment frequency

Mediation 2: X = deployment frequency, M = posttraumatic stress symptomology, Y = spousal relationship, controlling for age, gender, and deployment length

Mediation 3: X = deployment length, M = depressive symptomology, Y = spousal relationship, controlling for age, gender, and deployment frequency

Mediation 4: X = deployment frequency, M = depressive symptomology, Y = spousal relationship, controlling for age, gender, and deployment length

Mediation 5: X = deployment length, M = posttraumatic stress symptomology, Y = parent-child relationship, controlling for age, gender, and deployment frequency

Mediation 6: X = deployment frequency, M = posttraumatic stress symptomology, Y = parent-child relationship, controlling for age, gender, and deployment length

Mediation 7: X = deployment length, M = depressive symptomology, Y = parent-child relationship, controlling for age, gender, and deployment frequency

Mediation 8: X = deployment frequency, M = depressive symptomology, Y = parent-child relationship, controlling for age, gender, and deployment length

As proposed by Baron and Kenny (1986), the following steps were followed to perform each of the eight mediations. These four steps are outlined as a summary:

Step 1: Establish that there is an effect that may be mediated by demonstrating that the initial variable is correlated with the outcome. Use Y (family relationship) as the criterion variable in a regression equation and X (deployment factor) as a predictor.

Finally, estimate and test path c, which is psychological symptomology, i.e. posttraumatic stress and depressive symptomology. This step establishes that there is an effect to be mediated.

Step 2: Demonstrate that the initial variable is correlated with the mediator. Use M as the criterion variable (psychological factor) in the regression equation and X (deployment factor) as a predictor (estimate and test path a). This step requires treating the mediator as if it were an outcome variable.

Step 3: Demonstrate that the mediator affects the outcome variable. Use Y (family relationship) as the criterion variable in a regression equation and X and M (deployment and psychological factors) as predictors (estimate and test path b).

Step 4: Establish that M (psychological factor) mediates the X-Y (deployment-family relationship) relationship. If full mediation exists, the effect of X (deployment factor) on Y (family relationship) controlling for M (psychological factor; path c) should be zero.

According to Baron and Kenny (1996), “The effects in both Steps 3 and 4 are estimated in the same equation” (p. 1173). The last step does not always have to be met at ‘zero’. Partial mediation can occur if this last step does not produce a ‘zero’ (Dattalo, in press).

**Mediation 1.** Mediation 1 examined the effect of deployment length (X) as mediated by posttraumatic stress symptomology (M) on spousal relationship (Y) while controlling for age,

gender, and deployment frequency. In Step 1, spousal relationship was regressed on deployment length, deployment frequency, age, and gender. In Step 2, posttraumatic stress symptomology was regressed on deployment length, deployment frequency, age, and gender. In Steps 3 and 4, spousal relationship was regressed on deployment length, deployment frequency, age, gender, and posttraumatic stress symptomology. The results are presented in Table 16.

The effect of deployment length on spousal relationships or path c is equal to  $-.009$  ( $p < .05$ ), with a 95% confidence interval of  $-.023$  to  $-.015$ . Step one has passed. The effect of length of deployment on posttraumatic stress symptomology, or path a is equal to  $.075$  ( $p < .001$ ), with a 95% confidence interval of  $.050$  to  $.099$ . Step 2 has passed. The effect of deployment length on spousal relationships, path c' is equal to  $.001$  ( $p > .005$ ), with a 95% confidence interval of  $-.034$  to  $.040$ . Step 4 has passed. Thus, the final requirement for mediation was met because introducing posttraumatic stress symptomology as the mediator rendered the effect of deployment length on the spousal relationship insignificant.

Therefore, the results of Mediation 1 support Hypothesis 4 by supporting that posttraumatic stress symptomology accounts for or mediates the relationship between deployment length and spousal relationship. In other words, the results support that increasing length of deployment tends to decrease the quality of the spousal relationship because increasing the length of deployment increases the risk of experiencing posttraumatic stress symptomology, which tends to decrease the quality of the spousal relationship. There is a change in beta of  $-.009$  to  $.001$ . The effect of the mediation moved from  $-.009$  to  $0$ , which is identified as very small, but still present. In the presence of low levels of mediation and a large sample size such as the AFCA, it is not uncommon to conduct further examination of these results. Preacher (2007) offers an on-line tool referred to as a *sobel test* to calculate whether the mediation carries the

Table 16

*Results of Mediations 1 and 2: The effect of deployment length and frequency mediated by posttraumatic stress symptomology on spousal relationship, controlling for age, gender.*

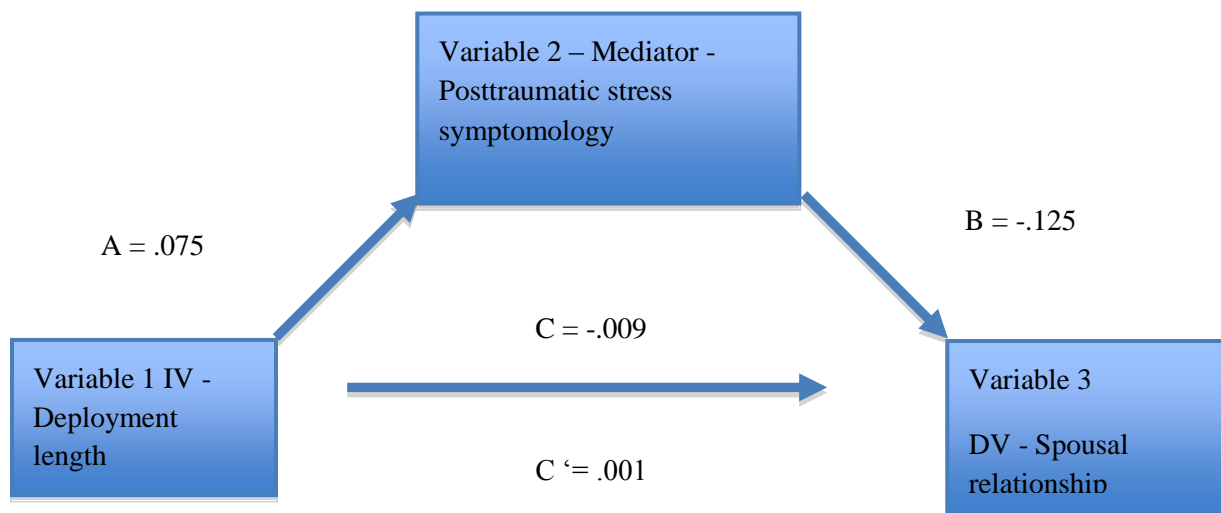
Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Step 1: DV = spousal relationship				
Deployment length	-.047	.019	-.009**	.003
Deployment frequency	-.087	.010	-.033***	
Age	-.217	.021	-.029***	
Gender	-.091	.047	-.006**	
Step 2: DV = Posttraumatic stress symptomology				
Deployment length	.054	.002	.075***	.006
Deployment frequency	-.005	.001	-.014***	
Age	-.032	.003	-.031***	
Gender	.094	.006	.043***	
Steps 3 & 4: DV = spousal relationship				
Deployment length	.003	.019	.001	.018
Deployment frequency	-.089	.010	-.033***	
Age	-.243	.021	-.033***	
Gender	.008	.046	.001	
Posttraumatic stress symptomology	-.918	.021	-.125**	

*Note.* The overall model in Step 1 was significant,  $F(4, 121746) = 79.17, p < .001$ . The constant for the model was 23.36. The overall model in Step 2 was significant,  $F(4, 149846) = 238.52, p < .001$ . The constant for the model was 0.29. The overall model in Steps 3 and 4 was significant,  $F(5, 121745) = 449.08, p < .001$ . The constant for the model was 23.58. Gender in all models was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher DV scores for females and negative coefficients indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$



influence of an independent variable to a dependent variable. This on-line sobel test calculator (<http://www.people.ku.edu/~preacher/sobel/sobel.htm>) was used to further examine the mediation effects set forth by Baron and Kenny (1996). The test involved entering the raw score regression coefficients and standard errors for step 2 (for the independent variable predicting the mediator) and step 3 (for the mediator predicting the dependent variable while controlling for the independent variable) from each of the proposed mediations. The Sobel test provided a z statistic and p-value for determining whether the mediation effect can be considered statistically significant. The sobel test for hypothesis four, mediation one produced a Z statistic of -22.97 and proved to be statistically significant ( $p < .001$ ). Figure 5 provides a pictorial representation of the results.

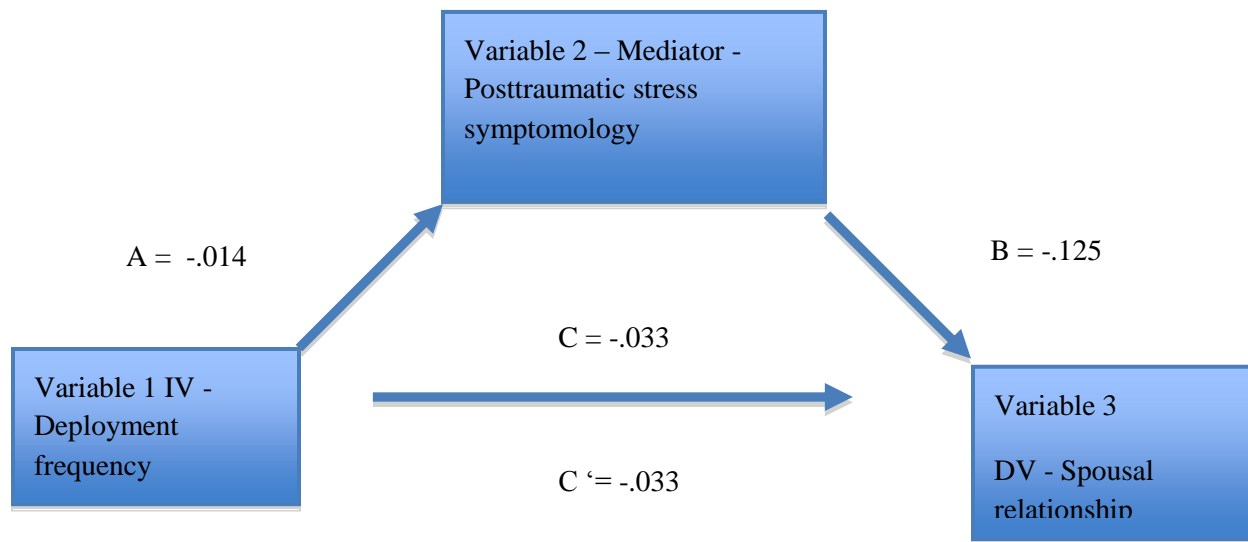


*Figure 5.* Correlations between the variables examined in Mediation 1. A = The standardized beta coefficient of variable 2 regressed on variable 1. B = The standardized beta coefficient of variable 3 (mediator) on variable 2. C = The standardized beta coefficient of variable 3 regressed on variable 1. C' = The standardized beta coefficient of variable 3 regressed on variable 1 controlling for variable 2

**Mediation 2.** Mediation 2 examined the effect of deployment frequency (X) as mediated by posttraumatic stress symptomology (M) on spousal relationship (Y) while controlling for age, gender, and deployment length. In Step 1, spousal relationship was regressed on deployment length, deployment frequency, age, and gender. In Step 2, posttraumatic stress symptomology was regressed on deployment length, deployment frequency, age, and gender. In Steps 3 and 4, spousal relationship was regressed on deployment length, deployment frequency, age, gender, and posttraumatic stress symptomology.

The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment frequency on spousal relationships or path c is equal to  $-.033$  ( $p < .001$ ), with a 95% confidence interval of  $-.106$  to  $-.068$ . Step one has passed. The effect of frequency of deployment on posttraumatic stress symptomology, or path a is equal to  $-.014$  ( $p < .001$ ), with a 95% confidence interval of  $.008$  to  $.003$ . Step 2 has passed. The effect of posttraumatic stress symptoms on spousal relationships or path b is equal to  $-.125$  ( $p < .001$ ), with a 95% confidence interval of  $-.959$  to  $-.877$ . Step 3 has passed. The effect of deployment frequency on spousal relationships (path c') controlling for path b is  $-.033$ ,  $P < .001$ , with a 95% confidence interval of  $-.108$  to  $-.070$ . Step four has not passed. Thus, the final requirement for mediation was not met because introducing posttraumatic stress symptomology as the mediator did not change the effect of deployment frequency on spousal relationship. Therefore, the results of Mediation 2 did not support hypothesis 4. An examination of these results through the sobel test for hypothesis four, mediation two produced a Z statistic of 4.97 and proved to be statistically significant ( $p < .001$ ). Figure 6 provides a pictorial representation of the results.

**Mediation 3.** Mediation 3 examined the effect of deployment length (X) as mediated by depressive symptomology (M) on spousal relationship (Y) while controlling for age, gender, and



*Figure 6.* Correlations between the variables examined in Mediation 2. A = The standardized beta coefficient of variable 2 regressed on variable 1. B = The standardized beta coefficient of variable 3 (mediator) on variable 2. C = The standardized beta coefficient of variable 3 regressed on variable 1. C' = The standardized beta coefficient of variable 3 regressed on variable 1 controlling for variable 2.

deployment frequency. In Step 1, spousal relationship was regressed on deployment length, deployment frequency, age, and gender. In Step 2, depression was regressed on deployment length, deployment frequency, age, and gender. In Steps 3 and 4, spousal relationship was regressed on deployment length, deployment frequency, age, gender, and depression. The results for both Mediations 3 and 4 are presented in Table 17.

The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment length on spousal relationships or path c is equal to  $-.009$  ( $p < .001$ ), with a 95% confidence interval of  $-.084$  to  $-.010$ . Step one has passed. The effect of length of deployment on depressive symptomology, or path a is equal to  $.034$  ( $p < .001$ ), with a 95% confidence interval of  $.089$  to  $.131$ . Step 2 has passed. The effect of depressive symptoms on

Table 17

*Results of Mediations 3 and 4: The effect of deployment length and frequency mediated by depressive symptomology on spousal relationship, controlling for age, gender*

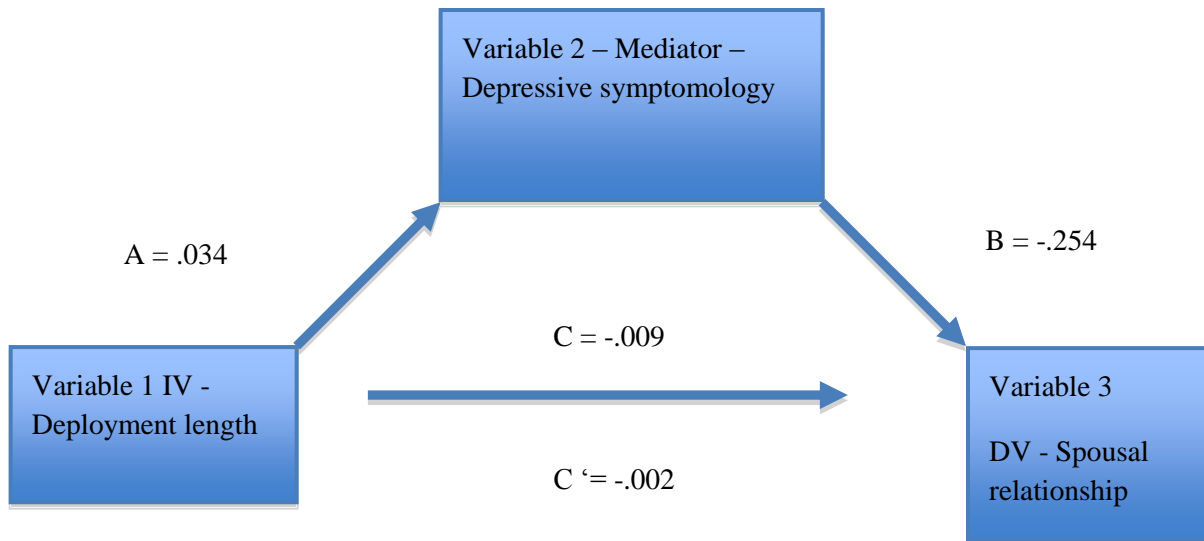
Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Step 1: DV = spousal relationship				
Deployment length	-.047	.019	-.009**	.003
Deployment frequency	-.087	.010	-.033***	
Age	-.217	.021	-.029***	
Gender	-.091	.047	-.006**	
Step 2: DV = depressive symptomology				
Deployment length	.11	.011	.034***	.005
Deployment frequency	.030	.006	.018***	
Age	-.186	.012	-.031***	
Gender	.489	.025	-.041***	
Steps 3 & 4: DV = spousal relationship				
Deployment length	-.009	.018	-.002	.067
Deployment frequency	-.065	.010	-.025***	
Age	-.269	.021	-.036***	
Gender	.146	.045	.009***	
Depressive symptomology	-.424	.005	-.254***	

*Note.* The overall model in Step 1 was significant,  $F(6, 121,744) = 32.72, p < .001$ . The constant for the model was 22.15. The overall model in Step 2 was significant,  $F(4, 121746) = 33.40, p < .001$ . The constant for the model was 0.29. The overall model in Steps 3 and 4 was significant,  $F(5, 121745) = 449.08, p < .001$ . The constant for the model was 23.36. Gender in all models was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher DV scores for females and negative coefficients indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

spousal relationships or path b is equal to  $-.254$  ( $p < .001$ ), with a 95% confidence interval of  $-.433$  to  $-.415$ . Step 3 has passed. The effect of deployment length on spousal relationships (path c') controlling for path b is  $-.002$ ,  $P > .05$  with a 95% confidence interval of  $-.045$  to  $.027$ . Step four has passed. Thus, the final requirement for mediation was met because introducing depressive symptomology as the mediator rendered the effect of deployment length on the spousal relationship insignificant. The sobel test for hypothesis four, mediation three produced a Z statistic of  $-9.93$  and proved to be statistically significant ( $p < .001$ ). A graphic description of mediation 3 is shown in Figure 7.

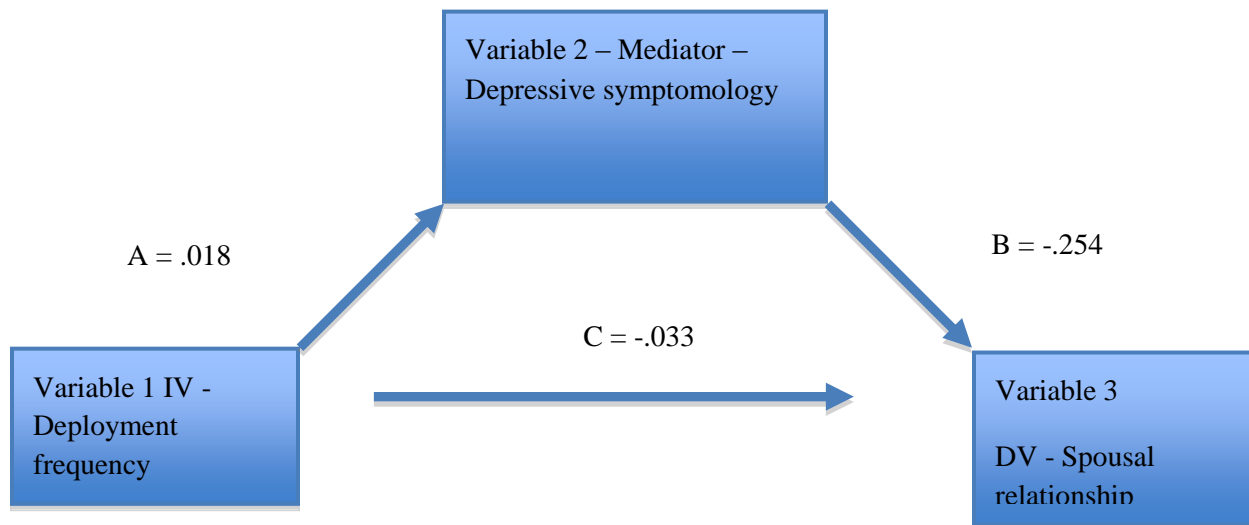
**Mediation 4.** Mediation 4 examined the effect of deployment frequency (X) as mediated by depressive symptomology (M) on spousal relationship (Y) while controlling for age, gender, and deployment length. In Step 1, spousal relationship was regressed on deployment length, deployment frequency, age, and gender. In Step 2, depressive symptomology was regressed on deployment length, deployment frequency, age, and gender. In Steps 3 and 4, spousal relationship was regressed on deployment length, deployment frequency, age, gender, and depressive symptoms. The results are presented in Table 17. The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment frequency on spousal relationships or path c is equal to  $-.033$  ( $p < .001$ ), with a 95% confidence interval of  $-.106$  to  $-.068$ . Step one has passed. The effect of frequency of deployment on depressive symptomology, or path a is equal to  $.018$  ( $p < .001$ ), with a 95% confidence interval of  $.019$  to  $.041$ . Step 2 has passed. The effect of depressive symptoms on spousal relationships or path b is equal to  $-.254$  ( $p < .001$ ), with a 95% confidence interval of  $-.433$  to  $-.415$ . Step 3 has passed. The effect of deployment frequency on spousal relationships (path c') controlling for path b is  $-.025$ ,  $P < .001$ , with a 95% confidence interval of  $-.084$  to  $-.47$ . Step four has not fully passed.



*Figure 7.* Correlations between the variables examined in Mediation 3. A = The standardized beta coefficient of variable 2 regressed on variable 1. B = The standardized beta coefficient of variable 3 (mediator) on variable 2. C = The standardized beta coefficient of variable 3 regressed on variable 1. C' = The standardized beta coefficient of variable 3 regressed on variable 1 controlling for variable 2.

The strength of the relationship between deployment frequency and spousal relationship changed .008 in the presence of depressive symptoms. It might be possible to explain this change in weight in the context of partial mediation because of the low level of the standardized regression coefficient. The sobel test for hypothesis four, mediation four produced a Z statistic of -4.99 and proved to be statistically significant (p.001). Therefore, the results of Mediation 4 support partially Hypothesis 4 with the existence of partial mediation. A graphic depiction of this model is provided in Figure 8.

**Mediation 5.** Mediation 5 examined the effect of deployment length (X) as mediated by posttraumatic stress symptomology (M) on parent-child relationship (Y) while controlling for age, gender, and deployment frequency. In Step 1, parent-child relationship was regressed on deployment length, deployment frequency, age, and gender. In Step 2, posttraumatic stress



*Figure 8.* Correlations between the variables examined in Mediation 4. A = The standardized beta coefficient of variable 2 regressed on variable 1. B = The standardized beta coefficient of variable 3 (mediator) on variable 2. C = The standardized beta coefficient of variable 3 regressed on variable 1. C' = The standardized beta coefficient of variable 3 regressed on variable 1 controlling for variable 2.

symptomology was regressed on deployment length, deployment frequency, age, and gender. In Steps 3 and 4, parent-child relationship was regressed on deployment length, deployment frequency, age, gender, and posttraumatic stress symptomology. The results for Mediations 5 and 6 are presented in Table 18.

The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment length on parent-child relationships or path c is equal to .001 ( $p=.852$ ), with a 95% confidence interval of -.016 to -.019. Step one has not passed. Thus the requirement for the initial variable to be correlated with the outcome in step one was not fulfilled. Because there was no effect to be mediated steps 2, 3, and 4 were not performed and it was concluded that mediation 5 did not support hypothesis 4. A graphic depiction of this model is provided in Figure 9.

Table 18

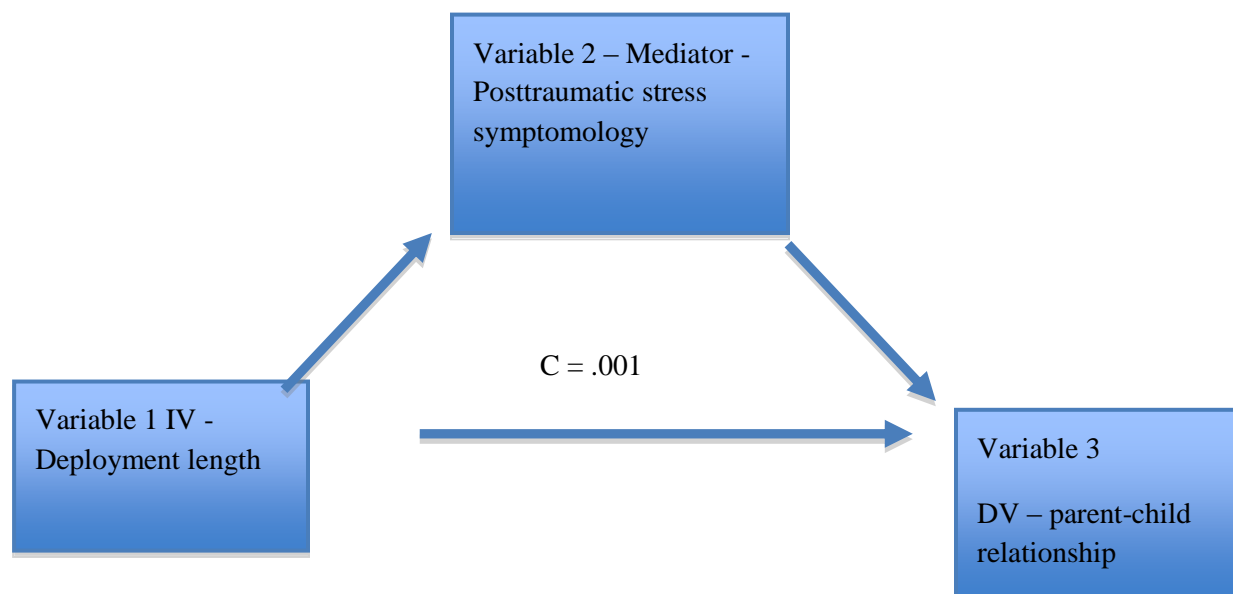
*Results of Mediations 5 and 6: The effect of deployment length and frequency mediated by posttraumatic stress symptomology on parent-child relationship, controlling for age, gender*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Step 1: DV = parent-child relationship				
Deployment length	.002	.009	.001	.004
Deployment frequency	-.030	.005	-.028***	
Age	-.111	.011	-.036***	
Gender	.262	.022	.041***	
Step 2: (Mediation 6) DV = Posttraumatic stress symptomology				
Deployment length	.054	.002	.075***	
Deployment frequency	-.005	.001	-.014***	
Age	-.032	.003	-.031***	
Gender	.094	.006	.043***	
Steps 3 & 4: DV = parent-child relationship				
Deployment length	.024	.009	.012**	.025
Deployment frequency	-.032	.005	-.031***	
Age	-.119	.011	-.038***	
Gender	.310	.022	.049***	
Posttraumatic stress symptomology	-.349	.010	-.121***	

*Note.* The overall model in Step 1 was significant,  $F(4, 82350) = 90.317, p < .001$ . The constant for the model was 15.85. The overall model in Step 2 was significant,  $F(5, 121745) = 1736.10, p < .001$ . The constant for the model was 27.46. The overall model in Steps 3 and 4 was significant,  $F(5, 121745) = 449.08, p < .001$ . The constant for the model was 23.58. Gender in all models was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher DV scores for females and negative coefficients indicate higher scores for males.

\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$

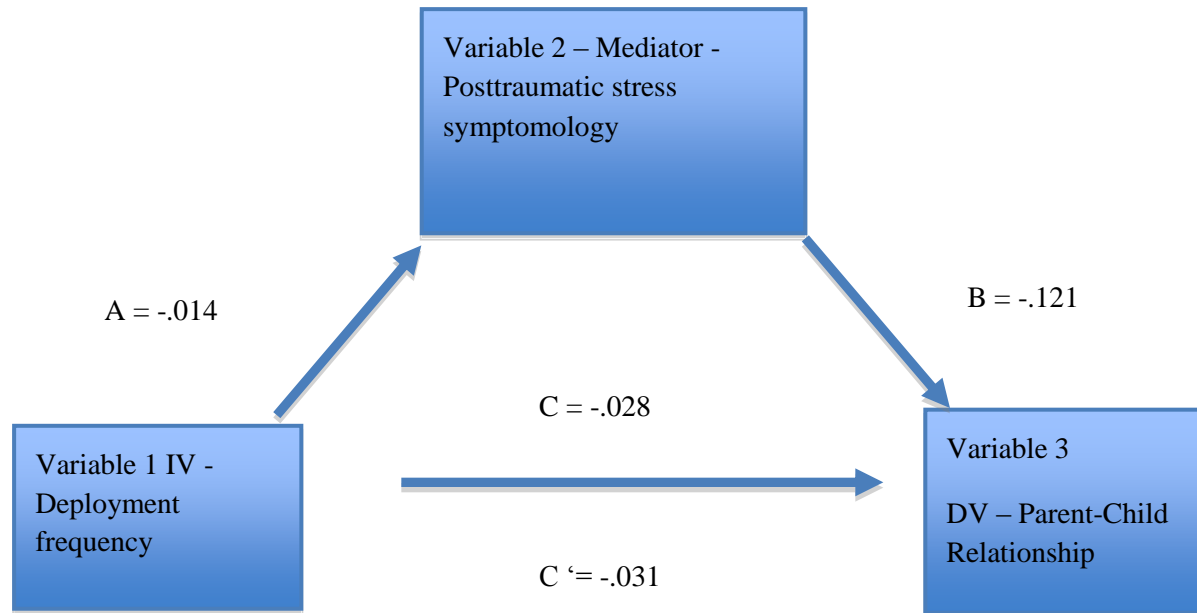




*Figure 9.* Correlations between the variables examined in Mediation 5. C = The standardized beta coefficient of variable 3 regressed on variable 1.

**Mediation 6.** Mediation 6 examined the effect of deployment frequency (X) as mediated by posttraumatic stress symptomology (M) on parent-child relationship (Y) controlling for age, gender, and deployment length. The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment frequency on parent-child relationships or path c is equal to  $-.028(p<.001)$ , with a 95% confidence interval of  $-.039$  to  $-.020$ . Step one has passed. The effect of frequency of deployment on posttraumatic stress symptomology, or path a is equal to  $-.014 (p<.001)$ , with a 95% confidence interval of  $.008$  to  $.003$ . Step 2 has passed. The effect of posttraumatic stress symptoms on parent-child relationships or path b is equal to  $-.121 (p<.001)$ , with a 95% confidence interval of  $-.368$  to  $-.329$ . Step 3 has passed. The effect of deployment frequency on parent-child relationships (path c') controlling for path b is  $-.031, P<.001$ , with a 95% confidence interval of  $-.041$  to  $-.023$ .

The regression weight in step one, .028 went to -.031 in step four. This slight change in weight might be explained in the context of partial mediation, however since the weight change was small in magnitude, step four has not passed. Thus, the final requirement for mediation was not met because introducing posttraumatic stress symptomology as the mediator did not change the effect the of deployment frequency on parent-child relationship. Therefore, the results of Mediation 6 did not support hypothesis 4. A graphic depiction of this model is provided in Figure 10.



*Figure 10.* Correlations between the variables examined in Mediation 6. A = The standardized beta coefficient of variable 2 regressed on variable 1. B = The standardized beta coefficient of variable 3 (mediator) on variable 2. C = The standardized beta coefficient of variable 3 regressed on variable 1. C' = The standardized beta coefficient of variable 3 regressed on variable 1.

**Mediation 7.** Mediation 7 examined the effect of deployment length (X) as mediated by depressive symptomology (M) on parent-child relationship (Y) while controlling for age, gender,

and deployment frequency. In Step 1, parent-child relationships were regressed on deployment length, age, gender, and deployment frequency. In Step 2, depressive symptomology was regressed on deployment length, deployment frequency, age, and gender. In Step 3 and 4, parent-child relationship was regressed on deployment length, deployment frequency, age, gender, and depressive symptomology. Table 19 displays the results of Mediation 7.

The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment length on parent-child relationships or path c is equal to be .001 ( $p = .852$ ), with a 95% confidence interval of  $-.106$  to  $-.068$ . Step one has not passed. Thus, the requirement for the initial variable to be correlated with the outcome variable in step one was not fulfilled, indicating that there was no effect that could be mediated. Consequently, steps 2, 3, and 4 were not performed and it was concluded that the results of mediation 7 did not support hypothesis 4. A graphic depiction of this model is provided in Figure 11.

**Mediation 8.** Mediation 8 examined the effect of deployment frequency (X) as mediated by depressive symptomology (M) on parent-child relationship (Y) while controlling for age, gender, and deployment length. In Step 1, parent-child relationship was regressed on deployment frequency, age, gender, and deployment length. In Step 2, depressive symptomology was regressed on deployment length, deployment frequency, age, and gender. In Steps 3 and 4, parent-child relationship was regressed on deployment length, deployment frequency, age, gender, and depressive symptomology. Table 19 displays the results of Mediation 8.

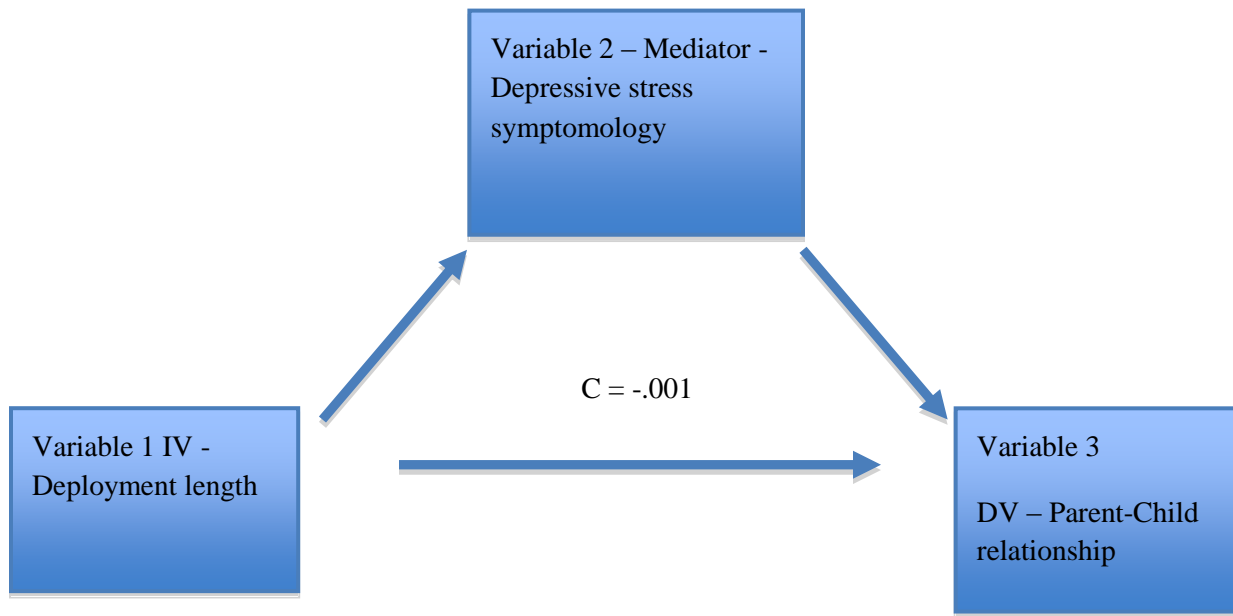
Table 19

*Results of Mediations 7 and 8: The effect of deployment length and frequency mediated by depressive symptomology, on parent-child relationship, controlling for age, gender*

Predictor	<i>B</i>	<i>SE B</i>	Beta	<i>R</i> <sup>2</sup>
Step 1: DV = parent-child relationship				
Deployment length	.002	.009	.001	.004
Deployment frequency	-.030	.005	-.028***	
Age	-.111	.011	-.036***	
Gender	.262	.022	.041***	
Step 2: DV = Depressive symptomology				
Deployment length	.110	.011	.034***	.005
Deployment frequency	.030	.006	.018***	
Age	-.186	.012	-.041***	
Gender	.489	.043	.050***	
Steps 3 & 4: DV = parent-child relationship				
Deployment length	.023	.009	.012**	.057
Deployment frequency	-.025	.005	-.025***	
Age	-.117	.011	-.037***	
Gender	.377	.022	.059***	
Depressive symptomology	-.148	.002	-.231***	

*Note.* Mediation 7: The overall model in Step 1 was significant,  $F(4, 78146) = 90.317, p < .001$ . The constant for the model was 15.85. Because the regression weight for deployment length was not significant, Steps 2, 3, and 4 were not completed. Mediation 8: The overall model in Step 1 was significant,  $F(5, 82350) = 90.317, p < .001$ . The constant for the model was 15.85. The overall model in Step 2 was significant,  $F(4, 149846) = 205.07, p < .001$ . The constant for the model was 10.12. The overall model in Steps 3 and 4 was significant,  $F(5, 78146) = 1503.44, p < .001$ . The constant for the model was 19.02. Gender in all models was coded as 0 = male and 1 = female such that positive regression coefficients indicate higher DV scores for females and negative coefficients indicate higher scores for males.

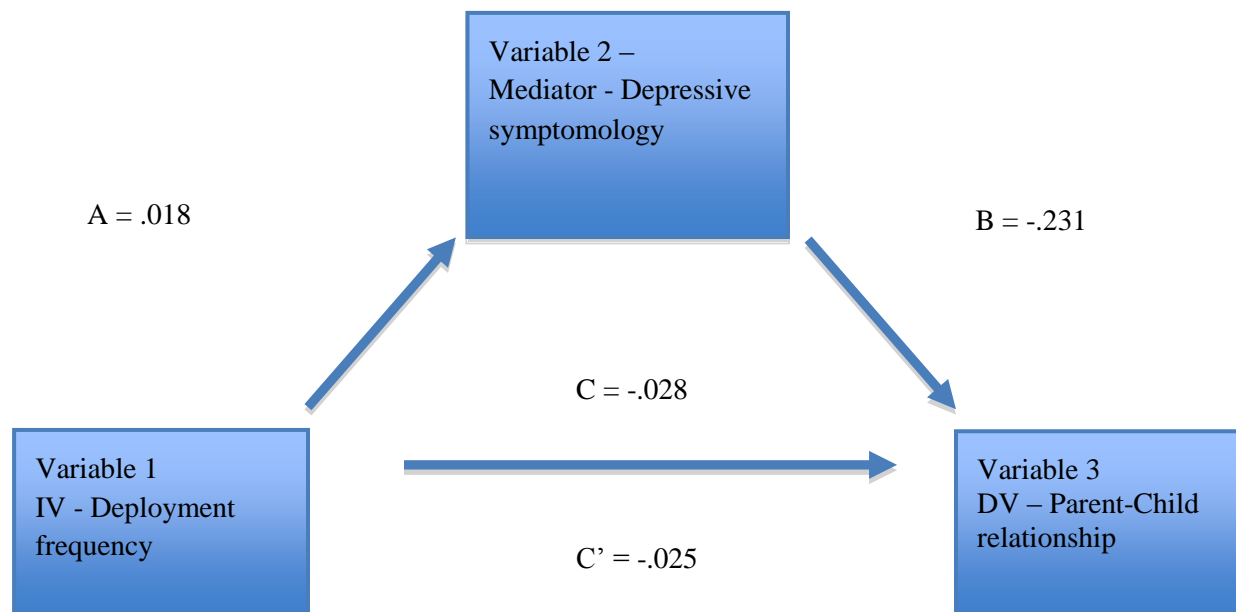
\* $p < .01$ . \*\* $p \leq .05$ . \*\*\* $p \leq .001$



*Figure 11.* Correlations between the variables examined in Mediation 7. C = The standardized beta coefficient of variable 3 regressed on variable 1.

The results of the four Baron and Kenny (1986) steps summarized above are as follows. The effect of deployment frequency on parent-child relationships or path c is equal to  $-.028$  ( $p < .001$ ), with a 95% confidence interval of  $-.039$  to  $-.020$ . Step one has passed. The effect of frequency of deployment on depressive symptomology, or path a is equal to  $.018$  ( $p < .001$ ), with a 95% confidence interval of  $.019$  to  $.041$ . Step 2 has passed. The effect of depressive symptoms on parent-child relationships or path b is equal to  $-.231$  ( $p < .001$ ), with a 95% confidence interval of  $-.153$  to  $-.144$ . Step 3 has passed. The effect of deployment frequency on parent-child relationships (path c') controlling for path b is  $-.025$ ,  $P < .001$ , with a 95% confidence interval of  $-.034$  to  $-.017$ . The standardized regression coefficient in step one was  $-.028$  and in step four it changed to  $-.025$ . This slight change may be explained in the context of partial mediation, however, since the change was small, it is concluded that step four has not passed. Thus, the final requirement for mediation was not met because introducing depressive symptomology as

the mediator did not change the effect the of deployment frequency on parent-child relationship. Therefore, the results of Mediation 8 did not support hypothesis 4. A graphic depiction of this model is provided in Figure 12.



*Figure 12.* Correlations between the variables examined in Mediation 8. A = The standardized beta coefficient of variable 2 regressed on variable 1. B = The standardized beta coefficient of variable 3 (mediator) on variable 2. C = The standardized beta coefficient of variable 3 regressed on variable 1. C' = The standardized beta coefficient of variable 3 regressed on variable 1 controlling for variable 2.

In conclusion, after examining eight mediation models to test the proposed mediation hypothesis; examining the relationship between key deployment factors (frequency and length) and perceived quality of family (spousal and child) relationships mediated by the presence of psychological symptomology (posttraumatic stress and depressive) the initial results suggest that both posttraumatic stress and depressive symptoms mediate the relationship between deployment length and spousal relationships. In other words, the relationship between length of deployment

and spousal relationships can be accounted for my psychological symptoms posttraumatic stress and depressive). The initial results did not fully prove the remaining hypotheses. There were two cases where it may be possible to conclude that partial mediation exists. Both of those cases examined the impact of the mediated relationship between deployment frequency and spousal and parent-child relationships in the presence of depressive symptoms. In other words, psychological symptomology (depressive symptomology) does not fully explain the relationship between deployment frequency and spousal relationships or parent child relationships with this sample, but there may be evidence of partial mediation.

In summary, initial results suggest that four of the eight mediations did not meet all of the requirements for the presence of full mediation; all Sobel tests were statistically significant ( $p < .001$ ). Three of the regressions that did not prove mediation involved the parent-child dependent variable.

## **Conclusion**

Finally, examining the risk and protective factors often associated with deployment; deployment length and frequency and psychological well being on the family relationships produced interesting results. Inevitably there are some risks that can be predicted within an active duty USAF sample, currently serving during an on-going wartime environment. For example, when controlling for age and gender, as deployment length and frequency increased, posttraumatic stress and depressive symptomology also increased. Likewise, both spousal and parent-child relationships can also be predicted by psychological well-being, defined in this study as the presence of posttraumatic stress and/or depressive symptomology.

The presence of social support, for the airmen involved in this study, also produced additional important findings. Consistent with the literature on this subject, the hypothesis

examined the perceived social support as a moderating variable for the relationship between deployment stressors (length and frequency) and family relationships (spousal and parent-child). Ultimately, social support was found to slightly moderate the relationship between both of the deployment stressors and both spousal and parent-child relationships. In both instances, (spousal and parent –child relationships) the amount of variance explained by the identified predictors and moderated by social support was small, yet still evident.

Finally, this study examined causal pathways through the use of traditional Kenny and Baron mediation techniques. Mediation is a statistical technique highlighted by Kenny and Baron, which continues to be used in the social science research today in an effort to advance or better understand the casual or path of relationships between complex variables. In this study, mediation techniques specifically contributed to an increased understanding of the relationships between deployment stressors, psychological well-being and family relationships. This study produced results that suggest that the relationship between deployment length and perceived spousal relationships varies in the presence of psychological symptomology (posttraumatic stress and depressive). Of equal importance is the information garnered from models where mediation did not exist. For example, the relationship between deployment frequency and either spousal or parent-child relationships is not mediated by psychological symptomology. This is an important finding, as deployment frequency is a significant issue or hallmark of the OIF and OEF conflicts.



## **Chapter 5**

### **Introduction**

Deployment, combat exposure, and subsequent combat-related mental health issues have clear effects on military families. Some of these effects are, as of yet, still not understood, particularly the long-term outcomes related to families. The primary aim of this research was to determine the path or course by which such effects occur within the context of risk and protective factors. For example, how do variables such as length and frequency of deployment, posttraumatic stress and depressive symptoms, and social support (potential risk and protective factors) predict outcomes related to family relationships after combat? The war efforts associated with the OIF and OEF conflicts have been unique, as outlined in this study. Consequently, as a society, we have few precedents to help us understand the phenomena (particularly the family-level characteristics of the phenomena) that have arisen as a result of the current long and intensive war. To date, there has been sparse research on how the current conflicts and subsequent psychological symptomology among service personnel affect family relationships. As recently as 2009, it was written that “little empirical research ... has focused on the family problems of veterans in the first year or two following their return from a major military conflict” (Sayers et al., 2009, p. 6). The current research took on the task of contributing knowledge related these issues within the U.S. Air Force.

Without question, the airmen serving in the U.S. Air Force have made significant contributions to the overall war efforts in Afghanistan and Iraq. Conducting this study through

the lens of the Air Force sheds light on many factors that are unique to airmen and their families. These factors—which include the historical culture of the profession, the current tempo of military operations, and the propensity for Air Force personnel to experience psychological distress and interpersonal problems within a larger family system—served as the backdrop for this study.

### **Study Goals and Objectives**

In a broad sense, frequent and long deployments are core characteristics of the current conflicts in Iraq and Afghanistan. Researchers have reported that after deployment in these environments, “in many instances a traumatized soldier is greeting a traumatized family and neither is recognizing the other” (Hutchinson & Banks–Williams, 2006). The overarching task of this study was to address the risk and protective factors that predict outcomes related to the degree of relationship difficulty within a family after combat trauma. This study does not take into consideration constructs such as ‘pre-existing vulnerabilities’ or prior trauma exposure, but instead focuses more specifically on providing an in-depth examination of “how” or in what context key factors such as length and frequency of deployment predict family outcomes. In addition, this study was an effort to examine the relationship between length and frequency of deployment and psychological distress. It included an investigation of the impact of posttraumatic stress and depressive symptoms on familial relationships. In light of the importance of social support for military families in wartime environments, this study examined the construct of social support as a moderator for the relationship between frequency and length of deployment and familial relationships.

Two research questions guided this study. These questions were examined through the use of secondary data from the 2008 Air Force Community Assessment, which were provided to this researcher by the U.S. Air Force for the purposes of this study.

1. What are the effects of deployment stressors such as deployment length and frequency on subsequent family adaptation, specifically couple and parent–child relationships?
2. With regard to the deployment stressors stated above on couple and parent–child relationships, how do risk factors (psychological symptoms such as posttraumatic stress or depressive symptoms) and protective factors (social support) influence these associations?

### **Review of Study Findings**

An examination of the risk and protective factors outlined in this study produced notable results. Long and repeated deployments slightly increased the likelihood of the presence of both posttraumatic and depressive symptoms. Posttraumatic stress symptoms proved to be slightly more prevalent than depressive symptoms (0.6% compared to 0.5% of the variance explained). This difference is likely of little practical value since it is so small in magnitude. One can examine multiple factors in interpreting this result. It is evident that these variances are low compared to previous research (primarily conducted with Army samples), which points toward longer and multiple deployments and an increased propensity toward combat exposure as strong correlates of psychological distress, including posttraumatic stress and depressive symptoms (Buydens–Branchey, Noumair, & Branchey, 1990; Sareen, 2009). Yet the authors of a RAND study titled *Invisible Wounds of War* noted the healthy nature of the Air Force population (Jaycox & Tanielian, 2008), which is consistent with this study. In the context of the results found in this

study, it is evident that the Air Force has fewer instances of psychological distress, and this finding may be related to the fact that members of the Air Force deploy for shorter periods and in some cases less frequently than members of the other branches of the military. Complicating this issue is the possibility that the Air Force recruits a population that has fewer pre-existing vulnerabilities, which could shed light on airmen's ability to rebound from combat experiences more quickly than their Army counterparts. Additionally, the actual combat experiences of airmen may at times differ from the combat duties and experiences of those in the other service branches that have dominated the research landscape in the literature to date.

The second hypothesis in this study was that as psychological symptoms increase, there is a decrease in the quality of family relationships. This hypothesis proved to be true, as the data indicated the presence of psychological symptoms and their impact on the relationships that existed within the family unit in the context of both the spousal dyad and the parent-child dyad. The amount of variance explained by psychological symptoms in the variable family relationships remained the same for both spousal and parent-child relationships (6.1%). This finding is consistent with the current empirical research on this subject, where evidence points toward the strong correlation between wartime psychological distress and lower marital satisfaction as particularly "detrimental to the marriage" (Goff, Crow, Reisbig, & Hamilton, 2007, p. 344). These findings also have great relevance within the context of parent-child relationships. Authors of research that emerged after the Persian Gulf War noted that parental wartime experiences may "constitute significant interferences with children's development" (Jensen & Shawa, 1996, p. 84). It is clear that the ability to navigate the course of child development successfully hinges on the quality of parent-child interactions and relationships. The results of this study highlight the notion that parent-child relationships are in some instances

impacted by psychological distress the active duty parent. Finally, according to the results of this study, in some instances, it is psychological symptoms that have the most impact on negative family outcomes, rather than deployment stressors such as length and frequency of deployment.

The third hypothesis in this study examined the moderated effects of social support on both spousal and parent-child relationships. The results produced in relation to this hypothesis were unanticipated. Consistent with the literature on this subject, the study examined perceived social support as a moderating variable in the relationship between deployment stressors (length and frequency) and family relationships (spousal and parent-child). Ultimately, social support was found to have a slightly moderating effect on the relationship between the deployment stressors and both spousal and parent-child relationships. This finding represents a slight departure from the existing literature, which highlights the importance of social support for military families. In both instances (i.e., spousal and parent-child relationships), the amount of variance explained by the identified predictors and moderated by social support was small yet evident.

Social support is consistently identified in the literature as the primary buffer or protective factor that differentiates those who do well from those who struggle with the deployment process (MacDermid, Samper, Schwarz, & Nishida, 2008; Tanielian & Jaycox, 2008). Yet the construct of social support can be complex. In the current study, social support was examined at the “community” or “family” level. While this type of social support is indeed important, within the military setting, it may be even more important to measure directly the moderating affects of “unit cohesion” as a form of “social support.” For example, in one recent (2009) Army study, researchers noted that soldiers who utilized the “buddy system” as a means of leveraging built-in social supports were better equipped to handle the day-to-day stressors of

the military lifestyle (Hall, 2009). For active duty airmen deployed in and out of the battlefield, a “unit cohesion” measure for the examination of workplace social support constructs might have been more suitable. In addition, the construct of social support may vary when examining it from the perception of the remain behind spouse compared to the active duty member.

Finally, this study determined through the use of mediation models that the relationship between deployment length and spousal relationships varies in the presence of both types of psychological symptomology (i.e., posttraumatic stress and depressive symptoms). The same is not true for the relationship between deployment frequency and spousal or parent–child relationships. In other words, in these data, there is not a mediated relationship in the presence of psychological symptomology. This is a notable finding because “deployment frequency” has been a significant issue or hallmark of the OIF and OEF conflicts. In summary, while much emphasis has been placed on both deployment length and deployment frequency in the context of the current OIF and OEF war efforts, the current data point toward more implications for deployment length compared to frequency when predicting outcomes related to family relationships. Finally, the effect sizes and percent of variance explained in the models tested in hypotheses 1, 2 and 4 in this study were very small, and while they were statistically significant, it is more likely that there is only a slightly meaningful relationship between the variables.

### **Study Strengths and Limitations**

While the current study is applicable across multiple areas of importance within the Air Force and more broadly across the military family programs arena, it has limitations that should be noted. The primary study limitation involves multiple factors associated with the use of secondary data. Secondary data provided a wealth of information on the topics examined in this study. From an ethical and practical standpoint, it makes sense to utilize pre-existing

(particularly un-mined) data if these data are relevant to the research questions. However, in the case of this study, despite these benefits, the fact remains that the data were not collected to analyze the exact questions of focus for this study. That being said, the measures utilized in this study were in some cases too brief to capture all of the complexities involved in the constructs under examination. For example, in order to measure the true quality of parent–child and spousal relationships and provide a more in-depth analysis of the difficulties associated with wartime deployment, psychological well-being, and the spousal/parent–child relationships, there remains a need to conduct an examination involving a more comprehensive measure. Such a measure would include more comprehensive questions targeting the quality of spousal/parent–child relationships after the deployment/combat experience. The same could be said for the posttraumatic stress measure. The measure utilized in this study contained four questions, with one question for each subset of symptoms identified within the DSM diagnostic criteria for PTSD: re-experiencing, hyper-arousal, emotional numbing, and avoidance. A more comprehensive measure that captured the full range of symptoms that fall within the continuum of posttraumatic stress would better identify the airmen’s struggles with such issues.

Another weakness of this study is that a secondary analysis captures a “snapshot in time.” Because Air Force personnel are a transient population and the changing needs of war dictate the operational stressors for the workforce, it is likely that the study does not fully capture the ever-evolving needs of the workforce.

A final study limitation is that it only captures the experiences of U.S. Air Force personnel. While that was the initial intent of the study, the study findings are not generalizable across all service branches. Each of the service branches has a unique culture, a unique ethos, and particular needs. It is important that future studies highlight service-specific needs while

drawing attention to similarities between service branches and perhaps among common occupational areas that reinforce the larger needs that exist across all service branches.

### **Implications for Policy**

President Obama recently shared his plan for a drawdown in military forces related to a large part the current war efforts. At a recent national convention for disabled veterans, Obama stated, “our commitment in Iraq is changing—from a military effort led by our troops to a civilian effort led by our diplomats” (CNN Wire Staff, 2010). A shift in military efforts will require strong policy efforts designed to prepare helping professionals to meet the needs that veterans develop during extended periods of “dwell time” (i.e., family togetherness).

Undoubtedly, the military leaders of tomorrow will need to turn to empirical research to develop policies that will guide the work of serving war returnees and their families. Studies such as this one that highlight the impact of deployment and the subsequent combat-related stress symptomology for service members and their families represent a first step toward helping military leaders and policymakers to identify risks and draw on protective characteristics within the military population. Subsequent steps will likely involve intervention research that identifies best practices, and longitudinal studies that examine the effects of war time issues over time. Broadly speaking, the policy implications of this study focus on “family-level” characteristics.

From a policy standpoint, the results of this study highlight a number of factors. First, they point toward the likelihood that the Air Force leadership has placed a high priority on family programs and the health and well-being of airmen. The Air Force has maintained shorter deployments compared to sister services, and this study indicates the benefits of this approach. Shorter deployments may have some explanatory power related to lower than expected rates of psychological distress within the Air Force population.



In addition to focusing on length of deployment, to the extent possible, U.S. Air Force policymakers should closely examine frequency of deployment as it relates to dwell time. While frequency of deployment was not a profound factor in the current study, it remains an important construct across all service branches. In so doing, they may develop ways to allow enough time between deployments for families to reconstitute and support one another through combat experiences. Military spouses are often cited as an inherent social support system for their active-duty spouses. With adequate dwell time as well as appropriate formal and informal resources, natural healing processes occurring in the context of family reunion/togetherness will have the opportunity to flourish.

Military policymakers need to prepare the future workforce of family-support social workers to respond to the long-term, complex needs of the families that they serve. As this study illustrates, service providers need appropriate policies that facilitate the examination of combat deployment, traumatic experiences, and subsequent psychological distress in the context of the family system. Military policies should encourage the involvement of military spouses and children in the treatment of combat-related traumatic psychological distress experiences. That being said, policies should also reflect a recognition of the long-term mental health needs of spouses and children, and they should contain provisions to meet these needs. Although policies that advocate the inclusion of spouses and children in assessments for posttraumatic stress call for a resource-intensive process, their benefits outweigh the costs of treating psychological distress and addressing related problems (e.g., increased rates of suicide, domestic violence, alcohol abuse, and sexual assault). Military policies should encourage the “fine tuning” of current practice models to ensure that the family unit is included in all aspects of care. These future policies should take into account the needs and inherent support structure of the family

unit. Such policies should be shaped by and targeted to “family-level” characteristics and/or interventions in an effort to prepare a “psychologically well” workforce for the years ahead. Examples of this include using “family language” and “family philosophical approaches” in future DoD policy. Other possibilities include policies regarding the treatment of psychological distress. These policies should contain allowances for family approaches, with treatment efforts targeting not only service members, but also their spouses and children. These approaches should honor the unique roles of spouses and children in the recovery process and be built on basic social work principles and values that promote strength-based, resilience-building practices. Finally, military policymakers should continue to ask practice-level questions such as whether airmen and their families are offered the appropriate services to meet their needs and whether there are gaps between available services. These services may fall under the umbrella of concrete services or may be more psycho-educational or psycho-therapeutic in nature. The knowledge gained through these systems of inquiry should continue to inform the policymaking process in the years ahead.

### **Implications for Social Work Practice**

Despite lower prevalence rates of psychological distress in the U.S. Air Force relative to other branches of the military, this study indicates that airmen struggle with deployment stressors and psychological symptoms and that in small number of instances, these factors interfere with their familial relationships. There are a number of practice-level implications that stem from this study. First, because the potential to experience traumatic events is inherent in today’s military, practitioners will be challenged with determining how to develop principles for trauma-informed care and therapeutic services to service members and their families in the years ahead. This type of care should stem from bio-psycho-social theoretical perspectives. The interconnectedness of

the biological and psychological and social spheres accounts for the complexities inherent in the experiences of military service members and their families. Furthermore, bio-psycho-social practices should focus on prevention and treatment strategies that help keep families well while buffering individuals from stressful events throughout the course of military life.

Whether in the context of prevention or treatment, practitioners need to prepare to utilize approaches that are focused around the family unit from the very beginning of screening and intake processes throughout the course of treatment. According to these data, there are low levels of posttraumatic stress and depressive symptoms; thus, future practice should focus on subclinical thresholds and how these lower yet chronic subclinical levels potentially interfere with optimal family and parental functioning. Practice clinicians should be prepared to distinguish between a “normal stress response” and a more “chronic response” that causes significant problems in multiple areas of functioning including social and interfamilial relationships. It seems intuitive that service members deployed in harsh combat zones will struggle with “normal” responses to what they have done and witnessed. It is essential that clinicians understand both the culture of the military and the harsh realities of deployment when engaging in the treatment of military service members and their families.

Furthermore, practitioners should maintain a current understanding of how the entire deployment process—from pre-deployment to deployment to reintegration—affects the ongoing development of service members’ children. Helping professionals should be ready to respond to both the immediate needs of children and the larger needs of the family unit. By recognizing that optimal child development depends on healthy parenting and the absence of key mental health symptoms (e.g., emotional numbing, depressive symptoms), one can see the work ahead in the practice arena for social workers and all helping providers within service delivery environments.

## **Implications for Current and Future Research**

This study, coupled with the existing literature, suggests that future studies might focus on a number of areas, including the impact of the current long war and the unique characteristics of IOF and OEF conflicts in terms of their effects on military families. Intervention research could examine optimal forms of family-level treatment for posttraumatic stress symptoms. Finally, as U.S. involvement in the intensive conflicts involved in the current war efforts decrease, research should be conducted on its impact on the well-being of children. Special emphasis should be placed on studies that build on the work of the current research by examining the risk factors that impede optimal family functioning and relationships in and around war. This current study should be replicated across other service branches in an effort to determine how length and frequency of deployment affects family relationships in instances where deployments are different from those experienced in the Air Force.

A close examination of how the current war effort and associated family separations and reunions influence the development of children will be necessary in the years to come. There is a need for specific research that targets the developmental outcomes of military children reared by service member parents serving in a constant state of war for almost a decade. Possible research questions include; examining the academic, social and emotional outcomes before and after individual deployments.

Additionally, as highlighted in this current study, there will be a need to examine service-specific contributions to the war effort. Taking this a step further, it will be necessary to conduct an intensive examination of certain military occupations and the family-level outcomes that are tied to them. For example, what are the differences between infantry soldiers and first-response medics in terms of their propensity for trauma exposure? What can be learned from the

individual experiences of those deployers in terms of their key deployment characteristics and their impact on family relationships? As more women are now serving in combat, it will also become critically important for future research to highlight gender-specific patterns that occur for service members as well as the families they leave behind during deployment. In addition, as this study points toward the high number of active duty members married to active duty members, ‘dual military couples’ (14.4% of this sample), future research and policy should focus on this population group as a unique group within the larger context, in an effort to both identify and appropriately respond to the needs of both spouse/parents serving in the military. Additionally, further research should examine the U.S. Air Force population at an organizational level, exploring the protective factors that result in such healthy experiences. Such research will promote the existing “resilience-based movement” that has sprung up across the DoD.

### **Implications for the Social Work Profession**

The willingness with which our young people are likely to serve in any war, no matter how justified, shall be directly proportional to how they perceive veterans from early wars were treated by our nation.

—George Washington (1789)

As far back in history as the days of our first president, both politicians and citizens recognized the nation’s responsibility to care for military populations. Americans past and present have understood and embraced the idea of a national obligation to care for the needs of those who willingly sacrifice their time and well-being for our freedoms. Today, our nation is at a critical point in its history with regard to the care of war returnees and their families. Responding to the needs of service members and their families undoubtedly requires an interdisciplinary approach.

The social work profession has a history of providing direct care services to the military that can be traced back to a demonstration project in 1918 conducted in collaboration with the

Red Cross (Daley, 2003). Based on its rich history and emphasis on interdisciplinary skills, the social work profession has an increased level of responsibility and the requisite skills to provide a leadership role in the recovery process for military service members and their families. This work often begins in the academic setting with training social workers to meet the varied needs of military populations. Some academic institutions have already assumed leadership roles in this arena. For example, the University of Southern California recently started a military “track” in which master’s-prepared social workers can take a specialized track of courses on issues unique to the military populations. Other schools such as Virginia Commonwealth University have developed trauma coursework that embeds the needs of the military population into the existing trauma curriculum. These efforts are a great start, but much more work will need to be done across the nation to prepare communities, agencies, and individual social workers with the skills they need to engage with military populations. Universities should also ensure that field placement partnerships and other experiences broaden the relationships between academic institutions and agencies serving military populations.

There is also a need for social work researchers to engage with DoD stakeholders concerning the ongoing development of a research plan that includes the future research needs outlined in this study. This plan should also include more comprehensive research needs that span the full spectrum of needs, from needs assessments to the development of intervention models that have been tested with military populations (evidence based practice) to large scale survey work to monitor the needs of the military population in the years ahead.

Finally, national-level advocacy and leadership organizations such as the Council on Social Work Education and the National Association of Social Workers should lead the way in the development of agendas that reinforce the importance of the military population as a

vulnerable and unique population group that will have complex and varied needs in the years ahead. Some of this work has already begun, as the Council on Social Work Education recently developed a set of educational guidelines that provide an overview of the specialized knowledge and skills that social workers need in order to effectively intervene with the military population at large. These standards highlight the military history and culture, stigma, war time common diagnoses, and notion of treating trauma across the family unit. The efforts are a first step toward the broad work that will need to be accomplished in the years to come within the military family arena. These agencies should continue to chart the course to ensure that social workers serving in civilian communities and military installations alike are prepared for future challenges associated with military service members and their families.

## **Conclusion**

U.S. airmen and their families have made many sacrifices over the last decade in an effort to protect our nation's freedoms by fighting terrorism across the globe. These sacrifices have come at great human costs to our society. The U.S. Air Force has lost over 100 airmen in battle and over 500 airmen have been wounded in action (Defense Manpower Data Center, 2010). Numerous other airmen have suffered "invisible wounds" and "psychological scars" that are sometimes difficult to detect. Rates of suicide, domestic violence, child abuse, and alcohol abuse have increased in some military populations. There have also been breakdowns in family unity and in the quality of family relationships. Nevertheless, as illustrated in this study, some airmen and their families have adjusted well to the stressors of war. The unique characteristics of these families should be highlighted and understood within the context of the greater discourse within the DoD on "resiliency." Social workers, practitioners, and researchers alike must prepare to meet the future needs of military service members and their families. These preparatory efforts

will honor the service and the sacrifices made by the airmen who serve. These efforts will involve developing a keen understanding and respect for the military history, culture, and ethos. Only in this context will social workers be able to engage in the policy, practice, and research necessary to help our nation set a path toward healing and recovery for airmen and all service members who have sacrificed so much in the OIF and OEF conflicts.



## References

## References

- Air Force facts.* (n.d.). Retrieved from <http://www.af.mil/factsheet>
- Air Force history.* (n.d.). Retrieved from <http://www.airforce.com/history>
- Air Force press release.* (n.d.). Retrieved from <http://www.af.mil/main/welcome.asp>
- American Psychiatric Association. (1952). *Diagnostic and statistical manual of mental disorders* (1st ed.). Washington, DC: Author.
- American Psychiatric Association. (1968). *Diagnostic and statistical manual of mental disorders* (2nd ed.). Washington, DC: Author.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. rev.). Washington, DC: Author.
- Baier, F. (2010). *Fifty questions every airman can answer*. Retrieved from <http://www.au.af.mil/au/awc/awcgate/afdc/50questions.pdf>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Basham, K. (2007). Homecoming as safe haven or the new front: Attachment and detachment in military couples. *Clinical Social Work Journal*, 36(1), 83–96.

- Beckham, J. C., Lytle, B. L., & Feldman, M. E. (1996). Caregiver burden in partners of Vietnam War veterans with posttraumatic stress. *Journal of Consulting and Clinical Psychology*, 64, 1068–1072.
- Black, W. (1993). Military induced family separation: A stress reduction intervention. *Social Work*, 38, 273–280.
- Booth, B., Segal, M., Bell, B., Martin, J., Ender, M., Rohall, D., & Nelson, J. (2007). *What we know about Army families*. Fairfax, VA: Family and Morale, Welfare, and Recreation Command.
- Bowen, G., Mancini, J., Martin, J., Ware, W., & Nelson, J. (2003). Promoting the adaptation of military families: An empirical test of a community practice model. *Family Relations*, 52(1), 33–44.
- Bowling, U., & Sherman, M. (2008). Welcoming them home: Supporting service members and their families in navigating the tasks of reintegration. *Professional Psychology Research and Practice*, 39, 451–458.
- Brown, L. (2008). *Cultural competence in trauma therapy: Beyond the flashback*. Washington, DC: American Psychological Association.
- Buydens-Branchey, L., Noumair, D., & Branchey, M. (1990). Duration and intensity of combat exposure and posttraumatic stress disorder in Vietnam veterans. *The Journal of Nervous and Mental Disease*, 178, 582–587.
- Campbell, W., & Rohrbaugh, R. (2006). *The bio-psychosocial formulation manual: A guide for mental health professionals*. New York, NY: Routledge, Taylor, & Francis.

- Carroll, E. M., Rueger, D. B., Foy, D. W., & Donahoe, C. P. (1985). Vietnam combat veterans with posttraumatic stress disorder: Analysis of marital and cohabitating adjustment. *Journal of Abnormal Psychology, 94*, 329–337.
- Caselli, L. T., & Motta, R. W. (1995). The effect of PTSD and combat level on Vietnam veterans' perceptions of child behavior and marital adjustment. *Journal of Clinical Psychology, 51*(1), 4–12.
- Clay, R., Deal, W., Murphy, E., Murphy, J., Center, K., Kolkow, T., & Grieger, T. (2008). On-the-record screenings versus anonymous surveys in reporting PTSD. *American Journal of Psychiatry, 165*, 775–776.
- CNN Wire Staff. (2010, August 2). *U.S. drawdown in Iraq proceeding as planned, Obama says*. Retrieved from [http://articles.cnn.com/2010-08-02/politics/obama.iraq.drawdown\\_1\\_wider-insurgency-end-of-american-sacrifice-iraqi-officials?\\_s=PM:POLITICS](http://articles.cnn.com/2010-08-02/politics/obama.iraq.drawdown_1_wider-insurgency-end-of-american-sacrifice-iraqi-officials?_s=PM:POLITICS)
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Coie, D., Watt, N., West, T., Hawkins, D., Asarnow, R., Markman, J., ... Long, B. (1993). The science of prevention: A conceptual framework and some directions for a national research program. *American Psychologist, 48*, 1013–1022.
- Corbett, S. (2007, March 18,). The women's war. *New York Times*. Retrieved from [http://www.nytimes.com/2007/03/18/magazine/18cover.html?pagewanted=1&\\_r=1](http://www.nytimes.com/2007/03/18/magazine/18cover.html?pagewanted=1&_r=1)
- Cozza, S. (2005). Military families and children during Operation Iraqi Freedom. *Psychiatry Quarterly, 76*, 371–378.

- Daley, J. (2003). Military social work: A multi-country comparison. *International Social Work*, 46, 437–448.
- Dattalo, P. (in press). *Analysis of multiple dependent variables*. New York, NY: Oxford University Press.
- Defense Manpower Data Center. (2010). *Home page*. Retrieved from <https://www.dmdc.osd.mil/appj/dwp/getLinks.do?category=dod&tab=3&clOn=dod>
- Dekel, R. (2004). The impact of PTSD on veterans' family relationships: An interpretative phenomenological inquiry. *International Journal of Nursing Studies*, 46, 838–847.
- Department of Defense. (2007). Mental health-related clinical experiences in relation to responses to health assessments after returning from Operation Iraqi Freedom in 2005. *U.S. Armed Forces Medical Monthly Surveillance Report*, 14(7), 1–5.
- Department of Defense Task Force on Mental Health. (2007). *An achievable vision: Report of the Department of Defense Task Force on Mental Health*. Falls Church, VA: Defense Health Board.
- Department of Defense & U.S. Army. (2009). *Military casualty information*. Retrieved from <http://siadapp.dmdc.osd.mil/personnel/CASUALTY/castop.htm>
- Department of the Air Force presentation to the House Armed Services Subcommittee on military personnel on the oversight of family support programs, *House of Representatives* (2009) (testimony of James A. Roy). Retrieved from <http://www.af.mil/shared/media/document/AFD-090724-036.pdf>
- Di Nola, G. (2008). Stressors afflicting families during military deployment. *Military Medicine*, 173, v–vii.

- Dole, B., & Shalala B. (2007). *The Dole-Shalala Report*. Retrieved from <http://www.bobdole.org/current.php>
- Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science*, 196, 129–136.
- Figley, C. R. (1993). Coping with stressors on the home front: Psychological research on the Persian Gulf War. *Journal of Social Issues*, 49 (5) 51-61.
- Flake, E. (2007). *Voices of children and adolescents in military families: Research and clinical perspectives on adjustment and well being*. Retrieved from [http://www.dcoe.health.mil/DcoEV2/Content/navigation/documents/tsd\\_conference/track%20ii/1230-flake%20tsd%202009%20presentation.pdf](http://www.dcoe.health.mil/DcoEV2/Content/navigation/documents/tsd_conference/track%20ii/1230-flake%20tsd%202009%20presentation.pdf)
- Forbes, D. Lewis, V., Parslow, R., Hawthorne, G., Creamer, M. (2008). A naturalistic comparison of models of programmatic interventions for combat related posttraumatic stress disorder. *Australian and New Zealand Journal of Psychiatry*, 42(12), 1051-1059.
- Forman, M. (2007). *Is the one year combat deployment right for the Army?* Carlisle Barracks, PA: U.S. Army War College.
- Frankel, R., Quill, T., & McDaniel, S. (2003). *The biopsychosocial approach: Past, present, future*. Rochester, NY: University of Rochester Press.
- Franklin, E. (2009). The emerging needs of veterans: A call to action for the social work profession. *Health and Social Work*, 34, 163–167.
- Fraser, M. (1997). *Risk and Resilience in Childhood*. NASW Press, Washington DC.
- Freedberg, S. (2005). They also serve. *National Journal*, 37(3), 1–5.

- Galovski, T., & Lyons, J. A. (2004). Psychological sequelae of combat violence: A review of the impact of PTSD on the veteran's family and possible interventions. *Aggression and Violent Behavior, 9*, 477–501.
- Ghosts in the machine: Do remote control war pilots get combat stress? (2008, August 11). *Air Force Times*. Retrieved from [http://www.airforcetimes.com/news/2008/08/ap\\_remote\\_stress\\_080708/](http://www.airforcetimes.com/news/2008/08/ap_remote_stress_080708/)
- Goff, B., Crow, J., Reisbig, A., & Hamilton, S. (2007). The impact of individual trauma symptoms of deployed soldiers on relationship satisfaction. *Journal of Family Psychology, 21*, 344–353.
- Grinker, R., & Spiegel, J. (1945). War neuroses in flying personnel. *American Journal of Psychiatry, 619–624*.
- Geren, P. (2007). Secretary of the Army Arrival Ceremony Remarks; Ft. Myer VA.
- Greenburg, D., Roy, M. (2007). In the shadow of Iraq: Posttraumatic stress disorder in 2007. *Society of General Internal Medicine, 22*, 888-889.
- Hall, J.C., (2009). Utilizing social support to conserve the fighting strength: Important considerations for military social workers. *Smith College Studies, 79*, 335-343.
- Harrell, M., Lim, N., Castaneda, L., & Golinelli, D. (2007). *Working around the military: Challenges to military spouse employment and education*. Santa Monica, CA: RAND Corporation. Retrieved from [http://www.rand.org/pubs/monographs/2004/RAND\\_MG196.pdf](http://www.rand.org/pubs/monographs/2004/RAND_MG196.pdf)
- Hearings before the House National Security Committee Subcommittee on Military Readiness*, (1998) (testimony of Lieutenant General William P. Hallin).

- Henderson, B. (2006). *Women in combat: A culture issue?* Carlisle Barracks, PA: U.S. Army War College.
- Herman, J. (1992). *Trauma and recovery*. New York, NY: Harper Collins.
- Hiew, C. (1992). Separated by their work: Families with fathers living apart. *Environment and Behavior*, 24(2), 206–225.
- Hillenbrand, E. (1976). Father absence in military families. *The Family Coordinator*, 25, 251–258.
- Himmelfarb, N., Yaeger, D., & Mintz, J. (2006). Posttraumatic stress disorder in female veterans with military and civilian sexual trauma. *Journal of Traumatic Stress*, 19, 837–846. doi: 10.1002/jts.20163
- Hobfoll, S., Spielberger, C., Breznitz, S., Figley, C., Folkman, S., Lepper-green, B. . . . Sarason, I. (1991). War-related stress: Addressing the stress of war and other traumatic events. *American Psychologist*, 46, 848–855.
- Hoge, C.W., Auchterlonie, J.L., & Milliken, C.S. (2006). Mental health problems, use of services and attrition from military service after returning from deployment to Iraq and Afghanistan. *Journal of American Medical Association*, 295 (9), 1023-1032.
- Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., & Koffman, R. L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *New England Journal of Medicine*, 351(1), 13–22.
- Huebner, A., Mancini, J., Wilcox, R., Grass, S., & Grass, G. (2007). Parental deployment and youth in military families: Exploring uncertainty and ambiguous loss. *Family Relations*, 56(4), 112–122.



- Hutchinson, J., & Banks-Williams, L. (2006). Clinical issues and treatment considerations for new veterans: Soldiers of the wars in Iraq and Afghanistan. *Primary Psychiatry*, 13(3), 66–71.
- ICF International, Air Force Community Assessment Data (2008)
- Jaycox, L. H., & Tanielian, T. (2008). *Invisible wounds of war: Psychological and cognitive injuries, their consequences and services to assist recovery*. Santa Monica, CA: RAND Corporation.
- Jensen, P., Lewis, R., & Xenakis, S. (1986). The military family in review: Context risk and prevention. *Journal of American Academy of Child Psychiatry*, 25, 225–234.
- Jensen, P., Martin, D., & Watanabe, H. (1996). Children's response to separation during Operation Desert Storm. *Journal of American Academy of Children and Adolescent Psychiatry*, 35, 433–441.
- Jensen, P., & Shaw, J. (1996). The effects of war and parental deployment upon children and adolescents. In R. Ursano & A. Norwood (Eds.), *Emotional aftermath of the Persian Gulf War: Veterans, families, and communities, and nations* (pp. 83–109). Washington, DC: American Psychiatric Press.
- Jordan, B. K., Marmar, C. R., Fairbank, J. A., Schlenger, W. E., Kulka, R. A., Hough, R. L., & Weiss, D. S. (1992). Problems in families of male Vietnam veterans with posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 60, 916–926.
- Kelley, M., Finkel, L., & Ashby, J. (2003). Geographic mobility, family and maternal variables as related to the psychosocial adjustment of military children. *Military Medicine*, 168, 1019–1024.
- Kennedy, P. (1987). *The rise and fall of the great powers*. New York, NY: Random House.

- Kuehn, B. (2009). Soldier suicide rates continue to rise: Military, scientists work to stem the tide. *Journal of the American Medical Association*, 301, 1111–1113.
- Kulka, R., Schlenger, W., Fairbank, J., Hough, R., Jordan, B., Marmar, C., et al. (1990). *Trauma and the Vietnam War generation: Report of findings from the National Vietnam Veterans Readjustment Study*. New York, NY: Brunner/Mazel.
- Lamberg, L. (2004). When military parents are sent to war, children left behind need ample support. *Journal of the American Medical Association*, 292, 1541–1542.
- Levai, M., Kaplan, S., Daly, K., & McIntosh, G. (1994). The effect of the Persian Gulf crisis on the psychiatric hospitalization of Navy children and adolescents. *Child Psychiatry and Human Development*, 24(4), 245–254.
- Logan, K. (1987). The emotional cycle of deployment. *Proceedings*, 2, 43–47.
- MacDermid, S., Samper, R., Schwarz, R., & Nishida, J. (2008). *Understanding and promoting resilience in military families. A report prepared for the Office of Military Community and Family Policy in the Office of the Secretary of Defense*. Retrieved from <http://www.mfri.purdue.edu/content/Reports/Understanding%20and%20Promoting%20Resilience.pdf>
- MacDonald, C., Chamberlain, K., Long, N., & Flett, R. (1999). Posttraumatic stress disorder and interpersonal functioning in Vietnam War veterans: A mediational model. *Journal of Traumatic Stress*, 12, 701–707.
- Manske, J. (2006). Social work in the Department of Veterans Affairs: Lessons learned. *Health and Social Work*, 31, 233–237.
- McCubbin, H. I., Thompson, E. A., Thompson, A. I., & Futrell, J. A. (Eds.). (1998). *Resiliency in African-American families*. Thousand Oaks, CA: Sage.

- Medical Surveillance Monthly Report (2007). *A publication of the Armed Forces Health Surveillance Center*, 14(3).
- Mental Health Advisory Team V. (2008). *Complete OIF/OEF overview*. Retrieved from [http://www.armymedicine.army.mil/reports/mhat/mhat\\_v/MHAT\\_V\\_OIFandOEF-Redacted.pdf](http://www.armymedicine.army.mil/reports/mhat/mhat_v/MHAT_V_OIFandOEF-Redacted.pdf)
- Milliken, C.S., Auchterlonie, J.L., & Hoge, C.W. (2007). Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq War. *Journal of American Medical Association*, 298 (18), 2141-2148.
- Mmari, K., Roche, K., Sudhinaraset, M., & Blum, R. (2009). When a parent goes to war: Exploring the issues faced by adolescents and their families. *Youth and Society*, 40, 455–475.
- Morris, A. S., & Age, T. R. (2009). Adjustment among youth in military families: The protective roles of effortful control and maternal social support. *Journal of Applied Developmental Psychology*, 30, 655–707.
- Mott, F. (1916). Special discussion on shell shock without visible signs of injury. *Journal of Royal Society of Medicine*, 9, i-xxiv.
- National Military Family Association. (2005). *Cycles of deployment: An analysis of survey responses from April through September, 2005*. San Diego, CA: Defense Web Technologies.
- National Center for Posttraumatic Stress Disorder: Retrieved on line:  
<http://www.ptsd.va.gov/professional/pages/epidemiological-facts-ptsd.asp>

- Niederhauser, V., Maddock, J., LeDoux, F., & Arnold, M. (2005). Building strong and ready army families: A multi-risk reduction health promotion pilot study. *Military Medicine*, 170, 227–233.
- Peeble-Klieger, M., & Klieger, J. (1994). Reintegration stress for desert storm families: Wartime deployments and family trauma. *Journal of Traumatic Stress*, 7, 173–194.
- Pietrzak, R., Johnson, D., Goldstein, M., Malley, J., & Southwick, S. (2009). Perceived stigma and barriers to mental health care utilization among OEF–OIF veterans. *Psychiatric Service*, 60, 1118–1122.
- Pincus, S., & Na, T. (1999). Psychological aspects of deployment. The Bosnian experience. *Army Medical Department Journal*, 1, 38–44.
- Ragahunathan, T., Lepkowski, J., Van Hoewky, J., & Solenberger, P. (2001). A multivariate technique for multiply imputing missing values using a sequence of regression models. *Survey Methodology*, 27, 85–96.
- Remote warfare ushers new kind of stress. (2009, July 23). *CNN.com*. Retrieved from <http://www.cnn.com/2009/world/americas/07/23/wus.warfare.pilots.uav/index.html>
- Rice, D. The Air Force and US National Security: Global Reach – Global Power, A white paper. Retrieved on line: <http://aupress.maxwell.af.mil>
- Riggs, D. S., Byrne, C. A., Weathers, F. W., & Litz, B. T. (1998). The quality of the intimate relationships of male Vietnam veterans: Problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress*, 11, 87–101.
- Rosen, L., Carpenter, C., & Moghadam, L. (1989). Impact of military life stress on the quality of life of military wives. *Military Medicine*, 154, 116–120.

- Rosen, L. Teitelbaum, J. & Westhuis, D. (1993). Children's reactions to the Desert Storm deployment: Initial findings from a survey of Army families. *Military Medicine*, 158, 465-469.
- Rubin, D. (1996). Multiple imputation after 18+ years. *Journal of American Statistical Association*, 91, 473-489.
- Ruscio, A. M., Weathers, F. W., King, L. A., & King, D. W. (2002). Male war zone veterans perceived relationships with their children: The importance of emotional numbing. *Journal of Traumatic Stress*, 15, 351-357.
- Ryan-Wenger, N. A. (2001). Impact of the threat of war on children in military families. *American Journal of Orthopsychiatry*, 71(2), 236-244.
- Samper, R. E., Taft, C. T., King, D. W., & King, L. A. (2004). Posttraumatic stress disorder symptoms and parenting satisfaction among a national sample of male Vietnam veterans. *Journal of Traumatic Stress*, 17, 311-315.
- Sareen, J. (2009)/. Emotional costs of war and peacekeeping high for many returning soldiers. *Canadian Psychiatry*, 5(1), 1-5.
- Sayers, S., Farrow, V., Ross, J., & Oslin, D. (2009). Family problems among recently returned military veterans referred for a mental health evaluation. *Journal of Clinical Psychiatry*, 70(20), 163-170.
- Schneider, R., & Martin, J. (1995). Military families and combat readiness. In F. D. Jones (Ed.), *Textbook of military medicine, Pt. 1, warfare, weaponry, and the casualty: Military psychiatry, preparing in peace for war* (pp. 19-30). Washington, DC: Borden Institute.
- Schnurr, P. P., & Green, B. L. (Eds.). (2004). *Trauma and health: Physical health consequences of exposure to extreme stress*. Washington, DC: American Psychological Association.

- Schwartz, N. (2009). *Keeping the promise*. Retrieved from <http://www.afa.org/events/conference/2009/scripts/AFA-090915-Schwartz.pdf>
- Seal, K., Bertenthal, D., Miner, C., Sen, S., & Marmar, C. (2007). Bringing the war back home. *Journal of Internal Medicine*, 167, 476–482.
- Segal, D., & Wechsler-Segal, M. (2005). America's military population. *The Diversity Factor*, 13(2).
- Sherman, M.D., Blevins, D., Kirchner, J., Ridener, L.C., Jackson, T. (2008). Key factors involved in engaging significant others in the treatment of Vietnam veterans with PTSD. *Professional psychology: Research and Practice*, 39(4), 443-450.
- Smith, T. C., Wingard, D. L., Ryan, M. A. K., Kritz-Silverstein, D., Slymen, D. J., & Sallis, D. J. (2009). PTSD prevalence, associated exposures, and functional health outcomes in a large, population-based military cohort. *Public Health Reports*, 124(1), 90–102.
- Sorensen, H., Sabroe, S., & Olsen, J. (19996). A framework for evaluation of secondary data sources for epidemiological research. *International Journal of Epidemiology*, 25 (2), 435-442.
- Southard, E. (1918). Shell shock and after. *Boston Journal of Medical Surgery*, 179, 73–93.
- Southwick, S. M., Morgan, C. A., III, Darnell, A., Bremner, D., Nicolaou, A. L., Nagy, L. M., & Charney, D. S. (1995). Trauma-related symptoms in veterans of Operation Desert Storm: A 2-year follow-up. *American Journal of Psychiatry*, 152, 1150–1155.
- Spera, C. (2009). Spouses' ability to cope with deployment and adjust to Air Force family demands: Identification of risk and protective factors. *Armed Forces & Society*, 35, 286–306.

- Spera, C., Franklin, K., Uekawa, K., Kunz, J., Szoc, R., Thomas, R., & Cambridge, M. (2010). Reducing drinking among junior Air Force enlisted members in five communities: Early findings of the EUDL program's influence on self reported drinking behaviors. *Journal of Studies on Alcohol and Drugs*. (in press).
- Stafford, E., & Grady B. (2003). Military family support. *Pediatric Annals*, 32(2), 110–115.
- Stoltzfoos, L. (2008). Increased risk of PTSD symptoms in combat-exposed military personnel. *Primary Psychiatry*, 15(3), 25–26.
- Stretch, R. (1985). Posttraumatic stress disorder among U. S. Army Reserve Vietnam and Vietnam-era veterans. *Journal of Consulting and Clinical Psychology*, 53, 935–936.
- Suicide rates remain high. (2009, March 23). *Air Force Times*. Retrieved from: [http://www.airforcetimes.com/news/2009/03/airforce\\_suicide\\_032309w/](http://www.airforcetimes.com/news/2009/03/airforce_suicide_032309w/)
- Tanielian, T., & Jaycox, L. (2008). *Invisible wounds of war psychological and cognitive injuries, their consequences, and services to assist recovery*. Arlington VA: Rand Study, Center for Military Health Policy Research.
- Turner, M., Gardner, R., & O'Neill, V. (2001). *Landscape ecology in theory and practice: Pattern and process*. New York, NY: Springer.
- United States Air Force: Community Assessment Data: 2008.
- van Vranken, E. W., Jellen, L. K., Knudson, K. H., Marlowe, D. H., & Segal, M. W. (1984). *The impact of deployment separation on families*. Washington, DC: Walter Reed Army Institute of Research.
- Veterans for America. (2009). *Legislative action: Veterans for America legislative initiatives summary*. Retrieved from <http://www.veteransforamerica.org/legislative-action/>

- Vinokur, A., Pierce, P., & Buck, C. (1999). Work-family conflicts of women in the Air Force: Their influence on mental health and functioning. *Journal of Organizational Behavior*, 20, 865–878.
- Von Bertalanffy, L. (1968). *General Systems Theory*. New York, NY: Braziller.
- Wang, S., Wilson, J. P., & Mason, J. W. (1996). Stages of decompensation in combat-related posttraumatic stress disorder: A new conceptual. *Journal of Integrative and Psychological Behavioral Sciences*, 31, 237–253.
- Waynick, T., Frederich, P., & Scheider, D. (2005, October). *Enabling military families to survive the traumas of war*. Paper presented at the 63rd meeting of the American Association of Marriage and Family Therapists, Kansas City, MO.
- Weiss, P. (1977). The system of nature and the nature of systems: Empirical holism and practical reductionism harmonized. In K. Schaefer, H. Hensel, & R. Brody, (Eds.), *Toward man-centered medical science*. Mt. Kisco, NY: Futura.
- Williamson, V., & Mulhall, E. (2009). *Invisible wounds: Psychological and neurological injuries confront a new generation of veterans*. Retrieved from [http://iava.org/files/IAVA\\_invisible\\_wounds\\_0.pdf](http://iava.org/files/IAVA_invisible_wounds_0.pdf)
- Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10(3), 1–10. Retrieved from <http://jcmc.indiana.edu/vol10/issue3/wright.html>

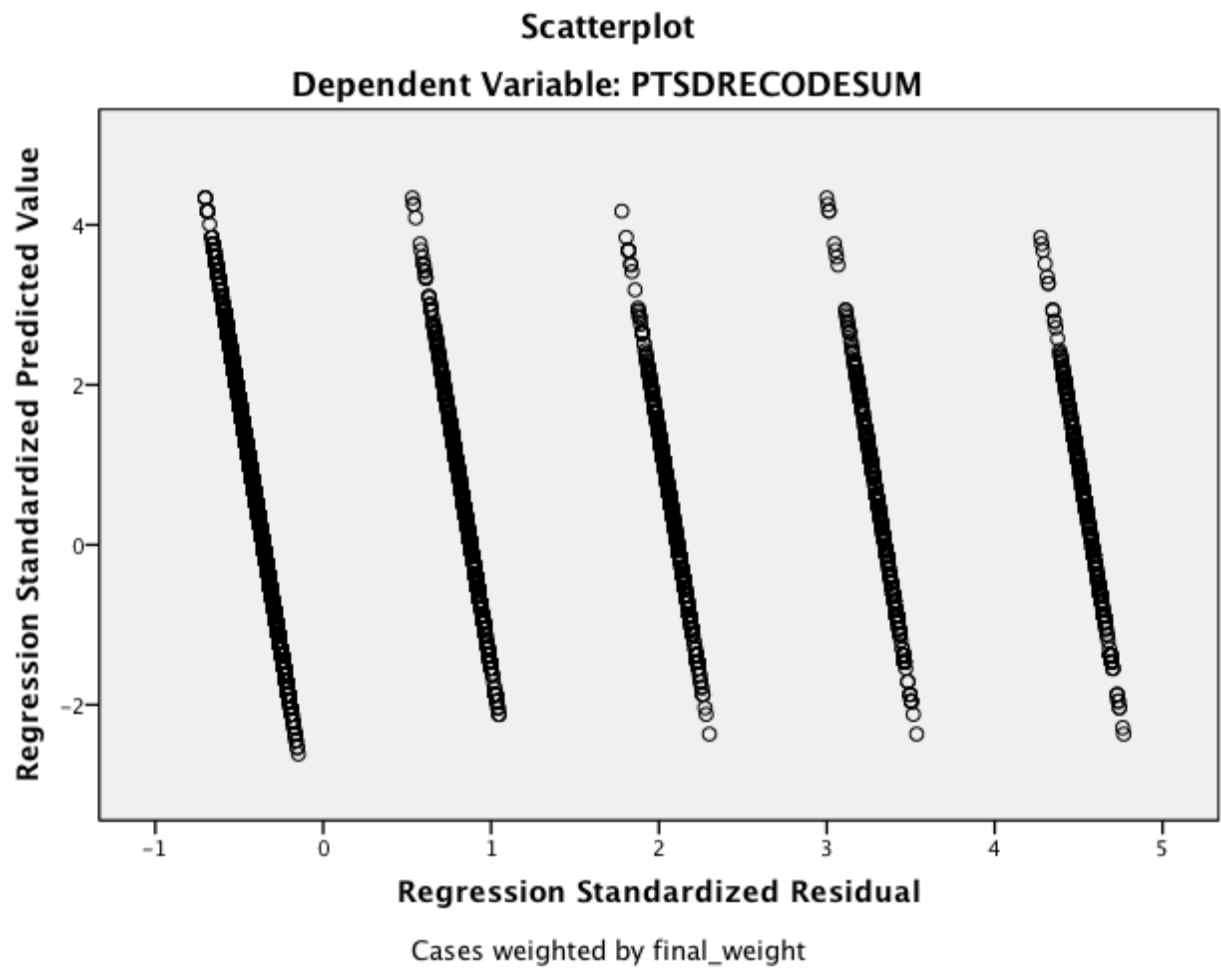


- Xian, H., Chantarujikapong, S. I., Scherrer, J. F., Eisen, S. A., Lyons, M. J., Goldberg, J., . . . True, W. R. (2000). Genetic and environmental influences on posttraumatic stress disorder, alcohol and drug dependence in twin pairs. *Drug and Alcohol Dependence*, 61, 95–102.
- Yuan, Y. (n.d.). Multiple imputation for missing data: Concepts and new development. SAS Institute, Rockville MD. (pp. 1-13).
- Yarvis, J. (2004). *Subthreshold PTSD in Canadian peacekeepers with different levels of traumatic stress* (Doctoral dissertation). Retrieved from VCU Electronic Theses and Dissertations (ETD's) Database.
- Zellman, G. L., Gates, S. M., Moini, J. S., & Suttorp, M. (2009). Meeting family and military needs through military child care. *Armed Forces & Society*, 35, 437–459.

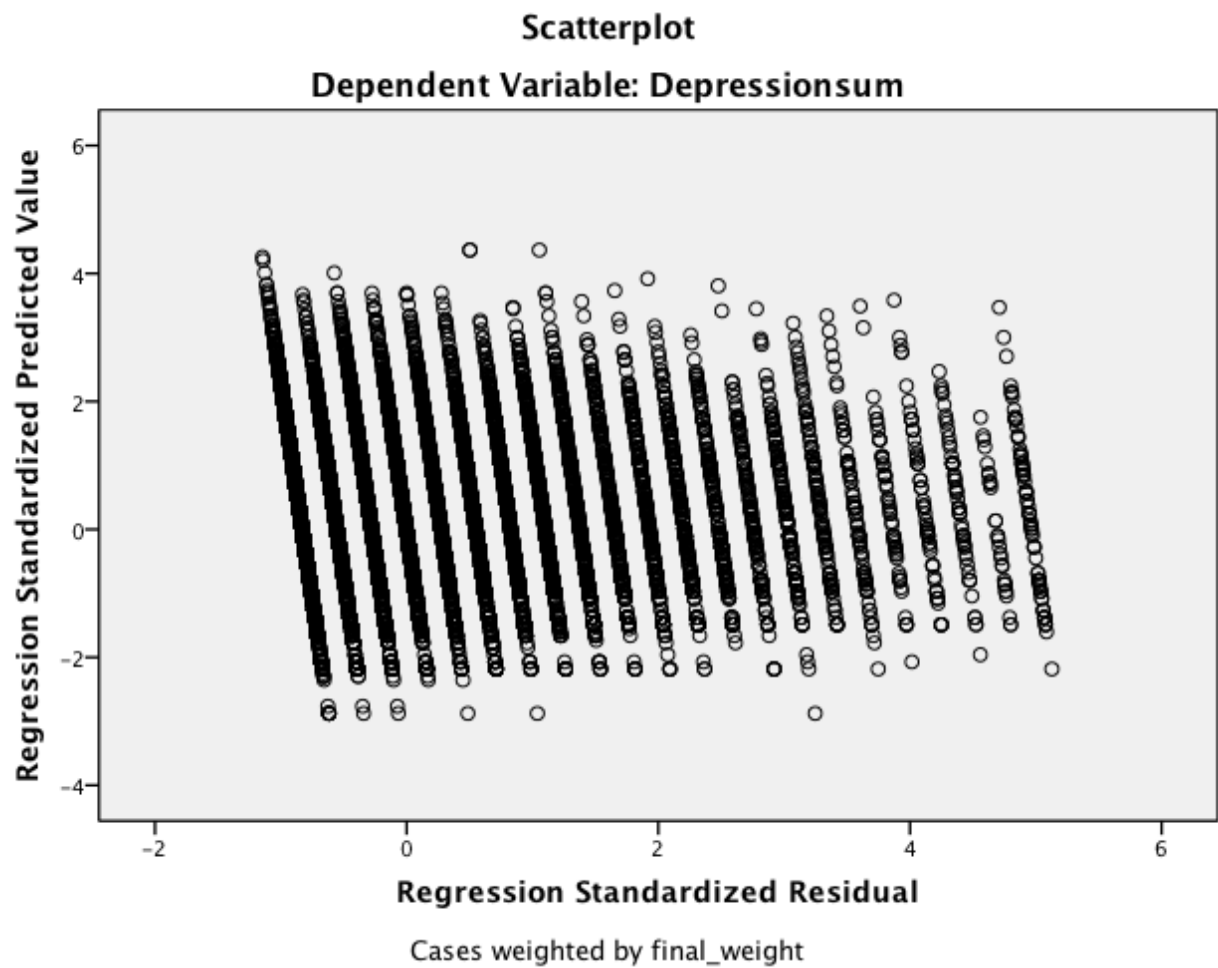
## **Appendix**

## Appendix

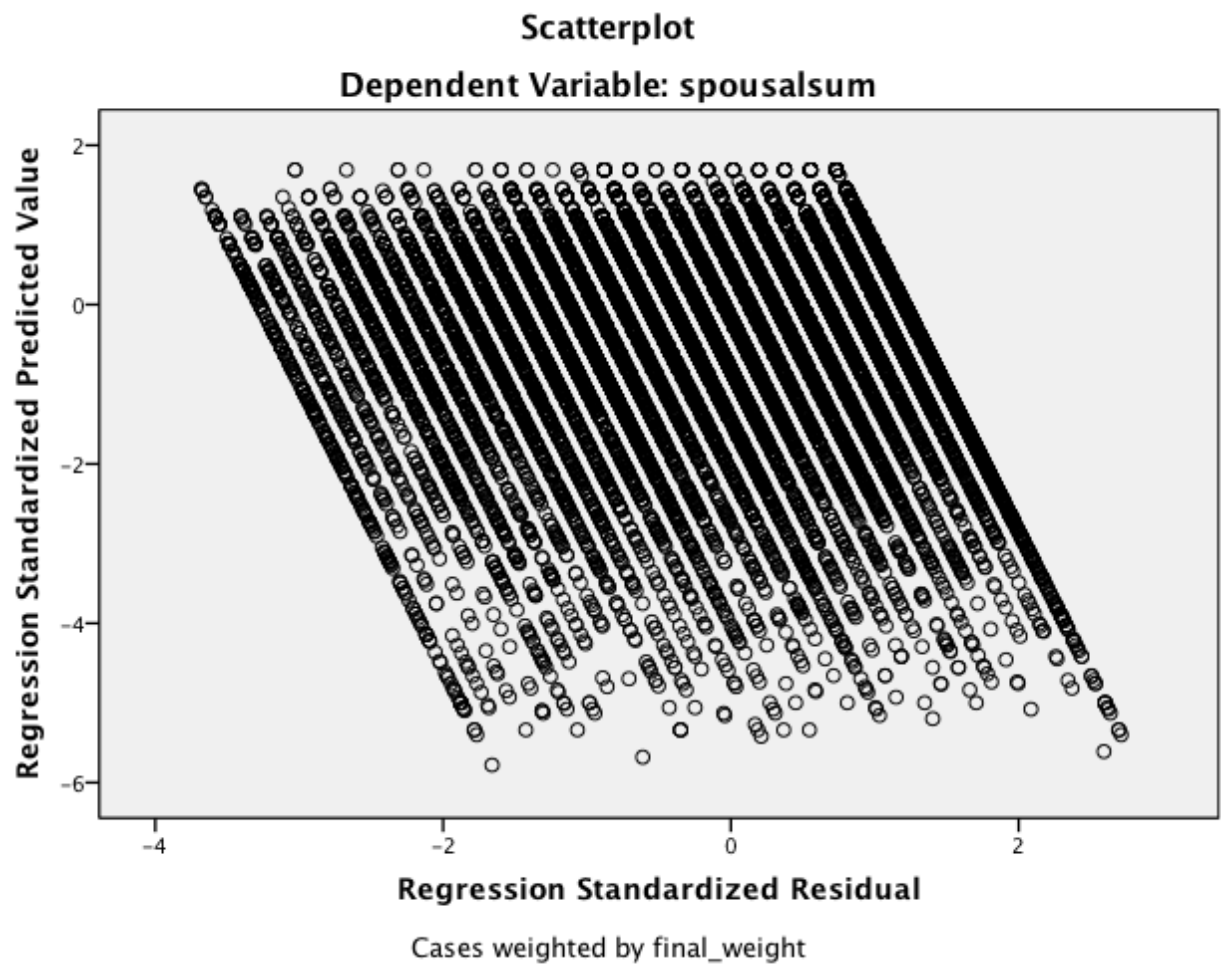
### Scatterplots



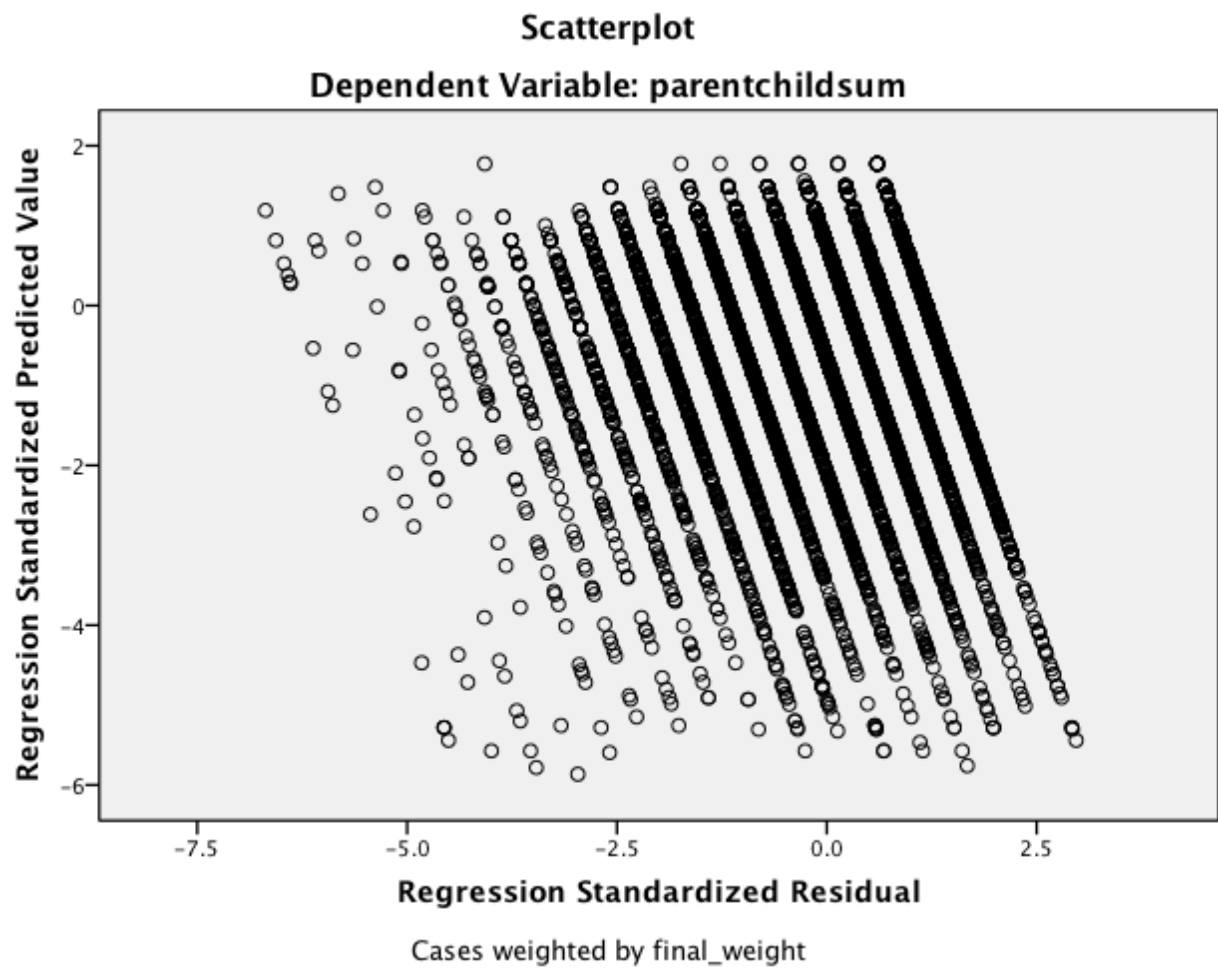
*Figure 13.* Hypothesis 1, regression 1: Examining Posttraumatic stress symptoms.



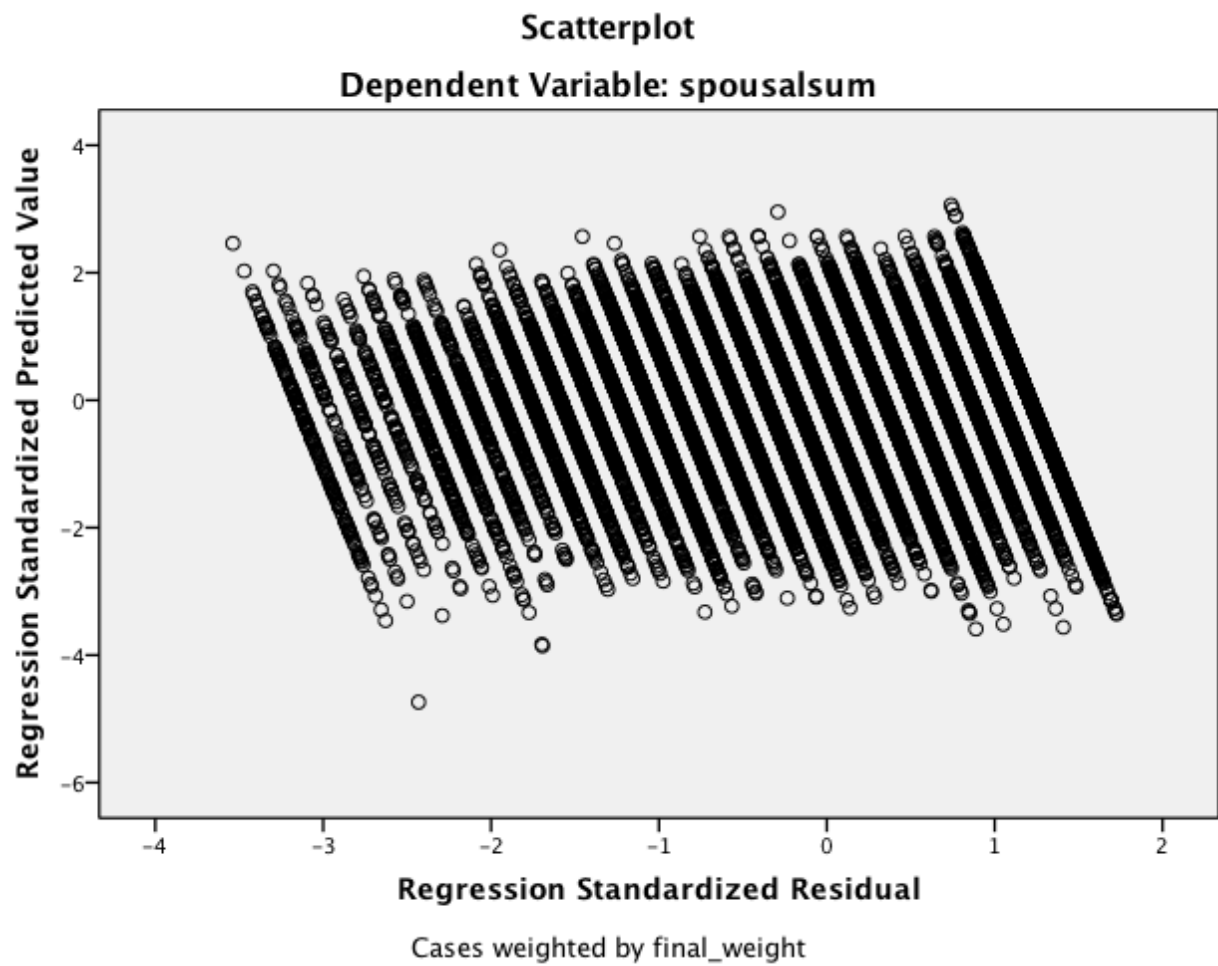
*Figure 14.* Hypothesis 1, regression 2: Examining Depressive Symptoms.



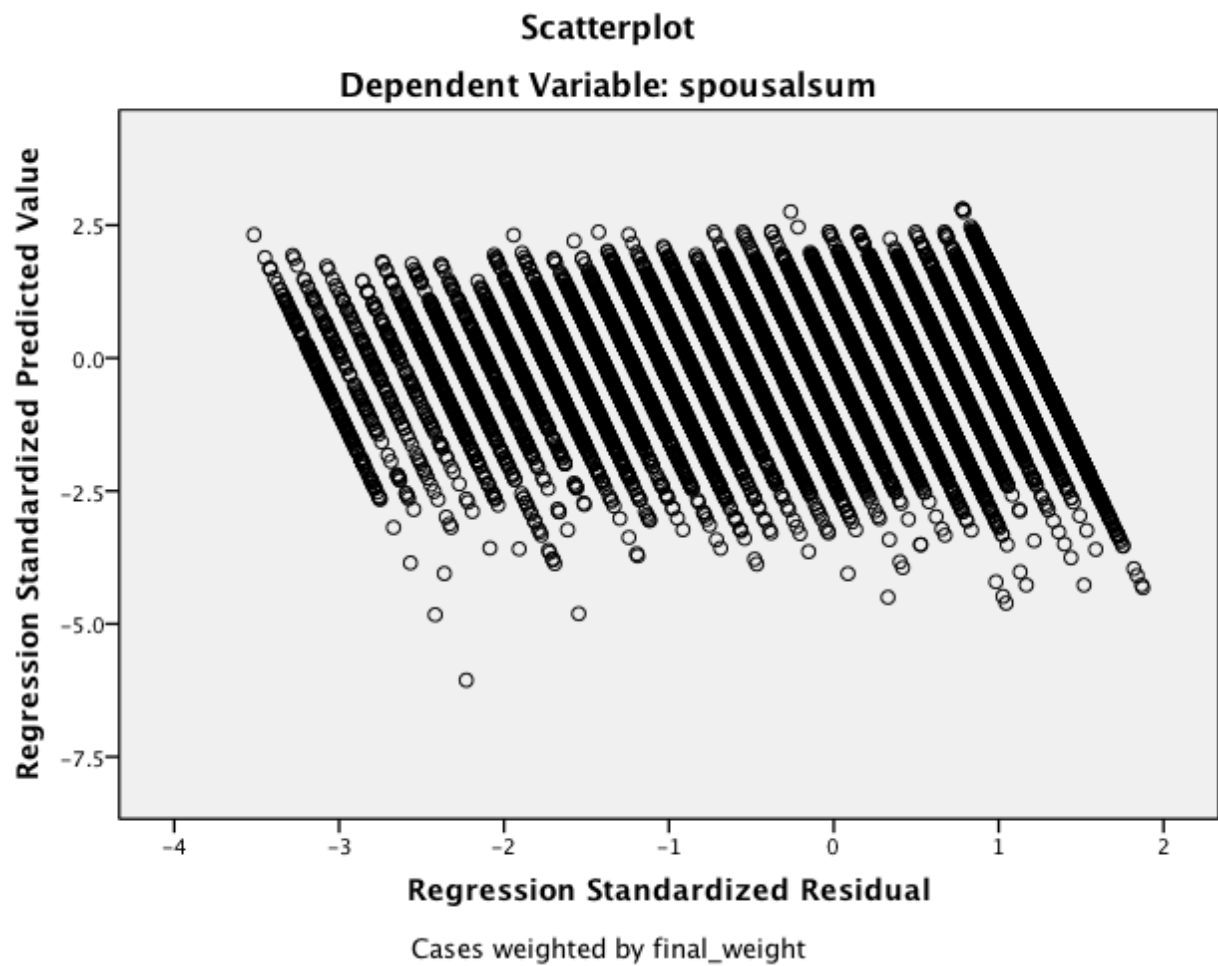
*Figure 15.* Hypothesis 2, regression 1: Examining Spousal Relationships.



*Figure 16.* Hypothesis 2, regression 2: Examining parent-child relationships.

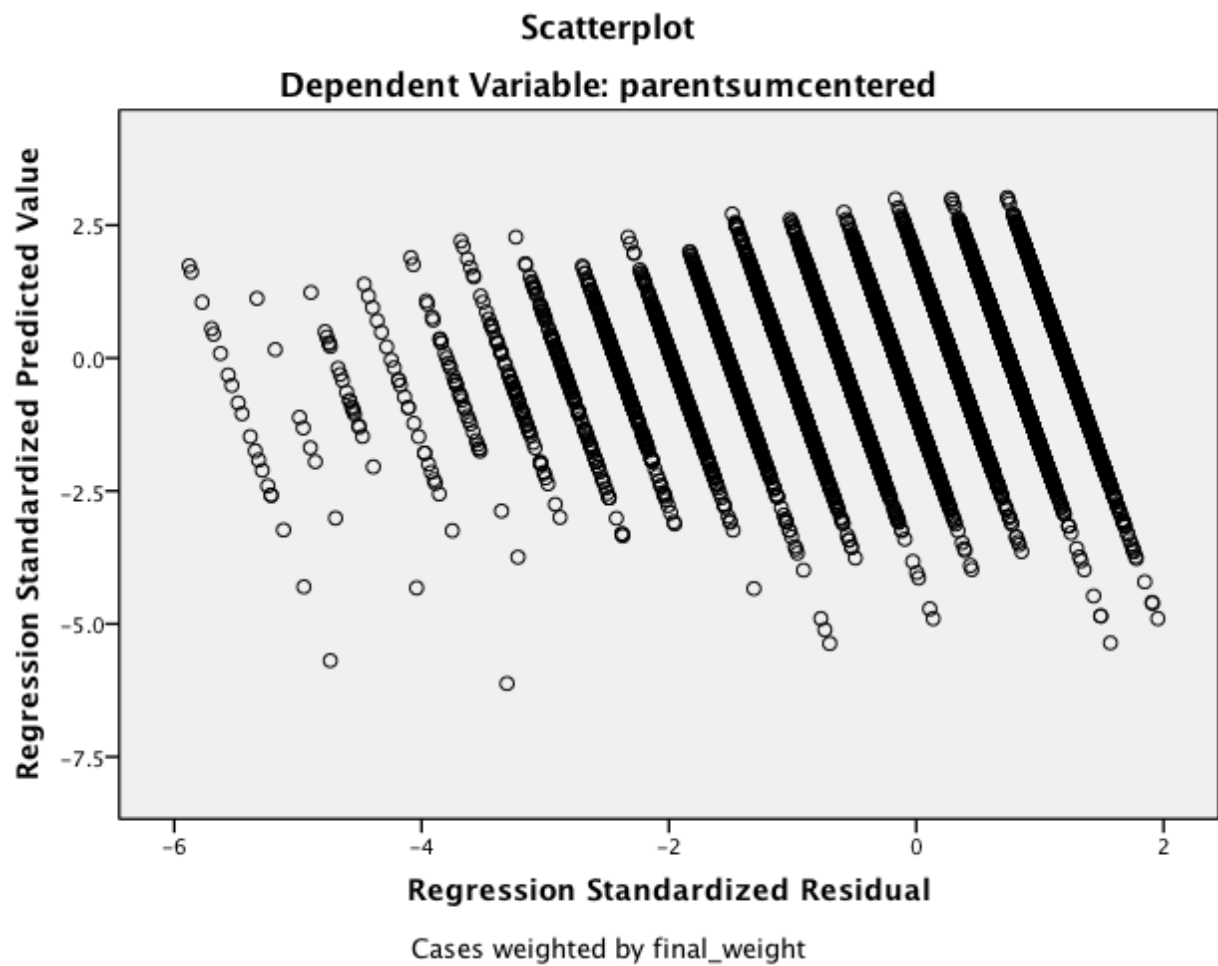


*Figure 17.* Hypothesis 3, regression 1: Examining spousal relationships.

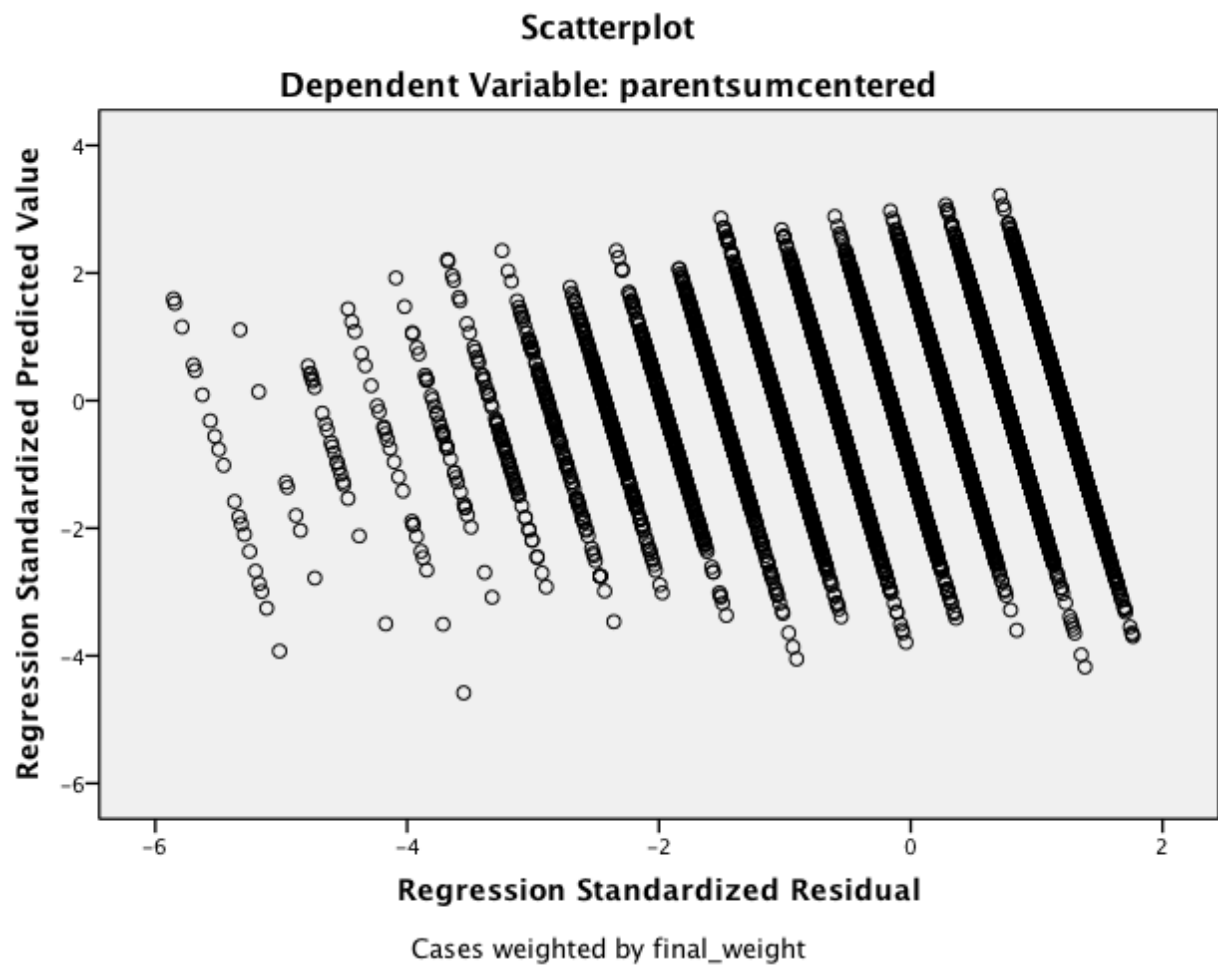


*Figure 18.* Hypothesis 3, regression 2: Examining spousal relationships.





*Figure 19.* Hypothesis 3, regression 3: Examining parent-child relationships.



*Figure 20.* Hypothesis 3, regression 4: Examining parent-child relationships.

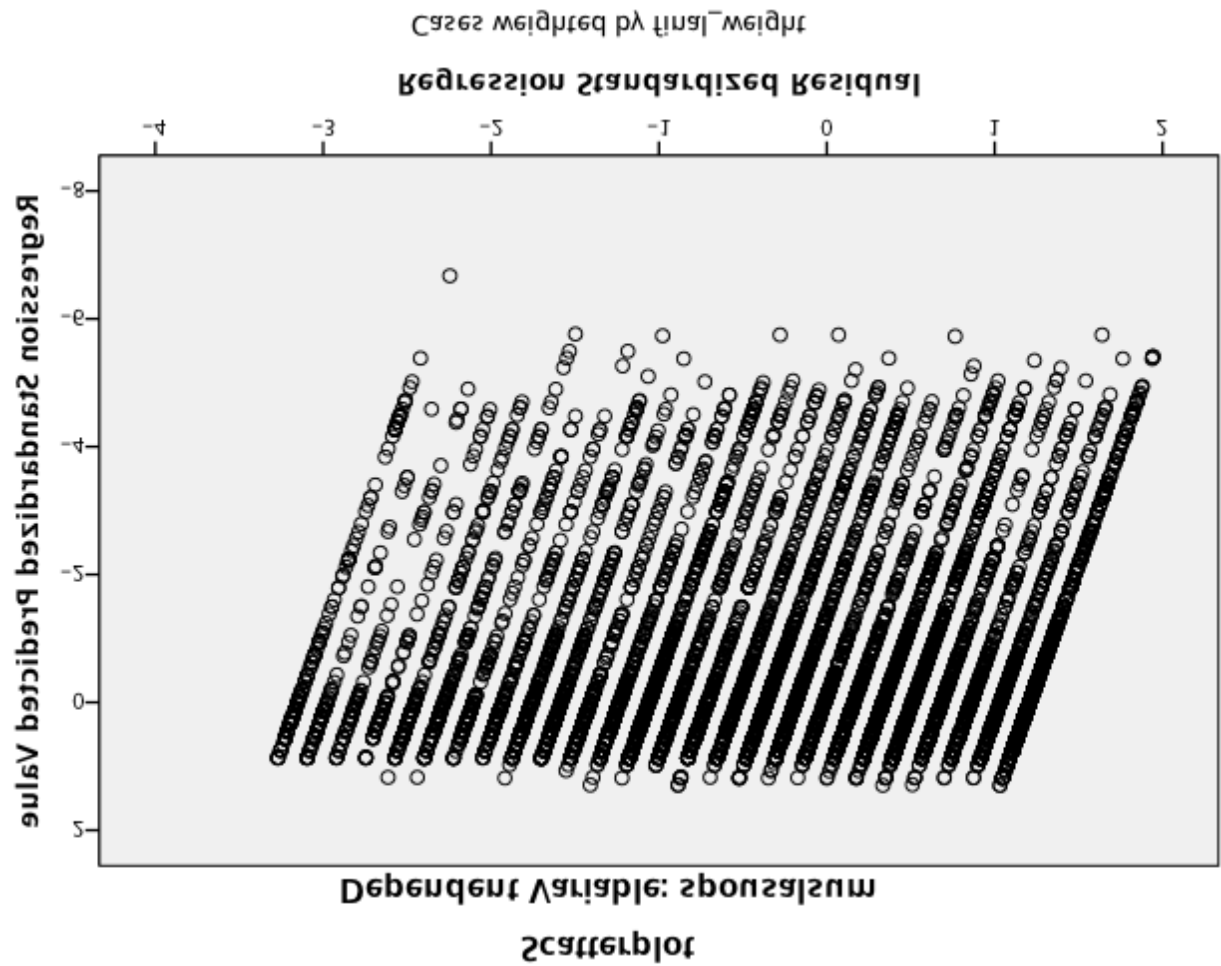


Figure 21. Hypothesis 4, regression 1: Examining spousal relationships.

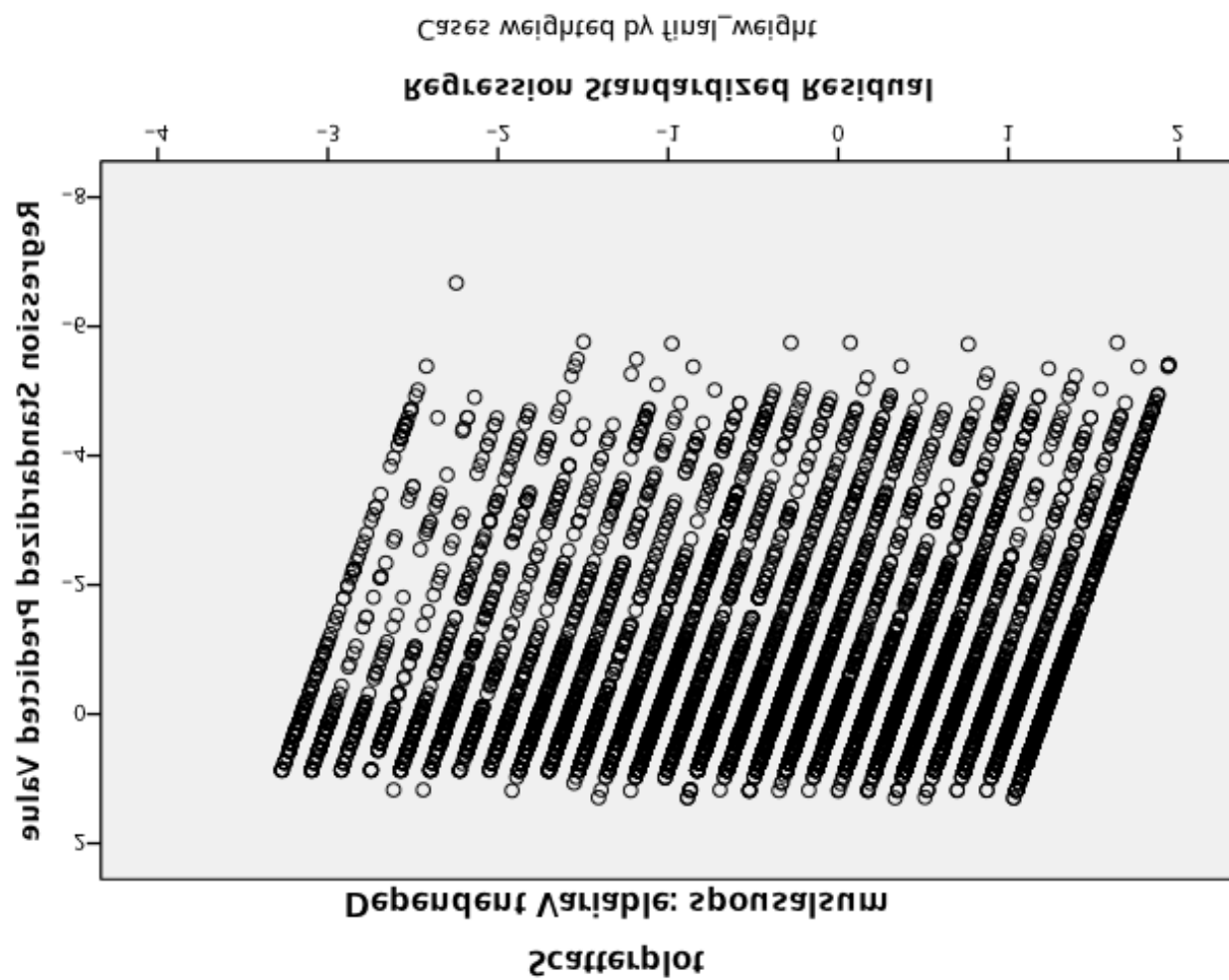
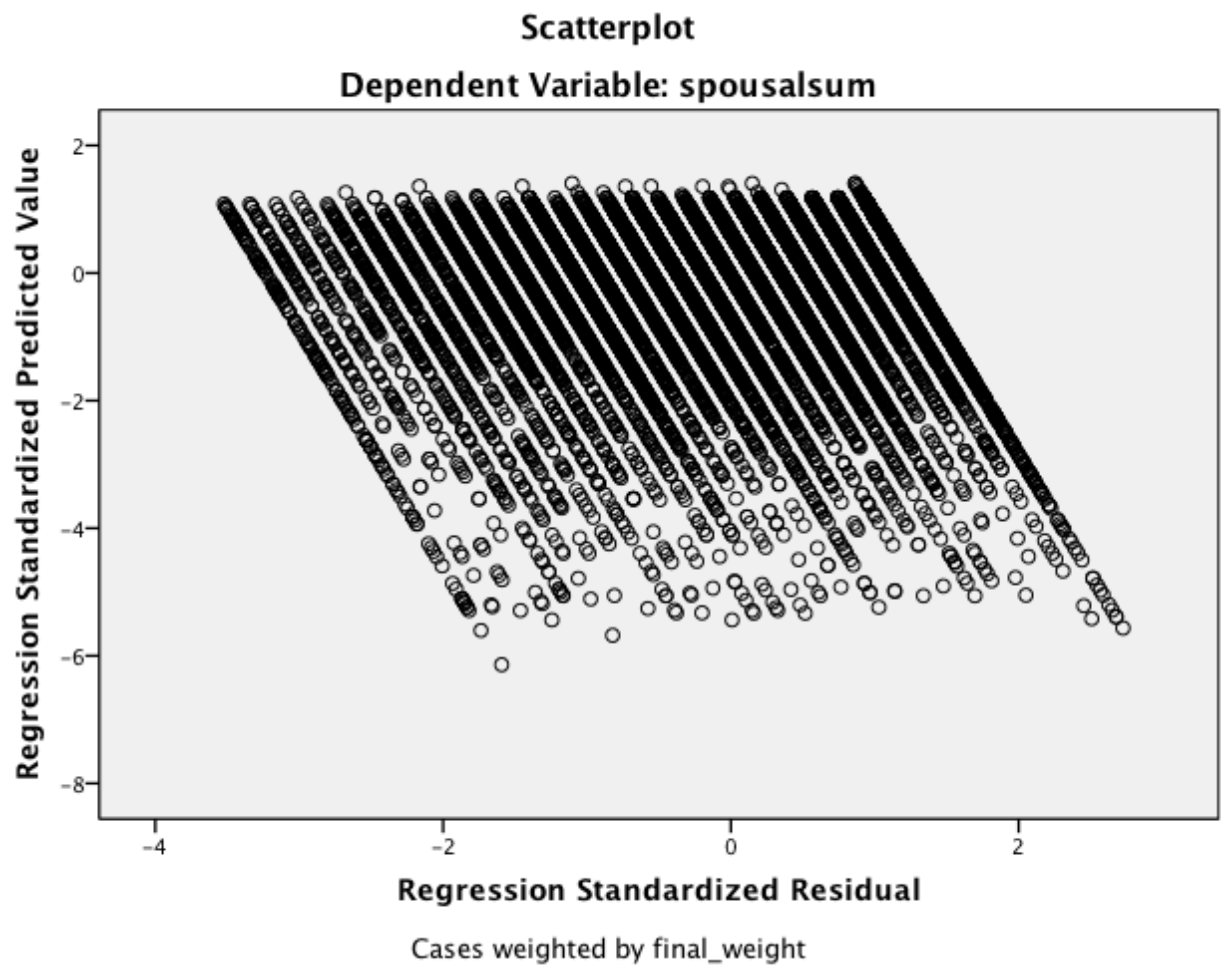
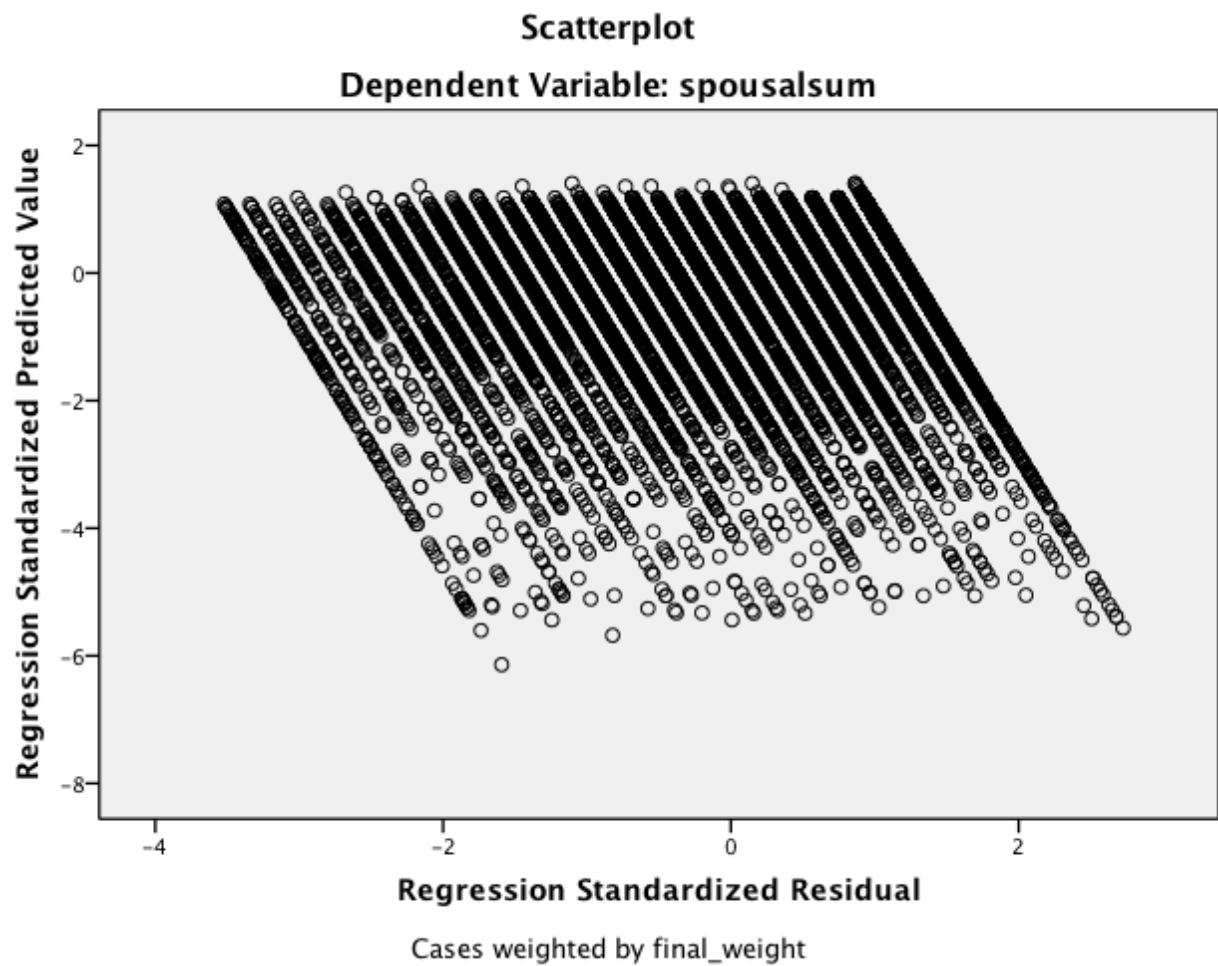


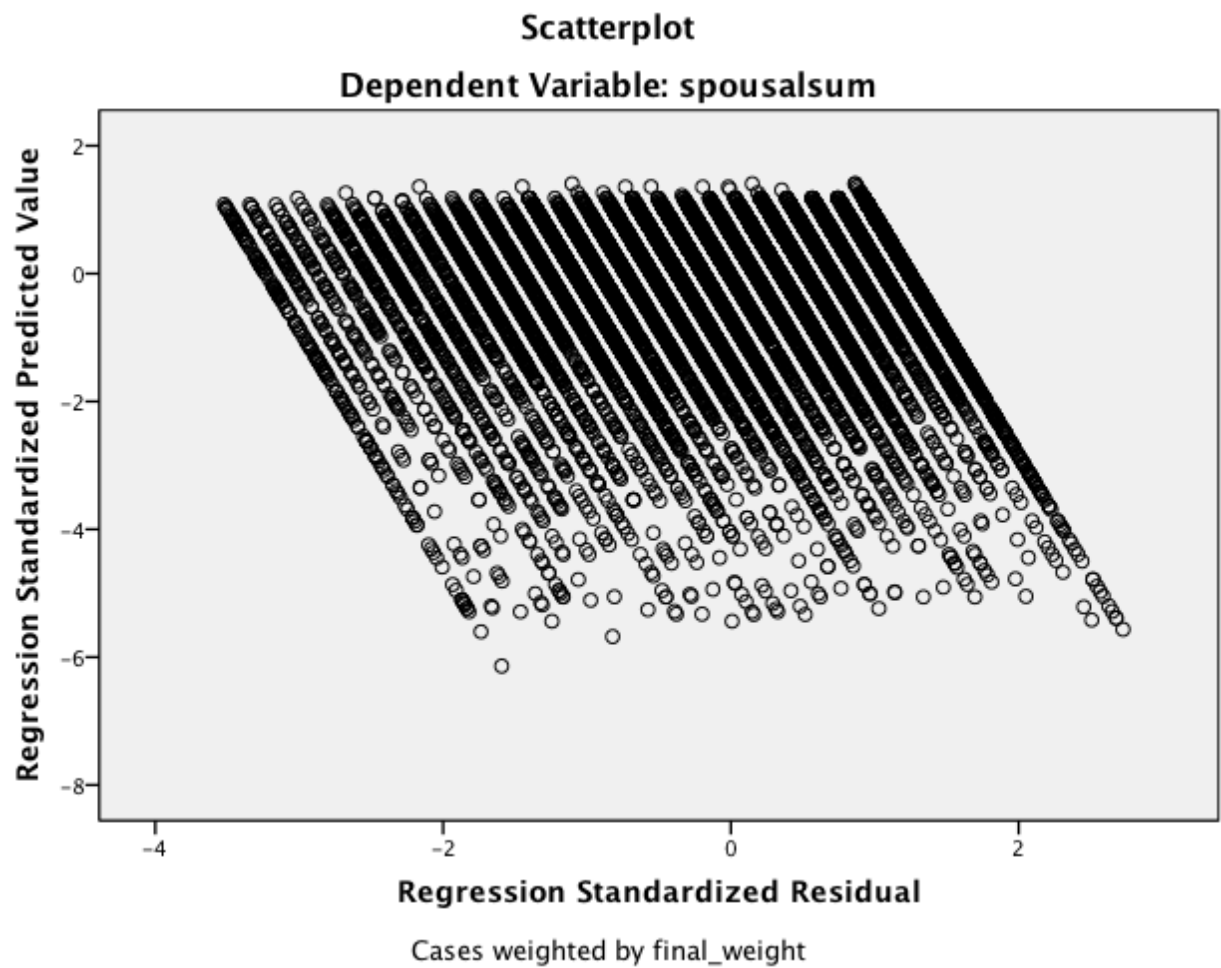
Figure 22. Hypothesis 4, regression 2: Examining spousal relationships.



*Figure 23.* Hypothesis 4, regression 3: Examining spousal relationships.



*Figure 24.* Hypothesis 4, regression 4: Examining spousal relationships.



*Figure 25.* Hypothesis 4, regression 5: Examining spousal relationships.

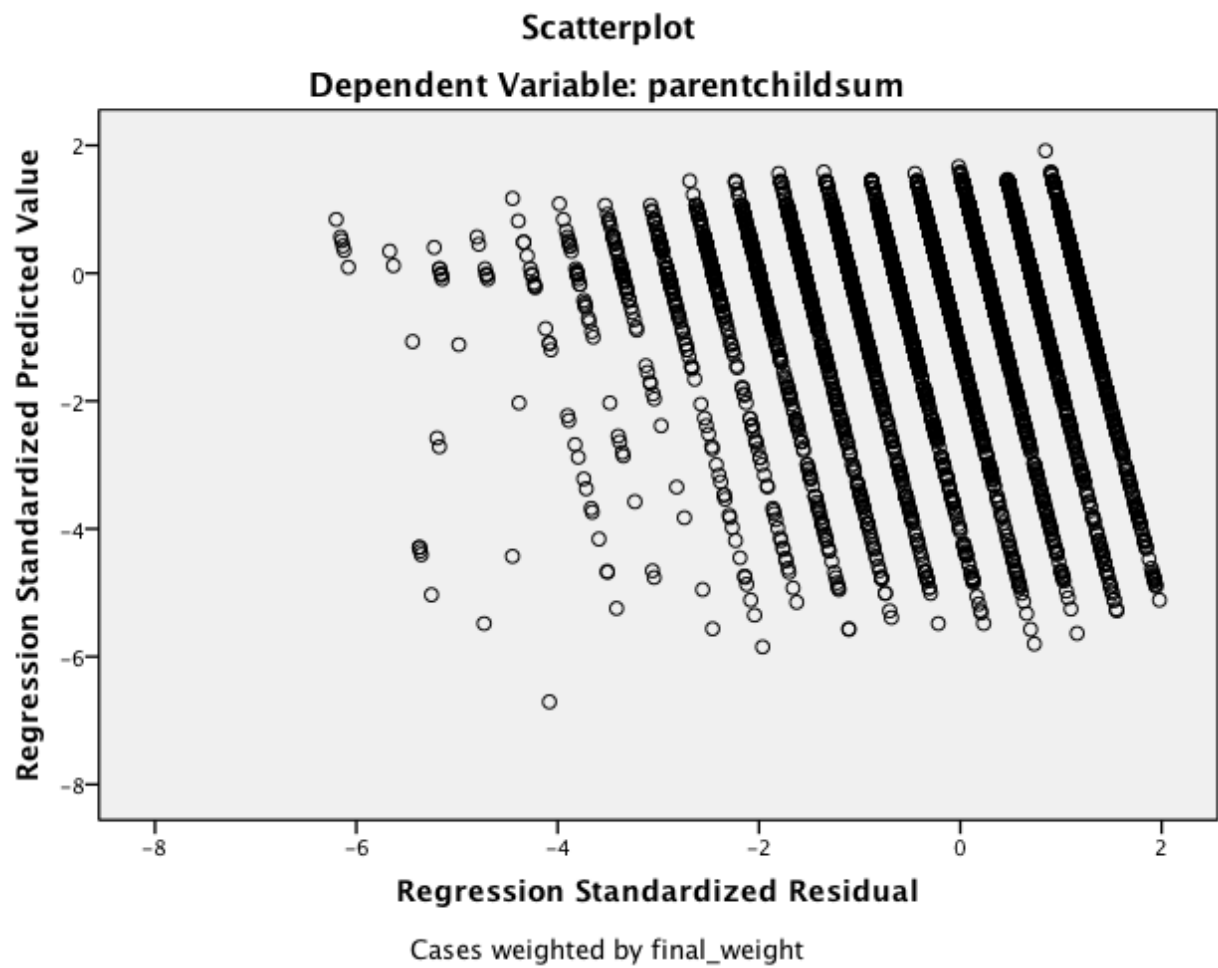
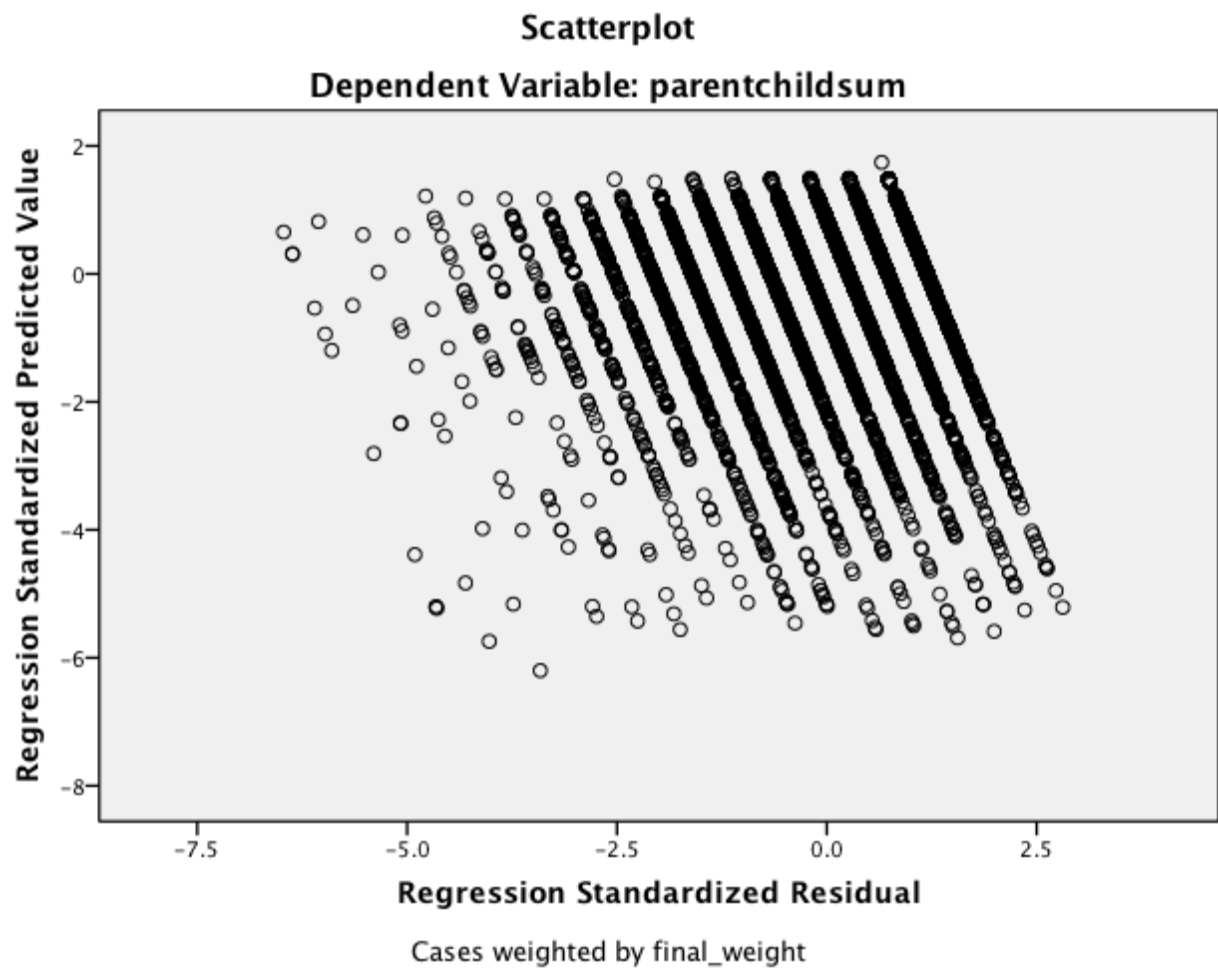
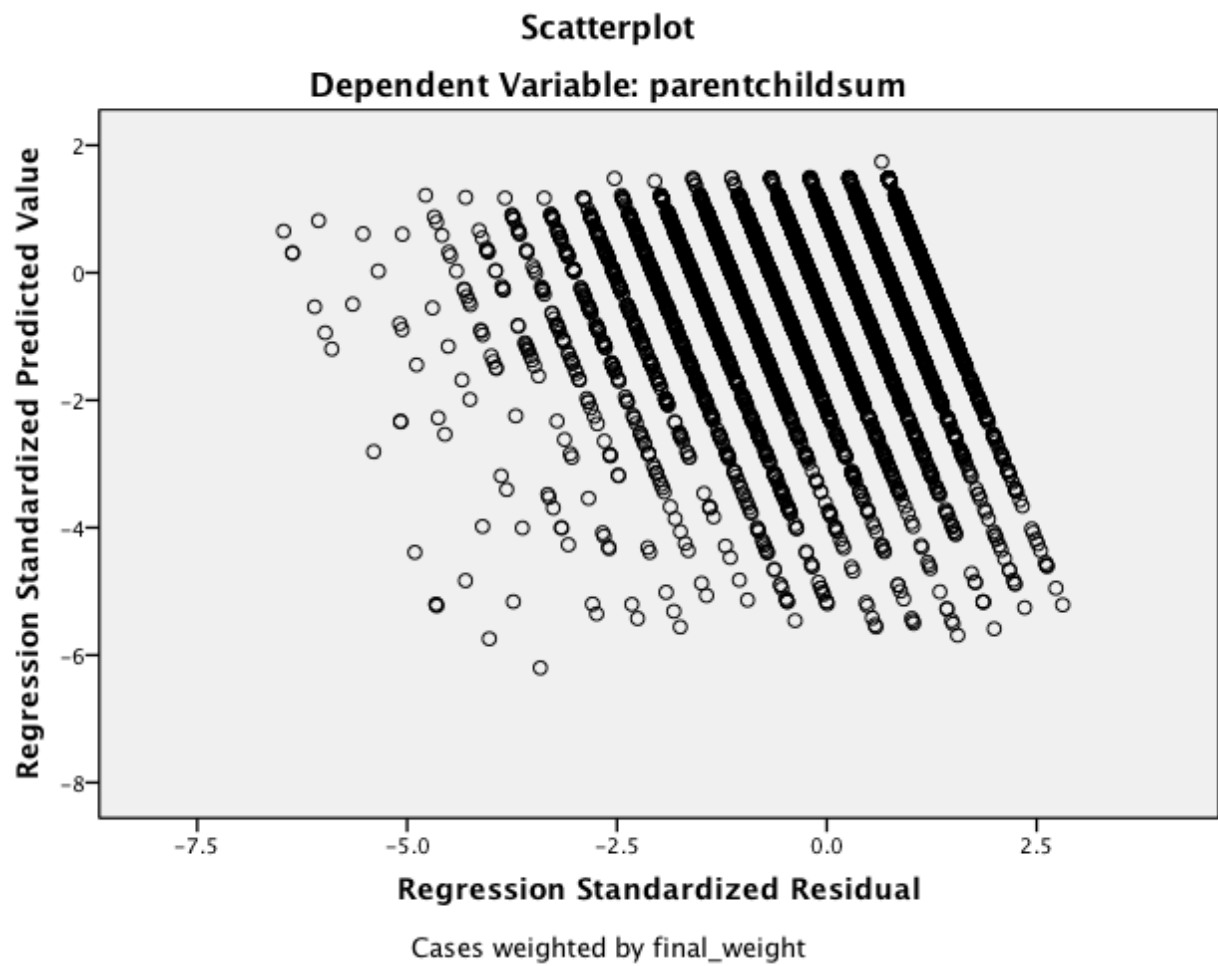


Figure 26. Hypothesis 4, regression 6: Examining parent-child relationships.





*Figure 27.* Hypothesis 4, regression 7: Examining parent-child relationships.



*Figure 28.* Hypothesis 4, regression 8: Examining parent-child relationships.