MAY 25 2004

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	20.May.04	DISSERTATION

4. TITLE AND SUBTITLE
JOB CHARACTERISTICS IN THE UNITED STATES AIR FORCE AND MENTAL HEALTH SERVICE UTILIZATION

5. FUNDING NUMBERS

6. AUTHOR(S)
MAJ BAUMGARTEN VICTOR A

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
ARIZONA STATE UNIVERSITY

8. PERFORMING ORGANIZATION REPORT NUMBER
CI04-350

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
THE DEPARTMENT OF THE AIR FORCE
AFIT/CIA, BLDG 125
2950 P STREET
WPAFB OH 45433

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION AVAILABILITY STATEMENT
Unlimited distribution
In Accordance With AFI 35-205/AFIT Sup 1

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

20040601 041

14. SUBJECT TERMS

15. NUMBER OF PAGES
143

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

JOB CHARACTERISTICS IN THE UNITED STATES AIR FORCE AND MENTAL HEALTH SERVICE UTILIZATION

by

Victor Baumgarten

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

ARIZONA STATE UNIVERSITY

April 2004

JOB CHARACTERISTICS IN THE UNITED STATES AIR FORCE

AND MENTAL HEALTH SERVICE UTILIZATION

by

Victor Baumgarten

has been approved

April 2004

APPROVED:

Ann E MacEachron, Chair

Mary Bonin

Raymond Arsenault

Supervisory Committee

ACCEPTED:

Director of the School

Dean, Graduate College

ABSTRACT

Data from the 2000 Air Force Community Needs Assessment were used to assess the significance and strength of the effects of job characteristics and social supports on mental health service utilization. In this study, mental health services included anger management, mental health, stress management and substance abuse services. Job stressors were hypothesized to increase service utilization. Social support was hypothesized to decrease service utilization and buffer the effects of job stressors. Four job stressors were used: shift work, long work hours, frequency of deployments, and length of deployments. Social support was evaluated on five levels: family support, community integration, co-worker support, supervisor support, and support by superiors. Family support was measured in terms of being accompanied by family members and family instability (conflict and doubt). Co-worker support was measured in terms of co-worker conflict.

Logistical regression was used in analyzing the predictive strength of job stressors and social supports on mental health service utilization. No main effects were found for job stressors. For social support, significant predictors of service utilization were family instability (OR = 1.293), co-worker conflict (OR = 0.975), community integration (OR = 1.208) and supervisor support (OR = 0.813). High family instability and high co-worker conflict emerged as the strongest risk factors for using mental health services. Additional analysis using ordinary least squares regression showed job stressors to have small direct effects on social support and marginal indirect effects on mental health service

utilization. Additional risk factors included being female, being enlisted, and being first-term personnel.

Mental health service utilization in the Air Force is not significantly associated with shift work, long work hours or deployments. Future research should look at other potential effects of these stressors and evaluate the effects of other job characteristics. This study found significant associations between social support and mental health service utilization and supports the need to strengthen social support programs and quality-of-life initiatives in the military.

ACKNOWLEDGEMENTS

This dissertation represents the culmination of three years as a Ph.D. student and almost ten years as a social worker in the United States Air Force. I am grateful to the Air Force for giving me the opportunity to pursue and obtain this degree, which I hope to put to good use during my next ten years of military service. I have had many colleagues and mentors, supervisors and peers who have encouraged me and guided me in my professional development and have kindled my patriotism and dedication.

Academically, I am also indebted to many. I extend my deepest thanks to Dr. Ann MacEachron who served as my graduate committee chairperson. Dr. MacEachron gave me unlimited access to her guidance and insight through the dissertation process. I am convinced that she was one of the driving forces that enabled me to complete my Ph.D. within the timeframe allotted me by the Air Force. I express my gratitude to Dr. Mary Benin who I found to be so talented a professor that I took more classes from her than from any other professor. Her expertise and passion for statistics and sociological matters made it possible to navigate the maze of statistics. I also thank Dr. Layne Stromwall for taking me on as a research assistant and giving me a solid footing in Ph.D.-level research and literature review. I am grateful for these three for their willingness to participate with me as my graduate committee. I also wish to express my gratitude to Dr. Robert Moroney and Dr. Josefina Figuira-MacDonough, both of whom have had lasting impressions on my philosophical and theoretical orientation.

I am grateful to my family – my beautiful wife for her support and encouragement and to my children, [redacted], [redacted], [redacted], [redacted] for their constant companionship and understanding. Without their support, this never would have come to completion. Additionally, I thank my parents and my in-laws who have visited us multiple times during our time here and have always gone out of their way to support us. The timely completion of this dissertation is largely a result of the outstanding family support that I have.

DISCLAIMER

The views expressed in this dissertation are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the U.S. Government

TABLE OF CONTENTS

Page

LIST OF TABLES x

LIST OF FIGURES xi

CHAPTER

1 INTRODUCTION 1

Rationale 2

2 BACKGROUND LITERATURE 10

Theoretical Frame 11

Mental Health Service Utilization 22

Shift Work and Long Work Hours 22

Deployment 25

Social Support 27

Exploratory analyses 36

Conclusion 37

3 METHODOLOGY 39

Source of Data 39

Measures 40

Data Analysis 46

Strengths and Limitations 48

4 RESULTS 50

Hypothesis Testing 59

Additional Analysis 71

CHAPTER Page

5 DISCUSSION 79

Limitations 81

Implications 83

Directions for Future Research 85

Conclusion 86

REFERENCES 88

APPENDIX

A AIR FORCE COMMUNITY NEEDS ASSESSMENT QUESTIONS 103

B FREQUENCY TABLES 109

C LOGISTIC REGRESSION RESULTS 117

D PROBABILITY TABLES 123

E ORDINARY LEAST SQUARES REGRESSION OF SOCIAL SUPPORTS ON JOB CHARACTERISTICS 130

LIST OF TABLES

Table Page

1. Means, Standard Deviations and Correlations of Job Stressors, Social Supports and Mental Health Services.....52
2. Odds Ratios for the Prediction of Mental Health Service Utilization by Control Variables, Job Stressors, and Social Supports.....61
3. Standardized Effects of Predictor Variables on Mental Heatlh Service Utilization.....75
4. Results of Hypothesis Testing 77

LIST OF FIGURES

Figure Page

1. Lazarus' psychological stress model 15
2. Stress model for empirical analysis 38
3. Distribution of age for first-term and career personnel 56
4. Structural equation model of job stressors and social supports on mental health service utilization 73
5. Revised stress model based on statistical analysis 76

Chapter 1: Introduction

Occupational stress is a potential health hazard in the military (Day & Livingstone, 2001; Dobreva-Martinova, Villeneuve, Strickland & Matheson, 2002). In recent studies, over a quarter of military personnel reported significant occupational stress (Pflanz & Sonnek, 2002) and more than half of a clinical sample from a military mental health clinic reported suffering from significant occupational stress (Pflanz, 2001). Furthermore, military mental health clients often reported that occupational stress had caused emotional distress and was a contributing factor to their mental illness.

While occupational stress research has grown over the past couple decades, researchers rarely study occupational stress in military settings. Similarly, the research seldom looks at the effects of social support in military settings despite empirical evidence that social support has both direct positive effects on mental health and buffering effects on the association between stressors and mental health (e.g., Cooper, Dewe & O'Driscoll, 2001; Lazarus, 1966).

This study has two primary objectives: 1) to determine if there are significant and strong associations between job characteristics and mental health service utilization among military members and 2) to test the buffering effect of social support on the relationship between job characteristics and mental health service utilization.

Rationale

Occupational Stress

Occupational stress refers to the stressors and strain that are related to characteristics of the work environment. "Job stress" and "work stress" are commonly used synonymously with "occupational stress," although the latter is generally used as an all-encompassing term for the field of study. I will follow the general convention in the literature (e.g., Cooper et al., 2001) and refer to job-related stressors or work-related stressors when discussing specific sources of stress in the workplace, and refer to occupational stress when discussing broader issues and theoretical areas.

Occupational stress research is based on the idea that some aspects of the work environment can have adverse effects on employees (Beehr, Farmer, Glazer, Gudanowske & Nair, 2003; Holt, 1993). Since the 1970s, research on occupational stress has burgeoned. PsychLit, for example, gives only six hits for occupational stress and its synonyms between 1965 and 1970, but more than 2500 hits from 1995 to 2000. Yet only a handful of studies address occupational stress in the military. Combat has been studied from psychological and medical perspectives as a trauma that is unique to the military, but the most common job stressors in the military are not related to combat. The most common job stressors are the same as those found in civilian organizations (Buddin & Do, 2002; MacDonough, 1991; Pflanz, 2001; Pflanz & Sonnek, 2002). These are the day-to-day stressors that create a chronic strain, such as shift work, conflict with

supervisors, and conflict between work and family demands. Along these dimensions, occupational stress in the military seems to be similar to occupational stress in the civilian sector.

Occupational Stress Research and the Military

Research on job characteristics and health outcomes has almost exclusively involved civilian populations. The military can benefit from extant research, but it is not clear how well these studies can be generalized to the military because of differences between the two populations. Today's military has two distinct aspects: 1) a traditional side that emphasizes chain of command, traditional military values and combat capabilities, and 2) a side that resembles a bureaucratized business organization (Sarkeskian & Conner, 1999). These two aspects are interwoven in the military culture and environment. While little is known about either component in the literature, the civilian-based research gives a good starting point for the military. Generalizing civilian research to military populations can be problematic, however, because of the differences associated with the military culture, environment and lifestyle. Military culture shapes military lifestyle and the family environment because virtually all activities are conducted within the official organizational structure and the military context (Sarkeskian & Conner, 1999).

There has been a long symbiotic relationship between civilian and military research. Posttraumatic stress and domestic violence are two examples where this relationship has been fruitful. Theory and treatments for posttraumatic stress

have been influenced by military psychological concepts including battle fatigue and shell shock (Department of the Army, 1994; Noy, 1991). The military continues to be on the cutting edge in this area with Critical Incident Stress Management teams and post-deployment debriefings. Domestic violence in the military is addressed by the Family Advocacy Program (FAP). FAP originally used civilian research with a focus on child abuse, but has since evolved to be a leader in programs targeting all forms of domestic violence with early intervention and comprehensive treatment for all family members.

The military may also learn from civilian research on occupational stress and offer new contributions. There has been very little research in the military on the impact of routine job characteristics on soldiers (Planz & Sonnek, 2002) even though such stressors may impact military readiness. At issue is how occupational stress impacts the unit's readiness through the individual soldier's mental and physical health.

The concept of military readiness warrants clarification at this point. Readiness is commonly used in lay settings as a vague and all-inclusive term, but military professionals have very specific conceptualizations and measurements for readiness. Readiness is generally conceptualized as being of two types – structural and operational. Structural readiness refers to the size of the military force and the logistical resources available to accomplish the mission. Operational readiness refers to the training and preparedness of soldiers to accomplish their assigned mission (Betts, 1995). Our interest here is in

operational readiness (throughout the remainder of this paper, "readiness" refers to operational readiness). In terms of the individual soldier, readiness is synonymous with preparedness and refers to the "capacity to perform one's mission when directed to do so" (Betts, 1995, p. 25). Unit readiness can then be seen as the sum or synergistic outcome of the readiness of the individual soldiers. Readiness deals with capacity and with timeliness. It includes an incessant preparation for no-notice or short notice (less than 24 hours) assignments. The relationship between occupational stress and readiness involves the individual soldier. When individuals are emotionally distressed, there is a higher risk for attrition, decreased productivity and interpersonal conflict (Planz & Sonnek, 2002). Mental and physical health are fundamental to a military member's preparedness and ability to fulfill his or her duties (Mangelsdorff & Gal, 1991). In the military this translates into issues of operational readiness. Declines in physical and mental health threaten the readiness of the individual and the unit he or she belongs to (Bray, Camlin, Fairbank, Dunteman & Wheeless, 2001). If occupational stress impacts the mental and physical health of the individual soldier, individual readiness is compromised and unit readiness is diminished.

The majority of jobs in the military do not involve combat, but instead support combat units, provide support to military families and focus on the day-to-day operation of the military organization. Most of today's military personnel have not been involved in combat (Pflanz & Sonnek, 2002). While some

elements of the military can be characterized as being traditionally military and focused on combat, a larger segment of the military has evolved to be comparable with the civilian sector (Segal & Segal, 1983). Even among combat units, the majority of personnel have not been involved in combat situations. Many military members spend their work time doing administrative, clerical, technical, legal, medical and skilled labor jobs. Day-to-day job stress in the military is associated with ambiguity and lack of job stimulation, low autonomy and job control, problems with co-workers and supervisors, workload and work schedule (Bray, Fairbank& Marsden, 1999; Day & Livingstone, 2001; Planz, 2001; Planz & Sonnek, 2002), the same issues that are dealt with in the organizational stress literature on civilian organizations. In these areas, occupational stress in the military appears to be similar to that found in the civilian sector.

Implications for the Military

The implications of occupational stress in the military relate to readiness, recruitment and retention, and quality of life for the soldier and the military family.

Readiness. Occupational stress has the potential to diminish individual readiness and subsequently compromise unit readiness. Military units need to be at their best possible levels of readiness when called for deployment in order to effectively and efficiently respond to the situations they encounter. Factors such as occupational stress that diminish readiness while in garrison (i.e., at their

home base) decrease initial readiness and can impair the unit's functioning on deployment.

Recruitment and retention. Today's military is an all-volunteer force. Joining and remaining in the military is generally left to individual choice, and so the military must compete with the civilian sector to acquire and keep personnel. The military shifted from a conscription force to an all-volunteer force in the early 1970s. Several societal factors prompted that shift. Perhaps the most influential factors were the unpopularity of the Vietnam War and the large number of baby-boomers coming of age for the draft (Chu, White, Berstein & Brown, 2001). Regardless of the reasons for the change, switching to an all-volunteer force has had long-lasting impact on the military. The demographics of the military have also shifted with an all-volunteer force. Today's military is a little older than it was under the draft, more military members are married, there are more women in the military, and the military is one of the most ethnically and racially integrated segments of society (Center for Strategic and International Studies, 2000; Segal & Segal, 1983). Serving in the military has become more like an occupation rather then a calling to serve one's country (Segal & Segal, 1983). The military has become a hybrid of traditional military values and contemporary business models. As this has happened, quality of life has become more important to military recruitment and retention. As a result, a vast array of social services and programs has developed. Occupational stress is among the quality of life factors that influence recruitment and retention.

Along with other factors, occupational stress may impact the desirability of a military career. Job satisfaction in the military is related to many aspects of the military lifestyle and culture that pose unique challenges for military members (Day & Livingstone, 2001; Pflanz & Sonnek, 2002). The U.S. military is the smallest it has been since the 1960s as the result of reductions in personnel, but it has more missions than ever before (Bray et al., 1999; Center for Strategic and International Studies, 2000; Polich & Sortor, 2001). A recent study argues that the today's military is undermanned and overworked, with many segments of the military also being under-paid and under-resourced (Center for Strategic and International Studies, 2000).

Family and Quality of Life. Because the military consists of volunteers, the majority of whom are married, quality of life issues consume time and resources. The relationship between work and family is pertinent to the discussion of stress in the military. Both the work and family areas are frequently identified as primary sources of stress (e.g., Edwards & Rothbard, 1999), and family factors have been associated with military readiness and retention (Schumm, Bell & Resnick, 2001). Conflict between work demands and family demands is itself a strain that can further exacerbate the stress in both realms.

In addition to stressors experienced by most other American families, military families regularly experience stressors related to military service. Geographic mobility, family separation, and living in foreign countries are common stressors for military families (Kaslow, 1993; MacDonough, 1991).

Military members are reassigned to a different base every three to four years, and, in most cases, are accompanied by their families. Frequently relocation disrupts social support systems and can isolate families from the resources they need. Military families often live in foreign countries where they either adjust to the foreign culture or confine themselves to the military installation. Foreign assignments result in wonderful cultural experiences for some and extreme anxiety and stress for others.

Deployment is one of the few job stressors that are unique to the military. With the downsizing of the military and the increase in military operations, most military members can expect to be deployed and separated from family at some time during their military career. While deployment has a positive effect on reenlistment and retention (Fricker, 2002; Hosek & Totten, 2002), it also has a negative effect on marital stability (MacDonough, 1991; Rotter & Boveja, 1999). The directions of these effects holds true whether the deployment involves combat or not, although the magnitudes of these effects may differ. Deployment involving combat has also been associated with spouse abuse (McCarroll et al., 2000), posttraumatic stress symptoms (Fontana, Rosenheck & Horvath, 1997; Gimbel & Booth, 1994; Noy, 1991), and other psychiatric and behavioral problems (Rothberg, Koshes, Shanahan & Christman, 1994).

The purpose of this study is to add to the body of knowledge about life in the military by examining the effects of job stressors and social supports in the military on the utilization of mental health services.

Chapter 2: Background Literature

I begin this chapter with an overview of the person-in-environment (PIE) perspective as the overarching framework for this study. I then present a critical overview of Lazarus' model of psychological stress and Karasek's job demand/control model and locate both of them in the PIE perspective. Using Lazarus' model of psychological stress, I discuss mental health variables as conceptual outcomes of stress. Lazarus' emphasis on cognitive appraisal conceptually supports the inclusion of social support in this study and offers an explanation for the buffering effect of social support. Karasek's job demand/control model predicts stress-related outcomes when an individual has high job demands but low decision-making latitude. In this study, shift work, long work hours and deployment are hypothesized to create higher job demands and result in higher stress-related outcomes. Maslach's conceptualization of burnout provides the framework for the outcomes of this study.

Because the military emphasizes service utilization rather than general mental health needs in determining mental health staffing and service provision, mental health service utilization was chosen as the outcome indicator for this study. Moreover, the literature that focuses on barriers to mental health service utilization and on the gaps between mental health needs and service usage assumes that there is an association between need and service utilization (e.g. Bauer, Shea, McBride & Gavin, 1997; Cornelius, Pringle, Jernigan, Kirisci & Clark, 2001; New & Berliner, 2000) An association between mental health needs and service utilization is also assumed to exist in the military and may be

stronger because the financial and logistical barriers to service utilization are minimized. I complete this chapter by reviewing the constructs I use in the data analysis and that form the building blocks for my hypotheses.

Theoretical Frame

Person-in-environment

The person-in-environment perspective has long been the organizing framework for social work (Kondrat, 2002; Wakefield, 1996a, 1996b). Systems theory, ecological theory and the eco-systems perspective are the prominent theories in social work that center on the person-in-environment perspective (Germain & Gitterman, 1987; Kemp, Whittaker & Tracy, 1997; Wakefield, 1996a, 1996b). They share central ecological principles even though systems theory places more emphasis on the physical environment while ecological theory emphasizes the social environment (Germain & Gitterman, 1987). The eco-systems perspective integrates systems and ecological theories into an overarching, generic framework (Kemp, Whittaker & Tracy, 1997; Wakefield, 1996a).

Ecological approaches are holistic, transactional models that emphasize reciprocal exchanges or "transactions" between the person and the environment and focus on person-environment fit (P-E fit) (Germain & Gitterman, 1987). Transactions that are adaptive promote personal growth and well-being while maladaptive transactions impair personal development and functioning and may damage the environment.

Social work assessment and intervention occur at multiple levels of the person-environment relationship a fundamental goal of improving P-E fit. Person-environment fit (P-E) models suggest that strain occurs when there is a disequilibrium in the relationship between person and environment. Applied to occupational settings, personal factors include values, goals, desires, and abilities while the environment consists of job characteristics (Edwards & Rothbard, 1999; Tausig, 1999). The lack of fit can result in unmet needs in both the person and the environment. The individual may lack the resources and abilities to meet environmental demands just as the environment may fail to fulfill the individual's goals and values. Poor P-E fit prompts behavior aimed at bringing about change in the individual, the environment or both in order to improve P-E fit.

Ecology's strength as a practice framework lies in this emphasis on P-E fit (Gitterman, 1996). Ecological perspectives place greater emphasis on consequences than on causes and focus on changing dysfunctional and maladaptive person-environment relationships (Germain & Gitterman, 1996). Assessment of P-E fit expands clinical focus beyond the individual to include environmental factors that are neglected by other perspectives. However, this breadth of attention also draws the strongest criticism of ecological perspectives. While a holistic approach is useful conceptually, ecological theories are too abstract and broad to provide practical guidelines for intervention (Brower, 1988; Kemp, Whittaker & Tracy, 1997; Wakefield, 1996a, 1996b). Holistic theoretical

approaches involve a multitude of factors while practice must parsimoniously focus on the factors that exert the most influence (Grzywacz & Fuqua, 2000). Wakefield (1996a) argues that clinicians ultimately rely on domain-specific theories to determine what is relevant for assessment and intervention even if an ecological theory is used as an overarching framework. In other words, domain-specific theories are needed to bridge the gap between the conceptual framework of ecological theory and the practical functions of social work.

Similarly, I use Lazarus' psychological stress model and Karasek's job demand/control model to move from the conceptual framework of ecological theory to practical measures of stress, social support and service utilization.

Lazarus' Psychological Stress Model

Stress has been defined many different ways in the literature, sometimes leading to apparently contradictory results. Stress has been operationalized as independent, dependent and intermediate variables. The difference between the meaning of stress in the common vernacular and the meaning in academic research often leads to further confusion.

In this study, I follow Lazarus' psychological stress model (1966; 1982; see also Lazarus & Folkman, 1984) which refers to stress as the overall process an individual goes through when stressors create strain on the individual. In ecological terms, this is when P-E fit is less than optimal. Stressors are external factors and events, and strain refers to the psychological, physical and

behavioral responses to those stressors. Outcomes are the consequences of the strain on the individual.

Lazarus' psychological stress model (See Figure 1) centers on the processes of cognitive assessment that he calls primary and secondary appraisal. Primary appraisal is a process whereby the individual gives meaning to the stressors and evaluates the threat posed by them (Copper, Dewe & O'Driscol, 2001). The threat does not have to be a physical one, but can be a threat to goal attainment, values, self-esteem and other aspects of the self (Lazarus, 1982). Primary appraisal can be summarized by the question, "How much danger am I in from this situation?"

Secondary appraisal involves an assessment of the individual's ability to deal with the stressor and includes a selection of coping strategies. It also involves an inventory of internal and external resources. Taylor and Aspinwall (1996) suggest that secondary appraisal involves an assessment of accountability, evaluation of potential outcomes using different coping strategies, and expectations for change in the situation. Secondary appraisal can be summarized by the question, "How much danger am I in from anything I do about the threat, and how much will the threat be alleviated by what I do?" The external resources assessed in secondary appraisal include the quantity and quality of social support.

Individual factors impact the process of determining whether the event is perceived as stressful. The presence of an external stressor is a necessary, but

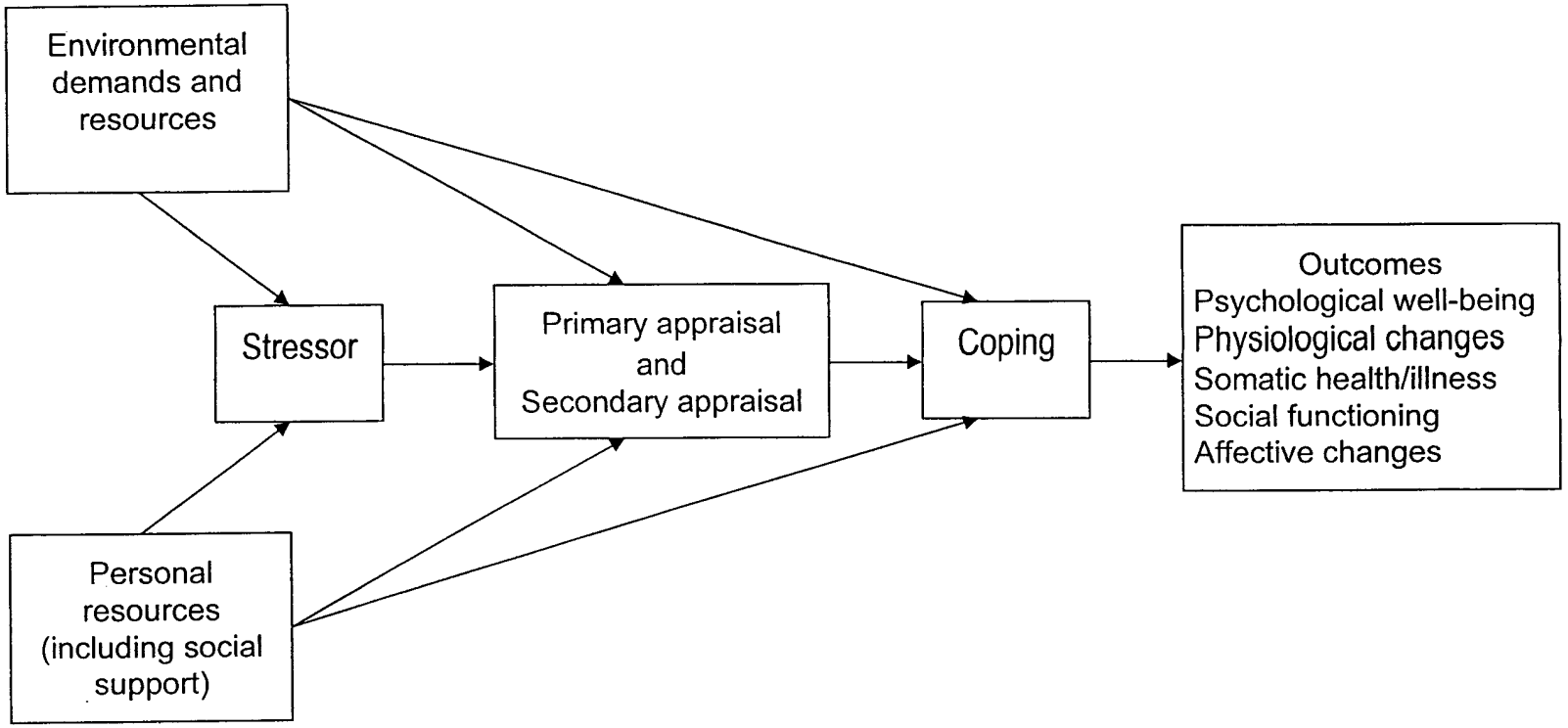

Figure 1. Lazarus' Psychological Stress Model (adapted from Lazarus & Folkman, 1984, and Taylor & Aspinwall, 1996).

not sufficient, condition for psychological stress. This position is in contrast to the vast majority of stress literature that defines stress either in terms of environmental stimulus or in terms of individual response (Cooper et al., 2001; Lazarus, 1999). A prominent example of the stimulus approach to stress is the Social Readjustment Rating Scale (Holmes & Rahe, 1967) in which certain life events are assigned scores of stress magnitude. Stimulus approaches to stress are limited because they assume that stressors have the same impact across the population. Response approaches define stress in terms of an individual's reaction to a stimulus. Biological and medical models of stress are of this type, and draw on Selye's general adaptation syndrome (GAS) (Selye, 1956, 1974, 1980) in which the focus is the physiological response of the body to demands placed on it. The GAS is a biological response involving three stages: 1) alarm reaction, 2) stage of resistance, and 3) stage of exhaustion. Models such as Selye's GAS provide the footing for research on the impact of stress on the physiological systems of the body, including endocrine, cardiovascular, gastrointestinal, respiratory and immune systems (Gevirtz, 2000; Sullivan, Kent & Coplan, 2000). Other response-base definitions identify behavioral and psychological outcomes (e.g., Holt, 1993). Behavioral outcomes generally relate to the coping strategies employed by the individual, and usually involve some form of avoidance, problem-focused coping or emotion-focused coping. Psychological outcomes typically involve depression, anxiety, mental health disorders, and changes in self-esteem and life satisfaction. Depression is the

most commonly studied outcome of stress (Holt, 1993). Response definitions of stress share the same limitation as stimulus definitions. Neither is able to explicate the causal relationship between environmental stressors and stress reactions because neither considers individual factors or person-environment transactions. These models of stress are taxonomic in nature (Cooper et al., 2001) and apply primarily to acute, or life event, stressors. The stressors in this study, however, are better described as chronic stressors, and are better explained by a transactional model of stress such as Lazarus' model.

Chronic stressors have a long-term, continuous course and are experienced on a daily basis. Chronic stress can deplete coping resources, moderate the effects of other stressors and contribute to depression and other health problems (Avison & Turner, 1988; Day & Livingston, 2001; Wheaton, 1996). Serious stressors, both acute and chronic, can also result in "stress proliferation" where additional stressors are generated from existing ones (Aneshensel, 1996; Pearlin, 1999). For the military, chronic stressors are important because they have the potential to alter a soldier's individual readiness and to deplete personal coping resources for dealing with acute stressors encountered during military missions.

Stress "depends on a particular kind of person-environment relationship" (Lazarus,1999, p. 29). Stress, from this perspective, involves a person-environment process in which demands from the environment are evaluated (appraisal) and dealt with through various coping mechanisms. P-E fit implicitly

incorporates Lazarus' process of cognitive appraisal (Edwards & Rothbard, 1999). It is the perceived mismatch between environment and personal characteristics that determines the amount of strain experienced. Lazarus refers to a seesaw analogy with environmental demands on one end and personal resources on the other to describe the basic concepts of P-E fit (Lazarus, 1999). Healthy amounts of stress exist when environmental demands and personal resources are balanced. When demands are low and resources are high, the individual experiences low stress, perhaps even boredom. High demands and low resources result in high stress.

The condition of high demands and low resources is the foundation for Karasek's job demand/control model. Karasek's model can be seen as specifically applying Lazarus' model to an occupational setting.

Karasek's Job Demand/Control Model

Karasek's (1979) job demand-control model states that psychological stress arises from the occupational elements of job demands and decision-making latitude (i.e., job control). Job demands consist of job-related psychological stressors. Decision making latitude is synonymous with control in regard to the worker's control over how to meet job demands. The model predicts occupational stress to occur when there is a mismatch between demands and control. Workers with low job demands and high job control are likely to be bored and underutilized. High job demands and low job control present the greatest potential for psychological strain and burnout. In this

circumstance, strain is essentially the excess of demands over control. Empirical research has strongly supported Karasek's model and has found the balance between work demands and job control is strongly associated with mental health (Copper, Dewe & O'Driscoll, 2001; Tausig, 1999). When job demands and control are out of balance, symptoms of burnout are likely to occur.

Burnout

Burnout was originally conceptualized in the 1970s as a phenomenon of the human services that resulted from the psychological strain of intense involvement with clients (e.g., Maslach, 1978). Burnout was believed to be unique to jobs that involved "people work" (Cordes & Dougherty, 1993). The vast majority of burnout research has involved human service occupations, but recent studies have looked at burnout in other occupational areas (Cooper et al., 2001; Posig & Kickul, 2003).

Maslach's conceptualization of burnout is the most accepted and studied (Cooper et al., 2001; Cordes & Dougherty, 1993; Kickul & Posig, 2001). In this model, burnout consists of three components: emotional exhaustion, depersonalization, and diminished personal accomplishment (Maslach, 1982). Emotional exhaustion involves a sense of depleted emotional resources and reduced emotional energy. Depersonalization refers to treating others as objects rather than people. This includes emotional detachment and callousness towards clients, patients and co-workers (Cordes & Dougherty, 1993). Finally, diminished personal accomplishment is characterized by a tendency to evaluate

personal performance and behavior negatively, and may involve a sense of incompetence and ineffectiveness.

Most researchers agree that emotional exhaustion is the main factor of burnout and precedes the other two (Cordes & Dougherty, 1993; Kickul & Posig, 2001). Emotional exhaustion is primarily predicted by workload and lack of social support (Houkes, Janssen, De Jong & Bakker, 2003) and is associated with role conflict, stressful events, community bonds and unmet expectations (Lee & Ashforth, 1996). Emotional exhaustion is also a strong predictor of job satisfaction, life satisfaction, job performance, absenteeism, turnover, and mental health problems (Cordes & Dougherty, 1993; Kickul & Posig, 2001).

Burnout and its correlates constitute the outcomes of occupational stress models like Karasek's job demands/control model and P-E fit models of occupational stress. Occupational stress variables like job demand and control are associated with well-being at work (Demerouti, Nachreiner, Bakker & Schaufeli, 2001; Kalimo, Pahkin & Mutanen, 2002) and with well-being in general (Cooper et al., 2001; Loscocco & Spitze, 1990; Tausig, 1999). Personality factors also play a part in stress and burnout and are strongly associated with measures of job satisfaction, personal well-being and burnout (Cooper et al., 2001; Houkes et al., 2003; Kalimo et al., 2002).

Despite the findings in occupational stress and burnout research to date, general models should be used with caution. Recent studies suggest that the causal pathways of burnout may differ across occupational types. Pousette and

Hanse (2002), for example, found statistically significant differences in causal pathways between blue-collar occupations, white-collar occupations, and human service occupations. While a general model can be applied to all three groups, differential models increase model fit and causal explanation by considering of group-specific characteristics. Applied to a military setting, this suggests the need to test group-specific models for several groups such as enlisted, officer, first-term enlisted, and career military. Officers, for example, generally differ from enlisted by having a college degree and greater leadership responsibility. Career military personnel have self-selected for continued military service while first-term personnel may be adapting to the military lifestyle and environment.

The discussion thus far has located Lazarus' psychological stress model, Karasek's job demand/control model and Maslach's conceptualization of burnout within the ecological perspective of social work. Lazarus' model provides the overall theoretical framework for this study and identifies social supports as personal resources that impact appraisal and coping mechanisms. Karasek's model integrates job characteristics as job stressors and Maslach's conceptualization of burnout identifies mental health outcomes as a potential result of the stress process. I now move toward operationalizing the constructs used in my hypotheses. The constructs discussed below are mental health service utilization; the job stressors of shift work, long work hours and deployment; and five levels of social support.

Mental Health Service Utilization

Four mental health-related social service programs within the military are used in this study: mental health services, anger management, stress management and substance abuse services. Each of these programs address potential outcomes of stress. Lazarus (1999) identifies anger, anxiety and sadness as "stress emotions" that arise from stressful situations. These are addressed through mental health, anger management and stress management services. The fourth service – the substance abuse program – deals primarily with alcohol abuse and dependence. The literature describes substance use as a maladaptive coping mechanism for dealing with stress (Bray et al., 2001; Bray et al., 1999).

In this study, I make the assumption that the utilization of mental health, anger management, stress management and substance abuse service is an indicator of mental health needs. This assumption is also held by military leaders who use levels of mental health service utilization at a military installation to determine the level of mental health staffing and the magnitude of service provision. The levels of service utilization are also seen as an indicator of the overall well-being of the military community.

Shift Work and Long Work Hours

Shift work has been more extensively researched than long work hours but the two constructs are related because they both limit leisure and social time with family and friends. Since some times of the week are more valuable for

leisure (Totterdell, Spelten, Smith, Barton & Folkard, 1995), both shift work and long work hours can have adverse effects related to leisure time and social activities.

Shift work is characterized by work schedules that fall out of the normal day-time work schedule. A regular work schedule is typically defined as being a 9 a.m. to 5 p.m., 40 hour per week schedule, although there is some flexibility in the actual scheduling of regular day-time work. Shift work is defined in this study as those schedules that involve 12-hour night shifts, 24-hour shifts, swing shifts (5 p.m. to 1 a.m.), and mid-shifts (1 a.m. to 9 a.m.).

Research has identified a wide variety of outcomes that are associated with shift work. Shift work has adverse effects on mental and physical health, friendship networks, and family relations (Totterdell et al., 1995; White & Keith, 1990). Shift work is also a significant predictor of absenteeism for women (VandenHeuvel & Wooden, 1995). Shift work is associated with high accidents rates on and off work (Gabarino et al, 2002; Haermae & Ilmarinen, 1999). This may be related to the disturbances that shift work causes in circadian rhythms (Gabarino et al., 2002; Totterdell et al., 1995) and sleep quality (Marquié, Foret & Quéinnec, 1999). Shift work can also have negative effects on marital quality and stability because it limits time with family (White & Keith, 1990). Because of the adverse effects shift work can have on mental and physical health, I expect shift work to also be associated with higher use of mental health services.

Hypothesis 1: Shift work will be associated with higher mental health service utilization.

In this study, the term "long work hours" refers to working more than the average number of hours per week. In the military, soldiers cannot earn overtime pay by working more than 40 hours per week, but are expected to put in the time needed to get the job done. As a result, the average number of hours worked in the military may be higher than 40 hours per week.

The impact of long work hours is similar to shift work to the extent that it limits leisure and social time. However, long work hours do not necessarily impact circadian rhythms and may not have the same magnitude of adverse health consequences as shift work, but are still associated with declines in physical and mental health (Gareis & Barnett, 2002; Pflanz & Sonnek, 2002). Research suggests that long work hours have a greater negative effect on men's health than it does on women's health (Gareis & Barnett, 2002; Stolzenberg, 2001). Long work hours by women is also associated with negative health effects for their husbands, but does not appear to impact their own health (Stolzenberg, 2001). The reason for the greater impact on men by their own work schedule and by their wife's is not clear. Long work hours do not appear to have a direct impact on men's marital relationships, but are associated with greater father-child conflict (Crouter, Bumpus, Head & McHale, 2001). Several studies also suggest that longer work hours are associated with high accident rates on and off work (Kirkcaldy, Trimpop & Levine, 2002; Lilly, Feyer, Kirk &

Gander; 2002; Trimpop, Kirkcaldy, Athanasou & Cooper, 2000). Long work hours cuts down on the time available for leisure and social activities and is expected to be a stressor that is associated with higher mental health service use.

Hypothesis 2: Long work hours will be associated with higher mental health service utilization.

Deployment

Deployments are temporary assignments away from the soldier's home installation and vary in duration and frequency. Some military units, such as combat communications units, can expect to be deployed more often and for greater lengths of time while other units have virtually no opportunity for deployment. Soldiers may be deployed to hostile areas or on humanitarian or training missions.

Research has shown deployment to be associated with retention of officers (Fricker, Jr., 2002) and enlisted personnel (Hosek & Totten, 2002). Among junior officers, higher retention rates are associated with a higher number of nonhostile deployments, and, to a lesser degree, hostile deployments. The association between deployments and retention is stronger among mid-grade officers - those who have already remained in the military beyond their initial commitment. Similarly, among first-term enlisted personnel, nonhostile deployment is positively associated with reenlistment while the effect of hostile deployment is negligible. For second-term enlistees - who have self-selected to

remain in the military - hostile and nonhostile deployments have positive effects on reenlistment.

Despite the positive effects that deployment has on retention, deployments are a primary cause of separation from family. Family separation is one of the leading sources of high stress reported by military personnel (Bray et al., 1999). Long-term separations can have dramatic effects on many families and stressful adjustments can continue long after reunification (MacDonough, 1991). In addition to family separation, exposure to combat during hostile deployments contributes to stress and antisocial behavior, and ultimately impacts marital stability (Gimbel & Booth, 1994). Deployment effectively separates soldiers from a primary source of social support and potentially impacts the quality of social support after reunification. Research has also shown that substance abuse and social work service utilization are higher in units that have deployed (Rothberg et al., 1994).

Both the frequency and the length of deployments may have adverse effects. Frequent deployments result in repeated disruption of social networks and family relationships. Deployments can vary in length from a few days to more than a year. Longer deployments result in extended disruptions in social networks, especially in family relationships. Each aspect of deployment – frequency and length – places strain on social support systems but may function as separate predictors of mental health outcomes. I propose a separate hypothesis for each aspect of deployment.

Hypothesis 3: More frequent deployments will be associated with higher mental health service utilization.

Hypothesis 4: Longer deployments will be associated with higher mental health service utilization.

Social Support

Social support is a multidimensional construct that refers to social bonds, social integration and primary group relationships (Turner, 1999). A commonly used conceptualization of social support by House (1981) identifies four kinds of support: 1) instrumental support, which involves directly receiving help, 2) emotional support, which includes sympathy, understanding and caring, 3) informational support, which deals with the provision of information to help with problems, and 4) appraisal support, which involves providing feedback about one's functioning. Social support can come from many sources, including family, community, co-workers and supervisors. In the military environment, support networks include the military members, their families, and their units, all of which have reciprocal relationships with each other (Schumm et al., 2001).

Social support research usually involves measures of perceived social support obtained from self-reports. This is appropriate for two reasons. First, perceived social support is easily obtained through self report whereas objective measures of received social support are more difficult to obtain. Second, perceived social support has a role in primary cognitive appraisal, or the evaluation of the level of threat from the stressor, and in secondary cognitive

appraisal, or the evaluation of available resources and alternative coping measures (Lazarus, 1999).

Social support has both direct and indirect effects in the stress process. Research consistently reports that social support has a direct positive effect on mental health and its correlates (e.g., Cooper et al, 2001; Turner, 1999). Social support has direct effects on the stress process for both men and women, but women are more likely to seek social support and report stronger effects on mental and physical symptoms (Beehr et al., 2003; Bellman, Forster, Still & Cooper, 2003; Day & Livingstone, 2001). The most common indirect effect for social support reported in the literature is a buffering effect on the stress process (e.g., Beehr et al, 2003; Kickul & Posig, 2001; Umberson, & Williams, 1999). Meta-analysis suggests that social support consistently moderates the stressor-strain relationship and may reduce the strength of stressors (Viswesvaran, Sanchez & Fisher, 1999). One of the reasons for the buffering effect of social support may be the role it plays in secondary appraisal and the selection of coping mechanisms. Social support promotes emotion-focused coping which in turn promotes long-term well-being while avoidance-focused coping is associated with low social support and has deleterious long-term effects (Ingledew, Hardy & Cooper, 1997).

While the stress literature emphasizes the importance of social support on the stressor-strain relationship (e.g., Lazarus, 1966), the effects of social support on job stress in a military context have not received attention with the exception

of research on the effects of combat and trauma. Research involving military combat and social support focuses on the impact of combat on the subsequent stability and functioning of the family. Exposure to combat has been related to both domestic violence (McCarroll et al., 2000) and marital instability (e.g., Gimbel & Booth, 1994). In such research, family factors are treated as outcome variables. The research outside of the military, however, reports that social support has mediating, moderating and main effects on the relationship between stress and health outcomes (e.g., Taylor & Aspinwall, 1996; Turner, 1999). It seems logical that social support would have similar effects in a military community. But in a recent search of the stress literature using PsychLit, only one article out of more than 75,000 was found in which family factors were treated as mediating variables in a military context. In that study, Fontana et al. (1997) found that homecoming support by family members decreased the likelihood of posttraumatic stress symptoms and other psychopathology among military members who had been exposed to combat. Family support appears to buffer the effects of combat on the psychological health of the military member. Other effects of social support in a military context have not been studied despite its role in the stress literature.

This study identifies five separate sources of social support: 1) family, 2) community, 3) co-workers, 4) supervisors, and 5) superiors.

Family

For the purposes of this study, family support refers to family of creation rather than family of origin. Family support is generally considered to be the strongest form of social support in the literature. In a recent study, for example, social support from family, co-workers and supervisors was negatively associated with burnout, with family support having the strongest association (Baruch-Feldman, Brondolo, Ben-Dylan & Schwartz, 2002). Family support has also been shown to be a protective factor for military members returning from combat zones (Fontana et al., 1997).

There is a general assumption in the literature that being married enhances well-being. Umberson and Williams (1999) offer a thorough analysis of the benefits of marriage. They argue that marriage provides benefits in terms of economic resources, social support, sense of purpose and sense of meaning. As a protective factor, marriage is stronger for men than it is for women. Non-married individuals generally report more depression, anxiety, physical health problems and higher mortality rates than married individuals. However, assuming that marriage is a protective factor can lead to false conclusions because those in unhappy marriages are generally worse off than those that are not married. Being in an unhappy marriage can ultimately be a liability and deteriorate coping resources.

In this study, family support has two dimensions. First, is the physical presence of family members. When stationed in the United States, it is assumed

that military members have their family living with them. When stationed overseas, however, military members may or may not be accompanied by their family. Unaccompanied overseas tours are generally a year shorter than accompanied tours. Military members often choose to serve a shorter tour in order to avoid disrupting their spouse's employment or the social and educational networks of their children. Furthermore, some overseas locations do not allow family members to join the military member. In this study, I assume that being accompanied by family members provides greater social support than being unaccompanied.

The second dimension has to do with the quality of family relationships. The dataset I am using for this study does not have direct measures of relational quality. It does, however, include two scaled items that report conflict with family members and thoughts of ending the marital relationship. In this study, I assume that higher family support is represented by lower conflict and fewer doubts about the relationship. High family support is hypothesized to have both the direct effects and the buffering effects of social support identified in the literature.

Hypothesis 5: High family support will be associated with lower mental health service utilization.

Hypothesis 6: Family support will have a buffering effect on the relationships between job stressors and mental health service utilization.

Exploratory analysis will test if gender has a moderating effect such that the above relationships are stronger for women than men. Similar exploratory

analysis will also investigate between-group differences for officers and enlisted and for first-term and career members. These same exploratory analyses will be performed for each category of social support, i.e., family, community integration, co-workers, supervisors, and superiors.

Community Integration

The construct of community integration is an emerging concept in the literature. Community integration is defined here as the level of social integration in the community, and involves a sense of comfort, security and subjective identification with the community. The concept of community integration links the macro level of the PIE perspective to the individual by looking at the direct and indirect connections an individual has within the community (Lin & Peek, 1999). Higher integration in the community is assumed to reflect better P-E fit. As such, high community integration suggests immersion into the community, acceptance of the communities values and a sense of belonging. Lin and Peek (1999) argue that the social environment impacts mental health in two ways. First, integration in a community enhances the psychological well-being of the individual by providing comfort and security and by bolstering identity and worth. Second, integration in a community increases the available resources to draw upon in appraisal and coping.

Community integration has particular implications for the military where living accommodations, medical care, shopping stores, religious services, and various other social services are offered on the military installation. Integration

with the military community would logically correlate with increased knowledge of services and resources, and would increase contact with others who share similar values, challenges, and lifestyles. Because military families face unique challenges, it is necessary to have a support network in which those challenges are understood and held in common. Practice experience suggests that social relationships in military communities develop along a different timeline than they do in civilian neighborhoods. There is a certain solidarity in military communities that seems to take into account the high turnover rates related to reassignments. It is reasonable to suggest that integration in the military community would have some effect on the relationship between job stress and health. Community integration is expected to have the same general effects as other sources of social support.

Hypothesis 7: Higher community integration will be associated with lower mental health service utilization.

Hypothesis 8: Community integration will have a buffering effect on the relationship between job stressors and mental health service utilization.

Co-Workers

Work-related support from colleagues and supervisors has been found to have a positive effect on indicators of well-being (Loscocco & Spitze, 1990; Kitaoka-Higashuguchi et al., 2003). In many studies, social support from co-workers is not distinguished from support from supervisors. It appears, though, that social support from these two sources differs in magnitude and outcomes

(Repetti, 1993). The relationship with supervisors naturally differs from that with colleagues because of authority dynamics and the ability to directly impact job control factors. While the literature often combines supervisor support and co-worker support, they are separated in this study for two reasons. First, supervisors are in a position of authority. This difference in authority may be accentuated in the military because supervisors have a higher rank than subordinates. Because of this power differential, the effects of social support from supervisors should be investigated separately from co-workers. These two groups can be combined only if no statistical significant differences are found. Second, the literature refers to a reverse buffering effect when social support comes from supervisors. This is discussed in detail below.

Hypothesis 9: Higher co-worker support will be associated with lower mental health service utilization.

Hypothesis 10: Co-worker support will have a buffering effect on the relationship between job stressors and mental health service utilization.

Supervisor Support

Higher social support at work, regardless of the source, is associated with less burnout and higher levels of health and job satisfaction. Even when social support from supervisors is combined with social support from colleagues, the general result is that social support is associated with well-being. However, when segregated from co-worker social support, supervisor social support has been found in some studies to have a reverse buffering effect (Beehr et al, 2003;

Fenlason & Beehr, 1994; Kickul & Posig, 2001). Reverse buffering occurs when social support strengthens the relationship between stressors and strains. In other words, social support from supervisors can have detrimental effects. The process of reverse buffering is still unclear, but it may arise when emotional and verbal support from a supervisor is not accompanied by instrumental support such as additional resources and empowerment. Kickul and Posig (2001) found high emotional support from supervisors to be more strongly related to emotional exhaustion apparently because the emotional support was not accompanied by tangible assistance. The supervisors essentially send a double message when they express support verbally but do not offer any actual support to the employee. Kickul and Posig focused only on the emotional exhaustion component of burnout, but if emotional exhaustion is the primary component as many researcher suggest, the components of depersonalization and diminished personal accomplishment would be expected to follow.

Hypothesis 11: Higher supervisor support will be associated with lower mental health service utilization.

Hypothesis 12: Supervisor support will have a reverse buffering effect on the relationship between job stressors and mental health service utilization.

Support from Superiors

Social support from superiors above the supervisor has not been the focus of research but is relevant to military populations because squadron commanders and base commanders are believed to have a strong impact on the

morale and climate on the military installation. For that reason, I distinguish supervisory social support from the social support received from others higher in the chain of command. Beyond the supervisor, the social support from other superiors such as the squadron commander or base commander is largely indirect but can have tremendous impact because the climate established at each level of command can affect morale, work conditions, and camaraderie. In this study, support from superiors refers to the perceived support from unit leadership (other than supervisor), group leadership and wing leadership

Hypothesis 13: Higher support from superiors will be associated with lower mental health service utilization.

Hypothesis 14: Support from superiors will have a buffering effect on the relationship between job stressors and mental health service utilization.

Exploratory analyses

In addition to testing the hypotheses outlined above, several exploratory analyses will also be conducted. First, the literature suggests that military deployment impacts family stability. Exploratory analyses will look at the association between deployment, family stability and service utilization. Second, the literature clearly supports the main effects and the buffering effects of social support. Exploratory analyses will look for other mediating effects of social support as well. Further exploratory analysis will look for moderating effects of gender as well of the categories of officer versus enlisted and first-term versus career military. I will also explore the impact of having a second job.

Conclusion

The person-in-environment perspective provides the conceptual framework for this study. Research and practice, however, rely on domain-specific theories to make the link from the conceptual to the practical. The theoretical framework of this study integrates Lazarus' psychological stress model, Karasek's job demand/control model and Maslach's conceptualization of burnout. Each of these theories elucidate different domains within the PIE perspective. I draw upon Lazarus' model to explain the buffering effects of social support via primary and secondary cognitive appraisal. For this study, I identify five categories of social support: family support, community integration, co-worker support, supervisor support, and support from superiors. I use Karasek's conceptualization of occupational stress in the selection of job-related stressors and to connect high job stress to burnout and other psychological outcomes. The job stressors addressed in this study are shift work, long work hours, and the frequency and duration of military deployment. Maslach identifies three components of burnout: emotional exhaustion, depersonalization, and diminished personal accomplishment. Emotional exhaustion is believed to the main component of burnout and is associated with various mental health problems. Rather than direct measures of mental health problems, I use mental health service utilization as an indirect indicator of mental health needs. The four mental health services considered in this study are anger management, mental

health, stress management, and alcohol abuse services as indicators of mental health service utilization.

When applied to the psychological stress model presented in Figure 1 (p. 15), the hypothesized relationships between job stressors, social supports and mental health service utilization can be represented by the model for empirical analysis in Figure 2. Job stressors talk the place of environmental demands and resources. Social supports take the place of personal resources, and mental health service utilization constitute the outcomes of coping processes. The cognitive processes of appraisal are not directly measured, and therefore are not presented in the model. The hypothetical model includes the direct effects of both job stressors and social supports on mental health service utilization and the buffering effects of social supports on the relationship between job stressors on service utilization.

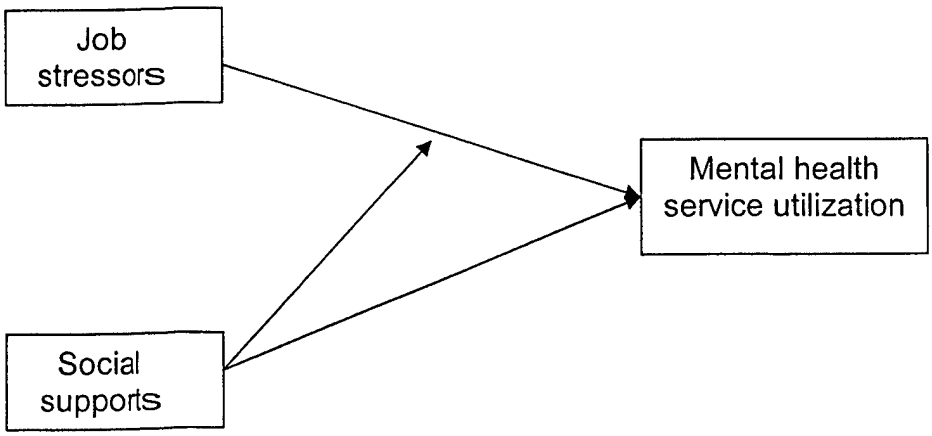

Figure 2. Stress Model for Empirical Analysis

Chapter 3: Methodology

Source of Data

Data for this study comes from the 1999-2000 Air Force Community Needs Assessment (CNA) which was administered by Caliber Associates, an organization that does triennial community assessments throughout all branches of the military (Caliber Associates, 2000, 2003). The surveys assess community satisfaction, personal preparedness, family adaptation, health and well being, spiritual well being, economic well being, and safety (Unger, 2003) and guide military planners in making enhancements to community services and policies (Caliber Associates, 2002).

For the 1999-2000 Air Force CNA, data collection took place from October to December 1999 and included every major Air Force base worldwide (N=83). Active duty Air Force members and civilian spouses of military members were randomly sampled at each base. Members of other military services, civilians not married to an Air Force member and Air Force Reserve personnel were not included in the survey. Active duty members received their surveys at their duty stations while surveys for civilian spouses of active duty members were sent to their home address. The response rate from active duty members was approximately 55%, resulting in 35,732 surveys. Civilian spouses returned an additional 23,000 surveys, but only surveys from active duty personnel will be used in this study. The survey questions used in this study for hypothesis testing are presented in Appendix A.

The active duty sample was found to be generally representative of the Air Force active duty population in terms of gender, marital status and rank (Bowen, Mancini, Martin, Ware & Nelson, 2003). The mean age was 30 years old (*SD* = 7.63). Males made up 77.2% of the sample, and females 22.8% (See Appendix B for frequency tables). Over 55% were married to a civilian and almost 12% were married to another military member. Thirty-three percent were not married. The distribution of pay grade groups shows enlisted personnel to be slightly over-represented when compared to the over-all Air Force population. The sample is 83% enlisted and 17% officer compared with 80.5% enlisted and 19.5% officer in the overall Air Force population (Air Force Personnel Center, 2004). First-term airmen and company grade officers are considered first-term personnel and make up 50.5% of the sample. Almost 80% were stationed within the continental United States.

Measures

Job Stressor Variables

Shift work. Shift work is a dichotomous variable derived from a multiple answer survey question. Respondents are considered to be working a shift work schedule if they work a mid-shift, night shift or rotating shift. In this sample, 19.7% report working a shift work schedule.

Work hours. The hours of work per week comes from the question, "Under normal circumstances, approximately how many hours per week do you work at your primary job?" For military members, their primary job is their military

job. Military members may have a secondary employment, but this study is primarily concerned with the impact of work hours at their military job. The mean hours of worked per week was 46.24 (*SD* = 11.71), showing that most military personnel work more than a 40-hour work week. Exploratory analysis will evaluate the impact of secondary employment.

Deployments. The frequency and length of deployments come from two questions asking first how many times the member has been away for temporary duty (TDY), deployment or training in the past year, and then how many days they have been away. For this study, TDY and training are assumed to have the same impact as deployment because they separate the military member from social support networks and cause disruptions to the family. TDYs and trainings can be thought of as mini-deployments. The mean number of deployments was 2.45 (*SD* = 6.48) and the mean number of days deployed was 40.17 (*SD* = 55.83). Both measures of deployment display a right skew because most military members go on few deployments. Thirty-six percent of the sample reported no deployments in the last 12 months.

Social Support Variables

Family support. Two measures address family support. The first, *accompanied*, is the physical presence of the family and is indicated by a survey question asking if the active duty member is accompanied by family members. Over 90% of married military members report being accompanied by their family members. The second dimension, *family instability*, deals with the quality of

family relations. *Family instability* is determined by two questions: "How often have you experienced conflicts with family members in the past month?" and "How often in the past year have you wondered whether you should continue your relationship?" *Family instability* is scored from 0 to 7 with 0 indicating no conflict or doubts about the relationship and 7 indicating frequent conflict and doubts. A low score on *family instability* should not be interpreted as representing strong family support because the absence of relational problems does not provide information about the strength or quality of available support but rather the degree to which problems are not present. Family instability is used here as an inverse proxy measure of family support.

Community integration. *Community integration* is the degree to which respondents identify with the base community. Respondents are asked to indicate whether they identify with the base community or the civilian community in regards to overall identification with community, religious services, volunteering, social activities, friends, medical care, shopping, and support services. Items endorsed as "civilian community" or "does not apply" will be recoded as zero. Items endorsed as "base community" will be recoded as one. The number of items endorsed in connection with the base community will be summed to represent the magnitude of *community integration* in the base community. In this sense, *community integration* is largely a measure of involvement in military community resources. It is not necessarily a measure of the quality of the support derived from the community.

Co-worker support. The survey used in this study does not have a direct measure of co-worker support. However, two survey questions ask the respondents to indicate the extent that certain job situations impact their ability to meet family responsibilities and their ability to perform their military duty. One of the job situations is conflict with co-workers, reported as being non-existent, slight, moderate or great. The degree of *co-worker conflict* on these two items will serve as an inverse proxy measure for co-worker support with the understanding that lack of *co-worker conflict* does not necessarily equate to high co-worker support and does not indicate the quality of co-worker support.

Supervisor support. *Supervisor support* is indicated by one survey item where the respondents are asked how supportive they feel their supervisor is to them and their families. Respondents may indicate their supervisor is not at all supportive, somewhat supportive, or very supportive.

Support by superiors. Respondents are asked to indicate how supportive their unit leadership, group leadership and wing leadership are to them and their families. These levels of leadership are analogous to squadron, battalion, and base in the Army. Respondents may indicate each level is not at all supportive, somewhat supportive, or very supportive. *Support by superiors* will be the summed total of the responses for these three levels. The totals will be adjusted so that 0 = not all supportive and 6 = very supportive.

Mental Health Service Utilization Outcome Variables

Four types of mental health service utilization are used in this study: anger management services, mental health services, stress management services, and substance abuse services. Respondents report which services they have used in the past 12 months on or off of the military installation. The frequencies for the mental health service utilization variables are small, ranging from 1.9% for substance abuse services to 6.2% for mental health services. Approximately 8.9% of the sample used one or more mental health services in the past twelve months. These four variables – anger management, mental health, stress management, and substance abuse – were also recoded into a dichotomous variable to indicate if any of these services has been used. Throughout the remainder of this dissertation, *mental health service utilization* and *service utilization* refer to this dichotomous variable.

Control Variables

For this study, age, gender, rank and years of military service are used as control variables. Ethnicity is not included in this survey and cannot be included in the analysis. Rank is a complex variable that involves two categories – enlisted and officers – with ordinal subcategories. More than 80% of the military is composed of enlisted personnel who typically join the military straight out of high school. Officers have a college degree and usually are placed in positions of authority and administration. The lowest ranking officer outranks the highest ranking enlisted member regardless of their respective time in service. Enlisted

personnel earn less than officers who have been in the military for the same amount of time. The jobs in the military that are comparable to blue-collar civilian jobs are typically done by enlisted personnel. In the statistical analysis, rank will be indicated by a dummy variable (*enlisted*) in which 0 = officer and 1 = enlisted.

In addition to differentiating officers from enlisted, military personnel serving their first military service commitment may differ from those who have served longer. In the Air force, enlisted personnel with the rank of Airman Basic, Airman, Airman First Class and Senior Airman are all in their first military enlistment. Staff Sergeants, Technical Sergeants, Master Sergeants, Senior Master Sergeants and Chief Master Sergeants have chosen to remain in the military and have re-enlisted. These ranks are also referred to as Non-Commissioned Officers and are typically given mid-management positions where they are supervisors over other enlisted personnel. Among officers, Second Lieutenants, First Lieutenants and most Captains are fulfilling their initial military commitment. These ranks are referred to as "company grade officers." The higher officer ranks of Major, Lieutenant Colonel, and Colonel are "field grade officers" and are composed of personnel who have chosen to remain in the military beyond their initial commitment. First-term enlisted and company grade officers differ from the other categories in the fact that they are becoming familiar with the military lifestyle and are evaluating the military as a career option. The other categories have self-selected to remain in the military (Hosek & Totten, 2002). In this study, first-term airmen and company grade officers are

considered first-term personnel and make up 50.5% of the sample and are represented by a dummy variable (*first-term*) in which 0 = career military personnel and 1 = first-term personnel.

Data Analysis

Diagnostics will be run to screen for multi-collinearity. Multi-collinearity occurs when variables are very highly correlated. Tabachnick and Fidell (2001) consider correlations higher than .90 to be multi-collinear. Multiple regression holds an assumption that perfect collinearity (or singularity) is not present (Miles & Shevlin, 2001). Even if this assumption is not violated, multi-collinearity can result in statistical problems that increase the standard error and cause inaccuracy in the regression coefficients (McClendon, 1994; Miles & Shevlin, 2001). It is anticipated that age and years of military service will be highly correlated, but multicollinearity diagnostics will be run on all the variables used in analysis to determine the tolerance and variance inflation factors (VIF) (Miles & Shevlin, 2001).

The tolerance of an independent variable is the degree that it cannot be predicted by the other independent variables. Tolerance varies from zero to one with zero meaning the variable is completely predicted by other independent variables and one meaning it is completely uncorrelated. VIF relates to the amount the standard error of the variable is increased because of multicollinearity. VIF is equal to one divided by the tolerance. Hence, VIF is

always has a value greater than one. A VIF greater than four is usually considered to indicate problematic multicollinearity (Miles & Shevlin, 2001). If multicollinearity is found, I will address it by removing or combining variables. Stepwise regression and collecting more data are also ways to address multicollinearity, but will not be used in this study (Miles & Shevlin, 2001, Tabachnick & Fidell, 2001). Collecting more data is not possible with secondary data analysis, and stepwise regression has a number of theoretical problems that make it an undesirable method of variable entry (Miles & Shevlin, 2001). Prior to analysis, the data will be screened for potential problems using univariate and bivariate analyses (Newton & Rudestam, 1999).

The low frequency of mental health service utilization creates some statistical problems. In regression analysis, skewness causes estimates and standard errors to be inaccurate (Miles & Shevlin, 2001). Even if the four dichotomous mental health service utilization variables are combined into an interval variable, the distribution remains highly skewed with only 8.9% of the population using any of the services. Larger sample sizes help to minimize the problems associated with skewness (Miles & Shevlin, 2001), but the outcome variables in this study are still considered rare events (< 10%). Ordinary least squares (OLS) regression has been shown to give inaccurate results when dealing with rare event data (Kleijnen, Vonk Noordegraag & Nielen, 2001). Logistical regression, however, is appropriate when investigating rare event outcomes (King & Zeng, 2001; Kleijnen et al., 2001; McNutt, Holcomb & Carlson,

2000) but requires a dichotomous dependent variable. In order to minimize the skewness of the sample, a dichotomous variable will indicate the use of any of the mental health services. Logistical regression will be used with *mental health service utilization* as the outcome variable to test the hypotheses presented in this study. Logistical regression employs an iterative process of maximum likelihood to determine the probability or odds of the dependent variable based on the independent variables (Miles & Shevlin, 2001).

Relationships between job stressors and social supports will be explored using ordinary lease squares (OLS) regression. OLS regression calculates the portion of variance in the dependent variable that can be attributed to each independent variable by "taking into account the correlations between independent variables, and assessing the effect of each independent variable, when the other variables have been removed" (Miles & Shevlin, 2001, p. 31). In OLS regression, the independent variables can be continuous, ordinal or categorical, but the dependent variable must be continuous (Aiken & West, 1991; McClendon, 1994).

Age, gender and rank will be used as control variables in all regression analysis. Rank will be represented by two dummy variables that identify enlisted from officers and first-term personnel from career personnel.

Strengths and Limitations

Perhaps the greatest advantage to using the Air Force CNA dataset is its large sample size. The sample size exceeds the cases-to-independent variable

ratio outlined by Tabachnick and Fidell (2001). Larger sample sizes produce smaller standard errors and improve the accuracy of parameter estimates (Miles & Shevlin, 2001) resulting in smaller confidence intervals and reducing the likelihood of a Type I error, or erroneously rejecting the null hypothesis.

The main limitations of this study arise from weakness of survey research and using secondary data analysis. Babbie (1998) states that survey research is generally weak on validity because of its inability to deal with complex topics or give a rich description of the context. He further argues that surveys tend to be artificial, superficial and inflexible because of the rigid question format. Validity is also an issue in secondary data analysis. When using an existing dataset, there is always some gap between the original purpose for the data collection and the intent of the secondary data analysis. As discussed earlier, there are some gaps in this study between the theoretical constructs and the measures available in the dataset. To improve the validity of this study, I have attempted to provide a sound theoretical framework and to identify the threats to validity. The gaps between the theoretical constructs and the indicators in the dataset have been acknowledged and can be addressed as I discuss the findings and implications.

Chapter 4: Results

This chapter presents the statistical analysis used to test the hypotheses proposed in Chapter 2. Hypotheses 1 – 4 focus on the main effects of job stressors on mental health service utilization. The remaining hypotheses address the main and buffering effects of social supports. All of the hypotheses are restated here with the statistical model(s) used to test the hypotheses indicated in parentheses. The buffering hypotheses were not tested for reasons described below.

Hypothesis 1 (Model B): Shift work will be associated with higher mental health service utilization.

Hypothesis 2 (Model C): Long work hours will be associated with higher mental health service utilization.

Hypothesis 3 (Model D): More frequent deployments will be associated with higher mental health service utilization.

Hypothesis 4 (Model E): Longer deployments will be associated with mental health service utilization.

Hypothesis 5 (Model F & G): High family support will be associated with lower mental health service utilization.

Hypothesis 6: Family support will have a buffering effect on the relationships between job stressors and mental health service utilization.

Hypothesis 7 (Model H): Higher community integration will be associated with lower mental health service utilization.

Hypothesis 8: Community integration will have a buffering effect on the relationships between job stressors and mental health service utilization.

Hypothesis 9 (Model I): Higher co-worker support will be associated with lower mental health service utilization.

Hypothesis 10: Co-worker support will have a buffering effect on the relationships between job stressors and mental health service utilization.

Hypothesis 11 (Model J): Higher supervisor support will be associated with lower mental health service utilization.

Hypothesis 12: Supervisor support will have a reverse buffering effect on the relationships between job stressors and mental health service utilization.

Hypothesis 13 (Model K): Higher support from superiors will be associated with lower mental health service utilization.

Hypothesis 14: Support from superiors will have a buffering effect on the relationships between job stressors and mental health service utilization.

The intercorrelations for the variables used in testing my hypotheses are presented in Table 1. Because of the large sample size, most of the correlations are statistically significant even though the associations are as small as 0.02. There are several relationships that are worth noting. As expected, *age* and *years of military service* are multicollinear (r = .90, *tolerance* = .14, VIF = 6.93). I elected to use *age* in the analysis because it shows similar size and direction of correlations with other variables. *Age* is also easier to interpret because *years of*

Table 1

Means, Standard Deviations and Correlations of Job Stressors, Social Supports and Mental Health Services

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Age	30.06	7.63	—								
2. Years of Service	9.24	6.98	.90*	—							
3. Gender‡	.23	.42	-.16*	-.18*	—						
4. Enlisted†	.83	.38	-.31*	-.14*	.05*	—					
5. First term†	.51	.50	-.74*	-.79	.15*	-.05*	—				
Job Stressors											
6. Shift work†	.20	.40	-.22*	-.20*	-.07*	.15*	.16*	—			
7. Work hours	46.24	11.71	.17	.16*	-.12*	-.18*	-.11*	.03*	—		
8. Deployments	2.45	6.48	.14*	.11*	-.08*	-.19*	-.06*	-.03*	.09*	—	
9. Days deployed	40.17	55.83	.04*	.05*	-.13*	-.06*	-.04*	.05*	.09*	.28*	—

Table 1 (*continued*)

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
Social Supports													
10. Accompanied	.62	.48	.38*	.37*	-.09*	-.11*	-.34*	-.13*	.08*	.05*	-.01	—	
11. Family instability	1.97	1.79	.05*	.07*	.02*	.06*	-.08*	-.00	.03*	.01*	.03*	.15*	—
12. Community	3.89	2.20	.03*	.02*	.02*	-.01	-.02*	-.04	.04*	-.02*	-.03*	.16*	.02*
13. Co-worker conflict	.70	1.37	-.07*	-.05*	.06*	.10*	.03*	.05*	.03*	-.01	.01*	.03*	.15*
14. Supervisor	2.52	.65	.05*	.04*	-.02*	-.06*	-.03*	-.09*	-.02*	.01*	-.03*	.03*	-.08*
15. Superiors	2.24	2.01	.16*	.14*	-.04*	-.14*	-.10*	-.10*	.06*	.02*	.01	.09*	-.04*
Mental Health Services													
16. Anger†	.03	.17	-.08*	-.07*	-.00	.06*	.06*	.02*	-.02*	-.00	.00	-.05*	.08*
17. Mental health†	.06	.24	-.04*	-.03*	.04*	.05*	.03*	.01	-.02*	-.01*	-.02*	-.02*	.12
18. Stress†	.04	.20	-.06*	-.06*	.03*	.05*	.05*	.01	-.01	.00	-.01	-.05*	.08*
19. Substance †	.02	.14	-.09*	-.08*	-.02*	.05*	.08*	.03*	-.04*	.01	.03	-.08*	.02*
20 Any MH service†	.09	.28	-.04*	-.04*	.05*	.06*	.04*	.01	-.02*	-.01	-.02*	-.03	.15*

Table 1 (*continued*)

Variable	12	13	14	15	16	17	18	19	20
12. Community —									
13. Co-worker conflict	-.06*	—							
14. Supervisor	.10*	-.21*	—						
15. Superiors	.19*	-.08*	.35*	—					
Mental Health Services									
16. Anger†	-.03*	.08*	-.03*	-.02*	—				
17. Mental health†	-.02*	.08*	-.04*	-.02*	.44*	—			
18. Stress†	-.03*	.10*	-.04*	-.02*	.57*	.44*	—		
19. Substance †	-.04*	.05*	-.03*	-.02*	.56*	.43*	.48*	—	
20 Any MH service†	-.02*	.10*	-.05*	-.02*	.55*	.83*	.68*	.45*	—

Note. N = 35732. ‡For *gender*, 0 = male, 1 = female. †*Enlisted, first term, shift work, accompanied, anger management, mental health, stress management, substance abuse* and *any mental health service* are dichotomous variables such that 0 = no, 1 = yes. Frequencies for these variables can be found in Appendix B.

* $p < 0.01$.

military service is complicated by the difference in age between enlisted and officers at the time of joining the military.

The correlation between *age* and *enlisted* (r = -.31) may reflect the fact that enlisted personnel generally join the military right out of high school while officers typically join through a college level Reserve Officer Training Corps (ROTC) program. Officers tend to be older than enlisted personnel on average. First-term military members are younger than career military (r = -.74). Figure 3 (p. 55) shows the age distribution of first-term personnel and of career personnel.

The correlation between *gender* and *age* (r = -.16) shows women are somewhat more likely to be found among younger personnel. Women are also slightly more likely to be first-term (r = .15) and a little less likely to be accompanied by family (r = -.09). Women work slightly fewer hours than men (r = -.12).

Age is negatively correlated with the job stressor of *shift work* (r = -.22), suggesting that older military personnel are less likely to have a shift work schedule. Older personnel tend to work longer hours (r = .17) and to be deployed more often (r = .14) and for more days of deployment (r = .04).

Age is positively correlated with the family support indicator of *accompanied by family* (r = .38), but this correlation is deceptive because it includes single personnel. The correlation between *age* and *accompanied* is picking up the correlation between age and being married (not presented) (r = 0.39, $p < 0.01$). When single individuals are excluded from the analysis, the

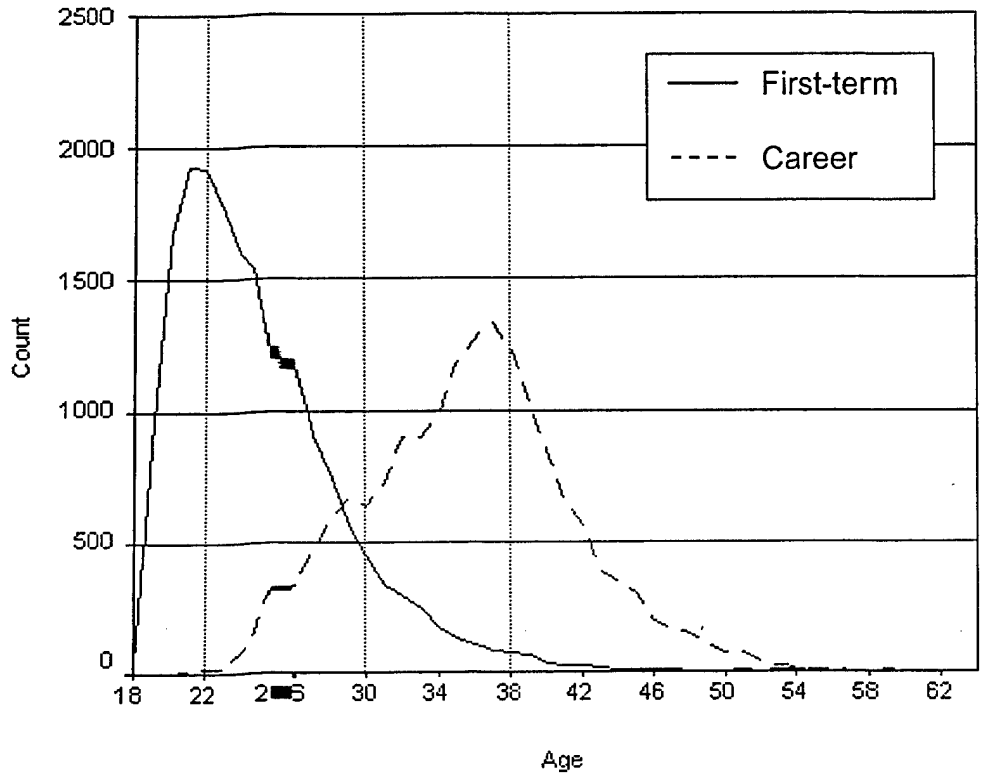

Figure 3. Distribution of *Age* for First-term and Career Personnel. Mean of *Age* = 30. Std dev = 8. One standard deviation below the mean of age = 22. One standard deviation above the mean of age = 38.

---

correlation between *age* and *accompanied by family* drops to .07 ($p < 0.01$) so that the likelihood of being accompanied is only slightly higher for older personnel.

Enlisted personnel are more likely to have a job stressor of *shift work* ($r = .15$), but work fewer hours ($r = -.18$) and go on fewer deployments ($r = -.19$) when compared to officers. Enlisted also experience less work-related social support as indicated by more perceived co-worker conflict ($r = .10$) and less

support from their superiors (i.e., chain of command) (r = -.14). First-term personnel are also more likely to have a shift work schedule (r = .16), to work fewer hours (r = -.11) and to perceive less support from their superiors (r = -.10). Overall, those that work shift work schedules are less likely to perceive their supervisors as being supportive (r = -. 09) or their superiors as being supportive (r = -.10). Enlisted personnel and first-term personnel are slightly more likely to use mental health services (r = .06 and .04).

From the perspective of job stressors, the *number of deployments* and the *number of days deployed* show a correlation of .28. This suggests that it is useful to treat the number of deployments and the length of deployments as separate constructs. Both the *number of deployments* and the *number of days deployed* are significantly correlated with *age* (r = .14, .04), *gender* (r = -.08, -.13) and *enlisted* (r = -.19, -.06), but the number of deployments is more strongly associated with being older and being an officer, while the number of days deployed is more strongly associated with being male.

Some relationships between each job stressor and service utilization are statistically significant but, because the significant correlations are very small (range of .01 to .04), they offer little predictive value. Shift work tends to marginally increase the use of anger management and substance abuse services. Longer work hours slightly decreases the use of anger management, mental health and substance abuse services. Deployment frequency and days deployed tend to decrease the use of mental health, and days deployed tends to

increase substance abuse services. Overall, neither shift work nor deployment frequency predict use of any mental health services. Longer work hours and days deployed tend marginally to decrease use of mental health services. This decrease in service utilization is opposite what would be expected from an increase in a job stressor. One possible explanation is that longer work hours decrease the time available to abuse substances or to access services. Similarly, being deployed limits access to substances and to services.

From the perspective of social support, *family instability*, is positively associated with *co-worker conflict* (r = .15), suggesting that problems at work may exacerbate problems in the home and vice versa. *Community integration* is positively correlated with both *supervisor support* (r = .10) and *support by superiors* (r = .19). *Supervisor support* is moderately associated with *support by superiors* (r = .35). The relationships between *community integration*, *supervisor support*, and *support by superiors* may be spuriously related to personal characteristics and other factors that contribute to involvement in the community and the perception of support from the chain of command.

Many of the relationships between social supports and mental health service utilization are statistically significant but small (range .02 to .15). Although stronger than the associations reported above for job stressors, these relationships generally have little predictive value. Being accompanied by family members, higher community integration, greater support by supervisors and superiors all slightly tend to decrease the use of all four mental health services

(range of -.02 to -.08). Higher family instability and co-worker conflict tend to increase the use of the four mental health services (range of .02 to .12). Overall, being accompanied, community integration, supervisor support and support by superiors tend to marginally decrease the use of mental health services while family instability and co-worker conflict increase service utilization. Of the social supports, family instability and co-worker conflict have the strongest associations with service utilization (.15 and .10).

The correlation between *co-worker conflict* and *supervisor support* (r = -.20) suggests either that supervisor support declines when conflict with co-workers increases or that the lack of supervisor support may contribute to increased conflict with co-workers.

Finally, the four mental health services used as outcomes are all moderately correlated with each other (between .43 and .57). The smallest of these correlations is between *mental health* and *substance abuse* services (r = .43), and the largest correlation is between *anger management* and *stress management* services (r = .57). This variable is referred to as *mental health service utilization* or *service utilization*. Each of the four mental health services correlates with *service utilization*, with *mental health* having the strongest association (r = .83) and *substance abuse* have the weakest (r = .45).

Hypothesis Testing

The odds ratios for all models used in this study are presented in Table 2. The odds ratios are related to the *B* coefficient through the log function. The *B*

coefficients are the natural logs of the odds ratios (odds ratio = e^B). The odds ratio provides the same information as the logistic regression coefficient, but presents it in a way that more clearly shows the effect of each independent variable. "The odds ratio is the number by which we would multiply the odds of [the dependent variable] for each one-unit increase in the independent variable" (Menard, 2002). An odds ratio greater than one shows an increase in the odds of the outcome for each one-unit increase in that predictor, and a odds ratio less than one indicates a decrease in the odds of the outcome (Menard, 2002; Tabachnick & Fidell, 2001).

While the odds ratios presented in Table 2 are a convenient way to report the results of logistic regression and see the relative strength of predictors, it is difficult to interpret the odds ratios for the entire equation or for specific values of the predictors. Probabilities for the entire equation can be calculated by solving of the equation using the *B* coefficients and substituting specific values into the equation. The *B* coefficients for logistic regression results for Models A through L are presented Appendix C. Solving the equation in this way results in the logit of the dependent variable. The logit is equal to the natural log of the odds ratio and can be converted to an odds ratio and to probabilities for the equation. Two examples at the end of Appendix C demonstrate how the logit for the equation is found and then converted to odds and probabilities using Model A. For 22 year-old, first-term enlisted males, the probability of mental health service utilization is 10.0% and for females, 12.9%.

Table 2

Odds Ratios for the Prediction of Mental Health Service Utilization by Control Variables, Job Stressors, and Social Supports

	Model					
Variable	A	B	C	D	E	F
Age	1.012*	1.011*	1.014*	1.012 *	1.012*	1.013*
Gender	1.342*	1.332*	1.352**	1.336*	1.334*	1.341*
First-term	0.756*	.0701*	0.767*	0.764*	0.761*	0.755*
Enlisted	1.427*	1.348*	1.446*	1.426*	1.399*	1.429*
First-term * Enlisted	2.100*	2.241*	2.102*	2.113*	2.115*	2.086*
Shift work		0.969				
Work hours			1.000			
Deployments				1.002		
Days deployed					1.000	
Accompanied						0.954
Family Instability						
Community Integration						
Co-worker conflict						
Supervisor support						
Support of superiors						
Constant	0.038*	0.042*	0.036*	0.037*	0.039*	0.038*
Nagelkerke R^2	0.018	0.017	0.019	0.018	0.018	0.018

Table 2 (*continued*)

	Model					
Variable	G	H	I	J	K	L
Age	1.009	1.012*	1.016*	1.013 *	1.013*	1.018*
Gender	1.280*	1.334*	1.255*	1.384*	1.352*	1.226*
First-term	0.725*	0.757*	0.747*	0.781	0.756*	0.696*
Enlisted	1.221*	1.429*	1.335*	1.423*	1.417*	1.144
First-term * Enlisted	2.352*	2.075*	2.223*	2.026*	2.141*	2.382*
Shift work						0.963*
Work hours						0.995
Deployments						1.004
Days deployed						0.999*
Accompanied						0.747*
Family Instability	1.293*					1.312*
Community Integration		0.975*				0.972*
Co-worker conflict			1.208*			1.150*
Supervisor support				0.813*		0.901*
Support of superiors					0.996	1.036*
Constant	0.027*	0.042*	0.030*	0.064*	0.039*	0.041*
Nagelkerke R^2	0.062	0.018	0.035	0.023	0.019	0.083

Table 2 (*continued*)

Note: Gender is coded 0 = male, 1 = female. First-term is coded 0 = career enlistment, 1 = first-term enlistment. Shift work is coded 0 = day shift, 1 = mid or swing shift. All models include all active duty personnel (N = 35732) except for Models F and G in which only married personnel (N = 23709) were included in the analysis. Nagelkerke R^2 is a pseudo R square measure that approximates the variance accounted for by the equation (Nagelkerke, 1991; Newsom, 2003). $^*p < .05$.

Probabilities are presented in Appendix D for the control variables (Model A), and the significant predictor variables in Table 2: *family instability* (Model G), *community integration* (Model H), *co-worker conflict* (I) and *supervisor support* (Model J). The equations have been calculated for high and low values of each social support variable. The resulting probabilities can be compared with the baseline probability of service utilization of .089 in the sample. Factors that raise the probability are considered risk factors and those the lower the probability are considered to be protective factors. The equations are computed using age at one standard deviation below the mean and one standard deviation above the mean. These values were used because one standard deviation below the mean of age captures primarily first-term personnel and one standard deviation above the mean captures primarily career personnel, as

shown in Figure 3. Tables C1 and C2 give the probabilities derived from Models G, H, I and J for females and males respectively.

Control Model

In Table 2, Model A serves is the control model and includes all demographic variables (*age*, *gender*, *enlisted*, *first-term*, and an interaction between *first-term* and *enlisted*). An examination of Model A shows that all demographic variables are significant predictors of *mental health service utilization*. Being older and being female increase the risk of using mental health services. There was a significant interaction between being enlisted and being in the first-term of military service. First-term enlisted personnel have the highest likelihood of using mental health services, followed by career enlisted personnel and then career officers. First-term officers have the lowest probability of using mental health services. Over all, enlisted personnel tend to have a greater probability than officers of using services (see Model A in Table D1 and D2 in Appendix D). The remaining models in Table 2 include the job stressor variables and social support variables entered one at a time (Models B through K) and then with all independent variables entered together (Model L).

Job Stressors

One general hypothesis is that job stressors will be associated with higher mental health service utilization. The logistic equations for using mental health service are shown in Table 2. Model A incorporates demographic variables as control variables and each job stressor is added separately so that Model B adds

just *shift work* to the control variables, Model C adds just *work hours*, Model D adds just *deployments*, and Model E adds just *days deployed*. No job stressor variable significantly improved the prediction of using mental health services. Thus our first four hypotheses were not supported: shift work (Hypothesis 1), work hours (Hypothesis 2), deployments (Hypothesis 3), and days deployed (Hypothesis 4) were not associated with higher mental health service utilization.

While shift work, long work hours and deployments were not found to be significant predictors of mental health utilization, exploratory analysis revealed having a second job to be significant. The database did not have specific information about the number of hours worked at a second job so the effect of having a secondary job was explored using a dichotomous variable. The results showed having a second job increases the chance of using mental health services by 15 percent ($OR = 1.152$, $p < 0.00$) when controlling for age, gender, enlisted status and first-term status. Having a second job may be a stressor in terms of work hours and time away from family. It may also have a spurious relationship with mental health services and may be indicative of financial or relationship problems.

Social Supports

Another general hypothesis is that social supports will be associated with lower mental health service utilization and will buffer the relationships between job stressors and mental health service utilization. Since the job stressors were not found to be significant predictors of service utilization, the buffering effects of

Conflict between 2nd job & mil. nature of 2nd job.

social supports cannot be tested. However, I computed interaction variables and ran all regression equations related to the buffering hypotheses to make sure there were no suppression effects or other unexpected results. No significant interactions were found. The remainder of this section addresses the direct effects of social support on mental health service utilization.

The logistic equations for using mental health services are presented in Table 2. Social support variables are added one at a time to the control variables (Model A) such that Model F adds just being *accompanied* by family, Model G adds just *family instability*, Model H adds just *community integration*, Model I adds just *co-worker conflict*, Model J adds just *supervisor support*, and Model K adds just *support from superiors*. Models F and G (for *accompanied* and *family stability*) were run using only married respondents to avoid artificially inflating the effects of family support. Approximately 10% of single military personnel have children, and over 80% of them are accompanied by their children. The dynamics of family support in a single-parent family, though not the focus of this study, are assumed to differ from those in a married family. *Family instability* specifically includes a survey question about the stability of the marital relationship and further necessitates limiting the analysis to married personnel.

Accompanied (Model F) was not a significant predictor of mental health service utilization, although the odds ratio is in the predicted direction. *Family instability* (Model G) has an odds ratio of 1.293, indicating that a one unit increase in *family instability* results in an almost 30% increase in the odds of

using mental health services. The increase in the probability of mental health service utilization associated with family instability is shown in the probability tables in Appendix D. *Family instability* emerges as the strongest risk factor in this study, with 22 year-old first-term enlisted females having a .183 probability (or 18.3% chance) of service utilization when *family instability* is high. High family instability is defined as one standard deviation above the mean of *family instability* (3.76). For males with the same factors, the probability is .149. High *family instability* increases the service utilization for all groups. Low *family instability* (one standard deviation below the mean = 0.18), on the other hand, serves as a mild protective factor and lowers the probability for all groups. Thus, while the physical presence of family members is not a significant predictor of service utilization, the degree of family instability significantly predicts service use. As a proxy measure of family support, the analysis of *family instability* supports the hypothesis that family support will be associated with lower mental health service utilization.

Additional analysis was done to explore the impact of having children. More than half of the sample (50.8%) reported having no children. A dichotomous variable was used to examine the impact of having children on *mental health service utilization*. Having children was not a significant predictor for the sample as a whole, nor when considering only married personnel. Having children was only significant when the analysis involved only non-married (i.e., single and divorced) personnel. For this subgroup, having children increased the

chance of mental health services by 67% (*OR* = 1.674, $p < 0.00$), suggesting that single parents are at greater risk for using mental health services than are other personnel. Gender was significant for both married personnel (*OR* = 1.323, $p < 0.00$) and for non-married personnel (*OR* = 1.297, $p < 0.00$) when controlling for *age*, *enlisted*, *first-term*, the interaction between *enlisted* and *first-term*, and children. Consistent with the other findings, women are at higher risk for using mental health services whether they are married or single. The odds ratios for married and single women are similar to those in Table 2. No significant interactions were found between gender and children for married or single personnel.

Community integration (Model H) is statistically significant in predicting *mental health service utilization*. With an odds ratio of 0.975, a one unit increase in *community integration* decreases the odds of mental health service utilization by 2.5% (1 – 0.975). The probability tables in Appendix D show that high *community integration* (one standard deviation above the mean = 6.09) decreases the probability of services for all groups. However, combining the effects for community integration, age, gender and enlistment, we find that enlisted females and enlisted first-term males exhibit probabilities above the baseline for all levels of community integration. In other words, while higher community integration decreases the probability of service utilization, it is not a strong enough protective factor to compensate for the increased probability associated with enlisted status. Statistically, hypothesis 7, that higher community

integration will be associated with lower mental health service utilization, is supported although it is difficult to discuss any practical application based on this data because the effects are small. It is also necessary to note the possibility of reverse causality since I am using cross-sectional data. While the analysis supports the hypothesis that higher community integration is associated with lower mental health services, it is also true that people who are mentally healthy are less likely to use services and better able to integrate into the community.

Co-worker conflict (Model I) has an odds ratio of 1.208. A one unit increase in *co-worker conflict* increases the likelihood of using mental health service by almost 21%. The probabilities associated with high and low levels of *co-worker conflict* in combination with other variables are given in Appendix D. *Co-worker conflict* is skewed so that one standard deviation below the mean falls below the minimum value. Therefore, low *co-worker conflict* is defined as the minimum value of zero and high *co-worker conflict* is two standard deviations above the minimum (2.74). The chance of service utilization for 22 year-old first-term enlisted females experiencing high conflict with co-workers is 16.8%, and for males is 13.9%. When compared to low *co-worker conflict*, high *co-worker conflict* increases the chance of service utilization by 57%. The impact is more pronounced among enlisted personnel who have a higher baseline probability than officers. Using *co-worker conflict* as a proxy measure of co-worker support, this analysis supports the hypothesis that higher co-worker support will be associated with lower mental health service utilization (Hypothesis 9).

The odds ratio for *supervisor support* (Model J) is 0.813. A one unit increase in *supervisor support* decreases the likelihood of using mental health services by almost 19% (1 – 0.813). The probabilities of service use associated with high and low levels of *supervisor support* are presented in Appendix D. Because one standard deviation above the mean exceeds the maximum value for supervisor support, high *supervisor support* is defined as the maximum value (3) and low *supervisor support* is defined as two standard deviations below the maximum value (1.70). Low *supervisor support* increases the chance of mental health service utilization by 32% compared to high *supervisor support*. High *supervisor support*, however, does not appear to improve the probabilities of service utilization when compared with Model A. Supervisor support is skewed towards high support suggesting that high *supervisor support* is perceived as being the norm and is not necessarily a protective factor while low supervisory support can be seen as a risk factor. The hypothesis that higher *supervisor support* will be associated with lower mental health service utilization (Hypothesis 11) is supported.

Support from superiors (Model K) is not a significant predictor of service utilization. Although the correlations between *support from superiors* and *service utilization* in Table 1 are significant and in the predicted direction, the correlations are small enough ($r = -.02$) that *support from superiors* does not add to our predictive ability and it is not a significant predictor in logistic regression. The

hypothesis that higher support from superiors will be associated with lower mental health service utilization (Hypothesis 13) is not supported.

Based on the statistical analysis, several protective factors and risk factors are identifiable. Protective factors that lower the probability of mental health service utilization include being male, being an officer, low family instability and high community integration. Risk factors raise the probability include being first-term, being enlisted, being female, high family conflict, low community integration, co-worker conflict and low supervisor support. These risk factors may have a cumulative effect. Using Model L in Appendix C, consider a 22 year-old enlisted female, accompanied by family and working an average number of hours without shift work or deployments. When family conflict and co-worker conflict are low and the other social supports are high, the chance of service use is 7.7%. With low supervisor support the chance increases to 8.9%. Add low community integration and the chance increases to 9.9%. Adding high co-worker conflict, the chance increases to 13.9%. And finally, adding high family instability, the chance jumps to 30.0%. The additive effects of poor social support on multiple levels is clear in this example.

Additional Analysis

No direct effects were found for job stressors on service utilization, but several effects were shown for social supports. I wondered if there might be a relationship between job stressors and social supports and perhaps indirect effects by job stressors on mental health service utilization. The Pearson

correlations in Table 1 (p. 52) suggest a relationship between job stressors and social support, a relationship I explored using hierarchical ordinary least squares (OLS) regression. The control variables *age*, *gender*, *enlisted*, *first-term* and a *enlisted*first-term* interaction term were included in each model. All four jobs stressors – *shift work*, *work hours*, *deployments* and *days deployed* – were also included in each model. Each social support variable that was found to be a significant predictor in logistic regression (see Table 2) was used as an outcome of OLS regression, resulting in four separate equations: *family instability* (Table E1), *community integration* (Table E2), *co-worker support* (Table E3) and *supervisor support* (Table E4). Table E1 shows that work hours and days deployed are significant predictors of family stability. When controlling for age, gender, enlisted status, first-term status, shift work and frequency of deployment, longer work hours and days deployed are associated with increased family instability (i.e., increased conflict). Table E2 shows that shift work, more deployments, and longer deployments decreases community integration, while greater work hours increase community integration. In Table E3, shift work, work hours and number of deployments are all positively associated with co-worker conflict. And Table E4 shows that shift work and greater work hours are negatively associated with supervisor support. The predictive power of these models is small (R^2 range of .005 to .018). Nevertheless, the direct effects of job stressors on social supports, and the direct effects of social supports on mental health service utilization suggest that job stressors have indirect effects on

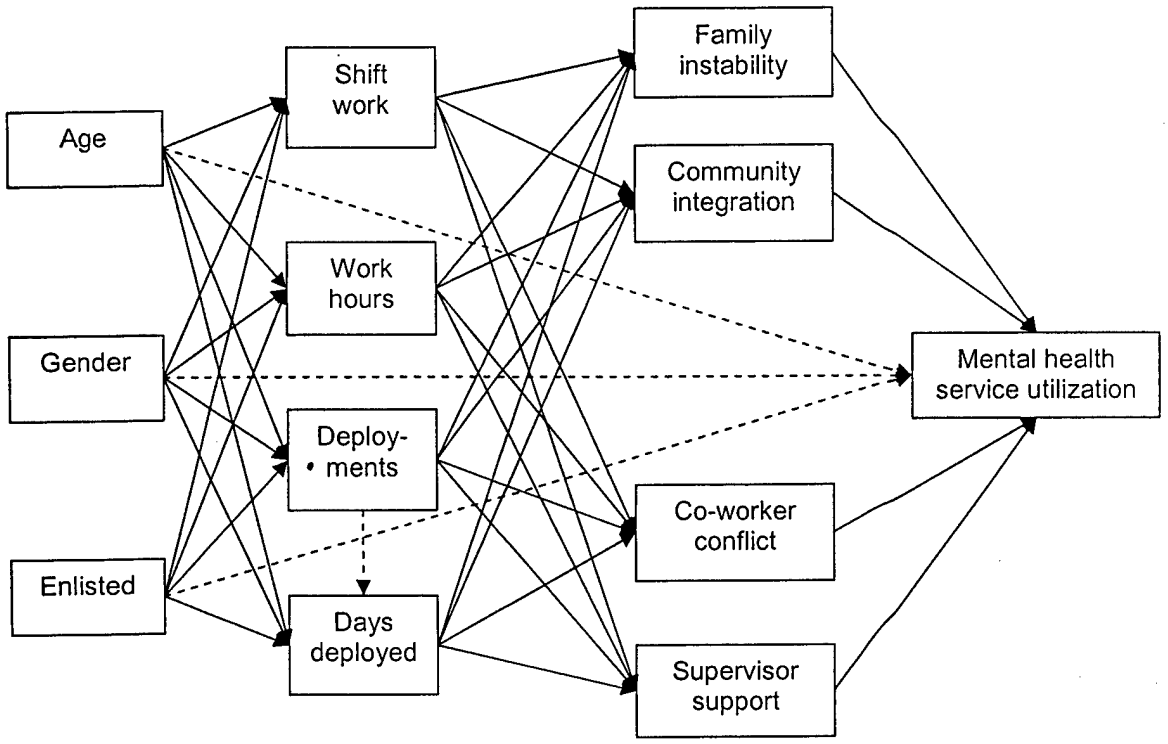

Figure 4. Structural Equation Model of Job Stressors and Social Supports on Mental Health Service Utilization. Chi-square = 3410.17 (p = 0.000). Df = 27. Chi-square/df = 126.30. RMSEA = 0.00. NFI = 0.87. IFI = 0.88. GFI = 0.97. Dotted arrows indicated paths indicated by modification indices.

---

service utilization. To investigate this possibility, service utilization and the variables used in the OLS regressions were analyzed in LISREL using structural equation modeling to simultaneously solve the equations represented by the diagram in Figure 4. This structural equation model excludes *first-term* and the interaction between *first-term* and *enlisted* due to statistical problems related to the inverse of the correlation matrix. The model also excludes *accompanied* and *supervisor* because they were not significant predictors in the logistical regression analysis.

In this model, the control variables predict job stressors, job stressors predict social supports, and social supports predict mental health service utilization. Additional paths (indicated by dotted arrows) were added based on modification indices from the control variables (*age*, *gender* and *enlisted*) to *mental health service utilization* and from *deployments* to *days deployed*. Some caution should be used in interpreting this model. The fit indices suggest a marginal to poor fit with the data. While the Root Mean Square Error of Approximation (RMSEA) suggests a close fit (0.00), the other goodness-of-fit measures suggest a poor fit. The Normed Fit Index (NFI) and the Incremental Fit Index (IFI) are well below the normally accepted standard of 0.95. The Goodness of Fit Index (GFI), while at an acceptable level at 0.97, is highly influenced by sample size and should not be interpreted independently of the other fit indices. The purpose of the structural equation modeling, however, was not to test an overall model as much as to explore the indirect effects of job stressors. Despite the poor fit of the model overall, the analysis provides insights into the effects of job stressors on mental health service utilization.

The standardized indirect and total effects are presented in Table 3. There were no modification indices indicating direct paths from the job stressors to *mental health service utilization*. This analysis confirms the results of logistical analysis, specifically that *family instability* has the largest effect (0.25) of the social support variables, followed by *co-worker conflict* (0.11). Overall, job

Table 3

Standardized Effects of Predictor Variables on Mental Health Service Utilization

Variable	Indirect Effect	Direct Effect	Total Effect
Age	0.00	-0.05	-0.05
Gender	0.00	0.08	0.08
Enlisted	0.00	0.00	0.00
Shift work	0.02	—	0.02
Work hours	0.01	—	0.01
Deployments	0.00	—	0.00
Days deployed	0.01	—	0.01
Family instability	—	0.25	0.25
Community integration	—	-0.04	-0.04
Co-worker conflict	—	0.11	0.11
Supervisor support	—	-0.06	-0.06

stressors have a very slight effect on mental health service utilization indirectly through social supports.

Based on this analysis, we can conclude that job stressors (*shift work*, *long work hours*, *deployments* and *days deployed*) do not have a significant direct effect on mental health service utilization, but do have marginal effects on social supports. In turn, social supports have direct effects on the use of mental health services, with *family instability* and *co-worker conflict* having the greatest

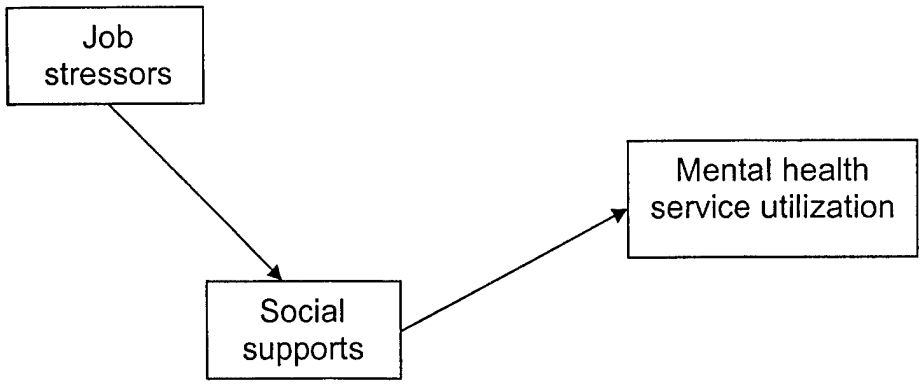

Figure 5. Revised stress model based on statistical analysis.

effects. These findings are generally consistent with the results of our hypothesis testing based on logistical regression in which job stressors were not significant predictors but the social supports of *family instability*, *community integration*, *co-worker conflict*, and *supervisor support* were significant predictors of *service utilization*. Based on the results of this study, the stress model presented in Figure 2 (p. 38) is not supported. Figure 5 presents a modified stress model based on the hypothesis testing and exploratory structural equation analysis. A summary of the hypothesis testing is presented in Table 4.

Table 4

Results of Hypothesis Testing

Hypothesis	Supported?
Hypothesis 1 (Model B): Shift work will be associated with higher mental health service utilization.	No
Hypothesis 2 (Model C): Long work hours will be associated with higher mental health service utilization.	No
Hypothesis 3 (Model D): More frequent deployments will be associated with higher mental health service utilization.	No
Hypothesis 4 (Model E): Longer deployments will be associated with mental health service utilization.	No
Hypothesis 5 (Model F): High family support will be associated with lower mental health service utilization.	Yes
Hypothesis 6: Family support will have a buffering effect on the relationship between job stressors and mental health service utilization.	Not tested
Hypothesis 7 (Model G): Higher community integration will be associated with lower mental health service utilization.	Yes
Hypothesis 8: Community integration will have a buffering effect on the relationship between job stressors and mental health service utilization.	Not tested
Hypothesis 9 (Model H): Higher co-worker support will be associated with lower mental health service utilization.	Yes

Table 4 (*continued*)

Results of Hypothesis Testing

Hypothesis	Supported?
Hypothesis 10: Co-worker support will have a buffering effect on the relationship between job stressors and mental health service utilization.	Not tested
Hypothesis 11 (Model I): Higher supervisor support will be associated with lower mental health service utilization.	Yes
Hypothesis 12: Supervisor support will have a reverse buffering effect on the relationship between job stressors and mental health service utilization.	Not tested
Hypothesis 13 (Model K): Higher support from superiors will be associated with lower mental health service utilization.	No
Hypothesis 14: Support from superiors will have a buffering effect on the relationship between job stressors and mental health service utilization.	Not tested

Chapter 5: Discussion

The overall purpose of this study was to determine the significance and strength of the association between job stressors, social supports, and mental health service utilization in the Air Force. The four job stressors used in this study were shift work, long work hours, number of deployments and number of days deployed. Each of these job stressors was hypothesized to be positively associated with the use of mental health services. Logistical regression analysis failed to support these hypotheses. No significant direct effects for these job stressors were found when controlling for age, gender, career status (first-term versus career) and rank status (enlisted versus officer).

Social support was hypothesized to have direct effects on mental health service utilization and to buffer the relationships between job stressors and service utilization. Five levels of social support were analyzed for direct effects: family support, community integration, co-worker support, supervisor support and support by superiors. Family support involved two dimensions: 1) the physical availability of family support by being accompanied by family members, and 2) a measure of family instability that measured the degree of conflict and relationship problems. Community integration addressed the degree of perceived identification with, and involvement in, the military base community. A direct measure of co-worker support was not available so co-worker conflict was used as a proxy measure indicating the absence of co-worker support. Supervisor support was the degree of perceived support by the immediate supervisor and support by superiors was the degree of perceived support by the chain of

command above the immediate supervisor. Family instability, community integration, co-worker conflict and supervisor support were found to have direct effects on mental health service utilization. The physical presence of family members (i.e., accompanied) and support by superiors were not statistically significant predictors. The buffering effects of social supports were not tested due to the absence of direct effects by job stressors.

The strongest predictors of mental health service utilization were gender, first-term status and enlisted status, followed by family instability and co-worker conflict. The only significant interaction term found in the analysis involved first-term status and enlisted status. Exploratory analysis identified small, but statistically significant main effects of job stressors on social supports, and hence, very small indirect effects on mental health service utilization.

Exploratory analysis also found having a second job to be a significant predictor of using mental health services. Further research is needed to examine the factors of secondary employment that have adverse effects for military personnel. Secondary employment may represent a set of additional stressors for the military member or it may be related to mental health utilization through spurious relationships with financial and other problems.

Exploratory analysis also identified single parents to be an increased risk for mental health utilization. Single parents in the military represent an at-risk group that merits additional research in order to minimize the unique stressors associated with the demands of military service and single parenthood.

Limitations

This study used a cross-sectional sample taken from the 2000 Air Force Community Needs Assessment. Cross-sectional studies have an inherent problem in that they attempt to clarify causal processes that occur over time by using data collected at only one point in time (Babbie1998). This study assumes that the job stressors used in testing my hypotheses temporally precede the social supports and use of mental health services. Other researchers may argue that certain forms of social support precede job stressors, or even that mental health service utilization is a causal factor rather than an outcome. I have used prominent theories of stress (Lazarus), occupational stress (Karasek) and burnout (Maslach) in forming the theoretical framework for developing and testing my hypotheses. This study represents one theoretically based approach to evaluating the relationships between job stressors, social supports and mental health service utilization. The causal order of the variables cannot be empirically assessed using cross-sectional data. The social support variables for co-worker conflict and family instability, for example, both measure problems that could also be the outcomes of mental health problems rather than causes. Conflict with others can also be a stressor that contributes to mental health problems as well as being a symptom. Longitudinal research is needed to clarify the causal processes involving social supports and mental health service utilization.

Additional limitations arise from using secondary data analysis. As is common in secondary data analysis (Babbie, 1998), the variables used in this

study do not perfectly fit the concepts developed in the theoretical framework. Co-worker support, for example, was not directly measured in the dataset, and co-worker conflict was substituted as a proxy measure. The measures of deployment and days deployed are two more examples. Neither of these measures dealt only with deployment, but included temporary duty (TDY) and training. A TDY for continuing education, for example, would have been included in the measures of deployment. The full impact of military deployment, therefore, may have been diluted by including TDY's and trainings. Future research in the military should separate deployment from TDY's and trainings in order to assess the full impact of each of these military requirements.

Using mental health service utilization as an outcome variable also presents limitations. The theory used to frame this study include mental health outcomes of the stress process. Mental health service utilization is an indirect measure of mental health problems, leaving a conceptual gap between theory and measurement. While service utilization is regularly used in the military for policy and service provision purposes, further research is needed to assess the link between mental health needs and mental health service utilization in the general population and in the military.

Future military needs assessments should consider additional items that provide direct measures of mental health needs. Mental health needs could be directly measured by including items such as the Beck Depression Inventory and Beck Anxiety Inventory. Items from substance abuse screening tools would give

direct information about substance abuse. By adding these or similar items to the needs assessment survey, researchers would be able to look at factors related to mental health needs and assess the relationship between need and service utilization.

From a statistical perspective, the rare event nature of the outcome variable (mental health service utilization) necessitated using logistic regression. Even though logistic regression is a robust method for rare event data, it is generally difficult to find clinical significance when some predictor variables are themselves rare events. This is akin to using regression analysis to predict a needle in a haystack. In this study, the predictive power of the equations is marginal and there is no improvement in the prediction matrices. At best, we can talk about the increase or decrease in the odds or probability of using mental health services. Despite these limitations, the statistically significant results highlight consistent trends in the data and point out directions for future research.

Implications

From a theoretical perspective, this study underlines the importance of social support as a personal resource in the stress process. Lazarus' model (see Figure 1, p. 15) identifies personal resources as a potential contributor to stressors as well as aiding in appraisal and coping. The effects of social support found in this study support Lazarus' model. When social supports are high, the general effect is a decrease in mental health service utilization, consistent with strengthening the appraisal and coping processes. When social supports are

low, and particularly when there is conflict in primary relationships, the risk of mental health service utilization greatly increases. This is consistent with poor social support acting a stressor and depleting resources used for appraisal and coping.

Karasek's job demand/control model is also partially supported by this study. The risk of mental health service use is higher for enlisted and first-term personnel. In general, these personnel have less autonomy, authority and decision latitude. From this perspective, the increased risk for these personnel is consistent with Karasek's model.

The job stressors used in this study were not significant predictors of mental health service utilization. One possible reason for this unexpected result is that shift work, long work hours and deployments are not perceived as stressors by military personnel. Hughes, Galinshky and Morris (1992) would identify these stressors as structural job characteristics because they are related to the scheduling and location of work. They argue that structural job characteristics do not directly impact mental health, but operate indirectly by impinging on family obligations and other social roles. However, psychosocial job characteristics related to job content and decision latitude have direct effects on mental health. Their argument is consistent with Karasek's model and offers a plausible explanation for the lack of predictive power by the job stressors used in this study. Shift work, long work hours, and deployments may be accepted as

part of the military lifestyle and only become stressors by impacting family and social relationships.

This study supports an ecological approach to clinical assessment and suggests a need for clinicians to assess the magnitude and quality of social support on multiple levels regardless of the presenting complaint. Conflict in primary social relationships reduces the personal resources for primary and secondary appraisal and for coping with stressors. Poor social support on multiple levels appears to have a cumulative effect, and suggests that individuals need to have consistent sources of social support at some level.

Directions for Future Research

Shift work, long work hours and deployments were not significant predictors of mental health service utilization in this study. Future research on job characteristics should evaluate other potential outcomes of these job stressors. Other studies have consistently found these job characteristics to have adverse effects on family relationships, physical health and mental health (e.g., Hughes, Galinshky & Morris, 1992; McCarroll et al., 2000; White & Keith, 1990). Future research should look at the effects of these job stressors within a military context and evaluate the impact they may have on other factors related to military readiness and retention of personnel.

Although the job characteristics used in this study were not significant, job stress is still a common presenting complaint in military mental health clinics (Pflanz, 2001). Future research needs to assess other job characteristics within

the military to determine the occupational factors that relate to mental health problems in the military.

Finally, the outcome measure in this study involved mental health service utilization. The degree that service utilization reflects service need is not clear. Future research regarding mental health in the military should address two specific questions. First, what is the association between mental health needs and mental health service utilization, and second, what factors contribute to mental health needs.

Conclusion

This study has identified several risk factors for mental health service utilization in the Air Force. Women are at higher risk than men. Enlisted personnel are at greater risk than officers. First-term personnel are at greater risk than career personnel. Risk also increases when certain social supports are low and when there is conflict in family or work relationships. Shift work, long work hours and deployments do not significantly increase the risk of using mental health services. Additional research is need to more fully understand the risks associated with being female, enlisted or first-term in the military.

Given the effect of social support on mental health service utilization, it is likely that the quality of social support plays a role in military readiness, retention of personnel and the overall quality of life in the military. Because first-term personnel are at greater risk for using mental health services, the military should continue efforts to facilitate acclimatization to the military environment and bolster

programs that provide support to new recruits. The Army, for example, recently implemented an initiative in which soldiers remain at their first assignment for six to seven years, allowing first-term soldiers to maintain and strengthen family relationships and other social supports (Army Public Affairs, 2004). Such initiatives give new personnel an opportunity to become familiar with the military lifestyle while having stable social supports in the community.

The revised stress model (Figure 5, p. 73) remains a multidimensional ecological model. The person-in-environment components are all important, although the linkages were different than expected. This study reinforces the need for an ecological approach to assessment that evaluates the resources and stressors in both the person and the environment.

REFERENCES

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.

Air Force Personnel Center (2004). *Interactive Demographic Analysis System (IDEAS)* [Interactive database]. Available from Air Force Personnel Center web site, http://www.afpc.randolph.af.mil/demographics/

Aneshensel, C. S. (1996). Consequences of psychosocial stress: The universe of stress outcomes. In H. B. Kaplan (Ed.), *Psychosocial stress: Perspectives on structure, theory, life-course, and methods*. New York: Academic Press.

Army Public Affairs. (2004, February 9). Army announces force stabilization initiative. *U.S. Army News Release*. Retrieved March 21, 2004, from http://www4.army.mil/ocpa/

Avison, W. R., & Turner, R. J. (1988). Stressful life events and depressive symptoms: Disaggregating the effects of acute stressors and chronic strains. *Journal of Health and Social Behavior, 29*(3), 253-264.

Babbie, E. (1998). *The practice of social research* (8th ed.). New York: Wadsworth Publishing.

Baruch-Feldman, C., Brondolo, E., Ben-Dylan, D., & Schwartz, J. (2002). Sources of social support and burnout, job satisfaction, and productivity. *Journal of Occupational Health Psychology, 7*(1), 84-93.

Bauer, M. S., Shea, N., McBride, L., & Gavin, C. (1997). Predictors of mental health service utilization in veterans with bipolar disorder: A prospective study. *Journal of Affective Disorders, 44*(2-3), 159-168.

Beehr, T. A., Farmer, S. J., Glazer, S., Gudanowski, D. M., & Nair, V. N. (2003). The enigma of social support and occupational stress: Source congruence and gender role effects. *Journal of Occupational Health Psychology, 8*(3), 220-231.

Bellman, S., Forster, N., Still, L., & Cooper, C. L. (2003). Gender differences in the use of social support as a moderator of occupational stress. *Stress and Health, 19*, 45-58.

Betts, R. K. (1995). *Military readiness: Concepts, choices, consequences.* Washington, D.C.: The Brookings Institution.

Bowen, G. L., Mancini, J. A., Martin, J. A., Ware, W. B., & Nelson, J. P. (2003). Promoting the adaptation of military families: An empirical test of a community practice model. *Family Relations, 52*(1), 33-44.

Bray, R. M., Camlin, C. S., Fairbank, J. A., Dunteman, G. H., & Wheeless, S. C. (2001). The effects of stress on the job functioning of military men and women. *Armed Forces and Society, 27*(3), 397-417.

Bray, R. M., Fairbank, J. A., & Marsden, M. E. (1999). Stress and substance use among military women and men. *American Journal of Drug and Alcohol Abuse, 25*(2), 239-256.

Brower, A. M. (1988). Can the ecological model guide social work practice? *Social Service Review, 62*(3), 411-429.

Buddin, R., & Do, D. P. (2002). *Assessing the personal financial problems of junior enlisted personnel* (RAND Publication No. MR-1444-OSD). Retrieved September 24, 2003 from http://www.rand.org/publications/MR/MR1444

Caliber Associates. (2000). *Air Force community needs assessment*. Fairfax, VA: Author.

Caliber Associates. (2002). Organizational and military community research. Retrieved April 24, 2003, from http://www.calib.com/home/practice_areas/cfcs/cfcs.cfm

Caliber Associates. (2003). Organizational and military community research project highlights. Retrieved January 15, 2004, from http://www.calib.com/home/practice_areas/omcr/projhigh.cfm

Center for Strategic and International Studies. (2000). *American military culture in the twenty-first century: A report of the CSIS International Security Program.* Washington, DC: CSIS Press.

Chu, D. S. C., White, J. P., Berstein, N., & Brown, J. (2001). Ensuring quality people in defense. In A. B. Carter & J. P. White (Eds.), *Keeping the edge: Managing defense for the future*. Cambridge, MA: MIT Press.

Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research, and applications.* Thousand Oaks, CA: Sage Publications.

Cordes, C. L., & Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Academy of Management Review, 18*(4), 621-656.

Cornelius, J. R., Pringle, J., Jernigan, J., Kirisci, L., & Clark, R. B. (2001). Correlates of mental health mental health service utilization and unmet need among a sample of male adolescents. *Addictive Behaviors, 26*(1), 11-19.

Crouter, A. C., Bumpus, M. F., Head, M. R., & McHale, S. M. (2001). Implications of overwork and overload for the quality of men's family relationships. *Journal of Marriage and Family, 62*(2), 404-416.

Day, A. L., & Livingstone, H. A. (2001). Chronic and acute stressors among military personnel: Do coping styles buffer their negative impact on health? *Journal of Occupational Health Psychology, 6*(4), 348-360.

Demerouti, E., Nachreiner, F., Bakker, A. B., & Schaufeli, W. B. (2001). The jobs demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499-512.

Department of the Army. (1994). *Leader's manual for combat stress control.* (AMEDDC&S Field Manual No. 22-51). Fort Sam Houston, Texas: Author.

Dobreva-Martinova, T., Villeneuve, M., Strickland, L., & Matheson, K. (2002). Occupational role stress in the Canadian Forces: Its association with individual and organizational well-being. *Canadian Journal of Behavioural Science, 34*(2), 111-121.

Edwards, J. R., & Rothbard, N. P. (1999). Work and family stress and well-being: An examination of person-environment fit in the work and family domains. *Organizational Behavior and Human Decision Processes, 77*(2), 85-129.

Fenlason, K. J., & Beehr, T. A. (1994). Social support and occupational stress: Effects of talking to others. *Journal of Organizational Behavior, 15*, 157-175.

Fontana, A., Rosenheck, R., & Horvath, T. (1997). Social support and psychopathology in the war zone. *The Journal of Nervous and Mental Disease, 185*(11), 675-681.

Fricker, R. D., Jr. (2002). *The effects of perstempo on officer retention in the U.S. military* (RAND Publication No. MR-1556-OSD). Retrieved September 24, 2003 from http://www.rand.org/publications/MR/MR1556

Gabarino, S. Beelke, M., Costa, G., Violani, C., Lucidi, F., Ferrillo, F., et al. (2002). Brain function and effects of shift work: Implications for clinical neuropharmacology. *Neuropsychobiology, 45*(1), 50-56.

Gareis, K. C., & Barnett, R. C. (2002). Under what conditions do long work hours affect psychological distress? A study of full-time and reduced-hours female doctors. *Work and Occupations, 29*(4), 483-497.

Germain, C. B., & Gitterman, A. (1987). Ecological perspective. In A. Minahan (Ed.), *Encyclopedia of social work* (18th ed.). Silver Spring, MD: National Association of Social Workers.

Germain, C. B., & Gitterman, A. (1996). *The life model of social work practice: Advances in theory and practice* (2nd ed.). New York: Columbia University Press.

Gevirtz, R. (2000). The physiology of stress. In D. T. Kenny, J. G. Carlson, F. J. McGuigan and J. L. Sheppart (Eds.), *Stress and Health: Research and Clinical Applications.* Australia: Harwood Academic Publishers.

Gimbel, C. & Booth, A. (1994). Why does military combat experience adversely affect marital relations? *Journal of Marriage and the Family, 56*(3), 691-703.

Gitterman, A. (1996). Ecological perspective: Response to Professor Jerome Wakefield. *Social Service Review, 70*(3), 472-476.

Grzywacz, J. G., & Fuqua, J. (2000). The social ecology of health: Leverage points and linkages. *Behavioral Medicine, 26*(3), 101-115.

Haermae, M. I., & Ilmarinen, J. E. (1999). Towards the 24-hour society—new approaches for aging shift workers? *Scandinavian journal of work, environment and health, 25*(6), 610-615.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research, 11*, 213-128.

Holt, R. R. (1993). Occupational stress. In L. Goldberger and S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (2nd ed.). New York: Free Press.

Hosek, J., & Totten, M. (2002). *Serving away form home: How deployments influence reenlistment* (RAND Publication No. MR-1594-OSD). Retrieved September 24, 2003 from http://www.rand.org/publications/MR/MR1594

Houkes, I., Janssen, P. P. M., De Jong, J., & Bakker, A. B. (2003). Personality, work characteristics, and employee well-being: A longitudinal analysis of

additive and moderating effects. *Journal of Occupational Health Psychology, 8*(1), 20-38.

House, J. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.

Ingledew, D. K., Hardy, L., & Cooper, C. L. (1997). Do resources bolster coping and does coping buffer stress? An organizational study with longitudinal aspect and control for negative affectivity. *Journal of Occupational Psychology, 2*(2), 118-133.

Kalimo, R., Pahkin, K., & Mutanen, P. (2002). Work and personal resources as long-term predictors of well-being. *Stress and Health, 18*, 227-234.

Karasek, R. A., Jr. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*, 285-308.

Kaslow, F. W. (1993). Attitudes, knowledge base, and skills essential to treat military families: Core elements in training and supervisory endeavors. In F. W. Kaslow (Ed.), *The military family in peace and war*. New York: Springer.

Kemp, S. P., Whittaker, J. K., & Tracy, E. M. (1997). *Person-environment practice: The social ecology of interpersonal helping*. Hawthorne, NY: Aldine De Gruyter.

Kickul, J., & Posig, M. (2001). Supervisory emotional support and burnout: An explanation of reverse buffering effects. *Journal of Managerial Issues, 13*(3), 328-344.

King, G., & Zeng, L. (2001). Logistic regression in rare events data. *Political Analysis, 9*(2), 137-163.

Kirkcaldy, B., Trimpop, R., & Levine, R. (2002). The impact of work hours and schedules on the physical and psychological well-being in medical practices. *European Psychologist, 7*(2), 116-124.

Kitaoka-Higashiguchi, K., Nakagawa, H., Morikawa, Y., Ishizake, M., Miura, K., Naruse, Y., Kido, T., & Sukigara, M. (2003). Social support and individual styles of coping in the Japanese workplace: An occupational stress model by structural equation analysis. *Stress and Health, 19*, 37-43.

Kleijnen, J. P. C., Vonk Noordegraaf, A., & Nielen, M. (2001). Sensitivity analysis of censored output through polynomial, logistic, and tobit regression meta-models: Theory and case study. In B. A. Peters, J. S. Smith, D. J. Medeiros & M. W. Rohrer (Eds.), *Proceedings of the 2001 Winter Simulation Conference* (pp. 486 – 491). Retrieved February 24, 2004, from http://www.informs-cs.org/wsc01papers/063.PDF

Kondrat, M. E. (2002). Actor-centered social work: Re-visioning "person-in-environment" through a Critical Theory lens. *Social Work, 47*(4), 435-448.

Lazarus, R. S. (1966). *Psychological stress and the coping process.* San Francisco: McGraw-Hill.

Lazarus, R. S. (1982). Why we should think of stress as a subset of emotion. In L. Goldberger and S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (2nd ed.). New York: Free Press.

Lazarus, R. S. (1999). *Stress and emotion: A new synthesis.* New York: Springer.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Lee, R. T., & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology, 81*(2), 123-133.

Lilly, R., Feyer, A., Kirk, P., & Gander, P. (2002). A survey of forest workers in New Zealand: Do hours of work, rest, and recovery play a role in accidents and injury? *Journal of Safety Research, 33*, 53-71.

Lin, N., & Peek, M. K. (1999). Social networks and mental health. In A. V. Horwitz & T. L. Scheid (Eds.), *A handbook for the study of mental health: Social contexts, theories, and systems.* New York: Cambridge University Press.

Loscocco, K. A. & Spitze, G. (1990). Working conditions, social support, and the well-being of female and male factory workers. *Journal of Health and Social Behavior, 31*(4), 313-327.

MacDonough, T. S. (1991). Noncombat stress in soldier: How it is manifested, how it is measured, and how to cope with it. In R. Gal and A. D. Mangelsdorff (Eds.), *Handbook of military psychology.* New York: John Wiley & Sons.

Mangelsdorff, A. D. & Gal, R. (1991). Overview of military psychology. In R. Gal and A. D. Mangelsdorff (Eds.), *Handbook of military psychology*. New York: John Wiley & Sons.

Marquié, J. C., Foret, J. & Quéinnec, Y. (1999). Effects of age, working hours, and job content on sleep: A pilot study. *Experimental Aging Research, 25*, 421-427.

Maslach, C. (1978). The client role in staff burn-out. *Journal of Social Issues, 34*(4), 111-124.

Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice-Hall.

McCarroll, J. E., Ursano, R. J., Liu, X., Thayer, L. E., Newby, J. H., Norwood, A. E., et al. (2000). Deployment and the probability of spousal aggression by U.S. Army soldiers. *Military Medicine, 165*(1), 41-44.

McClendon, M. J. (1994). *Multiple regression and causal analysis.* Itasca, Illinois: F.E. Peacock Publishers.

McNutt, L, Holcomb, J. P., Jr. & Carlson, B. E. (2000). Logistic regression analysis: When the odds ratio does not work: An example using intimate partner violence data. *Journal of Interpersonal Violence, 15*(10), 1050-1059.

Menard, S. (2002). *Applied logistic regression analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Miles, J., & Shevlin, M. (2001). *Applying regression and correlation: A guide for students and researchers.* Thousand Oaks, CA: Sage Publications.

Nagelkerke, N. J. D. (1991). A note on a general definition of the coefficient of determination. *Biometrika, 78*(3), 691-692.

New, M., & Berliner, L. (2000). Mental health mental health service utilization by victims of crime. *Journal of Traumatic Stress, 13*(4), 693-707.

Newsom, J. T. (2003). More on model fit and significance of predictors with logistic regression. Data Analysis II class lecture handout retrieved March 25, 2004, from http://www.upa.pdx.edu/IOA/newsom/

Newton, R. R., & Rudestam, K. E. (1999). *Your statistical consultant: Answers to your data analysis questions*. Thousand Oaks, CA: Sage Publications.

Noy, S. (1991). Combat stress reactions. In R. Gal and A. D. Mangelsdorff (Eds.), *Handbook of military psychology*. New York: John Wiley & Sons.

Pearlin, L. I. (1999). Stress and mental health: A conceptual overview. In A. V. Horwitz & T. L. Scheid (Eds.), *A handbook for the study of mental health: Social contexts, theories, and systems.* New York: Cambridge University Press.

Pflanz, S. (2001). Occupational stress and psychiatric illness in the military: Investigation of the relationship between occupational stress and mental illness among military mental health patients. *Military Medicine, 166*(6), 457-462.

Pflanz, S., & Sonnek, S. (2002). Work stress in the military: Prevalence, causes, and relationship to emotional health. *Military Medicine, 167* (11), 877-882.

Polich, J. M, & Sortor, R. (2001). *Deployments and Army personal tempo* (RAND Publication No. MR-1417-A). Retrieved November 4, 2003 from http://www.rand.org/publications/MR/MR1417.

Posig, M., & Kickul, J. (2003). Extending our understanding of burnout: Test of an integrated model in nonservice occupations. *Journal of Occupational Psychology, 8*(1), 3-19.

Pousette, A., & Hanse, J. J. (2002). Job characteristics as predictors of ill-health and sickness absenteeism in different occupational types—a multigroup structural equation modeling approach. *Work & Stress, 16*(3), 229-250.

Repetti, R. L. (1993). The effects of workload and the social environment at work on health. In L. Goldberger and S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (2nd ed.). New York: Free Press.

Rothberg, J. M., Koshes, R. J., Shanahan, J., & Christman, K. (1994). Desert Shield deployment and social problems on a U.S. Army combat support post. *Military Medicine, 159*(3), 246-248.

Rotter, J. C., & Boveja, M. E. (1999). Counseling military families. *The Family Journal: Counseling and Therapy for Couples and Families, 7*(4), 379-382.

Sarkeskian, S. C., & Conner, R. E., Jr. (1999). The US military profession into the twenty-first century: War, peace and politics. Portland: Frank Class.

Schumm, W. R., Bell, D.B., & Resnick, G. (2001). Recent research on family factors and readiness: Implications for military leaders. *Psychological Reports, 89*, 153-165.

Segal, D. R., & Segal, M. W. (1983). Change in military organization. *Annual Review of Sociology, 9*, 151-170.

Selye, H. (1956). *The stress of life*. New York: McGraw-Hill.

Selye, H. (1974). *Stress without distress*. Philadelphia, PA: Lippincott & Crowell.

Selye, H. (1980). The stress concept today. In I. L. Kutash, L. B. Schlesinger and Associates (Eds.), *Handbook on stress and anxiety*. San Francisco: Josey-Bass Publishers.

Stolzenberg, R. M. (2001). It's about time and gender: Spousal employment and health. *American Journal of Sociology, 107*(1), 61-100.

Sullivan, G. M., Kent, J. M., & Coplan, J. D. (2000). The neurobiology of stress and anxiety. In D. I. Mostofsky and D. H. Barlow (Eds.), *The management of stress and anxiety in medical disorders*. Boston: Allyn and Bacon.

Tabachnick, B. G. & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston: Allyn and Bacon.

Tausig, M. (1999). Work and mental health. In C. S. Aneshensel & J. C. Phelan (Eds.), *Handbook of the sociology of mental health*. New York: Kluwer Academic/Plenum Publishers.

Taylor, S. E. & Aspinwall, L. G. (1996). Mediating and moderating processes in psychosocial stress: Appraisal, coping, resistance, and vulnerability. In H. B. Kaplan (Ed.), *Psychosocial stress: Perspectives on structure, theory, life-course, and methods*. New York: Academic Press.

Totterdell, P., Spelten, E., Smith, L., Barton, J., & Folkard, S. (1995). Recovery from work shifts: How long does it take? *Journal of Applied Psychology, 80*(1), 43-57.

Trimpop, R., Kirkcaldy, B., Athanasou, J., & Cooper, C. (2000). Individual differences in working hours, work perceptions and accident rates in veterinary surgeries. *Work and Stress, 14*(2), 181-188.

Turner, R. J. (1999). Social support and coping. In A. V. Horwitz & T. L. Scheid (Eds.), *A handbook for the study of mental health: Social contexts, theories, and systems.* New York: Cambridge University Press.

Umberson, D., & Williams, K. (1999). Family status and mental health. In C. S. Aneshensel & J. C. Phelan (Eds.), *Handbook of the sociology of mental health.* New York: Kluwer Academic/Plenum Publishers.

Unger, M. Y. (2003, May 14). USAFE members receive Air Force assessment survey. *USAFE News Service.* Retrieved January 15, 2004, from http://www.usafe.af.mil/news.news03/unso3427.htm

VandenHeuvel, A., & Wooden, M. (1995). Do explanations of absenteeism differ for men and women? *Human Relations, 48*(11), 1309-1329.

Viswesvaran, C., Sanchez, J. I., & Fisher, J. (1999). The role of social support in the process of work stress: A meta-analysis. *Journal of Vocational Behavior, 54*, 314-334.

Wakefield, J. C. (1996a). Does social work need the eco-systems perspective? Part 1. Is the perspective clinically useful? *Social Service Review, 70*(1), 1-32.

Wakefield, J. C. (1996b). Does social work need the eco-systems perspective? Part 2. Does the perspective save social work from incoherence? *Social Service Review, 70*(2), 183-213.

Wheaton, B. (1996). The domains and boundaries of stress concepts. In H. B. Kaplan (Ed.), *Psychosocial stress: Perspectives on structure, theory, life-course, and methods.* New York: Academic Press.

White, L. & Keith, B. (1990). The effect of shift work on the quality and stability of marital relations. *Journal of Marriage and the Family, 52* (2), 453-462.

APPENDIX A

AIR FORCE COMMUNITY NEEDS ASSESSMENT QUESTIONS

Table A

Air Force Community Needs Assessment Questions

The following table gives the questions from the Air Force Community Needs Assessment survey that are used to derive the variables for this study.

Variable	Survey Questions	Variable Recoding
Age	Age in years ____	None
Gender	Are you: ____ 1. Male 2. Female	0 = Male 1 = Female
Paygrade	1 = E1 – E4 2 = E5 – E6 3 = E7 – E9 4 = O1 – O3 5 = O4 – O6	ENLISTED 0 = Officer (4, 5) 1 = Enlisted (1, 2, 3) FIRST-TERM 0 = No (2, 3, 5) 1 = Yes (1, 4)
Years of military service	How many years of military service have you or your spouse completed? ____	None
CONUSCO	1 = CONUS/In country 2 = OCONUS/Out of country	0 = Stateside 1 = Overseas
Shift work	What type of shift do you normal work at your primary paying job? ____ 1. 8 hour – day shift 2. 8 hour – mid shift 3. 8 hour – night shift 4. 8 hour – rotating shift 5. 12 hour – day shift 6. 12 hour – night shift 7. 12 hour – rotating shift 8. Other	0 = no shift work (1 and 5) 1 = shift work (2, 3, 4, 6, 7, 8)

Table A (*continued*)

Variable	Survey Questions	Variable Recoding
Work hours	Under normal circumstances, approximately how many hours per week do you work at your primary paying job? ____	None
Deploy-ments	For TDYs, deployments or trainings in the past 12 months please indicated: How many total times you have been away ____ How many total days you have been away ____	None
Community Integration	Please indicate which community you identify with in each of the following situations (1 = Base community, 2 = Civilian community, 3 = Does not apply) ____In general, I identify with the ____I attend religious service most frequently in the ____I volunteer most often in ____Most of my social activities are with people associated with ____Most of my friends are associated with the ____Non active duty family members go for medical care in the ____I shop most often in the ____I use support agencies most frequently in	0 = civilian community or does not apply 1 = base community INTEGRATION equals the sum of items marked "base community"
Accomp-anied by family	Is your family with you on this assignment? ____ 1. No, my family is not with me 2. No, I am single with no dependents 3. Yes, accompanied by family-command sponsored 4. Yes, accompanied by family-not command sponsored	ACCOMPANIED 0 = not accompanied 1 = accompanied

Table A (*continued*)

Variable	Survey Questions	Variable Recoding
Family instability	How often have you experienced conflicts with family members in the past month? ____ 1. Never 2. Almost never 3. Sometimes 4. Often 5. Very often How often in the past year have you wondered whether you should continue your relationship? ____ 1. Often 2. Sometimes 3. Rarely 4. Never	CONFLICT 0 = never 1 = almost never 2 = sometimes 3 = often 4 = very often DOUBT 0 = never 1 = rarely 2 = sometimes 3 = often FAMILY INSTABILITY equals the sum of CONFLICT and DOUBT

Variable	Survey Questions	Variable Recoding
Co-worker conflict	In the past six months, to what extent did any of the following job situations impact your ability to perform your military duty the best you can (1 = Not at all, 2 = Slight extent, 3 = Moderate extent, 4 = Great extent, 5 = Does not apply) ____Conflict with co-worker In the past six months, to what extent did any of the following job situations impact your ability to meet your family responsibilities? (1 = Not at all, 2 = Slight extent, 3 = Moderate extent, 4 = Great extent, 5 = Does not apply) ____Conflict with co-worker	DUTY 0 = Not at all, Does not apply 1 = Slight extent 2 = Moderate extent 3 = Great extent FAM 0 = Not at all, Does not apply 1 = Slight extent 2 = Moderate extent 3 = Great extent CO-WORKER CONFLICT equals sum of DUTY and FAM
Supervisor support	How supportive do you feel the following groups or programs are in your and your family's daily lives? (1 = Not at all supportive, 2 = Somewhat support, 3 = Very supportive, 4 = No experience) ____Supervisor	0 = Not at all supportive or no experience 1 = Somewhat supportive 2 = Very supportive

Table A (*continued*)

Variable	Survey Questions	Variable Recoding
Support by superiors	How supportive do you feel the following groups or programs are in your and your family's daily lives? (1 = Not at all supportive, 2 = Somewhat support, 3 = Very supportive, 4 = No experience) ____Wing leadership ____Group leadership ____Unit leadership	0 = Not at all supportive or no experience 1 = Somewhat supportive 2 = Very supportive SUPPORT BY SUPERIORS equals sum of support by wing, group and unit leadership
Service Utilization	Mark each program or service listed that was used on or off base in the past 12 months: ____Anger management ____Mental health services ____Stress management ____Substance abuse services	ANGER 0 = No 1 = Yes MENTAL HEALTH 0 = No 1 = Yes STRESS MGMT 0 = No 1 = Yes SUBSTANCE 0 = No 1 = Yes SERVICE UTILIZATION 0 = None 1 = Yes to Anger, Mental Health, Stress Mgmt and/or Substance

APPENDIX B

FREQUENCY TABLES

Table B

Frequencies of Categorical Demographic, Job Characteristic, Family Support and Mental Health Service Variables

	Frequency	Percent
DEMOGRAPHICS		
Gender		
Male	27491	77.2%
Female	8114	22.8%
Rank group		
Enlisted	28091	83.0%
Officer	5739	17.0%
First-term (E1 – E4, O1 – O3)		
Yes	17096	50.5%
No	16734	49.5%
JOB CHARACTERISTICS		
Shift work		
Works shift work	5858	19.7%
Does not work shift work	23883	80.3%
Deployment in past 12 months		
None	12534	36.1%
One or more deployments	22244	63.9%

Table B (*continued)*

	Frequency	Percent
FAMILY SOCIAL SUPPORT		
Stateside or overseas		
Stateside (CONUS)	28327	79.3%
Overseas (OCONUS)	7405	20.7%
Marital status		
Single	11745	33.1%
Married to civilian	19513	55.1%
Married to military	4196	11.8%
Accompanied by family (married only)		
No, not accompanied	2371	9.6%
Yes, command sponsored	19705	80.1%
Yes, not command sponsored	2539	10.3%
Doubts about relationship in the past year		
Often	3791	11.3%
Sometimes	5300	14.8%
Rarely	5956	16.7%
Never	18444	51.6%

Table B (*continued)*

	Frequency	Percent
Conflict with family members in past month		
Very often	810	2.4%
Often	2182	6.3%
Sometimes	9084	26.4%
Almost never	10486	30.5%
Never	11851	34.4%
COMMUNITY INTEGRATION		
"In generally, I identify with:"		
Base community	19633	60.5%
Civilian community	12817	39.5%
"I attend religious services most frequently in the:"		
Base community	5511	15.9%
Civilian community	13049	37.6%
Does not apply	16113	46.5%
"I volunteer most often in the:"		
Base community	17187	50.9%
Civilian community	10203	30.2%
Does not apply	6363	18.9%

Table B (*continued)*

	Frequency	Percent
"Most of my social activities are with people associated with the:"		
Base community	20787	60.9%
Civilian community	11709	34.3%
Does not apply	1656	4.8%
"Most of my friends are associated with the:"		
Base community	23749	69.5%
Civilian community	9171	26.8%
Does not apply	1259	3.7%
"Non-active duty family members go for medical care in the:"		
Base community	16012	46.9%
Civilian community	7266	21.3%
Does not apply	10886	31.9%
"I shop most often in the:"		
Base community	12247	35.9%
Civilian community	21203	62.1%
Does not apply	672	2.0%
"I use support agencies most frequently in the:"		
Base community	21424	62.0%
Civilian community	6160	17.8%
Does not apply	6988	20.2%

Table B (*continued*)

	Frequency	Percent
CO-WORKER CONFLICT		
To what extent did co-worker conflict impact your ability to meet your family responsibilities in the past six months?		
Not at all	17173	54.1%
Slight extent	3978	12.5%
Moderate extent	1727	5.4%
Great extent	1193	3.8%
Does not apply	7660	24.1%
To what extent did co-worker conflict impact your ability to perform your military duty in the past six months?		
Not at all	20548	62.6%
Slight extent	4369	13.3%
Moderate extent	1770	5.4%
Great extent	1282	3.9%
Does not apply	4840	14.8%

Table B (*continued)*

	Frequency	Percent
SUPPORTIVENESS OF SUPERVISOR AND SUPERIORS		
Supportiveness of supervisor		
Not at all supportive	2533	7.5%
Somewhat supportive	9218	27.3%
Very supportive	17770	52.6%
No experience	4281	12.7%
Supportiveness of unit leadership		
Not at all supportive	3850	11.4%
Somewhat supportive	10971	32.6%
Very supportive	11560	34.4%
No experience	7255	21.6%
Supportiveness of group leadership		
Not at all supportive	4463	13.3%
Somewhat supportive	9998	29.8%
Very supportive	5752	17.1%
No experience	13358	39.8%

Table B (*continued)*

	Frequency	Percent
Supportiveness of wing leadership		
Not at all supportive	4552	13.5%
Somewhat supportive	9613	28.6%
Very supportive	5424	16.1%
No experience	14081	41.8%
MENTAL HEALTH SERVICES		
Anger management services		
Yes, used in last 12 months	1020	2.9%
No, not used	34712	97.1%
Mental health services		
Yes, used in last 12 months	2230	6.2%
No, not used	33502	93.8%
Stress management services		
Yes, used in last 12 months	1536	4.3%
No, not used	34196	95.7%
Substance abuse services		
Yes, used in last 12 months	690	1.9%
No, not used	35042	98.1%

Note: See Appendix A for original survey questions and variable recoding.

APPENDIX C

LOGISTIC REGRESSION RESULTS

For the following models, the dependent variable is a dichotomous indicator of mental health service utilization.

Model A

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.012	.005	7.499	1	.006	1.012
Gender	.294	.044	45.079	1	.000	1.342
First term	-.280	.132	4.517	1	.034	.756
Enlisted	.356	.094	14.299	1	.000	1.427
Enlisted * First term	.742	.128	33.525	1	.000	2.100
Constant	-3.283	.208	249.449	1	.000	.038

Nagelkerke R^2 = .018.

Model B

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.011	.005	5.076	1	.024	1.011
Gender	.287	.048	36.403	1	.000	1.332
First term	-.355	.145	6.009	1	.014	.701
Enlisted	.299	.103	8.478	1	.004	1.348
Enlisted * First term	.807	.141	32.830	1	.000	2.241
Shift work	-.032	.054	.346	1	.556	.969
Constant	-3.158	.227	192.815	1	.000	.042

Nagelkerke R^2 = .017.

Model C

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.014	.005	9.028	1	.003	1.014
Gender	.302	.004	46.347	1	.000	1.352
First term	-.265	.132	4.013	1	.045	.767
Enlisted	.369	.095	15.060	1	.000	1.446
Enlisted * First term	.743	.129	33.329	1	.000	2.102
Work hours	.000	.002	.002	1	.964	1.000
Constant	-3.336	.210	252.103	1	.000	.036

Nagelkerke R^2 = .019.

Model D

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.012	.005	7.325	1	.007	1.012
Gender	.290	.045	42.431	1	.000	1.336
First term	-.269	.132	4.121	1	.042	.764
Enlisted	.355	.095	13.889	1	.000	1.426
Enlisted * First term	.748	.129	33.800	1	.000	2.113
Deployments	.002	.003	.696	1	.404	1.002
Constant	-3.296	.210	246.009	1	.000	.037

Nagelkerke R^2 = .018.

Model E

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.012	.005	7.231	1	.007	1.012
Gender	.288	.045	41.109	1	.000	1.334
First term	-.273	.132	4.239	1	.040	.761
Enlisted	.336	.095	12.594	1	.000	1.399
Enlisted * First term	.749	.129	33.878	1	.000	2.115
Days deployed	.000	.000	1.696	1	.193	1.000
Constant	-3.254	.211	236.865	1	.000	.039

Nagelkerke R^2 = .018.

Model F

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.013	.005	8.250	1	.004	1.013
Gender	.293	.044	44.832	1	.000	1.341
First term	-.281	.132	4.552	1	.033	.755
Enlisted	.357	.094	14.413	1	.000	1.429
Enlisted * First term	.735	.128	32.843	1	.000	2.086
Accompanied	-.047	.043	1.209	1	.272	.954
Constant	-3.273	.208	247.708	1	.000	.038

Nagelkerke R^2 = .018.

Model G

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.008	.005	3.269	1	.071	1.009
Gender	.247	.046	29.332	1	.000	1.280
First term	-.321	.135	5.658	1	.017	.725
Enlisted	.200	.096	4.342	1	.037	1.221
Enlisted * First term	.855	.132	42.158	1	.000	2.352
Family Instability	.257	.010	634.945	1	.000	1.293
Constant	-3.617	.215	281.756	1	.000	.027

Nagelkerke R^2 = .062.

Model H

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.012	.005	7.173	1	.007	1.012
Gender	.288	.044	42.886	1	.000	1.334
First term	-.279	.132	4.456	1	.035	.757
Enlisted	.357	.094	14.395	1	.000	1.429
Enlisted * First term	.730	.128	32.421	1	.000	2.075
Community Integration	-.026	.009	8.140	1	.004	.975
Constant	-3.165	.211	224.350	1	.000	.042

Nagelkerke R^2 = .018.

Model I

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.016	.005	10.644	1	.001	1.016
Gender	.227	.047	22.989	1	.000	1.255
First term	-.291	.138	4.450	1	.035	.747
Enlisted	.289	.097	8.764	1	.003	1.335
Enlisted * First term	.799	.134	35.417	1	.000	2.223
Co-worker conflict	.189	.012	238.237	1	.000	1.208
Constant	-3.494	.221	249.299	1	.000	.030

Nagelkerke R^2 = .035.

Model J

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.013	.005	7.194	1	.007	1.013
Gender	.325	.047	47.772	1	.000	1.384
First term	-.247	.137	3.251	1	.071	.781
Enlisted	.353	.099	12.798	1	.000	1.423
Enlisted * First term	.706	.133	28.074	1	.000	2.026
Supervisor support	-.207	.031	45.641	1	.000	.813
Constant	-2.743	234	137.014	1	.000	.064

Nagelkerke R^2 = .023.

Model K

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.012	.005	7.364	1	.007	1.013
Gender	.302	.044	46.164	1	.000	1.352
First term	-.279	.133	4.432	1	.035	.756
Enlisted	.348	.095	13.507	1	.000	1.417
Enlisted * First term	.761	.129	34.921	1	.000	2.141
Support by superiors	-.004	.010	.180	1	.671	.996
Constant	-3.256	.212	236.340	1	.000	.039

Nagelkerke R^2 = .019.

Model L

	B	S.E.	Wald	df	Sig.	Exp(B)
Age	.018	.006	9.108	1	.003	1.018
Gender	.204	.059	12.075	1	.001	1.226
First term	-.363	.163	4.948	1	.026	.696
Enlisted	.135	.116	1.346	1	.246	1.144
Enlisted * First term	.868	.159	29.662	1	.000	2.382
Shift work	-.038	.067	.320	1	.571	.963
Work hours	-.005	.002	4.137	1	.042	.995
Deployments	.004	.005	.653	1	.419	1.004
Days deployed	-.001	.001	6.889	1	.009	.999
Accompanied	-.292	.061	23.293	1	.000	.747
Family instability	.272	.013	430.283	1	.000	1.312
Community integration	-.029	.012	5.808	1	.016	.972
Co-worker conflict	.140	.016	79.339	1	.000	1.150
Supervisor support	-.104	.041	6.520	1	.001	.901
Support by superiors	.035	.014	6.039	1	.014	1.036
Constant	-3.184	.313	103.300	1	.000	.041

Nagelkerke R^2 = .083.

The following examples demonstrate the calculation of the probably of mental health service utilization using Model A at 22 years of age for men and women (male = 0, female = 1) who are enlisted, first-term personnel.

For enlisted males at the mean of age:

Logit(MHuse) = -3.283 + .012(Age) + .294(Gender) - .280(First-term) + .356(Enlisted) + .742(First-term)(Enlisted)

Logit(MHuse) = -.3.283 + .012(22) + .294(0) - .280(1) + .356(1) + .742(1)(1)

Logit(MHuse) = -2.201

Odds(MHuse) = $e^{-2.201}$ = 0.111 to 1

Probability(MHuse) = $\frac{.111}{1+.111}$ = .10 or 10%

For enlisted females at the mean of age:

Logit(MHuse) = -3.283 + .012(Age) + .294(Gender) - .280(First-term) + .356(Enlisted) + .742(First-term)(Enlisted)

Logit(MHuse) = -.3.283 + .012(22) + .294(1) - .280(1) + .356(1) + .742(1)(1)

Logit(MHuse) = -1.907

Odds(MHuse) = $e^{-1.907}$ = 0.149 to 1

Probability(MHuse) = $\frac{.149}{1+.149}$ = .13 or 13%

APPENDIX D

PROBABILITY TABLES

Table D1

Probabilities of Mental Health Service Utilization by Age, Military Career Status, Rank Category and Social Support for Females

Model A: Control variables only

	Enlisted	Officer
22 years-old First-term	12.9%	4.7%
38 years-old Career	10.2%	7.4%

Model G

Low Family Instability (0.18)

	Enlisted	Officer
22 years-old First-term	8.2%	3.0%
38 years-old Career	5.6%	4.7%

High Family Instability (3.76)

	Enlisted	Officer
22 years-old First-term	18.3%	7.3%
38 years-old Career	13.0%	10.9%

Model H

Low Community Integration (1.69)

	Enlisted	Officer
22 years-old First-term	13.6%	5.0%
38 years-old Career	10.8%	7.8%

Table D1 - females (*continued*)

High Community Integration (6.09)

	Enlisted	Officer
22 years-old First-term	12.3%	4.5%
38 years-old Career	9.8%	7.0%

Model I

Low Co-worker Conflict (0.00)

	Enlisted	Officer
22 years-old First-term	10.7%	3.9%
38 years-old Career	8.5%	6.5%

High Co-worker Conflict (2.74)

	Enlisted	Officer
22 years-old First-term	16.8%	6.4%
38 years-old Career	13.6%	10.5%

Model J

Low Supervisor Support (1.70)

	Enlisted	Officer
22 years-old First-term	15.8%	6.1%
38 years-old Career	12.8%	9.3%

Table D1 - females (*continued*)

High Supervisor Support (3.00)

	Enlisted	Officer
22 years-old First-term	12.6%	4.7%
38 years-old Career	10.0%	7.3%

Table D2

Probabilities of Mental Health Service Utilization by Age, Military Career Status, Rank Category and Social Support for Males

Control variables only

	Enlisted	Officer
22 years-old First-term	10.0%	3.6%
38 years-old Career	7.8%	5.6%

Model G

Low Family Instability (0.18)

	Enlisted	Officer
22 years-old First-term	6.5%	2.4%
38 years-old Career	4.5%	3.7%

High Family Instability (3.76)

	Enlisted	Officer
22 years-old First-term	14.9%	5.8%
38 years-old Career	10.5%	8.7%

Model H

Low Community Integration (1.69)

	Enlisted	Officer
22 years-old First-term	10.6%	3.8%
38 years-old Career	8.3%	6.0%

Table D2 - males (*continued)*

High Community Integration (6.09)

	Enlisted	Officer
22 years-old First-term	9.5%	3.4%
38 years-old Career	7.5%	5.4%

Model I

Low Co-worker Conflict (0.00)

	Enlisted	Officer
22 years-old First-term	8.7%	3.1%
38 years-old Career	6.9%	5.3%

High Co-worker Conflict (2.74)

	Enlisted	Officer
22 years-old First-term	13.9%	5.1%
38 years-old Career	11.1%	8.6%

Model J

Low Supervisor Support (1.87)

	Enlisted	Officer
22 years-old First-term	12.0%	4.5%
38 years-old Career	9.6%	6.9%

Table D2 - males (*continued*)

High Supervisor Support (3.17)

	Enlisted	Officer
22 years-old First-term	9.4%	3.5%
38 years-old Career	7.5%	5.4%

APPENDIX E

ORDINARY LEAST SQUARES REGRESSION OF SOCIAL SUPPORTS ON JOB CHARACTERISTICS

Table E1

Summary of Hierarchical Regression for Variables Predicting Family Instability (N = 25430)

Variable	*B*	*SE B*	β
Age	.006	.003	.025*
Gender	.178	.027	.042*
Enlisted	.430	.049	.085*
First term	-.114	.062	-.032
Enlisted*First term	-.143	.060	-.039*
Shift work	.026	.030	.006
Work hours	.006	.001	.034*
Times deployed	-.000	.002	-.001
Days deployed	.001	.000	.031*

*$p < .05$. $R^2 = .014$

Table E2

Summary of Hierarchical Regression for Variables Predicting Community Integration (N = 26533)

Variable	*B*	*SE B*	β
Age	.002	.003	.005
Gender	.109	.032	.021*
Enlisted	.131	.059	.022
First term	.129	.075	.030
Enlisted*First term	-.189	.072	-.043
Shift work	-.146	.035	-.026*
Work hours	.011	.001	.052*
Times deployed	-.009	.003	-.023*
Days deployed	-.001	.000	-.015*

*$p < .05$. $R^2 = .005$

Table E3

Summary of Hierarchical Regression for Variables Predicting Co-worker Conflict (*N* = 24182)

Variable	*B*	*SE B*	β
Age	-.004	.002	-.025*
Gender	.179	.021	.056*
Enlisted	.316	.037	.089*
First term	-.024	.047	-.009
Enlisted*First term	.071	.046	.026
Shift work	.119	.023	.035*
Work hours	.008	.001	.059*
Times deployed	.003	.002	.014*
Days deployed	.000	.000	.012

*$p < .05$. $R^2 = .018$

Table E4

Summary of Hierarchical Regression for Variables Predicting Supervisor Support (N = 22776)

Variable	*B*	*SE B*	β
Age	.000	.001	.006*
Gender	-.044	.010	-.029*
Enlisted	-.078	.018	-.046*
First term	-.010	.023	-.008
Enlisted*First term	-.025	.022	-.019
Shift work	-.133	.011	-.080*
Work hours	-.002	.000	-.025*
Times deployed	.000	.001	.002
Days deployed	.000	.000	-.029

*$p < .05$. $R^2 = .014$