2003

A Multi-Level, Longitudinal Study of the Strain Reducing Effects of Group Efficacy, Group Cohesion, and Leader Behaviors on Military Personnel Performing Peacekeeping Operations

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A MULTI-LEVEL, LONGITUDINAL STUDY OF THE STRAIN REDUCING EFFECTS OF GROUP EFFICACY, GROUP COHESION, AND LEADER BEHAVIORS ON MILITARY PERSONNEL PERFORMING PEACEKEEPING OPERATIONS

By

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A Dissertation submitted to the Department of Social Work in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Degree Awarded:
Spring Semester, 2003

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To Dr. Charles King a loving grandfather whose devotion to family, education, and civic responsibility will always inspire me to be my best.
ACKNOWLEDGEMENTS

First and foremost, I would like to take this opportunity to sincerely thank my loving spouse Rose for all of her support and encouragement throughout this process. Her endless patience during the last eleven years of my military career has helped me to remain focussed so that I could accomplish my goals. To my family and my parents who encouraged my every endeavor, I thank you. I would also like to thank Dr. Delva for the support, guidance, and mentorship that he provided me as I maneuvered through the process of finishing my degree. I would like to thank Dr. McNeece for the wisdom he shared with me as I approached the end of my program and Dr. Perrewé, whose expert advice served to help me develop the conceptual clarity I needed to frame my research. Special thanks go to Lieutenant Colonel Carl Castro and his staff at the US Army Medical Research Unit in Heidelberg, Germany for their work in collecting and entering the data. Thank you Jeff, Lynn, Butch, and Lisa for the great times we shared. From skydiving to tailgating, golf and darts, your friendship and support has meant so much to Rose and I. Thank you Milton Spaulding for your editorial services. Finally, I would like to thank Colonel Virgil Patterson, whose encouragement in the early years of my social work career have led me to this point.
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LIST OF ABBREVIATIONS

CSR – Combat Stress Reaction
CTC – Combat Training Center
DoD Department of Defense
EB – Empirical Bayes
FM – Field Manual
HLM – Hierarchical Linear Modeling
IDF – Israeli Defense Forces
MOS – Military Occupational Specialty
NASW – National Association of Social Workers
NATO – North Atlantic Treaty Organization
NCO – Non-commissioned Officer
UNPROFOR – United Nations Protection Force
USAMRU-E – US Army Medical Research Unit – Europe
WRAIR – Walter Reed Army Institute of Research
ABSTRACT

The current study examined the longitudinal moderating effects of organizational social phenomenon (viz, leader behaviors, cohesion, and collective efficacy) on the relationship between stressors associated with military peacekeeping operations and psychological distress. This study was a secondary analysis of longitudinal data collected by personnel from the US Army Medical Research Unit – Europe. The original data were collected from US Army personnel deployed in support of the NATO peacekeeping operation in Kosovo. Data collection occurred in two waves. The first wave occurred during the mid-deployment phase of an approximately six-month deployment, while the second wave occurred approximately two months after the soldiers returned from Kosovo to capture post-deployment psychological distress. Data were separated into individual-level variables and organizational-level variables. The individual-level variables consisted of individual perceptions of operation-related stressors including, (a) role conflict and mission ambiguity associated with the role of peacekeeper, (b) concern for family well-being and (c) exposure to potentially traumatic events and the outcome variable assessing psychological distress. Organizational-level variables represented group perceptions of leader behaviors, cohesion, and collective efficacy aggregated at the US Army company to which the soldiers were assigned. Data from a sample of 546 soldiers assigned to 37 different US Army companies were examined using hierarchical linear modeling. Initial results indicated that, within organizations, only role conflict/mission ambiguity served to predict post-deployment individual psychological distress. None of the organizational-level variables predicted the within-groups relationship between role conflict/mission ambiguity and post-deployment psychological distress. However, a between-groups interaction of leader behavior and role conflict/mission ambiguity with psychological distress was observed. When leader behavior lacks clear direction and support and the mission is perceived of as vague or ambiguous, soldiers, on average, are more likely to experience greater degrees of psychological distress than in units where leaders exhibit strong characteristics of directive and supportive behaviors. This discrepancy, however, diminishes as soldiers perceive the peacekeeping environment as meaningful and pertinent. The results of this study reinforce the theory that leaders influence attitudes of subordinates which in turn positively affects psychological adaptation to potentially stressful environments.
CHAPTER 1

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Since the end of the Cold War in 1989, the United States Army has been involved in a number of extended (i.e., six-months or longer) overseas deployments, far exceeding the number of military operations during the previous 15-year period (1975-1989). In one of the few studies estimating the extent of overseas deployments performed by US Army personnel (sometimes referred to as personnel tempo), Levy and colleagues (2000) estimated that, during the period of 1991-1996 (excluding Operation Desert Storm), there were, on average, almost 13,000 soldiers deployed in any given month. This figure is almost twice the average number of US Army personnel deployed in any given year between the years 1975 to 1989. The increase in overseas operations occurred during a time when the US Army underwent a major reduction in overall personnel strength (773,000 to 483,000). If one were to factor in changes in end-of-year personnel strength into the deployment rates previously described, the results would represent an almost three-fold increase in deployment rates for US Army personnel. In light of the increased personnel tempo, military leaders have begun to question the toll that military deployments have on individual, organizational, and familial functioning (Levy et al., 2000). Recent studies on the impact of military peacekeeping operations, for example, have examined the effects of leadership, coping, previous traumatic events, and exposure to traumatic events on psychological well-being (Arincorayan, 2000; Bolton, Litz, Britt, Adler, & Roemer, 2001; Deahl et al., 2000; Hall, 1996; Lamerson, 1996; Lamerson & Kelloway, 1996). Other studies have sought to examine the impact these absences have on family functioning (Applewhite & Mays, 1996; McCarroll et al., 2000; Zeff, Lewis, & Hirsch, 1997). Most importantly, these studies seek to identify not only factors that contribute to the potentially harmful nature of military deployment on psychological well-being, but also the long-term psychological consequences of deployment for both soldiers and family members. This research has provided valuable information in helping military planners and health care providers in understanding the relationship between deployment stressors and individual strain reactions. A paucity of research, however, currently exists that attempts to examine the potential buffering properties of social phenomenon in military units in the stress-strain process. The purpose of this study, therefore, is to examine the impact that group level factors, specifically group cohesion, group efficacy (sometimes referred to as collective efficacy) and unit leadership, have on the relationship between the chronic stress of military deployment on individual psychological well-being.
Background

Military Deployment and Stress

Several potential stressors characteristic of military deployments are of interest to researchers and mental health providers. Sometimes referred to as operational stress (Deahl et al., 2000), these stressors include the extended absence from family and the concern soldiers may experience in relation to their family members’ ability to cope with their absence. Other unique elements of operational stress include austere environments, extended work-hours, cramped living quarters, boredom, exposure to human suffering (e.g., starvation, civil war, victims of war crimes), ambiguous rules of engagement, rapid transitions from operations other than war to combat operations, hostile host-nation relations, and limited public support (Bartone, Adler, & Vaitkus, 1998; Britt, 1998; Department of the Army, 1994; Young et al., 2001). For example, soldiers who deployed into the former Yugoslavia in the winter of 1995 as part of the Operation Joint Endeavor peacekeeping force, entered a country decimated by civil war. The people, homes, roads, and landscape bore the scars of a war that involved heavy artillery and mortar barrages, siege tactics, wide-scale use of land mines, snipers, and acts of genocide. The soldiers encountered disfigured victims of the civil war (including children), treacherous living conditions surrounded by possible land mine fields, and harsh winter conditions. Initial encampments were fraught with cramped tent living conditions with few opportunities for privacy, field latrines and limited bathing opportunities, the threat of hantavirus, and the threat of a breakdown in the cease-fire brokered through the Dayton Peace Accord in 1995 (Litz, 1996; Pincus & Benedek, 1998). Certainly some, if not most, of these elements are unavoidable aspects of military operations. As Cooper and colleagues (2001) assert, “the real issue is not [emphasis added] whether there is too much or too little stress in people’s lives but how much can we understand the stress process and its implications for the management of stress” (p. 20). Therefore, it is more beneficial to military leaders and health care providers alike to understand how individuals and organizations respond to these stressors, as well as the extent to which social aspects of the organization serve to attenuate the stress-strain process. Such an examination will yield valuable information that would allow military leaders and mental health care providers to propose effective policies and programs to address the problems associated with operational stress.

Organization of the Dissertation

The purpose of this study is to test the effects of organizational social phenomenon on the relationship between operational stress and individual well-being. A comprehensive review of the conceptual and empirical literature on operational stress and the factors that putatively moderate this relationship will be explored. Likewise, given that operational stress occurs in the context of the military member’s job it is conceptually appropriate to examine this problem from the perspective of the occupational stress literature. Following the review of the literature, a multi-level conceptual model of operational stress as it relates to military peacekeeping operations will be proposed, along with specific hypotheses that this study will seek to test. Koslowsky (1998) contends that a multi-level approach is necessary in occupational stress research to allow investigators to examine characteristics of the stress process whose origin and effect is beyond the individual. In addition, a multi-level model is
consistent with the unique eco-systemic perspective of social work, which recognizes the important and often reciprocal relationship between the person and his or her environment (Germain & Gitterman, 1996). Following a review of the pertinent literature, the results of this research will be analyzed and discussed.

**Relevance to Social Work**

Individual and organizational models examining the relationship between occupational-related stressors and physical, psychological, and behavioral strains have been well-documented in the organizational behavior, industrial-organizational psychology, and human relations literature (for an overview of occupational stress research see Cooper et al., 2001; Crandall & Perrewé, 1995; Holt, 1993). Social work in industry, however, has lost its leadership role, once pioneered by creative and innovative social workers like Mary Parker Follett. In fact, Follett was a vanguard in applying social sciences theory to problems in business and industry (Fox & Urwick, 1982). Her concepts, while not fully embraced at the time due to the economic conditions of the 1930’s, are today considered representative of current beliefs in industry. She observed that organizations were characterized as open and dynamic systems in which labor and management shared reciprocal relationships to achieve business objectives (Sorge & Warner, 1997). Despite the work of Follett and other social workers during the profession’s nascent development, few references exist today that have been published by professional social workers examining the factors in industry associated with occupational stress (Barak & Bargal, 2000). In response to this shortcoming, Barak and Bargal (2000, p. 4) proposed that, in addition to research activities, occupational social workers should seek to achieve four common objectives to advance the profession in industrial-organizational settings. These objectives include:

1. Improve the fit between the needs of individuals and their families, work organizations, and communities. Specifically, they contend that occupational social workers intervene at the individual, family, and organizational/community level to enhance the overall well-being of individuals at work.
2. Help people in need of employment transition into jobs and become gainfully employed.
3. Introduce into the workplace social work values and principles such as valuing diversity and balancing family needs with work demands.
4. Generate knowledge in the area of social work and the world of work that will inform practice and policy.

The constructs of interest, leadership, collective efficacy, and cohesion are common themes in much of the occupational stress literature and provide rich data from which occupational social workers can recommend organizational changes, not just individual-level interventions (Donovan, 1987). As Donovan (1987) cogently argued:

Social workers in industry must resist the temptation to join the profitable bandwagon of stress management. Instead workers must engage in the more
painstaking task of understanding the stressful elements of specific work environments and various occupations. This knowledge will provide a solid basis for decision-making regarding the reduction of stress (p. 264).

Similarly, Balgopol (1989) argued that “social work’s survival and effectiveness in industrial settings, therefore, will be due in part to the nature and extent of professional expertise but also to an understanding of the special qualities of the setting” (p. 438).

Uniformed social workers have provided clinical services and case management to military members and their families for over 50 years (Harris, 1999). Today, uniformed social workers serving in Army operational assignments such as Division Mental Health teams and Combat Stress Control teams provide individual and group mental health services, preventive psycho-educational courses, and consultation to military leaders on the management of stress and crisis in military operations. The unique role of Army social workers serving in operational assignments is enhanced by the biopsychosocial perspective which provides the framework from which interventions and consultation with leaders are proposed (Martin & Campbell, 1999). Army social workers serving in operational assignments are the front-line mental health advisors and providers for units deployed and for those preparing to deploy. They must be knowledgeable in both the stressors inherent with such deployments and the individual and organizational factors that mitigate the effects of deployment-related stress. To be credible, such knowledge must be grounded in the scientific tradition. When predicated in empirical evidence, the relationship between front-line social workers, unit leaders, and soldiers is enhanced. Consequentially, the results of this study have important implications for enhancing the knowledge base from which Army social workers are able to propose specific organizational changes and policy recommendations that serve to enhance the well-being of soldiers and their families. In summary, there exists an historical precedent for social work’s involvement in industrial, organizational, and military settings as well as a continuing need for social work to contribute to the knowledge base of organizational behavior theory and individual effectiveness that includes the unique perspective of the profession.

**Statement of the Problem**

Individuals in uniform have a high likelihood of deploying overseas in support of humanitarian missions, peacekeeping operations, operations other than war, and combat operations. Following the events of September 11, 2001, this likelihood has increased dramatically. Operational stress researchers have sought to identify the unique stressors associated with corresponding missions as well as those factors that may attenuate or exacerbate stress-related illness and detriments to individual and organizational performance. For example, Britt and Adler examined the potential consequences of operational stress on 35 members of a military medical team deployed to Kazakhstan to provide humanitarian medical assistance to the local populace. While the team members did not report excessive symptoms of depression or somatic complaints, they did find that smoking behavior and alcohol consumption increased significantly among the team members. Likewise, Bartone and colleagues (1998) conducted a prospective study of 128
members of a US Army medical team deployed in support of the United Nations Protection Force (UNPROFOR) in Croatia. They found a statistically significant correlation between deployment-related stressors (i.e., boredom, isolation, lack of cohesion, and limited contact with family) and depressive and somatic symptoms. They also contended that military leaders play a meaningful role in moderating the relationship between operational stress and strain indices. Examples of leadership activities that Bartone and colleagues recommend include regular communication between leaders and subordinates, effective family support activities and routine family contacts for soldiers, an emphasis on training to prevent skill degradation, and opportunities for self- and team-development. Most importantly, these studies point to the need for further inquiry into the stressful elements of operational deployments, the strains associated with deployments, and, finally, the identification of organizational and individual factors that moderate or mediate the operational stress-strain process. As Bartone and colleagues (1998) explain,

Understanding the nature of stress on peacekeeping operations is important because individual soldier health as well as mission success depends heavily on how effectively soldiers adapt to these mission stressors (p. 592).

Delva and colleagues (2002) examined the relationship between deployment frequency, work family conflict, availability of social support, depression, and substance use among 890 soldiers assigned to a midwestern U.S. Army installation. Their findings demonstrated the toll that frequent overseas deployments have on family relationships and ultimately substance use and depression. In fact, for both men and women, deployment frequency was predictive of increasing levels of work-family conflict for the sample. In addition, they found that the increased levels of work-family conflict among both men and women were predictive of both depression and substance use. This study built upon a previous study by Lewis and Delva (2001) which demonstrated that increasing levels of work-family conflict contributed to a diminished desire to make the military a career. The implications associated with both of these studies point to the potential near and long term effects of deployment on family relationships, psychological well-being and retention of quality personnel.

Arincorayan’s (2000) study emphasized the importance of examining both organizational and individual factors affecting the stress-strain relationship. In his cross-sectional study of 1,001 US Army personnel deployed to Bosnia-Herzegovina to perform a NATO-led peacekeeping mission, he examined the operational stress buffering effects of cohesion and leadership. His findings indicated that an inverse relationship exists between individual perceptions of positive leadership traits and group cohesion with measures of physical and psychological strain. By limiting his level of analysis to the individual-level, however, he was unable to examine group level effects of leadership and cohesion on both individual outcomes and group performance and stress. Furthermore, the cross-sectional nature of his study limited any temporal or causal claims between individual and organizational predictors of the stress process. Despite these limitations, his study seems to suggest that group level factors do indeed interact with individual and group performance and should be modeled in future stress studies. His study
demonstrated the value of social work research in examining organizational and human resources theory in conjunction with micro-level theories of stress and coping.

These and other studies of operational stress point to the importance of this problem to military personnel. Each study, however, has shortcomings which this study hopes to address. First, most studies involved cross sectional data measuring deployment related stress at either the mid- or post-deployment phase (Arincorayan, 2000; Bliese & Britt, 2001; Deahl et al., 2000; Hall, 1996; Hall & Jansen, 1995; Lamerson, 1996; Lundin & Otto, 1996; Pincus & Benedek, 1998; Rosebush, 1998). Secondly, those longitudinal studies that were examined in the literature only provided descriptive information on small single organizations and consequentially, lack generalizability to other military units (Bartone et al., 1998; Britt & Adler, 1999; MacDonald, Chamberlain, Long, Pereira-Laird, & Mirfin, 1998). Finally, few of the studies sought to examine group-level or multilevel models of operational stress, opting solely for individual-level analyses and omitting the potential value of the naturally-occurring social environment (viz., military units) to which military personnel are assigned when deployed. In fact, only one recent study (Bliese & Britt, 2001) tested the extent to which social phenomenon at the group level moderated the relationship between deployment-related stress and individual strain outcomes. The cross-sectional nature of their data limited any causal claims regarding the role of social context in the stress-strain relationship. Nevertheless, their findings do provide support for “the idea that there is value in measuring and modeling the quality of social environments as a contextual moderator in stress-buffering models” (p. 434).

Similarly, James (1999) argued that one of the main problems with much of the organizational research literature is its predominant focus on the individual with little attention given to organizational factors having a significant impact upon the extent to which an individual appraises and copes with a stressful work environment. He argued that organizational research continues to “pathologize” (p. 546) the individual with stress becoming a “career limiting problem for individuals” (p. 546). Therefore, this study will add to the knowledge base on operational stress by creating and testing a longitudinal model of operational stress which incorporates the effects of organizational social phenomenon and extends the level of analysis beyond the individual level. Lastly, it is suggested that the results of this study will provide military leaders, mental health providers, and military researchers with additional knowledge which can be incorporated into programs to protect soldiers and maintain healthy, combat-ready organizations.
CHAPTER 2
REVIEW OF THE LITERATURE

Introduction
The deployment environment in conjunction with military units creates a complex social milieu. Elements of the military environment include formal and informal structures of leadership, decision-making processes, and, most importantly, social groups. Formal structures of the US Army are aggregated at the lowest level by team, section, squad, platoon and company. At the highest level, these elements make up battalions, brigades, divisions and corps elements with sufficient personnel to conduct complex military operations and sustain logistical and administrative support. As a social milieu, therefore, organizational factors of the work site have been associated with individual outcomes of job satisfaction, organizational commitment, performance, and health (Cooper et al., 2001; Katz & Kahn, 1978). Therefore, operational stress and the theoretical underpinnings for understanding this phenomenon need to be examined from both an individual and an organizational perspective. Lazarus and Folkman’s (1984) transactional theory of stress provides the conceptual background to understand the individual stress-strain process. Their theory can be understood as a comprehensive theory developed in response to criticisms associated with theories of stress that viewed stress as either response based or stimulus based.

The Stress-Strain Process: Introduction and Theoretical Underpinnings
An obstacle to conducting research on stress is the discrepancy existing in the literature in regard to the nature and sources of stress – specifically, how stress is conceptualized and operationalized (Brief & George, 1991; Cooper et al., 2001; Lazarus, 1995). In general, stress has been defined as either a response, a stimulus, or a result of a transaction between the environment and the person. Stress occurs when an imbalance between the two exists (Cooper et al., 2001). To ensure theoretical clarity, it is important to examine the different definitions of stress and establish an understanding of its underlying theoretical framework as incorporated in this study. This section will conclude with a brief introduction to the concept of strain – the outcome of the stress-strain process.

Stress as a Response
The earliest hypotheses of stress defined it as a response. Response-based theories of stress were derived from the early work of medical researcher Hans Selye (1956), who claimed that stress was a “nonspecific response of the body to any demand placed upon it” (p. 1). Selye’s definition was guided by his medical research wherein he categorized
common responses to a variety of events which he coined as “stressors” (p. 51). The stress response, which he described as general adaptation syndrome, was characterized by general malaise, loss of motivation, loss of appetite and loss of strength. Underlying his propositions were the assumptions that stress responses are fairly universal and invariant to the nature of the stressor (Cooper et al., 2001). The assumptions associated with response-based theories of stress are the source of most criticisms. Lazarus and Folkman (1984) contend that response-based definitions do not provide a theoretical foundation to derive potential stressors. Therefore, “we then have no systematic way of identifying prospectively what will be a stressor and what will not” (Lazarus & Folkman, 1984, p. 14). Likewise, Edwards (1992) summarized that psychological processes of appraisal and individual coping differences are overlooked by theories of stress which assume universal and invariant processes. Finally, Cooper and colleagues (2001) argued that theories emphasizing the stress response ignore important environmental factors, such as intensity, frequency, and duration of the stimulus. Despite these criticisms, evidence remains that, while not comprehensive, response-based definitions of stress have heuristic value in the overall stress literature by describing taxonomies of common physiological, psychological and behavioral stress reactions. Such taxonomies, therefore, should be considered as one part of understanding the stress process.

Stress as a Stimulus

Inevitably, the limitations of Selye’s (1956) general adaptation syndrome contributed to a shift in research that sought to determine the external conditions leading to stress. As early as 1953, Grinker proposed that “the human organism is part of and in equilibrium with its environment, that its psychological processes assist in maintaining an internal equilibrium and that the psychological functioning of the organism is sensitive to both internal and external conditions” (p. 152). Stimulus-based definitions of stress, therefore, sought to identify those internal and external conditions that disrupted individual equilibrium. For example, in the previous discussion of military deployments, the peacekeeping environment would be defined as stress, regardless of individual responses to the environmental stimulus. Similar to response-based definitions, stimulus-based definitions have played an important role in the stress literature by creating categories of potential stress-producing events. Likewise, similar to the response based concept of stress, stimulus-based definitions of stress have also been criticized for being too focussed on the objective components of stressors, being unidimensional and reductionistic, and overlooking individual differences (Cooper et al., 2001; Lazarus, 1995; Perrewé & Zeffars, 1999). Lazarus and Folkman (1984) described the shortcomings of unidimensional definitions succinctly, “there is no objective way to predict psychological stress without reference to properties of the person” (p. 21). Therefore, what is lacking in the stimulus- and response-based definitions of stress is a comprehensive theory of stress, especially one that attempts to describe the perceptual and cognitive processes of stress appraisal and individual differences in appraisal and stress responses (Cooper et al., 2001).

Transactional Theory of Stress

In an attempt to formulate a more comprehensive theory and definition of stress, Lazarus and Folkman (1984) proposed a transactional theory of stress which responded to
the shortcomings of the traditional stimulus-response (S-R) based definitions previously discussed. Specifically, they proposed that stress represented a “relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (p. 19). They proposed that two cognitive mechanisms serve to mediate the individual and stressor relationship: cognitive appraisal and coping.

**Cognitive appraisal.** Cognitive appraisal is the evaluative cognitive process that intervenes between the event and the reaction (Lazarus & Folkman, 1984). Two forms of appraisal involved in the stress process proposed by Lazarus and Folkman are described as primary and secondary appraisal. Primary appraisal consists of “the judgment that an encounter [with the environment] is irrelevant, benign-positive or stressful” (p. 53) which results in classifying the transaction as having motivational relevance for the individual (Perrewé & Zellars, 1999). Irrelevant encounters, on the one hand, are appraised as having no personal meaning for the individual. Benign-positive encounters, in contrast, are deemed beneficial or desirable encounters. Finally, stressful appraisals are categorized as either a threat, a challenge, potentially harmful, or indicative of actual or perceived loss (Lazarus & Folkman, 1984). For example, a soldier who faces the possibility of an extended overseas deployment may appraise the pending deployment as a potential stressor if that individual is concerned that the soldier’s family will not cope well with his or her absence. This form of primary appraisal may represent a threat of loss or harm to the soldier. The cognitive process of identifying what can be done to minimize the threat of loss or harm has been described as secondary appraisal (Lazarus & Folkman, 1984). Secondary appraisal requires an evaluation of one’s own abilities and resources as well as the resources available in the environment to counter the situation deemed stressful. Secondary appraisal also involves identifying the potential consequences of a particular strategy or course of action (Lazarus & Folkman, 1984).

Finally, primary and secondary appraisals differ from simple passive information processing by virtue of the evaluative process the individual activates when encountering a potentially stressful situation. First, the individual determines the importance or meaning ascribed to the event. Next, the individual identifies possible actions to take to counter the stressful situation. Secondary appraisal differs from simply identifying all possible courses of action. Individuals consider not only resources available in the environment, but also their own capabilities, and possible outcomes – sometimes referred to as efficacy expectation and outcome expectancy (Bandura, 1986). Using the previous example, during the secondary appraisal process, the soldier might consider different actions to manage the stressful environment. This soldier may evaluate the resources available as well as the consequences of actions. The options a soldier may consider might involve efforts to delay or avoid the deployment, prepare his or her family for the deployment, withdraw from the family or the military unit, or avoid distressing thoughts. These cognitive and behavioral efforts have been described by Lazarus and Folkman (1984) as coping.

**Coping.** The other cognitive mediating process in the stress-strain relationship proposed by Lazarus and Folkman (1984) is coping. They defined coping as the cognitive and behavioral efforts a person makes to manage demands that tax or exceed the
individual’s personal resources. Two primary forms of coping, emotion- and problem-focused, were described by the authors. Briefly stated, problem-focused coping involves strategies directed at acting upon the stressful environment, whereas emotion-focused coping involves behaviors serving a palliative function in relieving the emotional consequences of appraised stress. Coping, however, is not a one shot strategy. The consequences of one’s coping strategies provide a negative feedback loop back to the environment and individuals must continuously re-appraise the efficacy of their coping strategies. Successful coping results in removal of the stressor or stress reaction. Unsuccessful coping, on the other hand, requires renewed coping strategies. These may be new learned behaviors or additional resource engagement (Edwards, 1992). For example, during the early stages of an operational deployment, work hours are typically very long and work output demands are unusually high. New soldiers experiencing stress due to the workload demands may engage in problem-focused strategies by prioritizing tasks and ensuring that each task is completed prior to starting another. In addition, they may practice deep breathing relaxation activities when they begin to feel overwhelmed with the workload. As described in the example, emotion- and problem-focused coping strategies can be employed separately or jointly and are constrained by personal and environmental resources (Lazarus & Folkman, 1984).

**Criticisms and difficulties in measuring coping.** Critics of Lazarus and Folkman’s transactional theory contend that: (a) as a phenomenological theory, the relationship between private, subjective cognitions and the objective environment are threatened by the truthfulness of self-report, and (b) the concept of appraisal is tautological, in that “subjective appraisal itself can only be verified by reference to the very outcome we want to predict” (Lazarus & Folkman, 1984, p. 46). To counter the problem of the accuracy of self-report, Bandura (1986) argued that, while self-reports are not entirely devoid of ambiguity, they are no less informative than actions and behaviors. He speculates that the problem of misrepresenting one’s beliefs or thoughts is not unique to verbal indices. In fact, “people can equally deceive others by their actions as they can by their words” (Bandura, 1986, p. 119). Likewise, by identifying individual and environmental determinants of the stress process, the phenomenological tautology is no longer a reasonable criticism of the transactional theory of stress (Lazarus & Folkman, 1984).

The accurate measurement of coping is similarly problematic. The dynamic nature of the stress-coping-strain process, as proposed by various authors (Edwards, 1998; Lazarus, 1995; Lazarus & Folkman, 1984), alludes to the difficulties in measuring coping. More specifically, if the stress process involves primary and secondary appraisal and a negative feedback loop, then coping itself is a dynamic process involving the appraisal of the effectiveness of coping behaviors and the testing of new strategies in the face of ineffective coping or continued stressor exposure. In light of this dynamic process, quantitative coping checklists, like the Ways of Coping Checklist (Folkman & Lazarus, 1980; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985), fall short of capturing the dynamic process of coping (Oakland & Ostell, 1996). Likewise, Dewe and Guest (1990) argued that the dual distinction of problem- and emotion-focussed coping places conceptual limitations upon the researcher in capturing the full range of coping strategies.
They claimed that the lack of psychometric reliability demonstrated by coping checklists along with the unstable range of coping factors (from three to nine) elicited in coping research provides further evidence of a broader range of coping strategies. Newton (1989) demonstrated the difficulties associated with measuring coping. In his re-analysis of data from a study conducted by Dewe, Guest and Williams (1979), he demonstrated that often people’s espoused coping styles differ dramatically from their actual coping behaviors. Therefore, the instability of the range of coping factors as described by Dewe and Guest (1990) might itself be an artifact of respondent bias when completing quantitative coping checklists. Such instability of measurement coupled with the dynamic nature of the stress process raises questions about the potential value of measuring coping behaviors or styles as self-reported by the individual.

However, despite the limitations of measuring coping (and not the construct itself), transactional theory provides a good conceptual framework to begin to understand and examine operational stress as it relates to military peacekeeping operations. More specifically, transactional theory helps to explain the relationship between cognitive appraisal of stressful deployment-related conditions, the moderating effect of individual coping, and the relationship between coping and the physiological, psychological and behavioral consequences of stressors, often referred to as strain.

**Strain**

The research literature on stress at work has identified a number of negative consequences of work-related stress at both the individual level and the organizational level (Cooper et al., 2001; Jackson & Schuler, 1985; Sullivan & Bhagat, 1992). These consequences represent the “strain” in the stress-strain process and have been examined across three broad categories – physiological strain, psychological strain, and behavioral strain (Kahn & Byosiere, 1992). Physiological strain is characterized by the physiological problems that have been empirically associated with occupational stress. These include cardiovascular symptoms (e.g., blood pressure and heart rate), biochemical processes (e.g., abnormal levels of cortisol, cholesterol and catecholamines), and gastrointestinal symptoms (e.g., peptic ulcers) (Fried, Rowland, & Ferris, 1984; Schulz, Greenley, & Brown, 1995).

The relationship between work-related stress and psychological strain is one of the phenomena most extensively examined by organizational researchers. This is due in part to the phenomenological conceptual definition of stress proposed by Lazarus and Folkman (1984) along with the substantial influence of psychology in industrial settings (Hurrell, Nelson, & Simmons, 1998; Sullivan & Bhagat, 1992; Wright & Doherty, 1998). While job satisfaction has been the most widely examined form of psychological strain, evidence suggests that occupationally related stress is also associated with diminished self-esteem, anxiety, depression, boredom, and organizational commitment (Sullivan & Bhagat, 1992).

Finally, behavioral strain is often characterized by organizational factors, especially performance. Ostensibly, individual and organizational performance are the primary interests of organizational researchers. Much of the work-related stress research has focused on individual behavior especially job performance, turnover, absenteeism,
and conformity, along with higher-level indices of performance (Sullivan & Bhagat, 1992).

While the individual is the primary interest of most occupational stress research, one cannot ignore the fact that the work environment is itself a social milieu calling for greater emphasis on the role of the social environment (James, 1999). Recent theorists have argued that the social milieu plays a significant role in providing cues and interpretations for the individual. Therefore, its imperative to create a bridge between the individual-oriented transactional theory of stress and the group processes involved in secondary appraisal. Social information processing theory (Salancik & Pfeffer, 1978) provides the necessary link to begin to understand the role that social contextual factors have on job perceptions, attitudes, and motivation. The model of combat stress reactions proposed by Gal and Jones (1995) provides an illustrative example of social information processing theory and military-related stress. They argued that not only do individuals appraise the combat environment, but also that the unit leader influences the individual soldier’s appraisal of the combat environment. In fact, a burgeoning number of theories of occupational stress propose that organizational and social informational characteristics contribute to the individual stress-strain process. For example, Edwards (1992; 1998) cybernetic theory of occupational stress conceptually incorporates the interactive relationship between social and environmental characteristics in the stress-strain process.

**Social Information Processing Theory**

As noted earlier, appraisal of the contextual environment is partially determined by the social milieu, especially when social cues are particularly important, or the source of the information (e.g. authority figures or leaders) is deemed credible. As a result, conceptual models of stress are beginning to incorporate the influential nature of social context into the stress-strain process. For example, Edwards (1992), who adopted a relational perspective of stress similar to Lazarus and Folkman’s (1984) transactional theory, defined stress as a “discrepancy between an employee’s perceived state and desired state, provided that the presence of this discrepancy is deemed important to the individual” (p. 245). In other words, he claims that stress evolves from an identified cognitive discrepancy that is salient to the individual. While this definition is similar to Lazarus and Folkman’s (1984) description of primary appraisal, the most relevant aspect of Edward’s (1992) conceptual model of occupational stress is the incorporation of organizational and social elements within his model. He contends that social information processes (Festinger, 1954; Salancik & Pfeffer, 1978) serve as both determinants and moderators of occupational stress. Edwards (1992) adopted the provisions of social information processing theory to describe how individuals rely on social information, defined as, “behaviors, opinions, and beliefs of others in the employee’s social environment” (p. 249), to shape the stress appraisal process. For example, he proposed that possible environmental cues might determine coping behavior. Such cues, he suggested, includes but are not limited to: availability of social support, organizational policies, and the behavior of leaders. Likewise, Salancik and Pfefeer (1978) claimed that when job situations are ambiguous, the worker is “likely to use social information [cues from fellow employees] in developing his or her perceptions of the meaningfulness,
importance, and variety of the job” (p. 228). Borrowing from the early work of Festinger (1954) and Festinger and colleagues (1950), Salancik and Pfeffer (1978) extrapolated social information processing theory.

Responding to the limitations of needs-satisfaction models of job attitudes and performance, Salancik and Pfeffer (1978) argued that social contextual factors, in addition to individual characteristics, influence job perceptions, attitudes, and motivation. They proposed that the social environment at work helps to explain human behavior in occupational settings, whereby individual perceptions and interpretations of the environment are influenced by expressed attitudes from peers, sometimes referred to as informational social influence (Deutsch & Gerard, 1955). They posited that the social context affects attitudes and emotions or strain in four interrelated ways. First, overt statements of coworkers shape individual perceptions of the job situation by assigning meaning to the complexities of the job. This is akin to the claim by Edwards (1992) that in the absence of physical cues, the interpretations and statements about the work environment expressed by coworkers shapes perceptions and opinions of individuals. Secondly, Salancik and Pfeffer (1978) posited that social influence processes structure a person’s attentional processes, whereby coworkers cue an individual as to what is important in the work environment. For example, when a new soldier arrives in a unit, the soldier is often told what the commander’s pet peeves are regarding such matters as maintenance, physical fitness, or appearance. Thirdly, the social context affects attitudes by interpreting and providing social constructive meanings to environmental cues. For example, when a unit leader describes an upcoming deployment as negatively affecting the combat readiness of the unit, social information processing theory proposes that the other unit members would also be more likely to interpret the deployment as a meaningless mission. Lastly, the social context influences what individuals may deem as necessary and important. More specifically, the work-group shapes what individuals consider is required to feel satisfied with the work environment.

Emphasizing the role of the leader in providing social information cues, Gal and Jones (1995) theorized that military leaders play an important role in shaping soldier perceptions of the combat environment. It can also be assumed that leaders would have a similar role during peacekeeping and humanitarian operations. They proposed that the behaviors and expressed attitudes of the unit leader serve as a metaphorical lens to focus soldier appraisal of the combat environment and that good leadership can help to minimize combat-related stress reactions. Their conceptual model incorporates the underlying assumptions of social information processing and the role of credible sources in shaping interpretations and coping behaviors.

In addition to informational social influence, the social context has been implicated in influencing individuals to conform their behaviors and attitudes to that of the group norm in exchange for positive group affiliation and membership, sometimes referred to as normative social influence (Deutsch & Gerard, 1955). Festinger (1954) argued that groups exert normative pressure on individuals for conformity in both ability and opinions and that the attractiveness of the group increases the likelihood that individual opinions and beliefs will conform to that of the group. The development and strength of collective efficacy (Bandura, 1997; Maddux, 1999), or the group’s shared
belief in its own collective ability to organize and execute courses of action, is one construct potentially influenced by normative social influences. Likewise, as O’Reilly and Caldwell (1985) contend, normative social behaviors are influenced by the cohesion and attractiveness of the group, which over time reduce the necessity of normative social influence.

**Empirical Testing of Social Information Processing Theory**

While the propositions of social information processing theory and normative social influence have intuitive appeal to researchers, Popper (1963) believed that the scientific criterion of a theory was its testability or fallibility. This criterion requires examination of both direct and indirect tests of social information processing theory. Specifically, social information processing theory proposes that attitudes, perceptions, and attention are shaped by the social environment. Organizational and group literature on characteristics of consensus, cohesion, and collective efficacy provide empirical examples of the significant impact of social context on individual attitudes, behaviors, and beliefs. In their examination of 52 US Army companies encompassing 1,923 soldiers deployed to Haiti in support of a military humanitarian mission, Bliese and Britt (2001) tested the relationship between group consensus of leadership, as rated on a leadership climate scale, and indices of individual morale. Using a multi-level random coefficient model analysis strategy, they demonstrated that soldiers in units with high consensus about leaders experienced higher degrees of morale under high stress conditions compared to those in low consensus units. These findings point to the importance of examining social contextual influences in shaping attitudes and perceptions of the work environment. A high degree of consensus is apparently evidence of strong social influence regarding attitudes about the current leadership climate. Groups with high degrees of consensus appeared to experience and promote enhanced morale. This and other studies of group consensus point to the relationship between social information processes, such as consensus on salient group issues, with strain indicators of individual morale and well-being (Bliese & Halverson, 1996; O'Reilly & Caldwell, 1985).

The shared belief elements of Bandura’s (1997) concept of collective efficacy are representative of the normative influence processes described by social information processing theory. As illustrated by Festinger (1954), groups exert pressure to conform in both ability and opinions and as an individual’s attitude becomes more congruent with the social group, the group becomes more attractive to the individual, thereby fostering group cohesion and establishing the foundation for promoting collective efficacy. Therefore, the more attractive that a group appears to an individual the more this person will minimize discrepant attitudes and beliefs so that the individual may maintain group membership. When groups share a collective belief about its ability, pressure is exerted to perform at a given level to achieve organizational goals. Illustrating this point, Shamir and colleagues (2000), in a cross-sectional study of 1,600 members representing 50 combat units in the Israeli Defense Forces (IDF), demonstrated that group identification (and attraction) was highly correlated with greater group level perceptions of combat readiness. These findings point to the saliency in examining collective efficacy and cohesion not only as a group level variable, but also as an indicator of the extent of the influence of the social context on individual indicators of stressor appraisal and strain.
Conceptual Model of Operational Stress

Incorporating the elements of social information processing theory and Lazarus and Folkman’s (1984) theory of stress appraisal and coping, establishes the conceptual foundation for a model of operational stress. The variables identified and described in the model (represented graphically in Figure 1) are described, analyzed, and defined in greater detail following a description of the conceptual model. Using the theoretical framework of stress, appraisal and coping proposed by Lazarus and Folkman (1984) as an underlying theory, it is proposed that stressors characteristically reported in military peacekeeping contexts have a direct relationship with psychological strain outcomes. As has been noted in the review of Lazarus and Folkman’s theory of stress and coping, considerable individual variability exists in the dynamic secondary appraisal process that determines which coping behaviors individuals use to counter the deleterious effect of operational stressors. Therefore, it is argued that social factors representative of informational and normative social influence processes serve as proxies for coping. In particular, group-level attributes of cohesion, collective efficacy, and leader behaviors moderates the stressor-strain relationship observed at the individual-level.

The conceptual model, as depicted in Figure 1, has three primary elements reviewed herein, namely social factors, stressors, and strain outcomes. Therefore, two primary objectives will be met in the review of the occupational stress literature as it relates to operational stress. First, after reviewing the pertinent conceptual and empirical literature pertaining to the constructs described in the model of operational stress, operational definitions will be promulgated. Second, testable hypotheses regarding the differing constructs of interest will be proposed that are conceptually coherent and integrated to represent formal tests of the proposed conceptual model of operational stress. To achieve these objectives, four major areas will be examined: operational stress, leadership, cohesion and social support, and collective efficacy.

Operational Stress

While there is considerable debate about the value of identifying categories of work-related events that may be considered stressful (Frese & Zapf, 1994; Lazarus, 1995; Perrewé & Zellars, 1999; Schaubroeck, 1999), at a practical level, military planners, mental health providers, and, ultimately, individual soldiers may benefit from identifying the differing aspects of military deployment that may impinge upon the performance and health of both soldiers and the military organization (Britt, 1998; Litz, 1996). However, as previously described, potential confusion abounds between the terms “stress” and “stressor.” In an attempt to maintain conceptual clarity, the term operational stress herein refers to intrinsic and extrinsic stressors relevant to military operations, specifically peacekeeping and humanitarian missions. Furthermore, throughout the text, the terms peacekeeping and humanitarian operations may be used interchangeably to denote operations other than war. Beyond combat, one of the most profound military operational stressors that soldiers encounter, recent research has pointed to several recurring themes that contribute to the appraisal of operational stress.

Britt (1998) described peacekeeping operations as being fraught with psychological ambiguity surrounding the degree of individual control over mission
Figure 1. Conceptual Model of Operational Stress
success and safety and the relevance of the mission to the soldier’s personal identity and career. Britt argued that three elements – mission clarity, mission relevance and personal control – form linkages that serve as “crucial ingredients in determining an individual’s level of engagement” (p. 117) which also determines the soldier’s performance level along with perceived stress. In fact, role ambiguity and mission ambiguities have routinely been found to be sources of stress for soldiers deployed to military operations. Bartone and colleagues (1998) identified that, throughout the deployment cycle (pre-, mid- and post-deployment), issues of uncertainty and ambiguity remained ever-present. Personnel interviewed and those who provided data about the medical peacekeeping mission described numerous ambiguities contributing to increased individual stress. These stressors included unclear command and organizational structures, unclear rules of behavior, lack of public recognition, lack of personal relevance of the mission, and doubts about the long-term value of the mission. In addition to identifying the mission and organizational-related ambiguities just described they also identified that family-related stressors were sources of distress for deployed servicemembers. Examples of familial concerns that deployed soldiers experienced included personal limitations in caring for family needs while deployed, communication difficulties due to separation, and concerns about spousal infidelity. Bartone and colleagues demonstrated significant correlations between ambiguous mission characteristics (e.g., boredom, problems with leadership and isolation) and depressive and somatic symptoms. However, it should be noted that inferences drawn from this study are limited due to the researchers’ use of a convenience sample of 81 individuals of a medical task force totaling over 250 personnel. Additionally, their research sample was drawn from a single organization comprised of predominately health professionals and para-professionals not necessarily representative of US Army personnel and units in general.

Themes of role conflict and restrictive rules of engagement were similarly shared among US Army peacekeepers deployed to Somalia in support of Operation Restore Hope (Litz, 1996; Orsillo, Roemer, Litz, Ehlich, & Friedman, 1998). Litz and colleagues (Litz, Orsillo, Friedman, Ehlich, & Batres, 1997), who reported on an earlier survey of 3,461 Somalia veterans, identified that the conflicting role of ‘warriors as peacekeepers’ in a dangerous and hostile environment contributed towards clinically significant psychological distress of approximately 25% of the veterans surveyed. In an attempt to identify those conditions that predicted distress, they found that exposure to war-zone events and the restrictive rules of engagement and other aspects of the peace enforcement mission (viz., poor defensive positions) were the strongest predictors of psychological distress. However, this study of Somalia veterans (Litz et al., 1997; Orsillo et al., 1998) was similar to other studies of military personnel wherein the researchers’ relied upon a purposive sample comprised most often of soldiers who were made available by their unit leaders for surveying.

While mission ambiguity may contribute to operational stress, alternatively, mission clarity and relevance are considered to reduce the likelihood of soldiers’ experiencing operational stress. In their prospective study of 35 members of a single unit performing a humanitarian medical mission, Britt and Adler (1999) contended that mission relevance, readiness, and importance explained the low scores on measures of
depressive and somatic symptoms. Interviews with team members indicated that individuals perceived that the skills gained during the mission were readily transferable to their regular non-deployed military duties. Participants believed that the operational mission enhanced their overall individual mission readiness for future missions or combat operations. Similarly, team members described a high degree of engagement and commitment to the mission and a shared consensus that the mission was personally important. Despite the fact that these findings were based on interviews and open-ended questions and not tested inferentially, low-scores were observed on measures of depression and somatic symptoms suggesting that an inverse association existed between peacekeeping mission clarity and relevance towards physical and psychological distress strain outcomes. In summary, the literature on military peacekeeping missions provides a series of common themes that describe the unique contextual elements of military peacekeeping operations. These themes provide the foundation to formulate a definition of the construct of operational stress. Operational stress, therefore, is characterized as the extent to which individuals perceive any or all of the following (a) role and mission ambiguity arising from the peacekeeping mission and the prescribed rules of engagement, (b) their family as unable to cope with their absence, and (c) the environment as dangerous and a personal threat.

**Leadership**

If operational stress refers to discrepancies and ambiguities in occupational and familial roles, then, implicitly, the roles of leaders are to communicate to subordinates the importance of the mission for both the unit and the Army, and define the soldier’s job and performance expectations. Gal and Jones (1995) proposed that, in combat, the actions and statements of the unit leader provide additional meaning and context to soldiers entering combat, thereby promoting a realistic appraisal of the combat threat, enhancing individual combat readiness, and supporting a perception among unit members that the unit is also prepared for combat. They conjectured that effective leaders would mediate a soldier’s appraisal of the ensuing combat situation along with subsequent combat stress reactions. Because of the rigid hierarchical structure of Army organizations, leaders play a pivotal role in both initiating structure for subordinates and the organization and providing various levels of support to subordinates to complete operations. To demonstrate the importance of leader support and leadership among military personnel in combat operations, Solomon and colleagues (1986) compared 382 Israeli Defense Forces (IDF) soldiers who were treated for combat stress reactions (CSRs) during the 1982 Israel-Lebanon war with a matched sample of 334 IDF soldiers who did not develop CSRs and found that aside from battle intensity, leader support was strongly related to the absence of combat stress reactions. In contrast, Lamerson (1996) did not find a statistically significant relationship between confidence in unit leaders and stress reactions from a purposive sample of 428 Canadian soldiers deployed to Bosnia in support of a UN-led peacekeeping mission in 1992 (representing approximately 25% of the population of Canadian Forces that served in Bosnia during the same timeframe). Her findings, while limited to the sample, point to the potential limitations of the influence that leaders may exert in mediating stress appraisal and strain outcomes. In summary, the
contradictory findings of Solomon and colleagues (1986) and those from Lamerson (1996) bring to light the need to identify clear conceptual underpinnings of leader behavior and subordinate attitudes and occupational strain and further test the potential effect of leadership style or behavior in reducing role ambiguity and occupational strain, as proposed by Gal and Jones (1995). For both of these imperatives, path goal leadership theory provides a conceptual foundation for examining leader behavior and how these behaviors may serve to influence the behavior and attitudes of subordinates.

**Path-goal Leadership Theory**

Path-goal leadership theory is concerned with how leaders motivate employees to accomplish organizational goals (House, 1971; House & Dessler, 1974; Northouse, 1997). Path-goal theory proposes that organizational leaders help subordinates achieve organizational goals and individual goals by either defining the goal (providing role clarity), clarifying the steps to goal achievement, removing obstacles to goal achievement, or providing subordinates emotional support to enhance the employee’s efficacy. Path-goal theory proposes that leaders tailor their behaviors based upon the needs of the subordinates and the situation in which the subordinates are engaged. Therefore, path-goal theory makes several assumptions about leaders and the situation. First, leaders are actively engaged with employees in defining their needs and obstacles (both intrinsic and extrinsic to the subordinate) to goal achievement. Secondly, employees require extrinsic motivation to meet organizational goals. Lastly, leadership behavior is dynamic and is based on the leaders perception of the situational requirements (goals) and the characteristics of his or her subordinates (Northouse, 1997). The last assumption of path-goal leadership theory, dynamic behavior, is most important to this study. Military leader behavior is a dynamic balance between providing structure and mission clarity to subordinates to ensure successful mission accomplishment along with support and empowerment to promote an environment in which leaders are concerned for the well-being and development of their subordinates. In military peacekeeping operations, when soldiers and leaders have almost constant interaction, the leadership environment is intensified. More specifically, subordinate attitudes and beliefs are influenced by the attitudes and beliefs of their leader’s.

House (1971) proposed that leaders employ four behaviors, or combinations of such, to motivate employees toward goal achievement: (a) directive leadership, (b) supportive leadership, (c) participative leadership and (d) achievement-oriented leadership. Directive leadership is analogous to “initiating structure” proposed by the Ohio State studies (Katz & Kahn, 1978). The Ohio State Studies represented one of the most systematic and exhaustive attempts at identifying different leader behaviors that individuals engaged in when leading a group or an organization. The researchers questioned subordinates and leaders alike in an attempt to identify both common and critical leader behaviors. The results of their research identified over 1,800 different leader behaviors that were later condensed into 150 items as part of the Leader Behavior Description Questionnaire (Hemphill & Coons, 1957; Northouse, 1997). Directive leadership is characterized by giving explicit instructions to subordinates about that which is expected from them, how tasks are accomplished, time lines, and clear standards of mission success. Supportive leadership, on the other hand, resembles “consideration
“support” proposed by the Ohio State studies. Supportive leadership involves attending to the well-being of subordinates by listening, remaining approachable, and respecting subordinates by seeking their input on task performance. Leaders who invite subordinates to participate in the decision-making and goal-setting are using a participative leadership style. Finally, leaders who challenge subordinates to perform their work at the highest level are promoting an achievement-oriented style of leadership (Northouse, 1997).

Borrowing from the definitions proposed by House (1971) and the Ohio State studies, leadership, therefore, refers to both directive and supportive behaviors of organizationally sanctioned leaders.

**Leader Behaviors and Role Clarity**

Despite the practical appeal of path-goal theory, few attempts to measure leader behaviors beyond directive and supportive leadership have been undertaken (Wofford & Liska, 1993). For those that have been conducted, studies of path-goal leadership theory have demonstrated positive relationships between both directive and supportive leadership and role clarity (Wofford & Liska, 1993). More recent evidence of this relationship was demonstrated by Fenlason and Beehr (1994). They examined the effects of supervisor social support (instrumental and emotional) on stressor indices of employee underutilization, qualitative work underload, role conflict and work overload with almost 200 professional secretaries. Their findings indicated that both instrumental and emotional support from supervisors shared a statistically significant, inverse relationship with the four stressors previously mentioned. In addition to examining the extent of the relationship between instrumental and emotional leadership support on stressors, they also examined the contents of the communication to determine whether a relationship existed between supervisory communication and indices of both stressors and psychological strain. This analysis indicated that both positive job-related interactions and non-job related interactions were inversely related to both psychological strain and occupational stressors. Their findings also point to the magnifying effect of negative job-related communication between supervisor and subordinate on indices of psychological strain, which highlights one of the four ways that Salancik and Pfeffer (1978) claim that social information processes influence attitudes. Most importantly, these findings lend support to the important role of leaders in affecting the cognitive appraisal of work-related stressors, as previously proposed by Gal and Jones (1995) and implied by social information processing theory. It can be argued, therefore, that military leaders who emphasize the positive aspects of the work environment, communicate missions, and expectations clearly and are engaged with the soldier in a socially supportive nature will engender environments whereby soldiers appraise the stressors in less negative terms and experience fewer strain-related outcomes.

**Leader Behavior as an Organizational-level Antecedent Variable**

Yammarino, Dansereau and Kennedy (2001) contend that research on leader behaviors must move beyond individual-level units of analysis towards a multi-level and multidimensional examination of leader behaviors. A majority of the studies of operational stress examined leader behavior based on individual perceptions of the leader without controlling for the fact that respondents were members of preexisting, natural groups. They identify four levels of analysis worth examining and integrating in studies
of leadership; these include (a) individual, (b) dyads, (c) groups/teams, and (d) collectives. Given the structured and intact nature of US Army units, a group level analysis of leader behaviors seems intuitively pragmatic. In fact, Bliese and Britt (2001) and Bliese and Castro (2000) both demonstrated the importance of examining the antecedent or direct relationship that leader behaviors within the group-level context exert on individual-level stressor and strain relationships.

In their examination of soldiers assigned to 52 different US Army companies, Bliese and Britt (2001) demonstrated that measuring group consensus about unit leaders provided valuable insight into the stress-buffering qualities of the social environment. Analyzing a purposive sample of 1,923 lower enlisted soldiers obtained by sampling from units headquartered in geographic proximity to two major troop encampments in Haiti, the researchers did not observe a statistically significant moderating effect of group-level ratings of leaders on the within-groups relationship between work-related stressors and psychological strain outcomes of depression and morale. However, they did observe statistically significant direct relationships between group-centered ratings of leader behaviors and psychological strain outcomes ($p < .0001$, morale and $p = .0003$, depression). Such a finding, while limited to the sample of deployed soldiers, examined during the middle deployment phase of the operation, suggests that leader behaviors may enhance the organizational climate and thus reduce the extent to which soldiers experience psychological distress.

In another study of group-level perceptions of leader behaviors interacting with work overload and role clarity, Bliese and Castro (2000) examined a purposive sample of 1,538 soldiers assigned to 53 different US Army companies or company-sized elements preparing to rotate through a thirty-day high-stress combat simulation field exercise. Using the Global Severity Index (GSI) of the Brief Symptom Inventory (BSI, Derogatis & Melisaratos, 1983) to measure psychological strain, they found a statistically significant group-level interaction of leader support behaviors, work overload, and role clarity on GSI scores for individuals. In fact, their findings indicated that up to “55% of the [between-groups] variance in the role clarity-work overload slope on GSI scores was predicted by the contextual variable of leadership support” (p. 70). These findings, coupled with the qualitative findings presented by Bartone and colleagues (1998), point to the potentially important moderating effect that leader behaviors, (viz. directive and supportive behaviors) have on the group’s or unit’s experience in a deployed theater.

In summary, leaders behaviors are defined as both directive and supportive behaviors used by organizationally sanctioned leaders to motivate subordinate soldiers to achieve the goals of peacekeeping operations. It is proposed that the behaviors of leaders share a direct relationship with operational stressor appraisal and strain reactions. The variable, leader behaviors, must be examined as a group-level unit of analysis rather than an individual-level of analysis, given that individuals assigned to different military units have specified leaders. Since deployments are temporally bound with distinct time phases (i.e., pre-deployment, deployment, post-deployment), it is also hypothesized that leader behavior is an antecedent variable in the operational stress-strain relationship. The nature of the antecedent relationship results in a social milieu whereby leaders establish a command and unit environment that will shape future stressor appraisal and strain reactions.
outcomes. Therefore, as depicted in the conceptual model in Figure 1, it is suggested that leader behaviors serve as a moderating variable in the relationship between operational stressors and strain indicators.

Cohesion and Social Support

Definitions and Measurement of Cohesion

Cohesion is a concept critical to any understanding of interpersonal bonds. Cohesion has been referred to as the “X factor” (Manning, 1994) that binds military members together and is considered one of the most important characteristics that “enables an infantry soldier to keep going with his weapons” (Marshall, 1966, p. 42). Describing the importance of cohesion to military units, Manning (1994) referred to it as “confidence in the ability and willingness of peers and leaders to protect [themselves] in combat and a feeling of obligation to do the same for them” (p. 15). He further implicates cohesion as a necessary element in combat units to prevent emotional breakdown in combat. Despite the seemingly intuitive appeal of cohesion as a form of fraternal bonding forged in combat and so aptly described by Marshall (1966) in his book titled _Men Against Fire_, there remains substantial disagreement about the definition and dimensional structure of group cohesion (Cota, Evans, Dion, Kilik, & Longman, 1995; Mudrack, 1989). From a review of the themes presented in the literature on cohesion, several definitions are identified.

The predominant literature has described cohesion as interpersonal attraction and “the desire of individuals to maintain their membership in a group” (Lott & Lott, 1965, p. 259), whereby, individuals like and are liked by those in their cohesive groups (Klein & Mulvey, 1995; Martin & Hunt, 1980; O'Reilly & Caldwell, 1985). Inconsistencies in measurement however, have resulted in several definitions of cohesion as either a unidimensional or multidimensional construct (Cota et al., 1995). Extending the concept of cohesion beyond the simple distinction of bonding between members, Bliese and Halverson (1996) characterized cohesion as involving both vertical and horizontal elements. Vertical cohesion is the “perception of subordinates that leaders are considerate and competent,” and horizontal cohesion refers to the degree of “fraternal bonding and kinship” (p. 1174). Building further on this definition, Mael and Alderks (1993) proposed that in organizations with structured hierarchies of leadership, such as military units, leaders must also appear as a “coordinated and cohesive authority and decision making structure” (p. 142) and labeled this form of cohesiveness leadership cohesion.

In contrast, Manning and Fullerton (1988) and Beehr (1976) defined cohesion as a form of social support. Manning and Fullerton (1988) suggested that the strictly ‘interpersonal attraction’ definitions, previously proposed, fall short of the interpersonal bonding referred to by Marshall (1966). Rather, they proposed that cohesion is best understood as the degree of social support provided by group members and leaders, wherein cohesion is evidenced by the extent that group members provide and receive both instrumental and emotional support from peers and leaders. They contended that by linking cohesion to social support opened a “whole new way of looking at interpersonal bonding . . . complete with a wide array of suggestions for creating or enhancing it” (p. 505). Thus not only did they believe their definition accurately measured the multi-
dimensional dynamics of cohesion, but also their definition served a practical purpose for unit leaders and could be incorporated into US Army institutional leadership development schools.

Despite the apparently disparate definitions of cohesion in the literature, measures of cohesion used with military populations have attempted to capture all three elements—interpersonal attraction, bonding, and social support. For example, Bliese and Halverson (1996) assessed horizontal cohesion (peer relations) using an eight-item scale which indicated positive perceptions of social support and bonding within the unit. Typical items from their scale of horizontal cohesion included, “I spend time when not on duty with people in this company,” and “My closest relationships are with the people I work with” (p. 1176). Likewise, vertical cohesion was assessed using an eleven-item scale which reflected the extent of initiating structure and consideration of leaders. Items from their scale included, “My officers are interested in my personal welfare,” and “The NCOs in this company would lead well in combat” (p. 1176). Both the eleven-item vertical cohesion measure and the eight-item cohesion measure have been used and reported in other studies of military personnel (Arincorayan, 2000; Bliese & Britt, 2001; Bliese & Castro, 2000; Bliese & Halverson, 1998; Britt & Adler, 1999; Mael & Alderks, 1993). Similarly, Manning and Fullerton (1988) in their analysis of the relationship between military unit cohesion and health and psychological well-being, measured cohesion as the degree of peer and leader social support along with indices of small-unit functioning (i.e., communication, training, equipment and leader relations). Measures of cohesion with non-military populations have routinely used operational definitions involving the notions of support and group attraction. O’Reilly and Caldwell (1985) and Klein and Mulvey (1995) assessed cohesion based on the extent to which group members defended each other from criticism by outsiders, helped each other on the job, stuck together, and got along. Finally, Carlson and Perrewé (1999) examined the different possible relationships (i.e., antecedent, moderator, mediator, direct effect) that social support exhibited in the occupational stress-strain process. Using structural equation modeling techniques to test the different models of the role of social support, they found that social support (and by proxy, group cohesion) was best modeled as an antecedent variable in the work-family conflict and occupational strain relationship. Therefore, prior to operationalizing cohesion, it is necessary to examine the empirical support for cohesion as a buffer or antecedent in the stress-strain relationship.

**Cohesion, Social Support and Occupational Stress: Empirical Findings**

Cohesion, for the purpose of this examination, includes the concept of availability of peer social support, especially among groups who are highly task interdependent. This is an important distinction that differentiates cohesion and social support at work from conceptual discussions of social support that incorporate support from non-work friends or family. The latter assumes that the use of support represents an active coping behavior, while availability of social support in groups with high task interdependence represents cohesion, an antecedent condition exemplifying group climate. In addition, the availability of social support at work (i.e., cohesion) serves as a surrogate variable of coping when other measures of coping are unavailable.
Support for this argument can be found in the research by Terry and colleagues (1995). They proposed that highly cohesive groups provide the supportive relationships which help individuals adopt adaptive coping behaviors. To test their assertion, they examined longitudinal data from a cohort of 116 nonrandomly selected employees from a large retail organization collected two different times. Structural equation modeling was used to determine if certain coping strategies were employed as a result of potential sources of social support and the extent to which the coping methods mediated the relationship between social support and indices of strain. Their findings indicated that support from supervisors and colleagues (in contrast to support from non-work peers) promoted the use of adaptive instrumental coping behaviors and were inversely related to the use of maladaptive escape-type coping behaviors. Similarly, Greenglass and colleagues (1996) examined the availability of social support from peers, family and supervisors and the relationship between support and burnout among teachers. Most importantly, their findings demonstrated that support from peers provided the greatest buffering effects against burnout indices of emotional exhaustion.

The findings of Bliese and Britt (2001), as previously discussed, demonstrated that group consensus served a moderating function in the relationship between work-related stressors and psychological strain indices. These authors proposed that military units which achieved high degrees of consensus in leader ratings (i.e., exhibiting strong leadership characteristics) were also groups that established a positive and ostensibly supportive social environment. The results of their mid-deployment survey of US soldiers and units deployed in support of the peacekeeping mission in Haiti demonstrated that in units which exhibited a high degree of consensus, individuals in those units experienced higher morale and less depression. In spite of the inferential limitations due to the use of a nonprobability sample, the findings from the Bliese and Britt study reinforced the previous work by Bliese and Halverson (1998) who studied group consensus about peer and leader support among 3,456 soldiers assigned to 73 different US Army companies. Respondents for this study represented a subsample of a much larger and systematic study of US Army personnel stationed in Europe and the United States. Analyzing the data by group, the researchers demonstrated that the level of consensus regarding the extent of support from leaders and peers was significantly related to the average psychological well-being of group members. They concluded that high degrees of dissensus promoted a stressful social environment which contributed to increased psychological distress. Taken together, the work of Bliese and Britt (2001) and Bliese and Halverson (1998) demonstrate that not only must soldiers experience the availability of social support as an element of cohesion, but that group members must share similar perceptions regarding the social environment. The shared perceptions of the support available from peers and leaders, which are a consequence of a cohesive environment, predict enhanced psychological functioning. Thus cohesion involves both interpersonal attraction and availability of social support.

In their early work on conceptualizing and examining the effects of cohesion on health and well-being among personnel assigned to randomly selected US Army Special Operations units, Manning and Fullerton (1988) conceptually defined group cohesion as the extent of perceived social support provided by work-group peers. Using a step-wise
multiple regression technique, they demonstrated that unit cohesion (characterized by high levels of mutual social support) contributed significantly to measures of overall well-being, health, and satisfaction with the Army. In addition, they demonstrated that special operations personnel exhibited higher degrees of cohesion, confirming that unit level variables (cohesion and command climate) differed substantially between special operations soldiers and their airborne and mechanized infantry counterparts. They proposed these differences resulted in physically and emotionally healthier personnel. In another early study of individual perceptions of group cohesion (characterized as the extent that group members defend each other, help each other, and get along), group cohesion moderated the relationship between role ambiguity and outcome measures of self-esteem and depression (Beehr, 1976). Lastly, Arincorayan (2000) demonstrated a significant relationship between peer support (horizontal cohesion) and psychological well-being from a nonprobability sample of 1,001 soldiers deployed to a peacekeeping mission in Bosnia. He argued that organizations characterized as highly cohesive are much less disruptive and are not a threat to the psychological well-being of soldiers. Therefore, it can be argued that soldiers in highly cohesive units perform their jobs better and are able to concentrate on the mission at hand. In contrast, in non-cohesive work groups attention is directed towards the disruptive elements of working within a non-cohesive work-group.

Likewise, in studies where cohesion was defined as interpersonal attraction, the relationship between cohesion and strain outcomes also demonstrated a similar moderating effect (Cogliser & Schriesheim, 2000; Klein & Mulvey, 1995). In summary, there is evidence that cohesion exerts a moderating effect on the stress-strain relationship and that group cohesion in deployed environments directly contributes to overall well-being. The literature does not, however, yield any longitudinal studies establishing temporal order wherein pre-existing group cohesion is an antecedent factor that buffers individual stressor appraisal and strain outcomes during such major organizational changes as deployment. Similarly, the literature regarding cohesion and military members does not specifically assess unit cohesion in a deployed environment as a group-level variable; rather, the deployment literature has examined cohesion as an individual’s experience of their social environment.

Conceptual Definition of Cohesion and Proposed Hypotheses

Cota and colleagues (1995) suggested that a definition of cohesion should have two dimensions, one that conceptually generalizes across a broad description of group and a second that ties cohesion to a unique context or population. Furthermore, they proposed that the primary dimensions of cohesion should consist of group or peer task elements (i.e., interdependence) and social elements (i.e., social support, interpersonal attraction) (Carron, Widmeyer, & Brawley, 1985). Cota and colleagues (1995) suggested that, for military units, concepts like vertical cohesion are a secondary dimension of the construct. Therefore, to avoid duplicating conceptual definitions, it is proposed that cohesion be defined as peer support and interpersonal attraction among members of a US Army unit. This definition is in concert with the definition proposed by Manning (1994) and Manning and Fullerton (1988) and retains a focus on peer relationships. By
incorporating social support as an attribute of cohesion, this definition allows the construct to act as a surrogate variable for individual coping.

Building upon the work of Carlson and Perrewé (1999) cohesion should be, like leader behaviors, modeled as an antecedent phenomenon which exerts a stable influence on the appraisal of operational stress and strain outcomes throughout the deployment cycle. Therefore, as depicted in the conceptual model in Figure 1, cohesion is assumed to exert a moderating influence on the relationship between operational stressors and strain outcomes. This relationship is the operationalization of the surrogate status of cohesion as social support coping. A final issue about cohesion is the appropriate level of analysis (Bliese & Halverson, 1996). The definition, as proposed, implies that cohesion is a group level phenomenon, whereby data on group cohesion is collected at the individual level, though aggregated at the group level. This strategy is consistent with recent studies that suggest that group level analysis of cohesion should be consistent with the conceptual level of generalization – US Army Companies (Gully, Devine, & Whitney, 1995; Wech, Mossholder, Steel, & Bennett, 1998). Finally, the conceptual model of operational stress depicted in Figure 1 integrates the assumptions and propositions of social information processing theory on individual attitudes and behavior in the stress-strain relationship.

**Collective Efficacy**

While it is hypothesized that cohesion provides social support for unit and organizational members, it can be argued that cohesion is a necessary but insufficient condition to assess group capability and eventual performance. Collective efficacy, therefore, has been proposed as a phenomena which captures the collective group belief in its ability to perform specific tasks (Lindsley, Brass, & Thomas, 1995; Shamir et al., 2000). Collective efficacy is an outgrowth of Bandura’s (1986) theory of self-efficacy and social cognitive theory. Bandura’s social cognitive theory is a theory of learning and behavior which proposes that behavior is learned from observing others and is directed at particular goals. Bandura also proposed that behavior is self-regulated by an individual’s judgment of one’s own capabilities along with the individual’s judgment of the consequences of his or her behavior. Finally, social cognitive theory is based on the concept of “triadic reciprocity” in which characteristics of the environment, the individual and the individual’s behavior operate interactively and serve to shape one another in a dynamic fashion.

In terms of collective efficacy, Prussia and Kinicki (1996) contended that application of social cognitive theory represented the development of a “composition theory, wherein functional relations hypothesized at one level of analysis are expected to be similar or isomorphic to another” (p. 187). In other words, predictions at the individual level from social cognitive theory should serve as building blocks to generate similar theoretical relationships at the group and organizational level of analysis. In their conceptual paper on self-efficacy and organizational behavior, Brief and Aldag (1981) contended that self-efficacy is related to individual self-esteem, job performance, organizational socialization, and job stress outcomes (i.e., strain). The empirical support for their claims provides additional credence to the notion that perceptions of capability interact with the perceived environment to buffer the stress-strain process. Extending the
components of social cognitive theory to group behaviors, therefore, has support in the literature both conceptually and empirically (Bandura, 1997; Jex & Bliese, 1999; Jex & Gudanowski, 1992; Marks, 1999; Parker, 1994; Paskevich, Brawley, Dorsch, & Widmeyer, 1999; Prussia & Kinicki, 1996; Riggs & Knight, 1994). In terms of operational stress, given that each deployment or operational mission is unique and considered novel, it is proposed that the collective belief in the unit’s ability or capability to perform the mission serves as an antecedent or moderating variable in the stress-strain process. As the unit receives feedback about the nature of the deployment environment and its performance, it is proposed that collective efficacy also serves to buffer the relationship between operational stressors and strain outcomes. This relationship is depicted in the conceptual model of operational stress (Figure 1). Before proposing a final operational definition of collective efficacy, however, issues of definition and measurement need to be addressed along with a review of the empirical literature examining collective efficacy and group or organizational behavior.

**Definition of Collective Efficacy**

In his critique of recent publications of collective efficacy, Maddux (1999), claimed, “the problem is not that we do not yet fully understand what collective efficacy is; rather, the problem is that we have not yet agreed on what we want the term collective efficacy to mean and how we want to measure it” (p. 224). Examination of the differing definitions of collective efficacy in the empirical literature highlights this point. For example, Jex and Gudanowski (1992) defined collective efficacy as an individual’s perception of the extent to which the respective group the individual belonged to was capable of functioning effectively. They measured collective efficacy as an individual-level variable and were concerned with how individual beliefs of collective efficacy affected the individual stressor outcomes. On the other hand, Jex and Bliese (1999) described collective efficacy as the collective belief of group members regarding the capability of the group as a whole. Not surprisingly, to capture the collective belief of group members they aggregated individual ratings of the group’s capabilities to a “meaningful social unit” (p. 351), that is, US Army companies. In general, collective efficacy has been defined as either a group or individual perception of the group’s abilities or capabilities. In addition, the majority of definitions clearly distinguish collective efficacy from other group-related concepts by emphasizing that collective efficacy must be directed toward a particular situation, demand, or task. By including task or situation demands in the definition of collective efficacy, the resulting definition allows for the researcher to distinguish collective efficacy from such other similar group constructs as group potency (Guzzo, Yost, Campbell, & Shea, 1993), group aspiration levels (Zander & Meadow, 1963), and collective esteem (Crocker & Luhtanen, 1990). This being said, it is recommended that measures of collective efficacy specify the task or tasks that the group is expected to perform (Bandura, 1997; Maddux, 1999; Paskevich et al., 1999; Shamir et al., 2000). Unfortunately, this results in creation of measures of collective efficacy that are contextually specific and whose psychometric properties are limited to the population and context of interest. To overcome this limitation in military studies, researchers have focussed their inquiry on combat readiness or global mission
readiness attributes rather than specific mission efficacy beliefs (e.g., Jex & Bliese, 1999; Shamir et al., 2000).

Within any definition of collective efficacy, a critical assumption of interdependency is proffered. In particular, when measuring collective efficacy of groups, it is assumed that group members share a moderate to high degree of task interdependency to accomplish specific job-related tasks. One criticism of the studies by Jex and Gudanowski (1992) and Parker (1994) is that it is unclear whether those surveyed were rating collective efficacy in relation to group level task interdependency. On the other hand, studies by Marks (1999), Shamir (2000), Paskevich and colleagues (1999), and Jex and Bliese (1999) clearly sought to measure groups who share task interdependency.

Finally, as can be deduced from the discussion of the definition of collective efficacy, the appropriate measurement level to assess collective efficacy remains an issue. It has been argued that any study which does not aggregate collective efficacy measures to the group level are inadequate to assess the impact of collective efficacy (Jex & Bliese, 1999). In fact, Diez-Roux (1998) contends that contextually relevant group-level analysis holds great potential in understanding health and well-being problems in populations. Despite these assertions, the organizational behavior literature regarding collective efficacy presents mixed results. It is clear that, in those studies which collected survey data in loosely arrayed organizations and work-groups, there was a trend to report collective efficacy as an individual belief which guides individual behaviors (Jex & Gudanowski, 1992; Parker, 1994; Riggs & Knight, 1994). On the other hand, studies which attempted to infer group effects aggregated the data at the group level and performed analyses that effectively captured group effects on individual outcomes (Jex & Bliese, 1999; Marks, 1999; Paskevich et al., 1999; Prussia & Kinicki, 1996; Shamir et al., 2000). Therefore, it stands to reason that adopting the influence of groups on individual behavior requires that measures of collective efficacy should be aggregated into meaningful social units and that group-level analysis is the appropriate analytic strategy. Having resolved issues of specificity of definition, level of measurement, and task interdependency, the definition of collective efficacy proffered by Shamir and colleagues (1999) appears to address these elements. They described collective efficacy as collective beliefs individuals hold about the ability of their group or unit to perform its task. In this case collective efficacy is manifested in the collective evaluation of combat readiness. Similarly, since the focus of the proposed study is to understand operational stress in relation to peacekeeping and humanitarian missions, collective efficacy is the collective belief individuals hold about their unit’s (US Army Company) ability to successfully perform peacekeeping or humanitarian missions. Lastly, this definition implies that individual assessments of the unit’s ability to perform peacekeeping operations are only meaningful when aggregated as a group measure of collective efficacy.

**Relationship Between Collective Efficacy And Organizational Outcomes**

Group-level collective efficacy has been examined in both laboratory and field settings. However, there does not appear to be any research examining collective efficacy in peacekeeping or humanitarian missions. Nonetheless, two studies of military populations may shed some light on the importance of this variable on group
performance along with physical and psychological strain indicators. Jex and Bliese (1999) sought to test whether collective efficacy serves as a moderating variable in the relationship between occupational stressors (viz., work overload, work hours, and task significance) and strain (viz., job satisfaction, organizational commitment, psychological and physical strain) with a sample of 2,273 soldiers from a large (total population approximately 4,000 soldiers) combat team team, aggregated into 36 US Army companies. In their study, individual soldiers were asked to rate their units’ ability to perform upcoming missions using a four-item scale. A sample item, for example, included, “I have real confidence in my unit’s ability to perform its mission.” Their multi-level model demonstrated that collective efficacy moderated the relationship between work overload and job satisfaction. Their findings empirically demonstrated that individuals who were in units with high levels of collective efficacy, experienced greater job satisfaction under conditions of high workload than counterparts in units with low collective efficacy. In addition they demonstrated the moderating effect of collective efficacy in the relationship between task significance and organizational commitment. More specifically, individuals in units with high collective efficacy experienced greater organizational commitment when the task or mission was rated higher in contrast to units with low collective efficacy. However, this relationship was described by the authors as relatively weak and primarily due to limited variability of the dependent measure. Therefore, they concluded that, while collective efficacy represented an important contextual variable, further tests of the moderating effect of collective efficacy were required. Their conclusions aside, this study, like other studies involving military personnel, appeared to use a purposive sample. Thus, statistical conclusions derived from the analytic techniques are constrained to the sample.

In an attempt to understand antecedent or predictor variables associated with collective efficacy, Shamir and colleagues (1999) surveyed a purposive sample of 1,550 personnel belonging to 50 Israeli Army companies to identify predictor variables of combat readiness. Their findings indicated that stability of unit leaders and unit relationships predicted collective perceptions of combat readiness when analyzed at the group level. Furthermore, they found that organizational identification was the strongest predictor of combat readiness. This finding regarding organizational identification is counter to the findings of Jex and Bliese (1999), who attempted to establish a causal link from collective efficacy to organizational commitment. Their findings were not supportive of such a relationship. However, the findings by Shamir and colleagues (1999) demonstrated that, at a minimum, a reciprocal relationship between collective efficacy and organizational commitment existed and such a relationship promoted enhanced group performance and reduced levels of psychological distress in military units. One explanation of the contrary findings between Jex and Bliese (1999) and Shamir and colleagues (1999) could be due simply to sampling error. Both studies utilized nonprobability samples and thus findings derived from each of the studies could be due to sampling error.

In her laboratory study of collective efficacy in routine and novel environments, Marks (1999) created 79 teams of three students each from a random sample of students and had them perform a tank warfare simulation game. Teams initially practiced their
coordinated movement in simple environments. After completing the first mission, teams were tested performing two similar missions and a third more difficult (and considered novel) mission. Marks’ (1999) intent was to understand the relationship between collective efficacy and performance of routine and novel tasks. Her findings indicated that collective efficacy predicted overall team coordination and performance. However, in novel environments teams with higher collective efficacy scores tended to demonstrate weaker coordination of effort to accomplish the missions than those teams who rated themselves as experiencing low levels of collective efficacy. In spite of this trend, the teams with high collective efficacy continued to perform better in completing the missions than those teams with low and average collective efficacy. She noted that in novel environments, individuals in teams with high collective efficacy tended to venture from the team to scout possible alternatives. In teams with low collective efficacy, by contrast, there was little deviation from other team members within the game simulation. While she did not explore the implications of this discrepancy, one possible interpretation is that in teams with higher collective efficacy, there is an implicit shared trust among group members which allows individuals to take calculated risks in an effort to achieve group goals. However, this interpretation was not tested.

Based on these and similar findings for team sports and laboratory studies of ad hoc work-groups (Paskevich et al., 1999; Prussia & Kinicki, 1996), initial evidence indicates that collective efficacy is a moderating variable in the stress-strain process. However, this represents a significant gap in the literature, since only one study actually sought to test the moderating relationship between collective efficacy and work stressors and strain (Jex & Bliese, 1999). Secondly, the majority of studies were primarily interested in collective efficacy and task or job performance and not the relationship between collective efficacy and its impact on psychological well-being. Finally, the study by Marks (1999) provides an interesting element of collective efficacy which makes it applicable to military operations. Ostensibly, each military operation is a novel environment in terms of the situation, the soldier’s skill level, the degree of training the unit has conducted to perform the mission, the terrain, and the mission objectives. Units with high collective efficacy adapt to the unique nature of the deployed environment more rapidly than units who do not collectively share a belief in the unit’s ability to perform the mission. Similarly, like the other group-level variables, it is hypothesized that collective efficacy is a social phenomenon that is salient during the pre- and mid-deployment phases. This hypothesis is based on the assumption that the bulk of pre-deployment training is on peacekeeping and/or humanitarian mission-related activities. Therefore, as depicted graphically in the conceptual model (Figure 1), it is proposed that collective efficacy serves as a pre-existing group-level state or condition moderating the relationship between appraised stressors and strain outcomes.

Summary of the Literature Review
The conceptual and empirical literature concerning operational stress, leader behaviors, cohesion, and collective efficacy were examined to aid in developing both operational definitions of key constructs along with creating a conceptual model. The literature review yielded several issues related to operational stress and organizational
social phenomenon. First, the discussion of operational stress revealed a limited number of longitudinal studies that examined the relationship between operational stressors and post-deployment psychological distress. Those studies which surveyed large samples of soldiers (i.e., more than 500 respondents) were cross-sectional in nature surveying soldiers at either mid-deployment (Arincorayan, 2000; Bliese & Britt, 2001) or post-deployment (Lamerson, 1996; Litz et al., 1997; Solomon et al., 1986). This study seeks to understand the potential long-term psychological consequences as a result of participation in a peacekeeping mission by analyzing the data longitudinally. Secondly, the measurement and analysis of variables corresponding to elements of the social environment (i.e., leader behaviors, cohesion, collective efficacy) has been examined in the literature as either a group or individual phenomenon with varying results. It was determined from the conceptual literature that social phenomenon be examined as a group-level variable. The research by Bliese and Britt (2001) and Bliese and Halverson (1998) demonstrated that aggregation of perceptions of the social environment to a meaningful group level is a practical and informative strategy. Aggregation aids in analyzing the impact of social phenomenon as a contextual variable that buffers soldiers against the potential stressors inherent in peacekeeping and humanitarian missions. Lastly, non-probability samples were routinely used in studies of military personnel. Researchers have described that obtaining probability samples is difficult given operational constraints and difficulties accessing soldiers (Lamerson, 1996; Shamir et al., 2000). To overcome these obstacles it appeared that researchers attempted to sample from target populations representative of the deployed population (Arincorayan, 2000; Bliese & Britt, 2001; Litz et al., 1997; Solomon et al., 1986). Despite the putative constraints of obtaining a probability sample, the irrefutable fact remains that nonprobability sampling does not allow the researcher to estimate an unbiased sampling error and thus inferences to populations are uncertain (Pedhazur & Schmelkin, 1991).

Conclusion and Summary of Current Study

The current study seeks to examine how US military personnel respond to the unique demands of peacekeeping and humanitarian missions and the role of the social environment in buffering or moderating the potentially negative consequences of chronic stress associated with such missions. In addition, given that military deployments are characterized as having distinct temporal stages (pre-deployment, mid-deployment and post-deployment), a longitudinal study was conducted that measured characteristics of the individual and military unit at the mid-deployment and post-deployment phase to test the effects of organizational characteristics in the appraisal of deployment-related stressors and individual strain outcomes. A summary review of the conceptual model is provided prior to reviewing the study hypotheses.

Review of Conceptual Model

Lazarus and Folkman’s (1984) transactional theory of stress and coping provides the conceptual foundation from which to explain the stress and strain process. In summary, the theory proposes that stress results from a primary appraisal that a specific situation is perceived as posing a threat or, as Edwards (1992) claimed, represented a discrepancy between the current state and a desired state. Following primary appraisal of
a stressor, an individual uses cognitive appraisal strategies to cope with the stressor. Coping represents the cognitive and behavioral actions that an individual takes in response to a perceived stressor. When exposure to the event is deemed chronic or coping is ineffective an individual will experience either psychological, physical, and/or behavioral strain.

For this study, the concept of military peacekeeping operational stress was introduced. Operational stress is characterized by three contextual factors. First, operational stress occurs when soldiers perceive their role as ‘peacekeepers’ as irrelevant, ambiguous, and meaningless for their units fighting capabilities. Second, operational stress develops when individuals perceive the peacekeeping environment as potentially dangerous or hostile. This situation is exacerbated by unclear or vague rules of engagement which determine when soldiers may use force to protect themselves or prevent violent uprisings. Finally, family separation and concerns for family well-being are common stressors expressed by soldiers in extended deployments.

Since military personnel and the units they belong to are of primary interest in this study, a theory of group behavior and social influence was examined to derive the group level concepts of interest. Social information processing theory (Festinger, 1954; Festinger et al., 1950; Salancik & Pfeffer, 1978) points to the importance of the social environment and the influence of the social environment upon individual beliefs, attitudes, opinions, and behaviors. Social information processing theory proposes that salient social groups influence how individuals perceive the environmental context where stressors occur, especially as the environmental cues become less objective. The model of combat stress proposed by Gal and Jones (1995) is an illustrative conceptual example of the potential influence that leaders in the soldier’s social environment exert on individual perceptions of the combat theater. In addition, social influence theory promulgates that group cohesion and collective efficacy are characteristics of the social environment which exert normative social influence upon individuals to conform to group expectations of performance and attitude. In a deployed environment, when soldiers are removed from their families or routine social networks, the unit becomes an important source of support and influence. Social influence theory proposes that in the event that cohesion is absent or weak, there is little incentive to adopt a collective belief about the unit’s ability or performance expectations. Therefore, it is assumed that fewer support mechanisms are in place to assist soldiers when faced with operational stressors, to reframe the importance of the stressor, to provide advice or assistance, or to allay the soldier’s concerns. The availability of social support, or lack thereof, acts as a surrogate variable for coping. The use of social support as a surrogate variable is supported by the work of Terry and colleagues (1995) who, using a causal model demonstrated, a statistically significant relationship between work-related social support and adoption of adaptive coping responses.

Leader behaviors represent the actions and attitudes taken by organizationally sanctioned leaders which help the unit to achieve stated goals and objectives. In the present model, leader behaviors are directed at the unit accomplishing the peacekeeping or humanitarian mission. Two forms of leader behaviors are of interest – directive and supportive (House, 1971; House, 1996). Directive leader behaviors are characterized as
giving explicit instructions to subordinates about what is expected of them and are assumed to minimize potential role ambiguity, aid in mission clarity, and set clear standards for mission accomplishment. Supportive leader behaviors, on the other hand, relate to the humane element of leader behaviors that attends to the emotional needs of soldiers. Supportive leader behavior is also characterized as an attitude that soldier well-being is a top priority to the leader. While supportive leader behaviors have been considered a secondary dimension of cohesion (Cota et al., 1995), it is proposed that the two leader behaviors described, represent a unique construct that serves to influence the extent that operational stress has on strain outcomes. This distinction is highlighted in the model of combat stress proposed by Gal and Jones (1995). Building on prior research, leader behaviors will be analyzed as a group-level antecedent variable to determine the extent to which leader behaviors moderate the relationship between individual perceptions and strain outcomes.

Another group-level variable considered to shape individual perceptions of operational stressors, and ultimately strain outcomes, is group cohesion. Marshall (1966) characterized cohesion as the group factor that “enables an infantry soldier to keep going with his weapons” (p. 42). In the conceptual model of operational stress, cohesion refers to the degree of social support provided by peers and the sense of interpersonal attraction between members in the unit. In congruence with social information processing theory, cohesive units are expected to exhibit a high degree of agreement, influence members to achieve similar attitudes and expectations for performance, and make group membership attractive to members within the group and for those wishing to become group members (Festinger et al., 1950). Cohesion, like the other social contextual variables, is expected to act as a moderator in the relationship between operational stressors and strain outcomes by providing a positive environment and establishing support systems to enable group members to adopt adaptive coping behaviors. Furthermore, in cohesive groups the social environment will serve to provide additional interpretations of operational stressors that seek to sustain group members in the face of chronic stressors. The inherent attractiveness and support provided within the cohesive group fosters collective attitudes, that as a group, the unit will succeed in mission objectives. This phenomenon has been referred to as collective efficacy and is the final group-level variable described in this study.

As mentioned, collective efficacy refers to the shared belief that individuals hold about their unit’s ability to perform the peacekeeping or humanitarian mission successfully. It has been demonstrated within the literature that teams and groups with high collective efficacy are successful in performing assigned tasks and that collective efficacy helps groups and teams perform in both routine and dynamic situations. Furthermore, as depicted in the conceptual model, it is proposed that collective efficacy serves as a moderating group-level phenomenon in the stress-strain relationship by enhancing individual and group performance, thereby reducing the potential of role ambiguity, perceived threats of personal danger, and concerns for family member well-being.
Hypotheses

Based upon the literature review and the conceptual model depicted in Figure 1, the following hypotheses are proposed:

**Hypothesis 1**

Perceived operational stress at mid-deployment will be positively related to psychological distress at post-deployment.

**Hypothesis 1a.** Perceived role ambiguity at mid-deployment will be positively related to psychological distress at post-deployment.

**Hypothesis 1b.** Concern for family well-being at mid-deployment will be positively related to psychological distress at post-deployment.

**Hypothesis 1c.** Perceived threat and personal danger at mid-deployment will be positively related to psychological distress at post-deployment.

**Hypothesis 2 – Leader Behavior as a Unit-Level Predictor**

Group level ratings of leader behavior measured at mid-deployment will moderate the relationship between operational stressors and psychological distress.

**Hypothesis 2a.** Perceived role ambiguity will be positively related to psychological distress only in companies where leaders are rated as low in directive and supportive behaviors. In contrast, in companies with leaders rated as high in directive and supportive behaviors there will be no relationship between perceived role ambiguity and psychological distress.

**Hypothesis 2b.** Concerns for family well-being will be positively related to psychological distress only in companies with leaders rated as low in directive and supportive behaviors. In contrast, in companies with leaders rated as high in directive and supportive behaviors there will be no relationship between family well-being concerns and psychological distress.

**Hypothesis 2c.** Perceived threat and personal danger will be positively related to psychological distress only in companies with leaders rated as low in directive and supportive behaviors. In contrast, in companies with leaders rated as high in directive and supportive behaviors there will be no relationship between perceived threat and personal danger and psychological distress.

**Hypothesis 3 – Cohesion as a Unit-Level Predictor**

Group-level unit cohesion measured at mid-deployment will moderate the relationship between operational stressors and psychological distress.

**Hypothesis 3a.** Perceived role ambiguity will be strongly related to psychological distress only in companies with low cohesion. In contrast, in companies with high cohesion there will be no relationship between perceived role ambiguity and psychological distress.

**Hypothesis 3b.** Concerns for family well-being will be positively related to psychological distress only in companies with low cohesion. In contrast, in companies with high cohesion there will be no relationship between family well-being concerns and psychological distress.

**Hypothesis 3c.** Perceived threat and personal danger will be positively related to psychological distress only in companies with low cohesion. In contrast, in companies...
with high cohesion there will be no relationship between perceived threat and personal danger and psychological distress.

**Hypothesis 4 – Collective Efficacy as a Unit-Level Predictor**

Group level collective efficacy measured at mid-deployment will moderate the relationship between operational stressors and psychological distress.

**Hypothesis 4a.** Perceived role ambiguity will be positively related to psychological distress only in companies with low collective efficacy. In contrast, in companies with high collective efficacy there will be no relationship between perceived role ambiguity and psychological distress.

**Hypothesis 4b.** Concerns for family well-being will be positively related to psychological distress only in companies with low collective efficacy. In contrast, in companies with high collective efficacy there will be no relationship between family well-being concerns and psychological distress.

**Hypothesis 4c.** Perceived threat and personal danger will be positively related to psychological distress only in companies with low collective efficacy. In contrast, in companies with high collective efficacy there will be no relationship between perceived threat and personal danger and psychological distress.
CHAPTER 3

METHODOLOGY

Introduction

This study attempts to answers the primary research question: “what are the effects of organizational social phenomenon on the relationship between individual military operational stress and well-being?” This study is based on secondary analyses of longitudinal data from a study conducted by research personnel assigned to the US Army Medical Research Unit – Europe (USAMRU-E) a subordinate unit to the Walter Reed Army Institute of Research (WRAIR). Data for the study were collected by USAMRU-E personnel and personnel assigned to the Office of the Inspector General of the 1st Infantry Division. Permission to use the database was provided by the Commanding Officer of WRAIR. The data were collected in three waves from active duty service-members assigned to units deployed in support of the NATO peacekeeping mission in Kosovo in the summer and fall of 1999. The three administrations of the survey were in concert with the three phases of the deployment cycle: pre-deployment, mid-deployment, and post-deployment (Department of the Army, 1992) and coincided with the deployment of personnel from the 1st Infantry Division, headquartered in Germany. Data from individuals who completed both the mid-deployment and post-deployment survey were used for this study. An overview of the original study is provided next as background information.

Background of The Original Study

The Kosovo Soldier Study is a longitudinal assessment of US service-members deployed in support of the NATO mission in Kosovo based upon a research protocol entitled A Human Dimensions Assessment of the Impact of OPTEMPO on the Forward Deployed Soldier (Castro et al., 1999). The Commanding General of the US Army Europe/Seventh Army initiated the study. Survey instruments were created and data collected by personnel assigned to USAMRU-E. The surveys were administered in three waves coinciding with the temporal phases of the deployment cycle from US Army personnel primarily assigned to the 1st Infantry Division, headquartered in Germany. All respondents were voluntary participants in the study. Following a brief NATO-led military air campaign the 1st Infantry Division was the primary combat division scheduled to deploy in support of a NATO peacekeeping mission to Kosovo to protect the province’s ethnic Albanian majority from Serbian repression. Data collected from personnel deployed to the Kosovo theater of operations are considered generally representative of US Army active-duty (i.e., not part of the US Army Reserves or Army
National Guard) organizations across such demographic characteristics as size, organizational structure, and military occupational specialties (MOSs). While not a panel study by design, the database is unique in that a subsample of respondents answered questionnaires during all three data collection periods \( (n = 186) \), additionally, another subsample provided data for the first two data collection periods \( (n = 178) \), the second and third data collection periods \( (n = 482) \), and the first and third data collection periods \( (n = 126) \). Respondents who completed the survey at both mid- and post-deployment were included in this study \( (n = 655) \). Finally, surveys were collected from soldiers belonging to 37 different companies or equivalent-sized organizations.

**Sampling**

**Mid-deployment survey**

US military personnel were administered surveys on-site in the Kosovo theater of operations during October, 1999, by two research personnel from USAMRU-E. The number of completed, usable surveys was 1,718 out of approximately 2,000 surveys distributed to unit leaders/representatives. However, specific response rates are indeterminate due to the sampling method (C.A. Castro, personal communication, March 25, 2002). The researchers sought to obtain a representative sample of approximately 7,000 US Army personnel deployed to the Kosovo theater of operations. To achieve this, research personnel traveled to the two primary base camps in Kosovo and numerous remote sites totaling over 20 survey sites. Surveys were distributed to unit leaders and personnel representatives with directions to distribute the surveys to soldiers in their command. Surveys were re-collected from the same unit leaders/personnel representatives. The Kosovo mid-deployment questionnaire is a multi-dimensional scale measuring individual perceptions of the unit social environment (i.e., operational readiness, cohesion, and leader behaviors), individual perceptions of deployment stressors (mission attitudes, potentially stressful peacekeeping events, and concerns for family well-being), and indices of emotional distress.

**Post-deployment survey**

Following the return of the deployed personnel from the six-month operation, US Army soldiers were surveyed again in their German-based garrison environment during February, 2000 (approximately one to two months after returning from the Kosovo theater). Surveys were distributed to the same units that were sampled during the mid-deployment survey with unit leaders making the individuals in their unit available to USAMRU-E research personnel in large groups. Personnel were solicited to participate voluntarily and approximately 2,000 surveys were distributed, with 1,215 returning usable surveys (C. A. Castro, personal communication, March, 25 2002). The Kosovo post-deployment survey assessed the same individual perceptions of the unit social environment, perceptions of deployment stressors and strain indicators.

**Instrumentation**

The *Kosovo Deployment Soldier Surveys* (Appendices A-G) were designed to be multi-dimensional surveys measuring a soldier’s experience of deployment stressors,
individual perceptions of unit combat readiness, degree of unit cohesion, perceptions of leader behaviors, and indicators of psychological distress. Pertinent demographic information was also collected to include, age, gender, ethnicity, educational level, marital status, number of children living at home, military rank, military unit and type (e.g., combat arms, combat support, combat service support), length of time in years served in the military, and length of time in months deployed.

For the purpose of this study, unit-level variables were created using individual scores aggregated at the unit (US Army Company) level to create group-level variables. Klein and colleagues (1994) suggested that aggregating individual scores to create group- or higher-level measures is acceptable when it is clear that items direct the respondents attention to the predicted level of theory. In this study, aggregated items directed the respondent to consider the unit the individual is assigned to. For conceptual clarity, the unit is defined as the soldier’s “company,” as companies are the lowest level of command in which the commanding officer retains judicial authority over the soldiers (Bliese & Castro, 2000; Jex & Bliese, 1999). A typical company is normally led by a captain (pay grade O-3) as the commanding officer, and a first sergeant (pay grade E-8) as the senior non-commissioned officer (NCO). Furthermore, a company is normally comprised of three or more subordinate platoons of soldiers with a platoon leader (officer) and platoon sergeant (NCO) as the leaders. Each platoon typically has three or more squad-sized elements with an NCO assigned as the squad leader.

**Individual-level Operational Stress Measures (Individual-level Predictors)**

Operational stress was measured using three scales to capture (a) role and mission ambiguity and relevance, (b) concerns for family coping capability, and (c) concerns for personal safety. All of the scales were created by researchers at WRAIR and, having been used in previous unpublished studies of deployed personnel, are thus considered to have face and content validity only. The measures were collected at the mid-deployment phase of the study and represent the contextual nature of stressor appraisal. These measures are described next.

**Mission Attitudes Scale (MAS).** The *Mission Attitudes Scale* is a 15-item scale designed to assess the extent to which individuals experienced mission ambiguity and perceived the mission as relevant to themselves and the primary mission of their unit. This scale reflects the definition of operational stress as described by Britt (1998). Respondents were asked to rate their level of agreement or disagreement with the scale items using a five-point Likert-type scale with scores ranging from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating a greater sense of mission ambiguity and mission irrelevancy. Composite scores for the scale were obtained by summing the values for each item to obtain a total score range of 15-75. Examples of items on the scale include, “I consider the role of ‘peacekeeper’ relevant to my military training (reverse scored),” “peacekeeping missions take the ‘fighting edge’ away from soldiers,” “good soldiers do what they are trained to do whether in combat or peacekeeping (reverse scored).” The Cronbach’s alpha for this study was estimated to be .84.

**Peacekeeping Events Scale (PES).** The *Peacekeeping Events Scale* is a 16-item measure designed to survey the extent of exposure to various events during the deployment that could be considered distressing or perceived as situations in which
individuals felt their safety was threatened. Respondents were asked to indicate, either “yes” (2) or “no” (1), if they were exposed to the potential events. This scale, developed by researchers at WRAIR, is considered to have both face and content validity. Sample items from the scale included, “witnessing an accident which resulted in serious injury or death,” “conflict between the warring factions,” “having to aid in the removal of human remains,” and “being shot at.” Total scores were obtained by adding the number of incidents to which the soldier was exposed with higher scores indicating exposure to a greater number of potentially distressing or threatening events (total score range 16-32).

In this study, Cronbach’s alpha for this scale was estimated to be .78.

Family Well-Being (FAM). Four-items were selected from a larger deployment stressor scale (nine items) which measured the extent to which individuals expressed concern for their family members, well-being. These four items were selected by conducting a factor analysis of the nine items in the deployment stressors scale. The factor analysis yielded three factors with an eigenvalue greater than one, that explained 62% of the variance of the total scale. The scale was re-estimated by applying an oblique rotation for the three factors. The four items, representing concerns for family well-being, all loaded on one dimension and explained 18% of the total variance of the deployment stressor scale. This scale was developed by researchers at WRAIR and is heavily context dependent upon the deployment environment and thus has only face and content validity. Respondents were asked to rate the extent to which different family concerns may have “troubled or concerned them” during the deployment. Response options on the six-point Likert-type scale were: 0 – does not apply, 1 – very low, 2 – low, 3 – medium, 4 – high, and 5 – very high. Total scores were obtained by summing the values for each item, with total scores ranging from 0-20. Higher scores on this scale indicate greater appraisal of distressing events. The four items included: “financial problems,” “arguments with my spouse,” “health problems of my family members,” and “rear detachment taking care of family members.” Cronbach’s alpha for this scale was estimated to be .70.

Individual-level Strain (Outcome) Measure – General Health Questionnaire

General Health Questionnaire (GHQ). The General Health Questionnaire is a 12-item standardized scale designed to measure non-psychotic psychological symptoms of distress (Goldberg & Hillier, 1979). The GHQ was administered to respondents at mid-deployment (GHQ1) and post-deployment (GHQ2). Respondents were asked to describe the frequency of experiencing different non-psychotic psychological symptoms of distress on a four-point scale ranging from: 1 – not at all, 2 – no more than usual, 3 – rather more than usual, and 4 – much more than usual. Total scores for this scale were obtained by summing the values for each item with total scores ranging from 12-48 with higher scores representing greater psychological distress. Discriminant validity threshold values, however, for the GHQ show wide variability and are thus inaccurate in assessing clinical cut-offs for severe psychological distress (Chapman, 2001; Van Hemert, Den Heijer, Vorstenbosch, & Bolk, 1995). Examples of questionnaire items include, “have you recently been unable to concentrate on whatever you’re doing,” “have you recently felt constantly under strain,” “have you recently been losing confidence in yourself,” and “have you recently been able to enjoy your normal day-to-day activities (reverse-scored item).” The scale is considered to be a valid measure of psychological distress in the
general population and has been used extensively. Reliability estimates for the scale range from .84 to .91 (McCabe, Thomas, Brazier, & Coleman, 1996). The scale also has been found to be a reliable and consistent measure of psychological distress over multiple applications (Pevalin, 2000). Cronbach’s alpha for this study was estimated to be .75

**Unit-Level Predictors**

As noted previously, the three unit-level predictors used in this study consisted of US Army Company mean scores for each measure created by aggregating individual-level data for each company. This strategy is in conjunction with those recommended by Klein and colleagues (1994) and utilized by researchers studying various contextual-level influences on such outcomes as violent crime (Sampson, Raudenbush, & Earls, 1997), drug use (Delva, Mathiesen, & Kamata, 2001), and psychological strain (Bliese & Britt, 2001; Bliese & Castro, 2000).

**Cohesion (COH).** Cohesion was previously operationally defined as peer support and interpersonal attraction. This definition is in concert with the one proposed by Manning (1994) and Manning and Fullerton (1988). Three items from the *Kosovo Soldier Surveys* were used to assess the individual perceptions of cohesion. These items are revised versions of a three-item cohesion scale developed by Podsakoff and MacKenzie (1994). The items included, “the members of my unit are cooperative with each other,” “the members of my unit know that they can depend on each other,” and “the members of my unit stand up for each other.” Respondents were asked to rate their level of agreement or disagreement for each question on a five-point Likert-type scale and were scored accordingly: 1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, and 5 – strongly agree with higher scores indicating higher degrees of perceived unit cohesion and social support. The original scale was validated in two separate studies with divergent populations. In the first study, 411 employees (professional, managerial and technical employees) from 10 different organizations were sampled. The second study was even more diverse with a sample drawn from a wide range of industries and organizational levels (Podsakoff & MacKenzie, 1994). Scores for the scale were obtained by adding the values for each item with total score values ranging from 3-15. The coefficient alpha for the three items, as a scale, ranged from .88 to .92 (Podsakoff & MacKenzie, 1994). The items are considered to have both discriminant and convergent validity. Cronbach’s alpha for this study was estimated to be .88.

**Leader Behaviors (LDR).** Leader behavior was previously operationally defined as both directive (i.e., initiating structure) and supportive behaviors (i.e., consideration) used to motivate subordinate soldiers to achieve the goals of peacekeeping operations as similarly defined by Bliese and Halverson (1996). The 12-items selected to assess leader behaviors were intended to quantify a soldier’s perception of both the degree of consideration and the initiating structure that are provided by either the soldier’s officers or non-commissioned officers (NCOs). The items designed to measure initiating structure included: “the officers (NCOs) in my unit establish clear work objectives,” “the officers (NCOs) in my unit avoid micromanaging soldier’s work,” and “the officers (NCOs) in my unit delegate work effectively.” The items designed to measure supportive behavior included: “the officers (NCOs) in my unit let soldiers know when they have done a good job,” “the officers (NCOs) in my unit are interested in my personal welfare,” and “the
officers (NCOs) in my unit are interested in what I think and how I feel about things.” Respondents rated their level of agreement or disagreement with each of the items on a five-point Likert-type scale with scores ranging from 1 (strongly disagree) to 5 (strongly agree) for each item with higher scores representing higher levels of leadership direction and support. Scores for this scale were obtained by summing the values for each item into a total score with values ranging from 12-60. These items exhibited good reliability properties in previous studies of US Army personnel. Cronbach alpha estimates for these studies ranged from .89 to .92 (Bliese & Halverson, 1996; Marlowe et al., 1985; Vaitkus, 1994). For this study, the Cronbach’s coefficient alpha was estimated to be .92.

**Collective Efficacy (CE).** Seven items were used to assess the degree to which individuals perceived their unit’s ability to perform military combat or peacekeeping missions successfully and the unit’s operational readiness, referred to herein as collective efficacy. Respondents were asked to rate their level of agreement or disagreement on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating a high degree of collective efficacy. Examples of items include “my company is ready for combat,” “I have real confidence in my unit’s ability to perform its mission,” “I think the level of training in this company is high,” and “I am confident in my unit’s mission essential-equipment.” These items were previously used by WRAIR personnel and the items have acceptable psychometric properties with Cronbach’s reliability estimates ranging from .79 to .83 (Jex & Bliese, 1999; Manning & Fullerton, 1988; Marlowe et al., 1985; Vaitkus, 1994). Total scores for this scale were obtained by summing the values for each item with total score values ranging from 7 to 35. The scale is considered to have good face and content validity. The Cronbach’s alpha for this study was estimated to be .93.

**Analysis Strategy**

**Introduction to Multilevel Analysis**

The Kosovo Soldier Study purposefully collected surveys from individuals in naturally occurring clusters (i.e., the military unit) producing a hierarchical structure of the data. More specifically individual soldiers are considered nested within their military unit. Such a hierarchical structure poses certain problems with standard ordinary least squares (OLS) regression models, namely a violation of the assumption of independence of observations. Such a violation occurs in hierarchical data structures because the values observed at the individual level share values at the military unit level.

Two less than optimal analysis strategies could be employed to analyze the data. First, the non-independence at the individual level could be ignored and univariate regression models could be estimated on the individual-level variables. However, this method yields underestimated standard errors for the regression coefficients and thus increases the likelihood of committing a type I error. The other possible sub-optimal analysis strategy is to aggregate the individual-level variables to the unit or organizational level. However, this strategy results in the loss of potentially valuable individual information (Raudenbush & Bryk, 2002). Therefore, any analysis strategy proposed should be able to determine the effects of unit-level variables on individual-level outcomes within the context of the organization.
Often referred to as random coefficient models, or hierarchical linear models (HLM), multilevel models provide the flexibility and analytical properties to analyze complex data structures in which individuals are considered to be nested within organizations and variables are gathered at both the individual and organizational level. Hierarchical linear models correct the problem of underestimated standard errors by permitting the analyst to incorporate into the statistical model a unique random effect for each organizational unit. For this study, hierarchical modeling was employed to test the proposed hypotheses (Raudenbush & Bryk, 2002). The steps associated with the estimation and analysis of hierarchical linear models will be reviewed following (a) a basic overview of HLM analysis and (b) the model used to test the proposed hypotheses.

**Hierarchical Linear Models: An overview.** Hierarchical linear models extend the simple linear model assumed under OLS to account for the dependency of the error occurring when data are nested within a second, higher-order group. In this case, data from individual soldiers are considered to be nested within the context of the soldier’s military unit such that the values obtained from each individual may be dependent upon the contextual environment (i.e., US Army company). When this occurs, the intercept and slope coefficients normally estimated using OLS analysis may vary as a result of group membership. Therefore, HLM analysis allows the analyst to incorporate group, or higher-level predictors of individual outcome scores, providing more accurate point estimates and standard errors. As is common in organizational research, two-level models are developed to test the extent to which organizational attributes affect individual outcomes (Raudenbush & Bryk, 2002). For illustrative purposes, the level-one model (sometimes referred to as the individual, or within-groups model) with one predictor (X$_{ij}$) is denoted as:

\[ Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + r_{ij} \]  

Where each person’s score on the outcome variable (Y$_{ij}$) in group j (j = 1…j groups) is a function of individual characteristics (X$_{ij}$). In addition, β$_{0j}$, β$_{1j}$ are corresponding level-one intercept and slope coefficients for each group (fixed effects), and r$_{ij}$ is the unique effect (random effect) associated with person i that is assumed to be normally distributed with a mean of zero and variance $\sigma^2$. Hierarchical linear models assume that each group has a unique intercept and slope coefficient and thus the intercept and slope values are a function of group membership. Consequently, when intercepts and slopes exhibit between group variability, empirical evidence exists for the analyst to propose and develop models that will more accurately predict β$_{0j}$, and β$_{1j}$. More specifically, a second-level, or level-two model can be developed using characteristics of the organization (e.g., cohesion, leader behaviors, collective efficacy) to predict the individual-level model regression coefficients. For example, the level-two model (group model) with one group-level predictor (W$_j$) and a randomly varying intercept (β$_{0j}$) and slope coefficient (β$_{1j}$) has the form

\[ \beta_{0j} = \gamma_{00} + \gamma_{01}W_j + u_{0j} \]  
\[ \beta_{1j} = \gamma_{10} + \gamma_{11}W_j + u_{1j} \]
Equation 3.2 models the effect of each group $j$ on the group mean score of the outcome (Y) while holding the group effect $W_j$ constant, with $u_{0j}$ representing the unique (random) effect of group $j$. Equation 3.3 is representative of a randomly varying effect of group $j$ on the group slope coefficient while holding the group effect $W_j$ constant, with $u_{1j}$ representing the unique (random) effect of group $j$. Equation 3.3 can also be modeled with the slope ($\beta_{1j}$) representing a fixed effect such that only the intercept (average score across the organizations on the outcome variable) of the level-one model is assumed to vary at the group-level. The fixed effect model is depicted as

$$\beta_{1j} = \gamma_{10} \quad (3.4)$$

In the level-two model, $u_{0j}$, $u_{1j}$ are assumed to have a mean value of zero, constant variance ($\tau_{qq}$, or tau), and the cov ($u_{0j}$, $r_{ij}$) = cov ($u_{1j}$, $r_{ij}$) = 0. In addition, since the intercept and slope in the level-one model become the outcomes in the level-two model, the interpretation of these outcomes is dependent upon the location of the level-one predictor variables, referred to as centering.

The centering strategy determines how the level-one intercept and slope coefficients are interpreted. Two strategies are most common in the organizational literature – grand-mean centering and group-mean centering. Grand-mean centering yields intercepts that can be interpreted as the adjusted mean value for the outcome for group $j$ such that $\beta_{0j} = \mu_Y - \beta_{1j}(\bar{X}_j - \bar{X}_..)$. Grand mean centering is used when the researcher hopes to account for the effect of the individual-level variables in the group-level model (Hofmann & Gavin, 1998; Kreft, De Leeuw, & Aiken, 1995). Group-mean centering, on the other hand, yields intercept values that can be interpreted as the mean value for group $j$, such that $\beta_{0j} = \mu_{Yj}$, representing the unadjusted mean for group $j$. Similarly, $\text{Var}(\beta_{0j})$ is the variance among either the adjusted or unadjusted level-two group means.

**Proposed Model:** This study utilized a two-level hierarchical model with grand-mean centering at the individual level which allows for testing the proposed hypotheses. The apriori level-one (individual-level) model has the form,

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{MAS}) + \beta_{2j}(\text{FAM}) + \beta_{3j}(\text{PES}) + \beta_{4j}(\text{GHQ}_1) + \beta_{5j}(\text{AGE}) + r_{ij} \quad (3.5)$$

where $Y_{ij}$ is the value of the GHQ2 at post-deployment for individual $i$ in group $j$. The outcome variable measured at mid-deployment (GHQ1) is included in the individual level model as a covariate to account for any variability in the outcome due solely to mid-deployment levels of psychological distress. In addition, previous studies have indicated that stress and strain measures with military populations are inversely related to the age of the individual soldier (Arincorayan, 2000). Therefore, the variable AGE (years) is introduced and controlled for in the individual-level model. Finally, the individual-level model, as proposed, is necessary to counter arguments that “effects from groupings at a higher level are no more than artifacts of poorly specified individual-level models” (Garner & Raudenbush, 1991, p. 252).
The level-two (unit-level) model is associated with the primary research question and seeks to test the common effect of the organization-level variables on the strain outcomes and the moderating effect of the organization characteristics in the stress-strain relationship, sometimes referred to as cross-level interactions (Bliese, 2002; Hofmann & Gavin, 1998). The level-two model, or slopes and intercepts as outcomes model (Bryk & Raudenbush, 1992), tests the antecedent effects of group cohesion, collective efficacy, and leadership on strain outcomes and stressor appraisal while controlling for the individual-level variables (Equation 3.5). Due to sample size constraints, the level-two model will be estimated three times, once for each organizational variable. Therefore, the unit-level model is proposed as

\[ \beta_{0j} = \gamma_{00} + \gamma_{01}W_j + u_{0j} \]  
\[ \beta_{1j} = \gamma_{10} + \gamma_{11}W_j + u_{1j} \]  
\[ \beta_{2j} = \gamma_{20} + \gamma_{21}W_j + u_{2j} \]  
\[ \beta_{3j} = \gamma_{30} + \gamma_{31}W_j + u_{3j} \]  
\[ \beta_{4j} = \gamma_{40} \]  
\[ \beta_{5j} = \gamma_{50} \]  

whereby in equation 3.6a the unit-level predictors collected at mid-deployment will be analyzed to determine the extent to which unit factors effect the adjusted within-company mean strain values and is analogous to a two-way analysis of covariance (ANCOVA) model. Equations 3.6b – 3.6d predict the adjusted within-company slope coefficients for the stressor-strain relationship for each group and the gamma (\( \gamma_{11}, \gamma_{21}, \gamma_{31} \)) coefficients will determine the extent to which the characteristics of the organization moderate the stressor-strain relationship. Finally, equations 3.6e and 3.6f are considered fixed effects for each company.

Raudenbush and Bryk (2002) and others (Bliese, 2002; Hofmann & Gavin, 1998), however, have demonstrated that grand-mean centering does not provide an unbiased estimate of the pooled-within-group slope (\( \gamma_{00} \)), but in certain occasions yields a mix of the within-group slope and between-group slope. Furthermore, Hofmann and Gavin (1998) demonstrated that when testing for cross-level moderating effects (\( \gamma_{21} \)) the gamma coefficient can also be a confound of both the moderation of the within-group slope by the group-level variable [i.e., \((X_{ij} - X_j)W_j\)] and the between-group interaction (i.e., \(X_j*W_j\)). Therefore, they proposed that in cases where cross-level interactions are observed or proposed, that to obtain an accurate estimation of the interaction, the model should be estimated using group-mean centering. Furthermore, group-mean aggregated individual-level variables should be re-introduced into the level-two intercept model to control for the effect of the individual-level variables in the group-level model. Lastly, a between groups interaction variable (i.e., \(X_j*W_j\)) should be introduced as a predictor in the group-level intercept model (i.e., \(\beta_{0j}\)).

**Relationship Between Proposed Model and Study Hypotheses**

Three HLM models were estimated to examine the extent to which characteristics of the soldier’s company (measured at mid-deployment) affect psychological distress.
(measured at post-deployment) and the extent to which company characteristics interact with or moderate the stress-strain relationship at the individual level. Table 1 provides a brief overview of each of the HLM models.

**Hypothesis 1 – Individual-Level Predictors**

Perceived operational stress at mid-deployment will be related to psychological distress at post-deployment. The regression coefficients derived from the individual-level model (Equation 3.5) will test the direct relationship between stressor appraisal indices and strain indices while controlling for all other individual level variables.

**Table 1.**

<table>
<thead>
<tr>
<th>Model #</th>
<th>Individual-level Variables (mid-deployment)</th>
<th>Unit-level Variables (mid-deployment)</th>
<th>Outcome Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAS, FAM, PES, GHQ1, AGE</td>
<td>LDR</td>
<td>GHQ2</td>
</tr>
<tr>
<td>2</td>
<td>MAS, FAM, PES, GHQ1, AGE</td>
<td>COH</td>
<td>GHQ2</td>
</tr>
<tr>
<td>3</td>
<td>MAS, FAM, PES, GHQ1, AGE</td>
<td>CE</td>
<td>GHQ2</td>
</tr>
</tbody>
</table>

**Hypothesis 1a.** Perceived role ambiguity at mid-deployment will be positively related to psychological distress at post-deployment ($\gamma_{10}$).

**Hypothesis 1b.** Concern for family well-being at mid-deployment will be positively related to psychological distress at post-deployment ($\gamma_{20}$).

**Hypothesis 1c.** Perceived threat and personal danger at mid-deployment will be positively related to psychological distress at post-deployment ($\gamma_{30}$).

**Hypothesis 2 – Leader Behavior as a Unit-Level Predictor**

Group level ratings of leader behavior measured at mid-deployment will moderate the relationship between operational stressors and psychological distress. This hypothesis is formally tested by examining the regression coefficients $\gamma_{11}$, $\gamma_{21}$, and $\gamma_{31}$, of the unit-level model (Equations 3.6a – 3.6d) and is represented as Model 1 in Table 1.

**Hypothesis 2a.** Perceived role ambiguity will be positively related to psychological distress only in companies with leaders rated as low in directive and supportive behaviors. In contrast, in companies with leaders rated as high in directive and supportive behaviors there will be no relationship between perceived role ambiguity and psychological distress ($\gamma_{11}$).

**Hypothesis 2b.** Concerns for family well-being will be positively related to psychological distress only in companies with leaders rated as low in directive and supportive behaviors. In contrast, in companies with leaders rated as high in directive and supportive behaviors there will be no relationship between family well-being concerns and psychological distress ($\gamma_{21}$).

**Hypothesis 2c.** Perceived threat and personal danger will be positively related to psychological distress only in companies with leaders rated as low in directive and
supportive behaviors. In contrast, in companies with leaders rated as high in directive and supportive behaviors there will be no relationship between perceived threat and personal danger and psychological distress ($\gamma_{31}$).

**Hypothesis 3 – Cohesion as a Unit-Level Predictor**

Group level unit cohesion measured at mid-deployment will moderate the relationship between operational stressors and psychological distress. This hypothesis is formally tested by examining the regression coefficients $\gamma_{11}$, $\gamma_{21}$, and $\gamma_{31}$, of the unit-level model (Equations 3.6a – 3.6d) and is represented as Model 2 in Table 1.

**Hypothesis 3a.** Perceived role ambiguity will be positively related to psychological distress only in companies with low cohesion. In contrast, in companies with high cohesion there will be no relationship between perceived role ambiguity and psychological distress ($\gamma_{11}$).

**Hypothesis 3b.** Concerns for family well-being will be positively related to psychological distress only in companies with low cohesion. In contrast, in companies with high cohesion there will be no relationship between family well-being concerns and psychological distress ($\gamma_{21}$).

**Hypothesis 3c.** Perceived threat and personal danger will be positively related to psychological distress only in companies with low cohesion. In contrast, in companies with high cohesion there will be no relationship between perceived threat and personal danger and psychological distress ($\gamma_{31}$).

**Hypothesis 4 – Collective Efficacy as a Unit-Level Predictor**

Group level collective efficacy measured at mid-deployment will moderate the relationship between operational stressors and psychological distress. This hypothesis is formally tested by examining the regression coefficients $\gamma_{11}$, $\gamma_{21}$, and $\gamma_{31}$, of the unit-level model (Equations 3.6a – 3.6d) and is graphically represented as Model 3 in Table 1.

**Hypothesis 4a.** Perceived role ambiguity will be positively related to psychological distress only in companies with low collective efficacy. In contrast, in companies with high collective efficacy there will be no relationship between perceived role ambiguity and psychological distress ($\gamma_{11}$).

**Hypothesis 4b.** Concerns for family well-being will be positively related to psychological distress only in companies with low collective efficacy. In contrast, in companies with high collective efficacy there will be no relationship between family well-being concerns and psychological distress ($\gamma_{21}$).

**Hypothesis 4c.** Perceived threat and personal danger will be positively related to psychological distress only in companies with low collective efficacy. In contrast, in companies with high collective efficacy there will be no relationship between perceived threat and personal danger and psychological distress ($\gamma_{31}$).

**Estimation and Evaluation of the Model**

The hierarchical linear model (Equations 3.5 and 3.6a-e) will be simultaneously estimated using HLM for Windows, version 5.04 (Raudenbush, Bryk, Cheong, & Congdon, 2000). Parsimonious model building is achieved by evaluating the extent of random variation at each level prior to introducing predictors at the next level, rather than estimating a completely saturated model with all predictors at all levels and random variation for the intercept and the slopes within the level-two model (Raudenbush &
This strategy, therefore, involves a step-up approach. More specifically prior to introducing unit-level predictors (i.e., W’s) there should be sufficient variability with the outcome of interest as indicated by the variance of the residual term (\(u_{0j}\)). Therefore, model estimation involved four primary steps.

1. The first step involved estimating the unconditional model, which involves estimating both level one and level two models without any predictor variables (\(\beta_{q}\) and \(\gamma_{q}\)). This step served to identify the extent to which the outcome variable (GHQ₂) varied across groups. If sufficient variability was observed, then model building proceeded.

2. Step two involved introducing level one predictors of the outcome variable. Referred to as a random coefficient regression model, this step determined the extent to which \(X_{ij}\) is statistically significant in predicting the outcome variable and determine if there is sufficient slope heterogeneity [i.e., \(\text{Var}(\beta_{q}) > 0\)]. The random coefficient regression model determined which level-one predictors to retain and which to discard. Raudenbush and Bryk (2002) recommend that to delete a level-one predictor two conditions must be met. First, there must be no statistical evidence of slope heterogeneity and, second, no statistical evidence of an “average” or “fixed effect” (p. 258) such that the \(t\)-ratio would be nonsignificant and the magnitude of the regression coefficient (\(\gamma_{q0}\)) is small.

3. Given that apriori cross-level interactions are posited, and following the guidance of Snijders & Bosker (2000), the full level model was estimated whereby both the intercept and the slopes of the level-one model were estimated as randomly varying. In addition, group-level predictors of the slopes and intercept were also included in this estimation (Equations 3.5 and 3.6a-3.6d). Any cross-level interactions observed in this step were cross-validated using the group-mean centering strategy previously described.

**Summary**

This study attempts to answer the primary research question, “what are the effects of organizational social phenomenon on the relationship between individual military operational stress and well-being?” This study is based on secondary analyses of longitudinal data from the Kosovo Soldier Study conducted by research personnel assigned to the US Army Medical Research Unit – Europe (USAMRU-E), a subordinate unit to the Walter Reed Army Institute of Research (WRAIR). Survey data collected from 655 soldiers assigned to over 35 US Army companies deployed to the Kosovo theater of operations in support of a NATO-led peacekeeping mission in the Balkans were used for this study and were analyzed using HLM, version 5.04 (Raudenbush et al., 2000) to test a multi-level model of operational stress.
CHAPTER 4

FINDINGS

Introduction

Survey responses from soldiers deployed to a NATO-led peacekeeping operation in Kosovo during the summer/fall of 1999 were used to examine the effects of organizational social phenomenon on the relationship between individual military operational stress and well-being. Data were collected at mid-deployment and post-deployment. The data were provided in two different data sets representing each time period. The data were merged using the Statistical Package for Social Sciences (SPSS Inc., 2001) by matching social security numbers collected at each data period. In addition to the study scales previously mentioned, pertinent demographic data were also collected from each respondent. Furthermore, respondents provided information regarding their US Army Company of assignment so that individual responses to the organizational characteristic variables could be aggregated into group-level variables.

The data were analyzed using SPSS software and the hierarchical model was estimated using HLM (version 5.04, Raudenbush et al., 2000) software. This section will present an overview of the characteristics of the study sample, characteristics of the study instruments and conclude with the presentation of the results of the hypothesis steps based upon the hierarchical model estimation procedure outlined in the last chapter.

Demographic Characteristics

The sample consisted of 655 personnel assigned to 37 US Army companies. Only those who completed all scales were used, reducing the sample to 546 individuals. A graphical representation of the demographic characteristics of respondents is depicted in Table 2. The average respondent was 25.7 years old ($sd = 5.49$), with just over five years of service in the US Army ($mean = 5.3, sd = 4.53$). Most respondents described themselves as males (92.5%) and white (60.3%). People of African American descent were the next largest respondents (20.9%), followed by Hispanic (9.7%), Other (6.3%), and Asian descent (2.8%). Junior enlisted soldiers (i.e., pay grade E1-E4) represented the majority of respondents (60.5%), followed by non-commissioned officers (28.9%), senior non-commissioned officers (4.1%), officers (5.6%), and warrant officers (1%). Over 53% of the participants were married with another 39.2% describing themselves as single (never married). Respondents who described themselves as divorced represented 4.8% of the sample, followed by separated (2.2%), and widowed (0.2%).

To assess the representativeness of the sample used and not used, $t$-tests were conducted on the model variables to determine if the sample used differed significantly
Table 2.

Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>25.7</td>
<td>5.49</td>
</tr>
<tr>
<td>Number of Years Military Service</td>
<td>5.3</td>
<td>4.53</td>
</tr>
<tr>
<td>Number of Months Deployed</td>
<td>3.3</td>
<td>1.34</td>
</tr>
<tr>
<td>Total Number of Months Served in Balkans</td>
<td>6.89</td>
<td>3.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>505</td>
<td>92.5</td>
</tr>
<tr>
<td>Females</td>
<td>41</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>323</td>
<td>60.3</td>
</tr>
<tr>
<td>African American</td>
<td>112</td>
<td>20.9</td>
</tr>
<tr>
<td>Hispanic</td>
<td>52</td>
<td>9.7</td>
</tr>
<tr>
<td>Asian</td>
<td>15</td>
<td>2.8</td>
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<tr>
<td>Other</td>
<td>34</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Rank

<table>
<thead>
<tr>
<th>Rank</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Enlisted (E1-E4)</td>
<td>325</td>
<td>60.5</td>
</tr>
<tr>
<td>NCO (E5-E6)</td>
<td>154</td>
<td>28.9</td>
</tr>
<tr>
<td>Senior NCO (E7-E9)</td>
<td>22</td>
<td>4.1</td>
</tr>
<tr>
<td>Warrant Officer (WO1-WO5)</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Officer</td>
<td>30</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Education

<table>
<thead>
<tr>
<th>Education</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than HS Graduate</td>
<td>12</td>
<td>2.2</td>
</tr>
<tr>
<td>HS Graduate/GED</td>
<td>260</td>
<td>47.7</td>
</tr>
<tr>
<td>Some College</td>
<td>225</td>
<td>41.5</td>
</tr>
<tr>
<td>Bachelor’s Degree/Graduate Degree</td>
<td>47</td>
<td>8.6</td>
</tr>
</tbody>
</table>
Table 2--continued

Demographic Characteristics

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single (never married)</td>
<td>214</td>
<td>39.2</td>
</tr>
<tr>
<td>Married</td>
<td>292</td>
<td>53.7</td>
</tr>
<tr>
<td>Separated</td>
<td>12</td>
<td>2.2</td>
</tr>
<tr>
<td>Divorced</td>
<td>26</td>
<td>4.8</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Note. N=546 individuals and 37 US Army Company Sized Units

from the respondents not used. Criteria for not selecting individual respondents for this study were either (a) not completing surveys both time periods or (b) missing data on one of the variables. Thus, the $t$-tests assessed if the sample used in this study was representative of the larger sample of soldiers who completed the Kosovo Soldier Study at either mid-deployment or post-deployment. Results of the $t$-tests indicate that the sample of respondents who were not used were older than the sample used and this age difference was statistically significant ($t(1524) = -4.422, p < .001$). There were no other statistically significant differences observed between the sample used and those not used on the other study variables (i.e., MAS, FAM, PES, GHQ$_1$, and GHQ$_2$). Furthermore, the two samples were compared on pertinent nominal demographic characteristics using the chi-square test statistic. The results of these comparisons also yielded no statistically significant differences across demographic characteristics between those in the study and those not in the study.

Instrument Characteristics

Individual and group-level variables were used to test the hypotheses introduced in Chapter 2. Each of the variables was collected from individual respondents with the group-level variables determined by aggregating individual scores into group mean averages based upon the US Army Company to which the individual was assigned. Characteristics of the individual-level variables are graphically depicted in Table 3.

As depicted in Table 3, preliminary analysis of the individual level variables indicated that two predictor variables (PES & AGE) were not correlated with the outcome variable (GHQ$_2$). Otherwise, all statistically significant correlation coefficients were in the expected direction.
Table 3

**Individual Level Variables: Mean, SD, Intercorrelations, & Reliability Estimates**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>sd</th>
<th>MAS</th>
<th>PES</th>
<th>FAM</th>
<th>GHQ₁</th>
<th>AGE</th>
<th>GHQ₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS</td>
<td>44.72</td>
<td>8.72</td>
<td>(0.84)</td>
<td>.199*</td>
<td>.185*</td>
<td>.311*</td>
<td>-.027</td>
<td>.244*</td>
</tr>
<tr>
<td>PES</td>
<td>19.51</td>
<td>2.97</td>
<td>(0.78)</td>
<td>.045</td>
<td>.118*</td>
<td>.001</td>
<td>.018</td>
<td></td>
</tr>
<tr>
<td>FAM</td>
<td>7.04</td>
<td>4.18</td>
<td>(0.70)</td>
<td>.213*</td>
<td>.115*</td>
<td>.140*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHQ₁</td>
<td>28.35</td>
<td>4.58</td>
<td>(0.75)</td>
<td>-.087*</td>
<td>.397*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>25.73</td>
<td>5.49</td>
<td>(NA)</td>
<td>-.043</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHQ₂</td>
<td>28.35</td>
<td>4.15</td>
<td>(0.75)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* N=546, Cronbach’s alpha reliability estimate in parentheses.

MAS = Mission Attitude Scale, PES = Peacekeeping Events Scale, FAM = Concern for Family Well-being Scale, GHQ₁ = General Health Questionnaire Mid-deployment, GHQ₂ = General Health Questionnaire Post-deployment, AGE = Age in years.

*p<.05.

Group-level variables were measured at the individual level and aggregated at the soldier’s respective US Army Company to create group-level ratings of the organizational characteristics of interest. The characteristics of the group-level scales are presented in Table 4. Preliminary analysis of the group-level variables indicated that the group level relationships were statistically significant and in the expected direction.

Table 4

**Group Level Variables: Mean, SD, Intercorrelations & Reliability Estimates**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>sd</th>
<th>LDR</th>
<th>COH</th>
<th>CE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDR</td>
<td>37.86</td>
<td>3.29</td>
<td>(0.92)</td>
<td>.700*</td>
<td>.603*</td>
</tr>
<tr>
<td>COH</td>
<td>9.56</td>
<td>1.05</td>
<td>(0.88)</td>
<td>.730*</td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>23.32</td>
<td>2.49</td>
<td>(0.93)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* N=37, Cronbach’s alpha reliability estimate in parentheses.

LDR = Leader Behavior Scale, COH = Unit Cohesion Scale, CE = Collective Efficacy Scale.

*p<.05
HLM Analysis

As described in the previous section, the HLM analysis involves three steps. First an unconditional model is estimated to determine if there is sufficient variability in the outcome measure across groups. Second, a random coefficient regression model is estimated to determine the most parsimonious individual-level model. Finally, the hypotheses are tested using a slopes and intercepts as outcomes model depicted by equations 3.5 and 3.6a – 3.6e. This strategy is in line with hierarchical modeling strategies proposed by Raudenbush and Bryk (2002) and Snijders and Bosker (2000). Lastly, the predictor variables were grand-mean centered in concert with recommendations by Bliese (2002), Hofmann and Gavin (1998) and Raudenbush and Bryk (2002).

Step 1: Unconditional Model

The first model estimated was the unconditional model used to determine if sufficient variability is observed in the outcome variable across the different US Army Companies. Results of the unconditional model are graphically depicted in Table 5. The unconditional model has the form,

\[
\text{Individual-level} \quad \text{GHQ}_2 = \beta_{0j} + r_{ij} \quad (4.1)
\]

\[
\text{Group-level} \quad \beta_{0j} = \gamma_{00} + u_{0j} \quad (4.2)
\]

As is depicted in Table 5, the variance component, \(\tau_{00}\), of the group-level model residual \((u_{0j})\) indicates that there is statistical evidence of between-group variability for \(\text{GHQ}_2\) \((\chi^2(36) = 65.94, p = .002)\). In other words, there was sufficient variability of the mean outcome measure across groups to warrant continuation of the hierarchical model building process. The intraclass correlation coefficient (ICC) for the unconditional model is .02, which indicates that approximately 2% of the total variance in scores on the

Table 5

| Unconditional Hierarchical Model for Post-Deployment GHQ values (GHQ2) |
|------------------|-----------------|-------|-----------------|
| **Fixed Effect** | **Coefficient** | **se** | **t-ratio**     |
| GHQ2 Mean (\(\gamma_{00}\)) | 28.344 | 0.208 | 135.95*         |

<table>
<thead>
<tr>
<th>Random Effect</th>
<th>Variance Component</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHQ2 Mean ((u_{0j}))</td>
<td>0.253</td>
<td>36</td>
<td>65.94</td>
<td>.002</td>
</tr>
</tbody>
</table>

Note: *\(p<.05\)
General Health Questionnaire at post-deployment is explained by group membership. The variability of the post-deployment GHQ scores can also be examined by calculating a plausible values range (Raudenbush & Bryk, 2002, p. 71). Thus it can be expected that approximately 95% of the Company mean scores on the post-deployment GHQ would range between 29.33 and 27.36. In summary, while the unconditional model appears to demonstrate that a relatively small percentage of the variance in GHQ scores resided between groups, this variance was statistically significant and, therefore, provides a basis for examining both individual-level and group-level predictors of GHQ.

**Step 2: Random Coefficient Regression Model**

The random coefficient regression model provides a test of Hypothesis 1a – 1c and is distinguished by estimating a model with random slopes for all individual-level predictors and no group-level predictors. Results of the random coefficient regression model are displayed in Table 6 on the following page.

The results of the random coefficient regression model identified three variables (FAM, PES, and AGE) that were considered for deletion based upon criteria established by Raudenbush and Bryk (2002). The decision to omit level-1 predictors (viz., FAM, PES, and AGE) is based upon a lack of a statistically significant t-ratio test statistic for each of the regression coefficients and a lack of between-groups variability (Var[βj] = 0) as indicated by the lack of statistical significance of the variance component (τ22, τ33, and τ55). The findings from the random coefficient regression model provide empirical evidence to support hypothesis 1a. However, there does not appear to be a statistically significant relationship to support hypotheses 1b and 1c. Specifically, psychological distress was related neither to the soldiers’ concern for their family’s well-being nor to exposure to potentially traumatic events. The results of the initial random coefficient regression model, depicted in Table 6, leads to a rejection of hypothesis 2b, 3b and 4b, all of which were related to the moderating effects of group perceptions of leader behaviors, cohesion, and collective efficacy on the relationship between concerns for family well-being and psychological distress. Similarly, hypotheses 2c, 3c and 4c were also rejected since they were related to the moderating effects of leader behaviors, cohesion, and collective efficacy on the relationship between exposure to potentially traumatic events and psychological distress. Hence, the variables FAM and PES were omitted from the final model.

A reduced random coefficient regression model was re-estimated with the variables FAM, PES, and AGE omitted, yielding a statistically significant slope coefficient for the MAS scale ($γ_{10} = 0.07$, SE = 0.03, $t(36) = 2.47, p = .02$) and the GHQ scale ($γ_{40} = 0.32$, SE = 0.04, $t(36) = 8.05, p < .001$). This model also yielded a proportion of individual-level (within-groups) variance explained to be 18.75%. In other words, by introducing the two predictors (MAS and GHQ1) into the model, almost 19% of the individual variance in the outcome measure is explained by the individual-level predictors. However, the chi-square test statistic of the respective variance components for the reduced random coefficient regression model ($τ_{00}$, $τ_{11}$, and $τ_{44}$) resulted in $p$-values greater than 0.05, indicating that, after including individual-level predictors, the within-group slopes did not vary significantly across groups, thus indicating a non-random slope.
<table>
<thead>
<tr>
<th>Fixed Effect</th>
<th>Coefficient</th>
<th>se</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHQ₂ Mean ($\gamma_{00}$)</td>
<td>28.292</td>
<td>0.171</td>
<td>165.30*</td>
</tr>
<tr>
<td>MAS Slope ($\gamma_{10}$)</td>
<td>0.080</td>
<td>0.030</td>
<td>2.714*</td>
</tr>
<tr>
<td>FAM Slope ($\gamma_{20}$)</td>
<td>0.065</td>
<td>0.044</td>
<td>1.463</td>
</tr>
<tr>
<td>PES Slope ($\gamma_{30}$)</td>
<td>-0.103</td>
<td>0.068</td>
<td>-1.532</td>
</tr>
<tr>
<td>GHQ₁ Slope ($\gamma_{40}$)</td>
<td>0.284</td>
<td>0.040</td>
<td>7.052*</td>
</tr>
<tr>
<td>AGE Slope ($\gamma_{50}$)</td>
<td>-0.025</td>
<td>0.035</td>
<td>-0.703</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Random Effect</th>
<th>Variance Component</th>
<th>df</th>
<th>Chi-square</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHQ₂ Mean ($u_{0j}$)</td>
<td>0.091</td>
<td>22</td>
<td>11.942</td>
<td>&gt;.50</td>
</tr>
<tr>
<td>MAS Slope ($u_{1j}$)</td>
<td>0.012</td>
<td>22</td>
<td>20.194</td>
<td>&gt;.50</td>
</tr>
<tr>
<td>FAM Slope ($u_{2j}$)</td>
<td>0.009</td>
<td>22</td>
<td>14.012</td>
<td>&gt;.50</td>
</tr>
<tr>
<td>PES Slope ($u_{3j}$)</td>
<td>0.040</td>
<td>22</td>
<td>12.766</td>
<td>&gt;.50</td>
</tr>
<tr>
<td>GHQ₁ Slope ($u_{4j}$)</td>
<td>0.004</td>
<td>22</td>
<td>12.653</td>
<td>&gt;.50</td>
</tr>
<tr>
<td>AGE Slope ($u_{5j}$)</td>
<td>0.008</td>
<td>22</td>
<td>14.615</td>
<td>&gt;.50</td>
</tr>
<tr>
<td>Sigma Squared ($r_{ij}$)</td>
<td>13.247</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Chi-square statistics are based on only 23 of 37 units that had sufficient data for computation. Fixed effects and variance components are based on all the data. *$p<.05$
However, Snijders and Bosker (2000) argued, “this filter should not be employed as a strict rule” (p. 96) if there are theoretical reasons to consider cross-level interactions. Therefore, the remainder of the hypotheses (2a, 3a, and 4a) were tested regarding group-level predictors (COH, CE, and LDR) of the relationship between role ambiguity (MAS scores) and psychological distress (GHQ2 values) after controlling for mid-deployment GHQ1 values. To partial out the effects of mid-deployment psychological distress (GHQ1) requires that the models be estimated using a grand-mean centering strategy and making the regression coefficient for mid-deployment psychological distress a fixed coefficient (i.e., Equation 3.7).

**Leader Behavior as a Unit-Level Predictor**

Leader behavior was characterized as the extent to which soldiers believed their leaders (both officer and NCO) demonstrated appropriate directive and supportive behaviors. It is assumed that soldiers perceive their leaders in a homogenous manner to allow for aggregation of individual perceptions into a group-level variable. Since the conceptual model and the relevant hypotheses predicted cross-level interactions of group characteristics on the individual stressor-strain relationships, the hierarchical model was estimated with random slope effects and group level predictors of both the intercept and the slope regression coefficient, as depicted in equations 3.5 and 3.6a. The results of the hierarchical model for leader behavior are displayed in Table 7 on the following page.

The results indicate preliminary empirical support for hypothesis 2a, whereby between different US Army Companies, the relationship between mission ambiguity and psychological distress is moderated by group level ratings of leader behavior. However, empirical evidence demonstrates that when the hierarchical model is grand-mean centered, the cross-level interaction may be confounded by a between-group interaction of the outcome measure (i.e., the between group regression coefficient representing the relationship of $\beta_{0j}$ regressed on $X_j^\ast W_j$) (Hofmann & Gavin, 1998). Therefore, the cross-level interaction ($\gamma_{11}$) was re-estimated using a group-mean centered (individual-level) model with the form:

Individual: $Y_{ij} = \beta_{0j} + \beta_{1j}(MAS) + \beta_{2j}(GHQ1) + r_{ij}$

Group: $\beta_{0j} = \gamma_{00} + \gamma_{01}(MAS) + \gamma_{02}(GHQ1) + \gamma_{03}(LDR) + \gamma_{04}(MASxLDR) + u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}(LDR) + u_{1j}$

$\beta_{2j} = \gamma_{20}$

This model represents a more accurate test of the moderating effect of leader behaviors on the within-group relationship between mission clarity and psychological distress (i.e., $\gamma_{11}$) as described by Hofmann and Gavin (1998). To aid in interpretation of all of the interaction terms, the values for the MAS were reverse scored so that higher scores represented greater mission clarity. The result of this test yielded no statistically significant cross-level interaction ($\gamma_{11} = 0.002, SE = 0.01, t(35) = 0.17$). However, an inverse effect of leader behavior on psychological distress was observed, ($\gamma_{03} = -2.91, SE = 0.80, t(32) = -3.66, p = .001$) such that, in units where the average rating of the leaders was considered high in directive and supportive behaviors, the unit’s mean value of psychological distress (i.e., the within-groups value) was lower than in units where the
Table 7

Hierarchical Model with Leader Behavior (LDR) as a Unit-level Predictor

<table>
<thead>
<tr>
<th>Fixed Effect</th>
<th>Coefficient</th>
<th>s.e.</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHQ2 Mean ($\gamma_{00}$)</td>
<td>28.419</td>
<td>0.184</td>
<td>154.28*</td>
</tr>
<tr>
<td>LDR ($\gamma_{01}$)</td>
<td>-0.131</td>
<td>0.075</td>
<td>-1.745</td>
</tr>
<tr>
<td>MAS Slope ($\gamma_{10}$)</td>
<td>0.070</td>
<td>0.023</td>
<td>3.085*</td>
</tr>
<tr>
<td>LDR ($\gamma_{11}$)</td>
<td>-0.017</td>
<td>0.007</td>
<td>-2.413*</td>
</tr>
<tr>
<td>GHQ1 Slope ($\gamma_{20}$)</td>
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<td>0.038</td>
<td>8.289*</td>
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<td>0.108</td>
<td>30</td>
<td>30.745</td>
<td>0.428</td>
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<tr>
<td>MAS Slope ($u_{1j}$)</td>
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<tr>
<td>Sigma Squared ($r_{ij}$)</td>
<td>13.828</td>
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Reliability of OLS Regression Coefficient Estimates

<table>
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<th>Coefficient</th>
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</tr>
<tr>
<td>MAS Slope ($\beta_{1}$)</td>
<td>0.136</td>
</tr>
</tbody>
</table>

*Note.* The chi-square statistics reported above are based on only 32 of 37 units that had sufficient data for computation. Fixed effects and variance components are based on all the data.

*p<0.05*
leaders average rating was considered low. In addition, this model yielded a small but statistically significant between-groups interaction for average ratings of mission ambiguity and average ratings of leader behaviors ($\gamma_{04} = 0.06, SE = 0.018, t(32) = 3.34, p = .003$). The form of the interaction is represented in the graph in Figure 2. The graphical representation of the interaction depicts that in units where leaders were rated as poor and the soldiers in these units perceived greater mission ambiguity, soldiers in these units experienced greater psychological distress in comparison to individuals in units where leaders were rated highly. The observed differences due to leadership quality tended to diminish as soldiers perceived greater mission clarity. Subsequently, the proportion of variance explained for the within-groups intercept (i.e., $\beta_{00}$) increases 11% by including the group aggregates for mission ambiguity (MAS) and mid-deployment psychological distress (GHQ$_1$), the group-level variable of leader behavior (LDR), and the between-group interaction of leader behaviors and mission ambiguity (MASxLDR). Together, these findings lend partial support to hypothesis 2a.

![Figure 2](image-url)

**Figure 2.** Interaction of Leader Behavior and Mission Attitudes on Psychological Distress

**Cohesion as a Unit-Level Predictor**

Group cohesion was characterized as the degree of peer support and interpersonal attraction experienced by individuals within their unit of assignment. Individual values of the cohesion (COH) scale were aggregated at the company level to create a group-level variable of cohesion. Similar to leader behavior, since the conceptual model and the
relevant hypotheses predicted a cross-level interaction of group cohesion on the individual stressor-strain relationships, the hierarchical model was estimated with random slope effects and group level predictors of the reduced random coefficient regression model. The results of the hierarchical model are displayed in Table 8 on the following page.

The moderating effect of group cohesion on the individual stressor-strain relationship was not observed in this sample ($\gamma_{11} = -0.02$, $SE = 0.026$, $t(35) = -0.811$, $p = 0.423$). Therefore, hypothesis 3a was rejected. Furthermore, there does not appear to be a significant direct effect of group cohesion on mean psychological distress values between companies.

**Collective Efficacy as a Unit-Level Predictor**

The final hypothesis to test was the moderating effect of collective efficacy on the relationship between perceived role ambiguity and psychological distress (hypotheses 4a). Collective efficacy was operationally defined as the degree to which individuals perceived their unit’s ability to perform military combat or peacekeeping missions successfully. The results of the hierarchical model with collective efficacy as a unit-level or group-level predictor are depicted in Table 9 on page 60.

As indicated in Table 9, there is no empirical support for hypothesis 4a. Specifically, the regression coefficient for the random slope for role ambiguity ($\gamma_{11}$) was not statistically significant. Further evidence is provided in the lack of statistical significance of the within-groups role ambiguity slope after introducing collective efficacy into the model. Finally, while not hypothesized, it is also important to note that collective efficacy did not exert a main or direct effect on psychological distress.

**Model Evaluation**

Any probability statements derived from statistical analyses are contingent upon apriori distributional assumptions of the population of interest. Snijders and Bosker (1999) outline two questions which must be answered concerning hierarchical models to determine the extent to which parameter estimates are considered reliable. Specifically, there must be evidence of constant variance for both the individual-level and group-level residuals. A chi-square test of the homogeneity of variance of individual-level variables reveals that the assumption of homoscedasticity is not violated ($\chi^2(28) = 37.82$, $p = .102$). To assess for violations of the assumption of residuals normally distributed and with constant variance in the group-level model involves a visual examination of residual values for the parameters estimated using the Empirical Bayes (EB) maximum likelihood function plotted against predicted values for the intercept and slopes. Visual examination of the scatterplot of the EB residuals for both the intercept ($\beta_0$) and the slope for role clarity ($\beta_1$) did not indicate a violation of the assumption of constant variance for the group-level model.
Table 8

Hierarchical Model with Cohesion (COH) as a Unit-level Predictor

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<tr>
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<th>t-ratio</th>
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<td>COH ($\gamma_{01}$)</td>
<td>-0.216</td>
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<td>-1.154</td>
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<td>MAS Slope ($\gamma_{10}$)</td>
<td>0.066</td>
<td>0.026</td>
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<tr>
<td>COH ($\gamma_{11}$)</td>
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<td>0.026</td>
<td>-0.811</td>
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<td>GHQ Slope ($\gamma_{20}$)</td>
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<td>0.038</td>
<td>8.254*</td>
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<tr>
<td>GHQ Mean ($u_{0j}$)</td>
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<td>&gt;.500</td>
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<td>Sigma Squared ($r_{ij}$)</td>
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Reliability of OLS Regression Coefficient Estimates

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<td>MAS Slope ($\beta_1$)</td>
<td>0.250</td>
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*Note. The chi-square statistics reported above are based on only 32 of 37 units that had sufficient data for computation. Fixed effects and variance components are based on all the data. *p<0.05
### Table 9

**Hierarchical Model with Collective Efficacy (CE) as a Unit-level Predictor**

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<td>28.347</td>
<td>0.176</td>
<td>161.160*</td>
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<tr>
<td>CE ($\gamma_{01}$)</td>
<td>-0.097</td>
<td>0.072</td>
<td>-1.341</td>
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<td>MAS Slope ($\gamma_{10}$)</td>
<td>0.063</td>
<td>0.023</td>
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<td>CE ($\gamma_{11}$)</td>
<td>-0.017</td>
<td>0.010</td>
<td>-1.750</td>
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<td>GHQ1 Slope ($\gamma_{20}$)</td>
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<td>8.276*</td>
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<td>GHQ2 Mean ($u_{0j}$)</td>
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<td>Sigma Squared ($\sigma_{ij}$)</td>
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**Reliability of OLS Regression Coefficient Estimates**

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<td>MAS Slope ($\beta_1$)</td>
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*Note.* The chi-square statistics reported above are based on only 32 of 37 units that had sufficient data for computation. Fixed effects and variance components are based on all the data.

*p<0.05*
Summary

Hierarchical linear modeling was utilized to determine the extent to which characteristics of a soldier’s company moderated the relationship between individual operational stressors and psychological distress. This study examined 546 US Army service members assigned to 37 different companies or company-sized elements. There was statistically significant evidence of an inverse effect of group level ratings of leader behaviors on indicators of psychological distress. Further, there was evidence of a statistically significant between-group interaction of group perceptions of leader behavior and role clarity on psychological distress. However, these observations were not proposed in the initial conceptual model. The results of the hierarchical models did not support any of the hypotheses regarding the moderating effect of organizational characteristics on the within-groups stressor-strain relationships. In summary, the conceptual model of operational stress and organizational characteristics moderating the relationships between operational stressors and post-deployment psychological distress were not evident in this sample. The conceptual implications of these findings will be addressed in the next section.
CHAPTER 5
DISCUSSION & CONCLUSIONS

Introduction
Social information processing theory proposes that the workplace social environment or social context exerts an influence upon individual perceptions, motivations, and attitudes by way of overt statements and socially constructed meanings about the work environment. Social information processing theory contends that the social milieu structures a person’s attentional processes to what is necessary and important about the work environment (Edwards, 1992; Festinger et al., 1950; Salancik & Pfeffer, 1978). Specifically, co-workers and supervisors serve as sources of workplace social influence. In the context of military operations such as combat, Gal and Jones (1995) proposed that military unit leaders provide their soldiers salient social cues about military operations which also tends to influence the individual soldier’s reaction to the operational stressors. In this study, it was proposed that, within military organizations, there are three primary forms of social influence, (a) leader behavior, (b) the collective belief in the unit’s ability to perform the mission (often referred to as collective efficacy), and (c) interpersonal attraction and social support, which is operationally defined as unit cohesion. It was proposed that these forms of social influence from unit leaders and peers would moderate the extent to which specific stressors commonly associated with military peacekeeping operations would affect individual post-deployment psychological well-being. This study was unique in that it attempted to assess the longitudinal effects of participating in non-combat military operations along with organizational social phenomenon that may serve to buffer the potentially deleterious effects of participating in peacekeeping or humanitarian operations.

To answer the primary research question about the extent to which organizational social phenomenon effect the relationships between individual operational stressors and psychological well being, a secondary analysis of longitudinal data was performed. The original data were collected in 1999, from US Army personnel deployed in support of the NATO peacekeeping operation in Kosovo by researchers from the US Army Medical Research Unit – Europe (USAMRU-E). The data were separated into individual-level variables that consisted of individual perceptions about the potential operational stressors and psychological distress and organizational-level variables which represented aggregated group perceptions of leader behaviors, cohesion, and collective efficacy (Klein et al., 1994). Aggregating the individual perceptions of the organizational phenomenon to the soldier’s military unit of assignment required that the analysis strategy compensate for the multi-level nature of the data. Hierarchical linear modeling (Raudenbush & Bryk, 2002) was performed to simultaneously analyze the individual-
and organizational-level data. This chapter summarizes the results of the analysis and discusses the practice and policy implications of the findings for social work and military populations. It will conclude with a discussion of the limitations of the study and directions for future social work research.

**Discussion**

Twelve hypotheses were tested in this study. Three of the hypotheses were concerned with the direct effect of operational stressors (i.e., exposure to potentially traumatic events, concern for family well-being and role ambiguity) on post-deployment individual psychological distress of US Army soldiers deployed to a peacekeeping operation. The remaining nine hypotheses sought to examine the extent to which organizational social phenomenon (i.e., leader behaviors, collective efficacy and cohesion) moderated the relationship between operational stressors and psychological distress.

**Operational Stressors and Post-deployment Psychological Distress**

Halverson and colleagues (Halverson, Bliese, Moore, & Castro, 1995) described four general factors associated with psychological distress among soldiers who participated in peacekeeping duties in Haiti: environmental, (e.g., austere living conditions), family separation and concern for family well-being, work overload, and policy issues, including psychological ambiguity about the value of the peacekeeping mission for combat trained forces. It was conceptually proposed that three operational stressors would contribute to post-deployment psychological distress (i.e., mission ambiguity, concern for family well-being, exposure to potentially traumatic events). However, in this study, only mission ambiguity appeared to be positively related to psychological distress. Contrary to the conceptual model, introduced on page 16, cumulative exposure to potentially traumatic events did not contribute to post-deployment psychological distress. This finding is also contrary to previous investigations of soldiers deployed on peacekeeping or humanitarian missions (Adler, Dolan, & Castro, 2001; Day & Livingstone, 2001; Lamerson, 1996; Litz, 1996; MacDonald et al., 1998; Stuart & Halverson, 1997; Weisaeth, Mehlum, & Mortensen, 1996). Lamerson (1996), for example, observed a significant relationship between exposure to potentially traumatic events and psychological stress reactions.

A post-hoc examination of the traumatic events soldiers were exposed to was conducted in order to understand the extent of exposure to potentially traumatic events. On average, soldiers witnessed four potentially traumatic events, with 80% of the respondents reporting six or fewer events. The five most prevalent events included (percentage of positive exposure in parentheses)

1. Seeing dead or injured civilians (48%)
2. Contact with traumatized civilians (44%)
3. Witnessing an explosion (41%)
4. Witnessing an accident that resulted in serious injury or death (32%)
5. Seeing human remains (32%)
Additionally, over 25% of the soldiers reported both witnessing continued conflict between the warring factions and witnessing warring factions abuse the local populace. The positive association observed between acute events and current psychological distress (as indicated by the statistically significant correlation between the PES and GHQ) possibly indicates that cumulative exposure to potentially traumatic events may only contribute to short-term distress, the impact of which eventually weakens over time as the soldiers were removed from the deployment environment and returned to their primary social support network (Davidson, Hughes, Blazer, & George, 1991).

Two plausible explanations for the lack of relationship between exposure to potentially traumatic events and post-deployment psychological distress are proposed. First, previous studies of peacekeepers tended to assess the extent of exposure and concomitant psychological distress after the deployment. Thus, the severity or magnitude of the events measured at mid-deployment may have been related to short-term distress; but, the relationship of these events tended to weaken over time. Studies of trauma victims provide evidence that the lack of a primary social support network plays an important role in the development of both acute stress reactions, and PTSD. It is suggested that, after returning from the deployment and removal from the dangerous environment, the soldiers’ primary social support network alleviated the impact of being exposed to potentially traumatic events thereby weakening the relationship between prior exposure and post-deployment psychological distress (Davidson et al., 1991; Ehlers & Steil, 1995; Green, Grace, Lindy, Gleser, & Leonard, 1990). Second, prior studies examined populations wherein the theater of operations lent itself to greater potential of personal danger and greater potential for role conflict (e.g., being shot at or being exposed to explosions due to grenade and land mine strikes) (Litz et al., 1997). The Kosovo deployment environment was contextually different from previous studies of peacekeepers. For example, while Litz and colleagues (1997) found the prevalence rates for posttraumatic stress disorder (American Psychiatric Association, 2000) among soldiers who served in Somalia relatively low compared to Vietnam war veterans. The deployment environment in Vietnam was dramatically different than that in Somalia. Similarly, it can be argued that the deployment environment in Kosovo was contextually different from the Bosnia theater or the humanitarian mission in Somalia. Orsillo and colleagues (1998) found that over 34% of soldiers (Somalia veterans) they surveyed frequently experienced (i.e., > 13 times) incidents upon which their unit came under either direct or indirect fire. On the other hand, being under fire was rarely recorded by soldiers in this study (18%).

In a similar fashion and contrary to previous empirical investigations, family separation was not associated with post-deployment psychological distress, although it was associated with distress at mid-deployment. Orsillo and colleagues (1998) observed that family separation was predictive of several dimensions of psychological distress, although the relationship was not as strong as exposure to potentially traumatic events. Other studies have also found a positive association between family separation and concerns for family well-being and differing dimensions of psychological distress (Bartone et al., 1998; Lamerson, 1996). In addition, historically, relationship problems have been associated with suicides among military personnel both in peacetime and
during peacekeeping duties (Hall, 1996). The lack of a significant observed relationship may be an artifact of sampling too few soldiers who were married or had immediate family concerns (i.e., children). In light of the findings from this study and from previous examinations, it is important to recognize that concerns for family well-being were, in fact, associated with mid-deployment psychological distress. Thus, while not fully examined, the statistical evidence suggests that a persistent need exists to ensure the stability of Army families during deployment and ensure that soldiers have regular contact with their family members. If in fact soldiers experienced distress during the deployment, their concerns may have been resolved once they returned home and found their families coping adequately. Therefore, increased communications and family stability may serve to enhance individual soldier performance and well-being during the deployment and reduce the possibility that the soldier may need to be evacuated from the theater of operations prematurely.

The potential for mission ambiguity and role conflict is a recurring theme in studies about military peacekeeping missions. Britt (1998) hypothesized that mission clarity and mission relevance represented two of the three components responsible for the extent to which soldiers are involved in the peacekeeping mission and ultimately contributes to emotional adaptation to the potential environmental stressors associated with peacekeeping operations (Britt, Adler, & Bartone, 2001; Litz, 1996). This study revealed that even after controlling for average levels of state-dependent psychological distress, mission ambiguity served as a predictor of post-deployment individual psychological distress. However, the magnitude of the relationship was smaller in comparison to the only other study seeking to determine the relationship between role stress and psychological distress (Lamerson, 1996). Similar results, though not as systematic, were observed for soldiers deployed in support of a peacekeeping mission in Haiti and Bosnia (Bartone et al., 1998; Halverson et al., 1995; Litz, 1996). Halverson and colleagues (1995) observed that over 60% of combat arms soldiers (e.g., infantry, artillery, air defense artillery) believed they were not trained for such duties and that these duties were better suited for military police units. They also observed that, in contrast to those who did not receive routine briefings, those soldiers who were well informed about the purpose and accomplishments of the mission exhibited a significantly higher belief in the value of the mission along with higher levels of physical and psychological well-being. In their description of the changing perceptions of US Army peacekeepers in Somalia, Miller and Moskos (1995) observed that, as the mission progressed, soldiers resolved issues of role conflict and ambiguity by adopting either a warrior or humanitarian perspective. Those adopting a warrior perspective regarded the indigenous culture negatively and felt increased hostility and aggression towards them. In light of the restrictive rules of engagement, those adopting the warrior status had no way to reconcile their hostile or aggressive emotions. Failure to do so may have contributed to some of the post-deployment psychological distress observed by Litz and colleagues (1997). On the other hand, those who adopted the humanitarian perspective sought to understand the Somali condition and to interact with the indigenous populace (Miller &

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It should be made clear, however, that deployment in and of itself has not been associated with increased suicide risk (Hall, 1996; Wong et al., 2001).
Moskos, 1995). While this study did not seek to test whether a similar phenomenon occurred among the peacekeepers in Kosovo, there remains compelling evidence that soldiers in Kosovo faced a potentially explosive peacekeeping environment (The Independent International Commission on Kosovo, 2002). In summary, the findings of this study suggest that greater mission ambiguity is directly related to both immediate and post-deployment psychological distress. The elements of mission ambiguity measured in this study included the extent to which individuals adopted the peacekeeper role, the extent to which information about the mission was disseminated, and the extent to which soldiers believed the mission would resolve the storied history of conflict in the Balkans.

**Leader Behavior, Post-deployment Psychological Distress and Role Ambiguity**

The conceptual model of combat stress described by Gal and Jones (1995) posited that leaders serve as a metaphorical lens to shape the attitudes, perceptions, and motivation of soldiers in a combat environment and thus alter the soldiers’ reaction to the various stressors associated with combat. In this study the aggregated perception of leader behaviors exerted the only group-level antecedent influence on individual psychological distress. Furthermore, post-deployment psychological distress was observed to be a convergent function of both aggregated group perceptions of leader behavior and aggregated perceptions of mission clarity. The form of this relationship is graphically depicted in the previous section; but, most importantly, the form of this relationship shows that, when leader behavior is lacking direction and support, and the mission is perceived as vague or ambiguous, soldiers experience greater psychological distress. However, as the mission purpose and goals become clear and are adopted by the soldiers, the discrepancy between leader behaviors becomes visibly less dramatic. What was not observed, however, was a within-group moderating effect of leader behavior on the relationship between mission clarity and psychological distress.

Throughout the history of modern warfare the influence of leaders has been a major component of understanding how American soldiers adapt to mission environments. As early as World War II, organizational researchers have commented upon the impact of leaders and their relationships with their soldiers (Stouffer, Suchman, DeVinny, Star, & Williams, 1949). Landmark research on the American soldier in World War II indicated that officers who were competent and looked after the welfare of their soldiers were more likely to be respected by their men than officers who were viewed as either incompetent or disinterested in the welfare of their men (Stouffer et al., 1949). Influencing subordinate soldiers is explicitly defined in the US Army’s manual on leadership. *Field Manual 22-100* defines leadership as “influencing people—by providing purpose, direction, and motivation—while operating to accomplish the mission and improving the organization.” (Department of the Army, 1999, p. 1-4). The message is clear – army leaders are charged with mission accomplishment and they must rely upon their subordinates to accomplish this. Those who establish a climate in which soldiers are aware of the mission and purpose of their unit and the Army create an environment where a soldier is less likely to experience distress. As House (1996) describes it, leader behavior is motivational and uses both transformational and transactional leadership styles to enhance subordinate abilities and clarify roles and expectations for goal oriented performance through the use of contingency rewards. Furthermore, he explains that
supportive relationships serve to increase the quality of supervisor–subordinate relationships and decrease subordinate distress. The findings from this study offer encouraging support for House’s propositions, especially in terms of the role that the direction and support that leaders provide reduces levels of psychological distress. Similar results were obtained by Gavin and Hofman (2002), who observed that group-level perceptions of leader behavior were inversely related to levels of increased hostility among soldiers deployed to a peacekeeping mission in Haiti. Furthermore, they observed a similar convergent relationship among task significance and group perceptions of leader behaviors with individual feelings of hostility, such that in units with low ratings of leader behaviors, and low ratings of individual task significance, soldiers experienced greater feelings of hostility. Gavin and Hofman concluded that supportive leadership climates serve to buffer the potentially negative affective responses to tasks that are perceived as relatively mundane. Such a buffering effect, it would appear, occurs as a result of the impact of leaders in shaping the attitudes and perceptions of subordinates through their use of contingency rewards and role clarification (Bliese, Halverson, & Schriesheim, 2002; Kozlowski & Doherty, 1989; Salancik & Pfeffer, 1978). In the long run it is suggested that leader behaviors exert an ongoing influence upon the organizational climate and individual perceptions regarding the potentially ambiguous peacekeeping mission environment and those elements of the environment that are deemed important or salient. The influence of army leaders exhibiting the tenets of “Be-Know-Do” (Department of the Army, 1994, p. 1-6) fosters an environment whereby mission accomplishment, regardless of the type of mission, is associated with enhanced psychological well-being.

Unit Cohesion and Post-deployment Psychological Distress

Manning and Fullerton (1988) argued that unit cohesion serves as a significant protective factor from the stresses of military operational requirements. In fact, the bulk of the literature previously examined tended to suggest that a considerable relationship exists between cohesion (and by proxy social support at the work place) and psychological well-being. However, in this study no direct relationship between unit cohesion and post-deployment psychological well-being was observed, nor was there a statistically significant moderating effect of unit cohesion on individual stressors. While Bliese and Halverson (1996) observed a similar lack of relationship between group cohesion and well-being, the inverse was true for Arincorayan (2000) who observed a small ($\beta = -.067$) yet statistically significant relationship between group cohesion and psychological distress. The primary difference between these two studies, however, involved the level of analysis for group cohesion. In the Bliese and Halverson (1996) study, which was similar to this study, group cohesion was examined as a group-level variable with a multi-level analysis strategy. On the other hand, in the Arincorayan (2000) study, cohesion was examined as an individual-level variable and the relationship between cohesion and psychological distress was estimated using multiple regression. The contradictory findings are interesting in that both were based upon a sample of US Army personnel and both used a similar scale for cohesion, with Arincorayan (2000) using a shorter version of the scale used by Bliese and Halverson (1996). Findings from a review of the parallel cohesion and work performance literature may shed some light on
the equivocal results from this study and the studies just mentioned. Prior research on cohesion has demonstrated that group-level analysis strategies normally tend to inflate the correlation between cohesion and performance (Gully et al., 1995). Thus, the relationship between cohesion and psychological well-being may also have similar properties due to the unit of analysis. In fact, Bliese and Halverson (1996) concluded that the scale items’ specific lack of reference to the company of assignment or level of aggregation may have confounded the lack of findings for cohesion and psychological well-being. Another plausible explanation for the lack of effect of cohesion from this study might be due to the lack of homogeneity of responses, or consensus, on the cohesion scale prior to aggregating individual values to the group mean. If, in fact, there is broad heterogeneity of responses on the cohesion measure, such aggregation bias could become a potentially severe problem in aggregating the cohesion measure (Gully et al., 1995).

**Collective Efficacy and Post-deployment Psychological Distress**

Collective efficacy has been described as a shared belief in the group’s ability or capability to perform in a particular situation (Prussia & Kinicki, 1996). In this study collective efficacy was concerned with the collective belief that individuals held about their unit’s ability to perform a peacekeeping or humanitarian mission successfully. It was hypothesized that collective efficacy, as a group level variable, would moderate the relationship between individual stressors and psychological distress. Similar to the findings by Jex and Bliese (1999), this study observed no moderating relationship between collective efficacy and the within-groups relationship between mission ambiguity and psychological distress. In addition, unlike previous studies, collective efficacy did not appear to affect the average group ratings of psychological distress (Jex & Bliese, 1999; Jex & Gudanowski, 1992; Riggs & Knight, 1994). For example, Jex and Bliese (1999) observed a statistically significant inverse relationship between group ratings of collective efficacy and within-groups psychological strain measures in their sample of US Army personnel preparing to rotate through a combat training center. Similarly Riggs and Knight (1994) observed that job satisfaction was directly related to individual beliefs about the ability of their group to perform work tasks successfully and concluded that such beliefs translated into collective opinions and that these collective beliefs were related to increased job satisfaction. The findings presented by Riggs and Knight were unique in that they observed that collective efficacy mediated the relationship between prior successes or failures and job satisfaction, rather than testing for a moderating relationship of collective efficacy.

The lack of observed effect of collective efficacy in this study could be related to three separate factors. First, collective efficacy was measured while the unit was in the midst of performing the peacekeeping operation. It is possible that the effect of collective efficacy was attenuated based upon upward efficacy-performance spirals (Lindsley et al., 1995) resulting from direct and indirect feedback related to the unit’s success in the mission up to the point the unit was surveyed. Therefore, post-deployment psychological distress could be less attributable to the perceived ability of the group but more a result of the unit’s actual performance. The second factor that could contribute to the lack of observed moderation among the study sample could be the overall problems with
aggregation previously discussed. To examine this, separate HLM reliability estimates were calculated for each of the group level variables (Bliese, 2002). The HLM reliability estimates were all higher than any of the individual-level variables observed in the model (leader behavior = .505, cohesion = .618, collective efficacy = .631), indicating that the aggregation strategy was appropriate since these values describe the extent to which the true proportion of variability across groups has been observed (Raudenbush & Bryk, 2002). Finally, the third factor involves the lack of slope variability across groups on the stressor-strain relationships. Such a lack of variability could be due to the number of groups observed. The ratio of the number of individuals per group in this study was at the bottom of the threshold of an acceptable ratio for multi-level analysis (Hox, 2002).

**Limitations of the Study**

Before examining the implications of this study for social work practice and policy and for future research, the limitations of the present study provide the context from which such implications may be examined. Specifically the issues pertain to external validity, sampling, threats to internal validity, and the use of a single indicator of the dependent variable. Therefore, a detailed explanation of the primary issues related to inferences which can be drawn from this study follows.

Inferences from multi-level studies rely upon a sampling strategy which draws probability samples from the groups of interest and then obtains a probability sample from the individuals within those groups. The sampling strategy employed by the WRAIR researchers was purposive in its attempt to sample from a representative number of units deployed in the Kosovo theater of operations and relied upon the availability of personnel and units and did not involve a systematic strategy to obtain a probability sample. Although, as described previously, the sample used for this study did not differ markedly from those individuals not included. Such a sampling strategy is difficult to avoid because of several operational constraints in the deployment environment. From the author’s experience, pre-deployment is an uncertain period and identifying which units and which personnel will deploy is sometimes unknown. Similarly, due to constraints in the deployed environment (e.g., limitations in movement between base camps, availability of unit personnel, responsiveness from unit leaders, and time constraints to collect surveys) researchers must rely upon purposive samples. The trend to use purposive samples, as has been pointed out previously and discussed in the review of the literature, is fairly common in prior studies of deployed soldiers. It can be argued that the inconsistent results of this study with prior studies may be due solely to the sampling strategy employed in this study or previously cited studies. Statistical values derived from a non-probability sample may not be representative of the true parameters. Additionally, the deployment environment itself limits the force structure deployed, thereby limiting the possibility for generalizing to other deployments. For example, the units sent to Kosovo were predominantly composed of mechanized infantry and armor units used in response to the terrain and potential threats to the deployed forces. For the peacekeeping mission in Haiti, by contrast, the units deployed were predominantly light infantry units prepared for operations in a climate conducive for light infantry operations and in response to the potential threats for that operation. The lack of generalizability, or
external validity (Cook & Campbell, 1979), exists despite the fact that the participants examined in this study were comparable in demographic characteristics to recent demographic data on US Army personnel (Bray, 1999). Nonetheless, the sampling strategy and the unique context of the deployment environment limits inferences of this study beyond the research sample.

Similarly, previous studies have observed both gender and ethnic differences in response to operational stressors and the health status of military personnel (Delva et al., 2002; Bray, 1999; Miller & Moskos, 1995; Orsillo et al., 1998). The study sample size was too small to examine the models while taking into account gender and ethnicity, therefore the impact of these variables on the outcome measure was indeterminate. An incorrectly specified model increases the likelihood of spurious findings and negatively affects the ability to generalize the findings from this study to other studies of military personnel. In order to better understand the impact of gender and ethnicity, future studies require a systematic stratified sampling strategy incorporating a sufficient number of respondents to assess the impact of both gender and ethnicity.

While the study was longitudinal in nature, causal inferences are still problematic as this study did not employ an experimental design and observations are based on only two time periods. Thus, threats to internal validity remain (Cook & Campbell, 1979). Plausible alternative explanations for the relationships observed could not be ruled out due to the lack of a contrast group. The study results could have been strengthened had the researchers collected similar data from units who were neither deployed nor preparing to deploy. Such a strategy would have allowed for creating multi-level models that accounted for deployment status. Such models would allow for a greater understanding of the psychological impact of military peacekeeping operations above and beyond routine job stressors.

The longitudinal design would also have been strengthened had the researchers collected more observations from the same individuals and groups during all three time periods. The current study is limited by the small number of respondents who were sampled during all three time periods. These limitations resulted in the examination of only mid- and post-deployment survey responses to increase the number of both individual and group sample sizes. Had there been a larger number of respondents who answered surveys during all three time periods from an equally representative larger number of US Army companies this study would have been able to develop a model that incorporated all three time period. In fact, some of the non-statistically significant regression estimates were of a greater magnitude than some of the significant estimates possibly indicating a lack of statistical power. It is plausible that a larger sample would have permitted the identification of estimates of some hypothesized associations as statistically significant. In addition to sample size constraints, the study design was limited by its failure to administer the outcome measure for all three time periods. By administering the same measures repeatedly, the model could have included covariates for all three time periods, thereby improving the detection of causal processes as a result of the introduction and removal of the deployment stressors.

The use of a single measure for the dependent variable can be viewed as underrepresenting the construct of psychological distress (Hurrell et al., 1998). Cook and
Campbell (Cook & Campbell, 1979) recommend that constructs be “multiply operationalized in order to triangulate on the referent.” (p. 65). As described earlier, work-related strain also includes physiological disturbances (e.g., heart rate, ulcers, cholesterol levels) and behavioral disturbances (e.g., job performance, substance use, absenteeism) not measured in this study. It can be argued that the GHQ, as a self-report measure, did not necessarily effectively measure the consequences of work-related stress but rather psychiatric morbidity (Chapman, 2001). Chapman also contends that respondents may even distort their responses in an effort to “fake bad” (p. 245) in an effort to obtain favorable or material rewards. In contrast, it is not implausible to consider that soldiers may also distort their responses favorably for fear of stigmas associated with seeking mental health services (Britt, 2000; Pincus & Benedek, 1998). In conclusion, the single indicator of psychological distress limits the plausible inferences related to post-deployment psychological consequences.

Implications of This Study

Among the policy statements published by the National Association of Social Workers (NASW), occupational social work has been recognized as “a legitimate field of practice with a developing focus and a body of knowledge that calls for a full range of appropriate skills” (National Association of Social Workers, 2002, p. 233). NASW further recognizes that occupational social work practice involves three primary categories – policy setting and planning, direct practice, and practice that combines both direct practice and administration/policy formulation. Historically, military social workers have engaged in the latter of the three categories, providing both direct services and administration/policy formulation. Thus, the results of this study serve to inform both occupational social work practice and organizational policy. The implications of the study results in social work practice and military organizational policy will be discussed. Suggestions for further research will conclude the primary implications of this study.

Implications for Practice

Following the terrorist attacks of September 11, 2001, the US Army and the Department of Defense have experienced a dramatic shift in their post-cold war mission (Neack, 2002). In addition to combating terrorism in conventional combat, there remains a continuing need to perform both peacemaking and peacekeeping operations in emerging democracies throughout the world. Such operations present both physical and psychological dangers for those serving in them. In these operational environments, social workers can continue to apply core clinical social work skills drawn from the historic person-in-environment perspective in providing primary and secondary preventive services (Martin & Campbell, 1999).

The findings from this study highlight the importance of consultative activities performed by social workers serving in operational assignments (Martin & Campbell, 1999). Martin and Campbell (1999) argued that one of the greatest lessons from the Vietnam war in respect to combat-related stress was the value of mental health prevention efforts focused on the individual soldier and the unit. Preventive efforts aimed at role clarification and psychological preparation of individuals for their peacekeeping roles would appear to contribute to the reduction in role ambiguity and long term
psychological distress (Bartone et al., 1998; Lamerson & Kelloway, 1996). Such activities include, but are not limited to, communicating to unit leaders about the potential stressors associated with operational environments that may impede soldier psychological well-being and ultimately combat performance. As observed in this study, mission ambiguity clearly stands out as a potential stressor for soldiers involved in peacekeeping and humanitarian operations. In the past the purpose and meaning behind peacekeeping and humanitarian missions were less well established and not well accepted among soldiers. However, given the decade long history of peacekeeping missions for US Army personnel, it appears peacekeeping operations have become more acceptable (Weerts et al., 2002). Furthermore, it could be argued that the recent terrorist attacks provide soldiers with clear evidence of the importance of peacekeeping and humanitarian missions as an extension of the war on terrorism. This perspective, however, requires greater systematic examination.

Preventive and secondary interventions that foster behaviors of leaders as caring and supportive should also be strongly encouraged by social workers employed in operational assignments. Most importantly, training leaders on differing aspects of human dimensions in combat and noncombat operations sensitizes them to the concerns of their soldiers. Similarly, social work consultants can use the information from this study to provide empirical evidence to leaders regarding the influential role the leaders have in shaping the attitudes and behaviors of their subordinates (Gal & Jones, 1995). Effective leaders who are also informed about dimensions of human behavior in military operations have historically been the most respected leaders, as rated by their subordinates (Stouffer et al., 1949). The nature of the information shared with leaders should go beyond simply pathologizing behavior of subordinates but include information that encompasses a broader person-in-environment perspective unique to social work core knowledge.

Implications for Policy

The problems associated with Gulf War Illness prompted Defense and Congressional leaders to establish programs to monitor the environmental and psychological hazards of deployment and monitor the health and well-being of soldiers deployed in support of combat and non-combat operations. The National Defense Authorization Act of 1998 mandates that soldiers be screened for medical as well as psychological conditions upon re-deployment from any contingency operation, including combat operations, and that the Department of Defense is responsible for providing feedback to Congress regarding the physical and psychological health of soldiers post-deployment. This study suggests that such screening programs may contribute to early recognition of psychological distress associated with participating in a peacekeeping mission, thus allowing for prompt attention by unit leaders and the military medical infrastructure. However, the actual benefits derived from this program must be weighed against the personal costs soldiers potentially experience in terms of the stigma associated with seeking mental health services described by Britt (2000).

Similarly, this study points to the importance of pre-deployment information dissemination and interventions. Department of Defense Directive 6490.5 (1999) related to combat stress control should also reinforce the importance of pre-deployment interventions by leaders and local mental health support personnel in preparing soldiers
for the potential challenges that deployments engender, especially in reference to mission ambiguity and role clarity. The current policy does not go far enough in promoting pre-deployment interventions since it focuses more on in-theater actions and post-deployment activities. Research on stress management programs in the workplace continue to demonstrate successful outcomes, especially in those programs with a cognitive behavioral component (van der Klink, Blonk, Schene, & van Dijk, 2001). Therefore, the policy should examine how such stress management programs may be beneficial when employed in the pre-deployment phase of training. The development of a specific combat stress doctrine (Department of the Army, 1994) and further Department of Defense Directives (Department of Defense, 1999) aimed at deployment-related stressors are examples of policies and programs that seek to institutionalize a comprehensive program of soldier psychological well-being across the deployment cycle. Deahl and colleagues (2000) contended that the operational stress training provided to British soldiers prior to deployment to the former Yugoslavia partially contributed to low rates of psychological distress and alcohol use following re-deployment. Further policy initiatives that integrate pre-deployment and post-deployment information dissemination, along with the empirical testing of such initiatives, could yield valuable information about the utility of such programs.

Finally, the results of this study point to the continued need to inject human dimensions training into leader professional development and training activities. This study clearly suggests that leaders are capable of influencing the reactions of subordinates when sufficient information is provided to soldiers regarding the nature of the mission or operation. Given that leader professional development in the Army is well-established and begins in the earliest stage of leader development, content on human dimensions of peacekeeping and humanitarian missions would provide added value for new and emerging leaders in emphasizing the role they play in managing their personnel.

Implications for Further Research

This study should be acknowledged as a first step in future longitudinal studies of US military personnel involved in non-combat operations. Future studies should systematically seek to sample from both units and personnel over an extended time period. Similarly, future research designs should also include a contrast group consisting of randomly sampled units and soldiers who did not deploy and remained in garrison. Such studies would address concerns with internal validity described previously and enhance the knowledge base regarding the unique stressors and reactions associated with peacekeeping and humanitarian missions, as opposed to combat operations or routine garrison environments.

While the US Army Company provided a convenient level to aggregate data, it must be recognized that, within a company, soldiers are influenced by several layers of leadership (i.e., team, squad, and platoon). It would be beneficial to examine which leaders influence perceptions of the operational stressors and which leaders influence strain outcomes. The measure of leader behaviors used in this study demonstrated exceptional psychometric characteristics as a unidimensional measure. However, the leader behavior scale distinguishes between officer and NCO leadership. Therefore, future studies should attempt to distinguish the influence of leader behaviors of the
specific leaders which match the organizational structure of units. Research conducted under these auspices may also serve to test the elements of leader-member exchange theory (Dansereau, Graen, & Haga, 1975; Graen & Uhl-Bien, 1995).

On a similar note, while aggregating individual responses to form group-level measures is an adequate strategy, ideally group level information would be independently measured. Some examples of unit variables worth examining include leadership tenure, unit readiness status, deployment tempo, rates of non-judicial punishment, number of alcohol and drug related incidents, and retention. A strategy of obtaining independent measures of group variables merits further investigation.

The contradictory nature of some of the findings from this study and previous studies indicates that there remains a further need to examine the relationship between both family related stressors and exposure to potentially traumatic events with long-term psychological distress. Recent concerns about the potential for extreme forms of domestic violence among soldiers returning from combat environments has led the Army to reconsider the extent to which soldiers and families adapt following separation due to extended and dangerous deployments (Cosner, 2002). Furthermore, as identified in the descriptive statistics, there appears to be a temporal relationship between state distress and concerns for family well-being and exposure to potentially traumatic events. The extent to which such distress continues to disrupt soldier psychological well-being upon return from a deployment should continue to be examined.

**Conclusion**

The United States, and the service members who have sworn to defend the country, face a new and challenging era following the terrorist attacks of September 11th, 2001. These challenges will continue to place demands on service members deployed abroad in rapidly changing operational environments that range from humanitarian assistance missions to peacemaking, peacekeeping, and combat operations. General Eric K. Shinseki, Chief of Staff of the Army, recognized the tremendous sacrifice that soldiers and their families make in defense of freedom and in the war on terrorism. In his vision for the Army he writes (2002),

> The Army is People: The magnificence of our moments as an Army will continue to be delivered by our people. They are the engine behind our capabilities, and the soldier remains the centerpiece of our formation....We will assure the Nation's security by equipping, training, and caring for our people and their families and enabling their full potential as individuals....We will provide the inspired leadership which celebrates our soldiers and nurtures their families, trains for decisive victories, and demonstrates responsible stewardship for the national treasure entrusted to us - our men and women in uniform, and the resources to make them successful.

For over 50 years, social workers in the Army have provided innovative services to soldiers and activated families. The mandate remains clear – provide services that strengthen and enhance the well-being of soldiers and families. In spite of the limitations
previously described, this study emphasizes the important role that social workers can play in providing such services to individuals in deployed environments. Social workers and other mental health providers can emphasize to unit leaders the importance of open communication with subordinates regarding the mission purpose and progress, enabling soldiers to develop positive cognitive sets and offsetting any negative consequences related to the environmental demands of peacekeeping and humanitarian operations.
APPENDIX A

MISSION ATTITUDES SCALE

Please rate the extent to which you **agree** with each statement. There are no right or wrong answers.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I consider the role of &quot;peacekeeper&quot; relevant to my military training.</td>
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<td>2. I feel comfortable in the role of peacekeeper.</td>
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<td>3. I like the &quot;human side&quot; associated with peacekeeping missions.</td>
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<td>4. The U.S. military serves an important function by participating in peacekeeping missions.</td>
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<tr>
<td>5. Peacekeeping missions take the &quot;fighting edge&quot; away from soldiers.</td>
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<tr>
<td>6. It's hard to go from a &quot;combat routine&quot; to a &quot;peacekeeping routine&quot;.</td>
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<td>7. It's a mistake for U.S. troops to be used to help solve other people's problems.</td>
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<td>8. I sometimes think there will always be conflict in the former Yugoslavia despite peacekeeping efforts.</td>
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<tr>
<td>9. Good soldiers do what they are trained to do, whether in combat or peacekeeping.</td>
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<tr>
<td>10. The guidelines for how to act on a peacekeeping mission are too unclear.</td>
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<tr>
<td>11. The rules of engagement on a peacekeeping mission are too ambiguous.</td>
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<td>12. I have trouble getting information from higher up.</td>
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<tr>
<td>13. The goals of this mission are clear.</td>
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<tr>
<td>14. The briefings about the mission have been useful.</td>
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<tr>
<td>15. I feel comfortable with my understanding of the rules of engagement.</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
APPENDIX B

PEACEKEEPING EVENTS SCALE

A number of events are listed below that may have occurred during the deployment so far. If you have NOT EXPERIENCED THE EVENT, PLEASE FILL IN "NO"; if you HAVE EXPERIENCED THE EVENT, PLEASE FILL IN "YES".

1. Expression of gratitude by local population
2. Witnessing abuse of the local population by NATO troops
3. Witnessing abuse of the local population by the warring factions
4. Witnessing an accident which resulted in serious injury or death
5. Contact with traumatized civilians
6. Conflict between the warring factions
7. Witnessing an explosion
8. Having to aid in the removal of human remains
9. Having to aid in the removal of unexploded ordnance
10. Being injured because of an accident
11. Being shot at
12. Being injured because of an assault/attack
13. Saw dead or injured civilians
14. Saw dead or injured NATO (non-US) soldiers
15. Saw dead or injured US soldiers
16. Saw human remains
APPENDIX C

FAMILY WELL-BEING SCALE

Think about your experience in THIS MISSION so far. Rate how much trouble or concern is caused by:

1. Boring and repetitive work
2. Uncertain redeployment date
3. Concerns about accidents
4. Concerns about disease
5. Concerns about mines/unexploded ordnance
6. Financial problems
7. Rear detachment taking care of my family
8. Arguments with my spouse over the phone
9. Health problems of family members
APPENDIX D

GENERAL HEALTH QUESTIONNAIRE

Have you recently:

1. been able to concentrate on whatever you're doing?
2. lost much sleep over worry?
3. felt that you are playing a useful part in things?
4. felt capable of making decisions about things?
5. felt constantly under strain?
6. felt that you couldn't overcome your difficulties?
7. been able to enjoy your normal day-to-day activities?
8. been able to face up to your problems?
9. been feeling unhappy and depressed?
10. been losing confidence in yourself?
11. been thinking of yourself as a worthless person?
12. been feeling reasonably happy, all things considered?
APPENDIX E

COHESION SCALE

Please use the following scale to tell us how much you agree or disagree with the statements below:

11. The members of my unit are cooperative with each other
12. The members of my unit know that they can depend on each other
13. The members of my unit stand up for each other
APPENDIX F

LEADER BEHAVIOR SCALE

Please use the following scale to tell us how much you agree or disagree with the statements below:

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. The officers in my unit establish clear work objectives</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>15. The officers in my unit are interested in my personal welfare</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>16. The officers in my unit delegate work effectively</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>17. The officers in my unit let soldiers know when they have done a good job</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>18. The officers in my unit avoid micromanaging soldiers' work</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>19. The officers in my unit are interested in what I think and how I feel about things</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>20. The NCOs in my unit establish clear work objectives</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>21. The NCOs in my unit are interested in my personal welfare</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>22. The NCOs in my unit delegate work effectively</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>23. The NCOs in my unit let soldiers know when they have done a good job</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>24. The NCOs in my unit avoid micromanaging soldiers' work</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>25. The NCOs in my unit are interested in what I think and how I feel about things</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>
APPENDIX G

COLLECTIVE EFFICACY SCALE

Please use the following scale to tell us how much you agree or disagree with the statements below:

4. My company is ready for combat
5. I am confident in my unit's mission-essential equipment
6. I think we are better trained than most other companies in the Army
7. I think the level of training in this company is high
8. I have real confidence in my unit's ability to perform its mission
9. If we went to war tomorrow, I would feel good about going with my unit
10. I think my unit would do a better job in combat than most U.S. Army units
APPENDIX H

FSU HUMAN SUBJECTS APPROVAL MEMORANDUM
APPROVAL MEMORANDUM
from the Human Subjects Committee

Date: March 20, 2002

From: David Quadagno, Chair

To: Steve J. Lewis
2002 Heatherbrooke Drive
Tallahassee, FL 32312

Dept: Social Work

Re: Use of Human subjects in Research
Project entitled: Operational Stress and Strain: A Longitudinal
Analysis of the Effects of Military Peacekeeping Operations on Well-
Being

The forms that you submitted to this office in regard to the use of human subjects in the proposal
referenced above have been reviewed by the Secretary, the Chair, and two members of the Human
Subjects Committee. Your project is determined to be exempt per 45 CFR § 46.101(b)4 and has
been approved by an accelerated review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit,
except to weigh the risk to the human participants and the aspects of the proposal
related to potential risk and benefit. This approval does not replace any departmental or
other approvals which may be required.

If the project has not been completed by March 19, 2003 you must request renewed approval for
continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of
the project to the Committee for approval. Also, the principal investigator must promptly report, in
writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is
reminded that he/she is responsible for being informed concerning research projects involving
human subjects in the department, and should review protocols of such investigations as often as
needed to insure that the project is being conducted in compliance with our institution and with
DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The
Assurance Number is IRB00000446.

Cc: Jorge Delva/Aaron McNeece
APPLICATION NO. 00-145
REFERENCES


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Major Steve J. Lewis was raised in Reno, Nevada. He received his Bachelor of Science degree from the University of Nevada, Reno in 1989, and his Master of Social Work (MSW) degree from California State University, Sacramento in 1992. After receiving his MSW, he entered the US Army as a Social Work Officer.

Steve Lewis has served as a Social Work Officer in the US Army for over ten years. Prior to entering the Ph.D. degree program with the School of Social Work at the Florida State University, he was an instructor with the US Army Medical Department Center and School in San Antonio, Texas. He has also had assignments in Wiesbaden, Germany, and Fort Benning, Georgia. He has served on peacekeeping operations in Croatia and Hungary and provided consultation to military mental health personnel in Colombia. His military awards and decorations include the Meritorious Service Medal with one oak leaf cluster, the Army Commendation Medal with three oak leaf clusters, the Army Achievement Medal with three oak leaf clusters, the National Defense Service Medal, the Armed Forces Expeditionary Medal, The Armed Forces Service Medal, the NATO Medal, the basic Parachutist Badge, and the Expert Field Medical Badge.

Steve Lewis’ primary research interests involve occupational and combat-related stress, military populations, and complex data analytic techniques. He has published in *Military Medicine* and *Aggression and Violent Behavior*. He is a member of several professional organizations, including the National Association of Social Workers, the Society for Social Work and Research, the Phi Kappa Phi National Honor Society, the International Society for Traumatic Stress Studies, and the International Critical Incident Stress Foundation.

Steve Lewis is married to the former Rose M. Gardella of Reno, Nevada. They are expecting their first child in April, 2003.