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**A Secondary Group Level Analysis of the Effect of Leader Support on the  
Relationship Between Combat Exposure and  
Post-Combat Aggression and Violence**

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by

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**A Secondary Group Level Analysis of the Effect of Leader Support on the  
Relationship Between Combat Exposure and  
Post-Combat Aggression and Violence**

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The purpose of this study is to test the group level effect of unit leader support on the relationship between the level of stressors in combat and the level of post-combat aggression and violence. One focus is whether unit leadership has a direct effect on the level of post-combat aggression and violence. Another focus is whether unit leadership interacts with unit combat experience and buffers the relationship between unit combat exposure and the level of unit post-combat aggression and violence. This study utilizes data from the Walter Reed Army Institute of Research Land Combat Study. The Land Combat Study was designed to examine the impact of combat experiences on the mental health and functioning of soldiers and their families. The sample consisted of active duty

soldiers who participated in combat as part of Operation Iraqi Freedom between 2003 and 2004. Data were aggregated to the unit level. Multiple regression analysis was employed to address the effects of unit combat exposure, unit perception of danger, and unit leader support on the level of unit post-combat aggression and violence.

Results indicate that combat experience, a combination of both unit level perception of danger and unit combat exposure significantly predict a unit's post-combat aggression and violence. The study also found the level of unit leader support buffered the level of unit combat experience and resulted in decreased levels of post-combat aggression and violence such that as unit combat exposure increased, increased levels of unit leadership decreased levels of post-combat aggression and violence. Finally, this study also found that the level of unit leader support did not significantly provide a main effect in lowering post-combat aggression and violence.

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## CHAPTER 1

### INTRODUCTION AND STATEMENT OF THE PROBLEM

#### Introduction

Since the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, over half (234,173) of the soldiers in the US Army have experienced combat in Afghanistan, Iraq or both (JTPR Data Base, 2004). Combat in Iraq has been noted as the most intense fighting the US Army has participated in since the Viet Nam War (Hoge, Castro, Messer, McGurk, Cotting & Koffman, 2004). Combat is known to have numerous direct deleterious effects on its participants (Glenn, Beckham, Feldman, Kirby, Hertzberg & Moore, 2002; Nock, Kaufman & Rosenheck, 2001; Beckham, Feldman & Kirby, 1998; Hobfoll, Spielberger, Breznitz, Figley, Folkman, Lepper-Green, Meichenbaum, Milgram, Sandler, Sarason & van der Kolk, 1991; Prigerson, Maciejewski & Rosenheck, 2002). In the combat environment, soldiers use extreme violence to accomplish organizationally directed objectives. Soldiers are also the target of extreme violence and in response or proactively use extreme violence for self preservation. In each of these examples, soldiers are sanctioned to appropriately use violence as a tool to control the environment. However, when soldiers return from the combat environment, their use of violence is no longer appropriate.

One of the primary factors in predicting aggression and violence in interpersonal relationships is the prior use of violence and aggression (Nock, Kaufman & Rosenheck, 2001). Because violence is an unavoidable factor of soldiering in combat, it is particularly important to investigate whether and how other factors, such as combat

stressors, and unit (group) characteristics affect soldiers' levels of post combat violence. This research has promise in a number of important areas. First, it may increase the ability to predict which soldiers will be aggressive and use violence after returning from the war zone. Second, and potentially most importantly, it may inform the Army about unit characteristics which best decrease soldiers' post combat violence. If we find that specific organizational factors decrease soldiers' use of aggression and violence after returning from combat, implications for organizational change may emerge. There are numerous examples of the Army changing procedures to better transition soldiers to post deployment environment. Some examples of changes are: mandated reunion briefings, redeployment half day leave schedule, and mandated mental health screening prior to redeployment and 3 months after returning home.

## **Background**

During the months of June and July 2002 there were four homicides of active duty soldiers' spouses at Fort Bragg, North Carolina. The four cases generated significant national and international news coverage. There were numerous media reported hypotheses about why the homicides had happened. Three of the four soldiers had just returned from duty in Afghanistan and were in the same Command, 7<sup>th</sup> Special Forces. As awareness of the tragedy increased, the US Army Office of the Surgeon General (OTSG) established a charter for an epidemiological consultation (EPICON) team to visit Fort Bragg and consult with local medical and line leadership. The team's objectives were to assess and provide recommendations to OTSG to address potential systemic and cultural factors that might have contributed to the homicides. One of the EPICON's

(OTSG, 2002) major recommendations was to further study of the impact of combat on domestic violence, health outcomes and health risk behaviors. At approximately the same time, the Chief of Staff for the 18<sup>th</sup> Airborne Corps at Fort Bragg requested that Walter Reed Army Institute of Research (WRAIR) commission a study to evaluate soldier wellness. The WRAIR constructed a survey that sought soldiers' responses on numerous questions pertaining to: combat experiences, work environment, morale, cohesion, communication, leadership, combat readiness, physical health status, mental health status, aggressive behaviors, alcohol/drug use, marital satisfaction, domestic violence, marital concerns, well-being and adjustment of children and retention intentions. This robust survey, called the Land Combat Study (LCS), was approved and access to soldiers of the 18<sup>th</sup> Airborne Corps was granted.

Units from the 18<sup>th</sup> Airborne Corps spearheaded the invasion and occupation of Iraq in 2003. Units from the 3<sup>rd</sup> Infantry Division at Fort Stewart Georgia, the 101<sup>st</sup> Airborne Division (Air Assault) at Fort Campbell Kentucky and the 82<sup>nd</sup> Airborne Division at Fort Bragg North Carolina completed the LCS three months after returning. For the first time in US Army history, and potentially military history, a large sample of combat soldiers from various units completed a survey on a wide array of stressor and strain variables. Additionally, the soldiers were surveyed anonymously and a relatively short time after their participation in intense combat. Possibly for the first time, the relationship between the stressors of combat and strain outcomes could be empirically tested.

## **Organization of the Dissertation**

The purpose of this study is to test the effect of organizational characteristics on the relationship between stressors in combat and post-combat aggression and violence. A comprehensive review of the conceptual and empirical literature on the relationship between combat stressors and post combat aggression and violence, along with factors that moderate this relationship, will be investigated. Given that this phenomenon encompasses both individual development and a soldier's occupational stress factors, literature from both civilian and military occupational stress fields will be reviewed. From the review, a conceptual model will be proposed along with testable hypotheses. The methodology section will build on the conceptual model by first describing and then proposing the use of a multiple regression analysis strategy. The data will be analyzed and then findings will be discussed.

Large numbers of US Army soldiers have participated in combat in Iraq. In past wars, combat has been found to have numerous negative consequences for soldiers. The most obvious are death and physical injury. The experience of combat also results in some soldiers experiencing mental health difficulties. Also noted in the literature is the phenomenon of soldiers returning from combat with higher rates of aggression and violence. Decreasing soldiers' post-combat difficulties is an important goal for active duty social work officers. Specifically, decreasing soldiers' post-combat aggression and violence supports combat soldiers' often difficult transition to non-combat duty. There are no studies that have investigated the role of combat stressors and organizational support on the amount of aggression and violence that combat soldiers report post-combat. Increasing knowledge in the area of post-combat aggression and violence is an

important undertaking that may potentially guide further research in this timely and vitally important issue. This increased knowledge could support and guide organizational interventions which focus on decreasing combat soldiers post-combat aggression and violence.

### **Relevance to Social Work**

The organizational behavior and industrial-organizational psychology fields have developed and tested individual and organizational models that examine the relationship between occupational stressors and physical, psychological and behavioral strains (see Cooper et al., 2001; Crandall & Perrew, 1995). Googins and Godfrey (1985) define occupational social work as “a field of practice in which social workers attend to the human and social needs of the work community by designing and executing appropriate interventions to insure healthier individuals and environment” (p. 38). Writing in the 1920s, the social worker Mary Follet was a vanguard in using social sciences to solve business problems (Fox & Urwick, 1982). Follet recognized that organizations were open and dynamic systems where labor and management worked together to achieve business objectives (Sorge & Warner, 1997). Even though some of the earliest organizational psychological writings focusing on occupational stress were written by social workers, few contemporary social workers publish on the subject (Barak & Bargal, 2000). Barak and Bargal (2000, p.4) suggest that occupational social workers focus their interventions at four objectives:

1. Improve the fit between the needs of individuals and their families, work organizations and communities.
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 that will inform practice and policy.

Pearline and Schooler (1984) suggest that work problems are intertwined with the social structure and organization of the workplace and thus require collective rather than individual responses. Balgopal (1989) concurs and suggests occupational social workers assess the environmental stressors, “An occupational social worker would include locating various stressors that are intrinsic to the work environment and persist independently of the client (p. 441). Donovan (1987) discusses the importance of incorporating environmental assessments into clinical practice and states:

...social work’s professional code of ethics mandates a broader concern, that is, concern about the “troubling working conditions” as well as “the troubled worker.” They advocate a preventative approach to service development, incorporating the work environment into assessments and interventions and expanding knowledge of the impact of poor working conditions on individual and family well being (p. 259).

Kurzman and Akabas (1981, p. 54) similarly state “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.” Balgopal (1989) articulates this point even further, “Practitioners will need to understand differences in organizational climate and character to make that particular environment responsive to intervention efforts and to share their results with other social workers” (p. 440).

Colonel David Lockett, the Social Work Consultant to the Army Surgeon General wrote in his overview of Army social work (1999), “Unlike social work practice in many other areas, military social work exists with the bottom line function of supporting the readiness of soldiers to fight and win wars for our nation” (p. 315). At face value,



supporting violence may appear to contradict social work ethics, but a deeper analysis reveals that Army social workers provide support to soldiers who perform the organization's objectives. Uniformed social workers have been commissioned in the Army since the 1950s, providing clinical services and case management for soldiers and their family members (Harris, 1999).

Currently, social work officers serve in the combat operational Army in one of three units: (1) Combat Divisions, (2) Medical Detachments (Combat Stress), and (3) Medical Brigades. In these positions, the social workers provide individual and group mental health services, preventive psycho-educational courses and consultation to leaders on the management and prevention of combat stress reactions. Social workers assigned to operational units are the front line behavioral health providers and consultants to soldiers and commanders during combat operations. They must know how combat stressors affect units and individual soldiers. Martin and Campbell (1999) addressed the unique position of the uniformed social worker as follows:

“You must have the capacity of grasping the reality of the physical mental and emotional stressors of combat and the impact of the leadership challenges faced by combat arms officers, NCOs and soldiers. You must be willing to face the hardships and be able to provide a stabilizing and calming force (p. 160).

Further, and possibly more importantly, social workers must know how to mitigate combat stressors through direct services or consultation to unit commanders. Ideally, this reduces soldiers' strain during combat and once they return home. When knowledge of the military system is combined with strong professional credibility, mastery of appropriate theory, political interactional skill and empirical evidence, the experienced military social worker may be able to effect change at the institutional level.

This study has the potential to increase the general social work knowledge base on combat stressors and soldier's strains upon returning from combat. Specific to the Army, the findings may support specific organizational changes and policy recommendations to enhance the functioning of soldiers and their families. In summary, there exists a historical precedent for social work involvement in the occupational setting of both private and military sectors. To be credible, this knowledge must be empirically based and scientifically tested.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **Introduction**

The purpose of this study is to test the effects of organizational characteristics on the relationship between combat stressors and post-combat aggression and violence. Therefore, this review appraises literature from three major areas: (1) literature that reviews stressor strain models; (2) literature that reviews the effects of combat on soldiers and their post-combat aggression and violence strain; and (3) occupational stress literature that tests how organizations buffer individuals from stressors. This review also highlights literature that focuses on combat or occupational violence as a stressor and aggression/violence as a strain. In an effort to better understand how these factors affect soldiers, studies that have used active duty military populations have also been reviewed.

#### **The Stress-Strain Process**

The literature contains varying definitions, conceptualizations and operationalizations for the concept of stress (Brief & George, 1991; Cooper, Dewe & Driscoll, 2001; Lazarus, 1995). Researchers have conceptualized stress in one of three ways: as a response to stimulus, as a stimulus, and as the result of a transaction between environmental and individual variables. The general definition used for this study is based on the transactional theory of stress. Stress occurs when there is an imbalance between the person and the environment (Cooper et al., 2001). To facilitate

understanding of the transactional stress theory, a brief review of the development of stress models is presented.

### **Stress as Response Model**

The earliest conceptualization of stress, as a response, developed out of Cannon's (1935) work in examining the central nervous system and the adrenal system in response to fear or pain. He posited that emergencies like fear and pain stimulate the central nervous system to instigate hormonal discharge of the adrenalin glands which results in cardiovascular changes to prepare the body for "fight or flight" (Cannon, 1935). Hans Selye (1956) performed laboratory research focused on understanding the effects of harmful substances on animals. He defined stress as "a non-specific response of the body to any demand placed upon it" (p.1). Based on his work of categorizing responses to "stressors" (p. 51), Selye posited that when individuals experience a stressful stimulus, they will respond with a predictable set of reactions, which he termed "general adaptation syndrome" (GAS). Selye conceptualized GAS as a three phase process: alarm reaction, adaptation response, and exhaustion. Underlying his theory, Selye assumed that stress response was universal and stimuli were undifferentiated.

The "stress as response" concept has been widely challenged. Lazarus and Folkman (1984) argue that response-based definitions do not provide a theoretical foundation to identify potential stressors. They state, "We then have no systematic way of identifying prospectively what will be a stressor and what will not" (Lazarus & Folkman, 1984, p. 14). Edwards (1992) criticized the theory for ignoring the individual and environmental psychological variables of appraisal and coping. Cooper and colleagues

(2001) argued that the stress as response theory ignored important environmental factors, such as intensity, frequency and duration of the stimulus. Seyle's concepts of stress as response and GAS have significantly influenced the conceptualization of stress. However, by failing to differentiate different types of stressors and ignoring the impact of psychological responses, Seyle limited his theory's utility in describing the whole of the stress process (Cox, 1987).

### **Stress as a Stimulus Model**

These theoretical shortcomings led to a shift in stress research. Researchers began to focus on external conditions influencing stress. As early as 1953, Grinker stated 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 conceptualizations and definitions of stress sought to identify internal and external sources that disturbed the individual's equilibrium. This approach has been criticized for ignoring individual differences, being too stressor focused, too one-dimensional, and too reductionist (Cooper et al., 2001; Lazarus, 1995, Perrewe & Zellars, 1999). Lazarus and Folkman (1984) point out the shortcomings by asserting that, "there is no objective way to predict psychological stress without reference to properties of the person" (p.21). Although the "stress as response" and the "stress as stimulus" models identify important components of the stress strain process, neither is comprehensive in their description of the whole process. They both ignore the perceptual

and cognitive processes of stress appraisal and individual differences in appraisal and stress responses (Cooper et al., 2001; Lewis, 2003).

### **Transactional Stress Model**

To formulate a comprehensive theory and definition of stress, Lazarus and Folkman (1984) developed the transactional theory of stress to address the identified shortcomings of both the stress as response and stress as stimulus models. The transactional stress model hypothesizes that stress is the result of a perceived disparity between the demands of an individual's environment and the way individuals respond (Aldwin, 1994; Cohen, Evans, Stokols & Krantz, 1986; Evans & Cohen, 1987; Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus & Launier, 1978). Lazarus and Folkman (1984) specifically defined stress as "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. 21). Lazarus and Folkman (1984) further proposed two cognitive mechanisms which moderate the individual's stressor strain relationship: cognitive appraisal and coping.

### **Cognitive Appraisal**

Lazarus and Folkman (1984) describe cognitive appraisal as the evaluative process that intervenes between the event and the reaction. The process of cognitive appraisal has both primary and secondary components. Primary appraisal is the judgment that an encounter (with the environment) is either irrelevant, benign-positive or stressful (Lazarus & Folkman, 1984, p53). Irrelevant encounters are those which the individual

deems as having no personal meaning for the individual. Benign-positive encounters are those appraised as beneficial or desirable. Stressful encounters are those that are considered as either a threat, challenge, harmful or indicative of actual or perceived loss (Lazarus & Folkman, 1984). Secondary appraisal is the cognitive process of identifying what can be done to minimize the threat of loss or harm (Lazarus & Folkman, 1984). Secondary appraisal requires individuals to evaluate their own abilities and resources as well as environmental resources available to counter the stressful situation. It also includes identifying the potential consequences of a strategy or course of action (Lazarus & Folkman, 1984). In summary of the appraisal process, an individual perceives a stressor and determines the importance or meaning of the event. Then the individual identifies and evaluates possible actions, available resources and potential consequences to counter the stressful situation. Lazarus and Folkman (1984) describe the culmination of these cognitions and behaviors as coping.

## **Coping**

Lazarus and Folkman (1984) define coping as “cognitive and behavioral efforts made to master, reduce or tolerate the internal or external demands that are created by the stressful transaction” (p. 43). The authors posit two primary forms of coping: problem-focused coping and emotional-focused coping. Problem-focused coping entails strategies aimed at acting upon the stressful environment to reduce its negative impact. Emotional-focused coping involves behaviors which alleviate the emotional consequences of the stressful environment but do not change the actual environment (Cooper et al., 2001). Coping is a continuous and dynamic process where individuals re-evaluate the efficacy of

their strategies. They determine whether their desired results have been achieved; if not, negative feedback initiates further coping, evaluation, and adjustment. Problem-focused and emotional-focused coping can be executed separately or jointly and are only constrained by the individual's personal and environmental resources (Lazarus & Folkman, 1984).

Transactional stress theory provides a broad conceptual framework to better understand and examine the effects of combat. Specific to this study, the theory helps to explain the relationship between cognitive appraisal of combat, moderating organizational factors which support coping strategies and the physiological, psychological and behavioral consequences of stressors. These consequences are termed strain.

## **Strain**

The stress research literature 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 negative consequences denote the "strain" in the stressor-strain process. Lazarus and Folkman (1984) indicate that strain occurs when individuals appraise the demands of the stressor in excess of their ability to cope. Strain is manifested in three primary areas: physiological, psychological and behavioral (Kahn & Byosiere, 1992).

Physiological strain is associated with physiological problems that have been empirically linked to occupational stress. Studies have linked occupational stress to cardiovascular symptoms (Karasek & Theorell, 1990; Schnall, Landsbergis & Baker,



1994), endocrine and immune system dysfunction (Uchino, Cacioppo & Kiecolt-Glasser, 1996), gastrointestinal symptoms (Fried, Rowland, & Ferris, 1984; Schulz, Greenley & Brown, 1995) and infectious disease (Schaubroeck, Jones & Xie, 2001).

In the occupational stress literature, psychological strain has been extensively researched. Job satisfaction has been the most widely examined form of psychological strain (Lewis, 2003), but evidence suggests that occupationally derived stress is also associated with diminished self esteem, anxiety, depression, boredom and organizational commitment (Sullivan & Bhagat, 1992). Military stress research has also identified a number of psychological strains as a result of combat: posttraumatic stress disorder, combat stress reactions, and hostility (Glenn et al., 2002; Nock et al., 2001; Beckham et al., 1998; Hobfoll et al., 1991; Prigerson et al., 2002)

Behavioral strains that have been linked to occupational stress are absenteeism, taken sick days and turnover (Cooper & Bramwell, 1992; Gupta & Beehr, 1979; Jamal, 1984), and job tension and commitment (Katz & Kahn, 1978; Sullivan & Bhagat, 1992). Studies specific to the stressor of combat have found behavioral strains in the form of aggression and interpersonal violence (Prigerson, Maciejewski & Rosenheck, 2002; Glenn, Beckham, Feldman, Kirby, Hertzberg, & Moore, 2002; Nock, Kaufman, & Rosenheck, 2001; Beckham, Feldman, & Kirby, 1998). How this study differs from the above studies will be described in detail.

### **Soldier Adaptation Model**

Bliese and Castro (2003) attempt to extend the transactional stress model and further refine it to specifically model military occupational stress. They propose the

Soldier Adaptation Model (SAM) as a meta-theory, a framework for hypothesis generation. The SAM is comprised of three major components: stressors, moderators (both individual and unit/organizational) and strains.

As implied in the title, the SAM is specific to military occupational stress. Stressors are aspects of the environment that place a load or demand on the soldier (Jex, Behr, & Roberts, 1992). The SAM assumes that measurable stressors exist in all soldier environments: training, garrison, peacekeeping and combat. Being able to distinguish specific stressors in each of these environments allows the comparison of the effects of stressors across environments. For example, soldiers in both peace enforcement operations and combat operations may engage in the stressful activity of handling human remains. By delineating and measuring the specific stressor “handling human remains” findings and recommendations developed in one environment can potentially be applied to the same stressor in other environments.

The second component of the SAM is moderators. Moderator variables change the form of the relationship between independent and dependent variables. They are constructs that intensify or buffer the relationship between stressors and strains. Bliese and Castro (2003) postulate that there are three levels where moderators impact. Those levels are the individual, the local group and the organization (Bliese & Castro, 2003). Like their assumption with stressors, moderators at each level must be identifiable and measurable. This supports research that measures the impact of moderators at different levels. Bliese and Castro (2003) argue that this line of inquiry is perhaps the most important in the military occupational stress field. They state:

In many situations (including peacekeeping) the stressors are likely to be immutable: mission accomplishment requires soldiers to endure difficult

living conditions, heavy workloads, ambiguity, etc. Thus, it is simply not always feasible (or necessarily desirable) to reduce strain by reducing stressors. In contrast, it is theoretically and often practically feasible to reduce strain by affecting the moderating variables. For instance, if unit cohesion serves as a moderating effect akin to social support and protects soldiers from the severe stressors of combat (see Manning, 1991; Shils & Janowitz, 1948), then there may be practically feasible interventions that can be designed to help foster cohesions during garrison training (p.7).

Bliese and Castro (2003) describe strains as outcomes. Unlike Lazarus and Folkman (1984), they classify strains into three different categories: health, attitudes and performance. Again, they assume that strains can be identified, measured and indicate the existence of strain. In the SAM, health strains include physical and psychological health measures. Herein lies one of the differences between the SAM and Transactional Stress Model: classification of strains. Bliese and Castro would classify depression or post traumatic stress disorder as a health strain, whereas Lazarus and Folkman (1984) would classify it as psychological strain. Bliese and Castro (2003) describe individuals' perceptions of their job or organization as "attitudinal strain." However, the majority of organizational research uses this term to describe individual job satisfaction and organizational commitment. The SAM also emphasizes that strain can and should be measured at the individual, group/unit and organizational level.

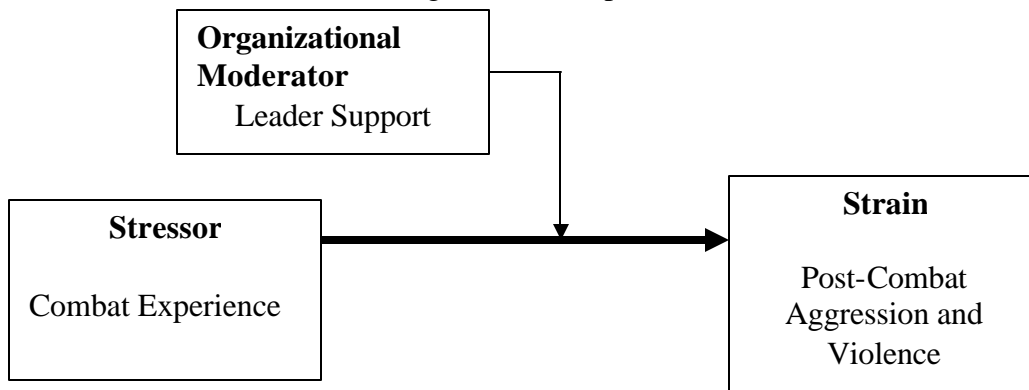
### **Conceptual Model**

Elements of Lazarus and Folkman's (1984) transactional model of stress and Bliese and Castro's (2003) SAM provide the conceptual foundation for this study. This resultant model specifies moderators of the stress-strain relationship. The model supports this study's conceptualization that organizational factors moderate the stressor-strain

relationship. The model is parsimonious and provides testable hypotheses about the relationships between variables.

The variables identified and described in the model (represented graphically in Figure 1) are described in greater detail following a description of the conceptual model. Based on the model, it is proposed that stressors reported in combat have a direct relationship with behavioral outcomes. As posited by Lazarus and Folkman (1984) and Bliese and Castro (2002), there is considerable individual variation in the second dynamic appraisal process of stressors and how to cope with them. Therefore, organizational factors which influence individual appraisal will be measured. The organizational moderator, leader support, will be measured at the group level.

Figure 1, Conceptual Model.



The proposed conceptual model, as depicted in Figure 1, has three primary elements. The elements are: 1) the objective stressors of combat and individual assessment of the danger of combat; 2) the organizational moderator of leader support; and 3) the strain of post-combat aggression and violence. After reviewing the pertinent

literature, operational definitions of the constructs will be described. Then, testable hypothesis regarding the differing constructs of interest will be proposed.

### **Combat Stressors**

The overall purpose of combat is to break the opponent's willingness to fight. This is accomplished by either killing them or subjecting them to hell-like conditions until they break down and can no longer endure the stress (Noy, 1991). Combat is chaotic, intense and highly destructive. The US Army's (1994) primary document of the effects of combat lists a number of stressors identified in past battles: extensive casualties, isolation, viewing mass destruction and death, massing of firepower in small areas resulting in total destruction, loss of members in unit, large numbers of killed in action, large numbers of wounded in action, fighting on unfamiliar or less familiar terrain, continuing battle with little information, and killing civilians and enemy combatants (p. 10-1). The US Army's (1994) definition of combat stressors is, "any stressors occurring during the course of combat-related duties" (p. 2-1).

There have been few psychometric scales developed to measure combat exposure. The self-report measure predominately used in the literature is the Combat Exposure Scale (CES) developed by Keane, et al. (1989). The CES is a seven-item scale which asks respondents to subjectively report their type of combat experience and number of times the specific situation occurred. An example question is: "Did you ever go on combat patrols or have other very dangerous duty?" The seven items are weighted differentially based on the severity of the experience (Keane et al., 1989).

A potential weakness of the CES is its inability to assess the combat veterans' appraisal of their combat experience. To match Lazarus and Folkman's model of transactional stress, it is important to assess both the objective experience and the veteran's primary appraisal whether the stressor is irrelevant, benign-positive or stressful.

There appears to be only one study that evaluates combat exposure's relationship to post-combat interpersonal violence and aggression in non-PTSD diagnosed veterans. Beckham, Feldman, Kirby, Hertzberg and Moore (1997) studied interpersonal violence among Vietnam veterans comparing those with and without chronic posttraumatic stress disorder. The PTSD group was recruited from 17 help seeking combat veterans with PTSD at the Durham Veterans Affairs Medical Center Posttraumatic Stress Disorder Clinical Teams. The comparison group of 20 Non-PTSD diagnosed combat veterans was recruited through a prescreening mailing to a random sample of 200 Vietnam veterans who sought services within the previous year at the Durham Veterans Affairs Medical Center.

Subjects were administered the Mississippi Scale for Combat-Related PTSD (Keane, Caddell, & Taylor, 1988). PTSD subjects scored above the recommended clinical cutoff score of 107. To be in the non-PTSD group, members scored below 89. To assess the stressor of combat exposure, subjects completed the CES (Keane et al., 1989). Overall, the average score fell in the moderate range of combat exposure. To assess the outcome of interpersonal violence, the subjects also completed Standard Family Violence Index (SFVI) which is the Violence Subscale of Straus's (1979) Conflict Tactics Scale (CTS). The items on the subscale include the behaviors of throwing something at someone, pushing, grabbing, shoving, slapping, kicking, biting, beating up, threatening

with a gun or knife, or using a gun or knife on someone. Subjects report the number of times in the past year they have executed such behaviors.

This study analyzed the main effects of age, socioeconomic status, PTSD and combat exposure. It found a significant relationship between PTSD and combat exposure. After controlling for all the covariates, combat exposure had a significant main effect on interpersonal violence level for combat exposure, independent of PTSD diagnosis. This is an important finding, but it must be considered in the context of its methodological weaknesses. The primary weakness of the study is its reliance on treatment seeking veterans recalling and describing combat events that happened decades prior. The data are vulnerable to inaccurate recall based on the elapsed time, as well as a tendency to exaggerate symptoms in treatment seeking groups. Another weakness is the small sample size. This study addresses some of these weaknesses through sufficient sample size, sampling method, unit level reporting of combat experiences and timely data collection.

## **Leader Support as Organizational Moderator**

### **Introduction**

Of particular interest to military researchers is the concept of leader support as a moderator of combat stressors. Manning (1991) proposes that caring and competent leadership (described in this study as leader support) in the military is conceptually equivalent to the concept of social support in non-military settings. From the civilian occupational literature, Wykes and Whittington (1989) suggest that social support is important in reducing the negative effects of exposure to work related violence. Britt and

colleagues (2004) point out that understanding the role of leadership support in the stressor-strain relationship is important for two reasons. First, the military exposes soldiers to a wide range of stressors, from mild to potentially fatal (Adler & Mathews, 1994; King, King, Fairbanks, Keane, & Adams, 1998). Secondly, extended exposure to stressors impedes mental health (Cohen & Williamson, 1991).

To maintain a healthy military, leaders must understand how they can reduce the negative effects of stressors. One of the primary goals of occupational stress research is to identify ways to reduce stress by identifying potential buffers of the stressor strain relationship. Researchers have investigated organizational variables with the potential to ameliorate or reduce the negative impact of stressors, making employees more resilient to the negative effect of stressors (Bliese & Britt, 2001).

Because of the powerful influence of leaders on subordinates, military researchers have focused a great deal of research on leadership behaviors. Leaders support in the form of supportive leader behavior consists of behaviors intended to provide psychological support for subordinates, especially in situations that are psychologically and physically distressing (Britt et al., 2004). Schat and Kelloway (2003) remarked on the paucity of research on social support buffering exposure to violence.

Cobb (1976) defined social support as “information leading the subject to believe that he is cared for and loved, esteemed and a member of a network of mutual obligations” (p. 300). House (1981) distinguishes four kinds of social support: instrumental, emotional, informational and appraisal. Instrumental support is the willingness to directly do things for others and or give material aid. It can be the provision of financial aid, material resources and needed services. Instrumental aid may



help reduce stress by direct resolution of instrumental problems or by providing the recipient with increased time for activities such as relaxation, or entertainment.

Instrumental support is also called aid, material support and tangible support.

Emotional support provides care, love and sympathy. Emotional support enhances self-esteem by communicating that people are valued and accepted for their own worth and experiences despite any difficulties or personal faults (Cohen & Wills, 1985).

Informational support is giving information that can be used by the receiver for coping with personal or environmental problems. It can be given informally or formally through training, and helps in defining, understanding and coping with problematic events (Schat & Kelloway, 2003). Appraisal support is providing feedback about personal functioning directed to enhancing self-esteem.

Although House (1981) conceptually delineates different types of social support, Thoits (1986) points out that in naturalistic settings the kinds of social supports are not independent. For example, Barling (1998) found that individuals rated all forms of social support as being partially confounded with emotional support. This study's conceptualization of measuring leader support as a cluster of behaviors measured at the group-level is therefore supported.

Using stressor strain terminology an important question can be created, "Why might social support serve to buffer strain from high level stressors?" On a gross theoretical level, Fusilier, Ganster, and Mayes (1987) posit that social support interacts with stress to influence strain. Berger, Farmer, Glazer, Gudanowski, and Nair (2003) report that social support weakens the relationship between stressors and strains. Some researchers theorize that specific types of social support have different mechanisms of

action. Even so, evaluation of theoretical proposals demonstrates there is still considerable overlap.

Cohen and Wills (1985) speculate that individuals use informational support in two ways to counter perceived lack of control: 1) to reappraise stressors as benign, or 2) to suggest appropriate coping responses. For example, soldiers who perceive a future combat operation as extremely stressful may approach a leader and express their fear. In return supportive leaders may provide their assessment of the enemy's known weakness, suggest tactics that have proven successful in similar operations in the past or through past performance increase the soldier's confidence in their leadership. In this way, the support intervenes between the stressful event and a stress reaction by attenuating or preventing a stress appraisal response. For the person experiencing the stressor, the knowledge that persons can and will provide support may redefine the potential for harm that the stressor initially presents, and enhances their perceived ability to cope with the demands of the stressor. Several studies suggest that social support aids stress resistance by supplying people with the information that they are loved, appreciated and part of a network of caring individuals (Caplan, 1974; Cobb, 1976). This information enhances a feeling of mastery that Bowlby (1982) has related to our earliest attachment experiences (Solomon, Mikulincer, & Hobfoll, 1986).

Researchers theorize that appraisal support works by enhancing the person's self esteem and thereby helping him or her to cope or master the stressor (Brown & Harris, 1978; Cobb, 1976). This coping and seeking mastery fosters positive affect and reduces the damaging impacts of stress (Thoits, 1986). Cohen and Wills (1985) suggest that appraisal support may counterbalance threats to self-esteem that commonly occur as a

response to stress appraisal. For soldiers in combat, Solomon, et al. (1986) state, “as combat is such a tremendously threatening event, it is not surprising that the existence of officer support might lead to the sense of mastery that the soldier so desperately seeks” (p. 1270). Leaders demonstrate appraisal support when they tell their subordinate how lethal and invulnerable they are to their enemies. House (1981) defines appraisal support as feedback about personal functioning directed at enhancing self esteem. Theoretically, appraisal support provides confirmation of social identity, which buffers members from negative appraisal of stressors (Bliese, & Britt, 2001; Cobb, 1976; Cohen and Wills, 1985; House, 1981). House (1981) posits that when subordinates’ tasks or work environments are dangerous, monotonous, stressful or frustrating, supportive leader behaviors increase subordinate effort and satisfaction by enhancing leader-subordinate relationships and self confidence which in turn, lowers stress and anxiety and compensates for unpleasant aspects of the work. Feedback from supportive companions, which reassures and affirms, prevents the negative impact of stressors on the person’s self-concept by confirming and enhancing self-esteem and personal efficacy (Epley, 1974; Gottlieb, 1983; Pearlin, Lieberman, Menaghan & Mullan, 1981).

Theoretically, emotional support provides a sense of belonging in a network of caring where persons are more capable of mastering stress (Cobb, 1976; Cohen & Wills, 1985; Solomon et al., 1987). Specifically addressing victims of violence, emotional support provides resources that victimization removes. The provision of acceptance may prevent the assessment that the environment is threatening, untrustworthy and rejecting (Kaniasty & Norris, 1992; Kutash, 1978; Silver & Wortman, 1980). Leaders that reassure

their soldiers that they are part of a team that take care of each other is an example of emotional support.

As Winnubst and Schabracq (1996) point out, social environment is not the only variable in the effectiveness of social support, but also the subject's receptivity to social support. ODriscoll and Dewe (2001) state that individual differences moderate the effectiveness of social support; "that is, the relationship is stronger for some people and weaker or non-existent for other people, perhaps because some people value social support more than others" (p. 234). Two ways that may explain the difference in effectiveness of social support are the subjective perception of the availability of social support and individual psychological differences.

Social support has been measured with both objective measures of available support and the perceived availability of social support (Cohen & Wills, 1985). However, Kessler and McLeod's (1985) review of the literature demonstrated that stress-buffering effects were found more consistently when social support was measured as a perception that one's network was ready to provide aid and assistance if needed. Research shows that perceived support is in general more important than received support in predicting adjustment to stressful life events (Henderson et al., 1981; Wethington & Kessler 1986). For this reason social support is generally operationalized in terms of perceptions of the recipient (Ganster, Victor, 1988; Wethington & Kessler 1986). Speculating on why perceived support is more effective than objective measures of support, Cohen and Wills (1985) propose that the buffering qualities of social support are cognitive and work by affecting one's interpretation of the stressor. It is possible that people who perceive themselves as having ready access to support are more likely than others to elicit

supportive behaviors when a crisis occurs in their lives (Wethington & Kessler, 1986). Cohen and McCay (1984) similarly describe the possibility that the perception of having access to social support protects against distress by affecting the subject's appraisal of the situation.

Other researchers argue that the effects of perceived support are spurious and can be explained by intra-psychic characteristics that negatively affect the evaluation of support availability (Dohrenwend, Dohrenwend, Dodson, & Shrout, 1984; Fusilier, Ganster, & Mayes, 1987; Henderson et al., 1981; Wethington & Kessler, 1986). Dohrenwend, et al. (1984) state, "some types of social support are consequences of personal dispositions in general and psychopathology in particular" (p. 229). They also propose that measures of social support may in fact be measuring the respondents' habitual pattern of constructing elements in their day-to-day life (Dohrenwend et al., 1984). Gottlieb (1983) argues that individual differences in social competence and disposition related to empathic responses deserve study because they may affect people's access to social support and their skills in rendering social support.

Of particular interest in this study is the potential effect that Post-Traumatic Stress Disorder (PTSD) has on an individual's perception of and access to the beneficial effects of social support. Solomon and Mikulincer (1990) found that combat related PTSD may impair the veteran's social functioning and create a negative social network orientation. Keane, Scott, Chavoya, Lamparski and Fairbank (1985) found that although Vietnam veterans with PTSD reported having "pre-military" social support equivalent to control groups, they reported a decrease in social support from the time of their discharge.

There may be a number of individual factors, resulting from PTSD, that potentially increase or decrease the effect of or receptivity to social support. PTSD symptoms, especially numbing of responsiveness, diminished interest in significant activities, feelings of detachment from others (Hanley, 1975; Hendin & Hass-Pollinger, 1984) and elevated levels of hostility (Hendin & Hoss-Pollinger, 1984) could be detrimental to their relationship with their social support and their ability to benefit from or perceive the benefit of social support (Solomon & Mikulincer, 1990).

Stress is assumed to affect persons with strong social support less adversely than it affects persons with weak social support. Research on the buffering hypothesis has moved toward greater definition specificity and has increasingly matched the type of support to the expected strain (Beehr, 1995; Beehr, Farmer, Glazer, Gudanowski, & Nair, 2003; Cohen & McKay, 1984; Hobfoll, 1990; Kaniasty & Norris, 1992). Viswesvaran's (1999) meta-analysis suggested that theoretical attention needs to be given to the types of social support expected to moderate effects of specific types of stressors (Cohen & Wills, 1985; Ganster, 1988; Ganster et al., 1986; House, 1981; Pratt & Barling, 1988; Tetrick & LaRocco, 1987). For example, in their seminal literature review of social support literature, Cohen and Wills (1985) posited that "there must be a reasonable match between the coping requirements and the available support in order for buffering to occur" (p. 315).

### **Social and Leader Support Research**

Both military and civilian based organizational stress literature focuses on formal supervisory support (as opposed to peer support) to understand the effects of social

support (Bliese & Castro, 2000; Manning, 1991; Winnubst & Schabracq, 1996). Leather, Lawrence, Beale, and Cox (1998) found that formal leadership support has a more positive impact on the negative effects of occupational exposure to stressors than informal support (which may originate from family, friends or coworkers). Supportive behaviors from within the immediate organizational context are expected to have stronger affect on perceptions than supportive behaviors originating outside the immediate organization (Indik, 1968; Schneider, 1983). This appears to hold true even when there is quantifiably more perceived informal support available (Beehr, 1995; Bliese & Castro, 2000; House & Wells, 1978; Kobasa & Puccettis, 1983; LaRocco, House & French, 1980; Leather, 1998; Marcelissen, 1987; Rosen & Moghadam, 1988). In their study of the Israeli Army, Solomon, Mikulincer, and Hobfoll (1986) found that unit Officer Support was the most impactful variable among different measures of social support. Leather, (1998) suggested that support from within the organization is best placed to help employees develop and sustain problem-focused coping strategies. Kobasa and Puccettis (1983) posited that the relative effectiveness of supervisor support in this context is probably attributable to the match between stressful events and support functions provided in the work setting. Social or contextual factors may ameliorate the negative effects of stressors. Bliese and Castro (2000) found evidence demonstrating that contextual factors (e.g., leadership climate) in Army Companies moderated relationships between individual stressors and individual strains. Specific to this study, these findings provide justification for the selection of leader support (instead of other types of social support) as a moderating variable.

Historically there have been a number of methodological weaknesses in social support studies. The use of clinical samples restricted the desirable sample characteristic of broad ranges of stress, social support and symptomatology. Cohen and Wills (1985) point out that numerous social support studies lack the methodological strength for testing the buffering model as a significant modifier of stressors and strains. Low reliability or validity of support measures also reduces the probability of showing either main or interaction effects. Unfortunately, many investigators used scales that were created post hoc from large data sets or created their own scales without psychometric testing or development. Others used single-item measures that almost necessarily have low reliability. Although most of these scales have some face validity, formal psychometric data are seldom reported (Cohen & Wills, 1985). Also, some scales are more sensitive to measuring recent stress or personality factors than social support. The prospective design assumes that predictor variables remain relatively stable over the period of prediction. Measuring support, especially perceived availability, might fluctuate considerably over long periods. These methodological and psychometric deficiencies potentially reduce the probability of demonstrating a buffering effect.

Another problem is that the social support measures often reflect subjective perceptions of support rather than their objective existence. Whereas some researchers have noted that perceived support is what is important (e.g., Henderson, Byrne, & Duncan-Jones, 1981), others have argued that this confounds the environmental nature of support with personal attributes (e.g., Dohrenwend & Shrouf, 1985; Solomon & Mikulincer, 1990).



Winnubst and Schabracq (1996) point out another issue with measuring social support. They address the problem that when measuring social support using individual measures, “it is unclear whether one is measuring (a) individual differences in perceptions of support, (b) actual contextual differences in support, or (c) some combination of individual difference and context. This brings to light the issue of level of analysis. Ambiguity about which “level of analysis” (individual or group) is best to measure the buffering effects of support may explain the rather inconsistent findings even though the theoretical rationale appears sound (Britt, 1997). Bliese and Britt (2001) discuss the problems of analyzing the buffering effects of social or contextual factors, which requires mixing levels of analysis. They point out that stressors and strains are typically measured at the individual level while contextual effects are measured as group level constructs. This can result in potential mismatching across levels of measurement and requires particular attention to how models are specified and tested. They suggest measuring social support as a contextual variable, stating that a group’s average rating of social support is potentially more accurate in measuring actual social support provided.

This view of social support is similar to the view of leadership behaviors suggested by Shamir, Zakay, Breinin, and Popper (1998). Specifically, Shamir, et al. argued that charismatic leader behaviors in military units tend to be ambient behavior directed at the unit as a whole. Bliese and Britt (2001) also take the position that the behaviors that leaders perform to create a supportive environment also tend to be directed towards the entire unit and thus provide a theoretical justification for treating the construct as a group- level variable (p.57). They found that Army companies with

positive social environments have members who are buffered from the negative effects of stressors (Bliese & Britt, 2001).

In military research, especially that which assesses contextual variables, the Army Company is the appropriate group size to research, because companies are well-established groups. Bliese and Britt (2001) state that, “the quality of company leadership influences nearly every facet of the work environment for soldiers” (p.55). Bliese and Halverson (1996) point out that most work related policies that impact a soldier’s quality of life are made at the company level. In addition, when soldiers deploy to combat, they normally do so as a Company (Gavin & Hoffman, 2002; Jex & Thomas, 2003) and therefore are likely required to perform in a somewhat similar task environment.

Bliese and Britt (2002) discuss the dynamics of Army Companies and report that members work interdependently and exit barriers make exit difficult for members to leave the group. There are several reasons to believe that the group level perspective is appropriate in measuring the effect of leadership social support. Bliese and Halverson (2002) articulate the conceptual distinction once level of analysis moves from individual to group rating of social support:

Note once again that there are subtle yet important differences in meaning between leadership support when defined as an individual soldier’s perception (influenced by individual experiences) and defined in terms of the average perceptions of an entire Army Company. The climate in a unit where on average, soldiers provide low leadership support ratings is likely to be important even for an individual soldier that views leadership support positively (p. 57).

Although early theorists may have hoped social support would be a panacea in the stress-distress relation (Cobb, 1976), more recent thinking suggests a more moderate, albeit meaningful, contribution (Champoux & Peters, 1987; Evans, 1985; Hobfoll, 1985; Hobfoll & Walfish, 1984; Leather, Lawrence, Beale & Cox, 1998; Schat & Kelloway,

2003; Solomon, 1985; Solomon, Mikulincer, & Hobfoll, 1986). Viswesvaran's social support literature review (1999) found a generally negative relationship between social support and measures of psychological strain, but stated that the correlations were often only in the teens or near 0.20. Zapf, et al. (1986) posit that given the multivariant nature of health, any single work stressor is unlikely to account for more than 4 to 7 percent of the variance in stressor strain relationships. Studying the effect of organizational support on exposure to aggression and violence, Leather, et al. (1998) found that organizational support had both consistent and significant direct effects upon psychological outcomes by explaining 2 percent to 13 percent of the variance. Specific to perception of officer support Solomon, et al. found only a modest (6.2 percent to 10.1 percent of explained variance) effect on psychological strain in Israeli combat veterans, which they point out as consistent with most reports of the effect of social support on stress outcome.

Leather, et al. (1998) studied the buffering effects of intra-organizational support on occupational violence. The population that they queried (through mailed surveys) was 242 United Kingdom alcohol drinking establishment workers. The survey contained both biographical and demographic information. Importantly, the survey took the objective stressor measurement approach by asking for the number of aggressive and violent incidents that the subjects observed at their work. They were asked how often each type of aggressive or violent incidents occurred: shouting and abusive language, pushing shoving, one-to-one fight (no weapons), one-to-one fighting (weapons), more than two fighting (no weapons) and more than two fighting (weapons). The researchers investigated the moderating effects of perceived intra-organizational support by asking respondents whether they received organizational support from: line manager, training

department, personnel department and security department. Respondent's perceptions were evaluated by subjects responses to "not at all supportive" through "could not have been more supportive." The researchers also sought the amount of perceived support from family and friends on the same scale from "not at all supportive" through "could not have been more supportive." Researchers conceptualized the dependent variable (strain) as reported job satisfaction, organizational commitment and well-being. Of most importance was well being which was measured through two factors: "worn out" and "up tight and tense." "Worn out" measured symptoms of tiredness, emotional lability and cognitive confusion. "Up tight and tense" measured symptoms related to worry, fear, tension and physical signs of anxiety.

Leather, et al. demonstrated that perceived social support ameliorated some of the effects of work related violence. Further, they demonstrated that only intra-organizational as opposed to family or friend support, was significant. Of particular note, the researchers found the buffering effects for organizational support strengthened as the level of violence increased. Overall, though the findings were significant, the effect size was small. Between 2 percent and 13 percent of the variance in the dependent variables was explained. Specifically, 6 percent of the variance in the dependent variable "worn out" was explained, as well as 5 percent of the variance in the dependent variable "up tight and tense."

Shat and Kalloway (2003) studied the effect of two types of organizational support: instrumental and informational on workplace violence and aggression. Their study was based on surveys from 225 employees in a health care setting. Specifically the researchers investigated how organizational support buffered the effects of workplace

physical violence, psychological aggression and vicarious violence on the outcome measures of: fear, emotional well-being, somatic health, job-related affect and job neglect.

The researchers used an objective measure of physical violence by asking about frequency of physically violent behaviors (e.g., being hit, kicked, threatened with a weapon) the respondents had experienced at work in the past year. Psychological aggression was similarly measured by frequency of being yelled at or being sworn at. Vicarious violence, or the witnessing or “hearing about” violence perpetrated in the work place, was measured by frequency reported in the last year. The moderators, perception of organizational support, were individually measured. Instrumental support at the co-worker, supervisor and management level was assessed. Respondents were asked to score the following question: “My coworkers provide support when I experience an aggressive or violent situation at work” on a 7-point scale from strongly disagree through strongly agree. Informational support was measured on whether respondents had received training (yes or no) on how to deal with aggression or violence at work. Emotional wellbeing was measured using the General Health Questionnaire (see Banks et al. for specific discussion).

Instrumental support was found to significantly moderate the effects of workplace violence on emotional well being, explaining 3 percent to 6 percent of the variance in the outcome. Overall, the researchers found that when the respondents experienced the three factors of workplace violence (physical violence, psychological aggression and vicarious violence), organizational support was associated with a reduction in negative psychological health consequences. However, there are methodological reasons that

these findings may not specifically relate to the current study. Specifically, the sample respondents were predominately female (86%). As has been pointed out, females may be more receptive to social support, and the current study's sample is predominately male.

### **Leader Support Research with Military Samples**

The following studies use active duty populations as they investigate the effect of organizational support. The first two articles, primarily authored by Solomon were conducted by the Israeli Defense Force; the subsequent studies were performed by the WRAIR. Not only do these Israeli samples contain subjects that are active duty military, they also use a combat experience to measure stress. The following two studies were conducted by personnel at the WRAIR, and though they look at an active duty US Army sample, they use peace keeping operations as the stressor.

Solomon, Mikulincer, and Hobfoll (1986) studied the buffering effect of Israeli Army Officer emotional support on the likelihood of male "front line combat" soldiers developing combat stress reactions (CSR). CSR is a cluster of combat-related reactions that manifest in numerous symptomatology: restlessness, psychomotor retardation, psychological withdrawal, startle reactions, confusion, nausea, vomiting and paranoid reactions (for an in depth description see Headquarters, Department of the Army, FM-22 Leaders' manual for combat stress control, 1994). Their study carefully matched 382 Israeli Lebanon War veterans who developed CSR (diagnosed by professionals both trained and experienced in diagnosing and treating combat related stress reactions) with a control group of 382 Israeli Lebanon War veterans who reported the same level of combat intensity and participated in the same battles, but did not develop CSR.

Unlike the studies cited previously, the researchers measured reported perception of the stressor (battle intensity). Soldiers indicated how threatening they perceived their combat experience to be. Perception of social support by officers was measured using the Military Company Environment Inventory (see Moos, 1973 for a detailed description).

The researchers found that the CSR and the control group differed significantly only on Officer emotional support ( $p < .01$ ) and perceived battle intensity ( $p < .01$ ). Officer emotional support explained 10.1 percent, and battle intensity added 2.5 percent, of the variance. Based on this regression, CSR soldiers rated battle as more intense and felt less officer emotional support. Of particular interest in these findings is the impact of officer emotional support on perceived battle intensity. What must be considered is that soldiers with CSR and soldiers in the control group both experienced high levels of objective stressors in the form of combat, which the researchers argue is a high level of stress for all participants.

From the same study, Solomon, Mikulincer, and Hobfoll (1987) studied the differences between subjective measures of stress and social support as predictors of CSR. The study used the same subjective measures of both stress and social support. However, this study also included objective measures of both stress and social support.

The researchers measured objective stress with the following questions: Did they actively participate in frontline battles? Had they received specific training that prepared them for their military role in battles? Were they near the front line during the war? Had they participated in activities related to the evacuation of dead soldiers? The article states that “The index of objective stress was computed by counting the soldier’s stressful experiences during the war” (p. 579). The researchers measured objective social support

by asking whether the subjects had previously fought or trained with the unit they fought with during the war.

Both of these measures must be considered as rather weak. The objective measure of stress or combat experience is poorly articulated and therefore would seem to limit the discriminating power of the measure. The objective measure of support only measures whether the soldier was assigned to the unit prior to fighting. The construct of support needs further articulation examining the support available in the unit. To be meaningful, objective measures of support should evaluate the amount and type of support provided, not just whether the soldier had prior experience with the unit.

The researchers conducted a hierarchical regression on CSR, entering socio-demographic information (age, education) first, followed by objective factors (stress and unit support) and finally subjective factors (stress and unit support). The objective measure of stress was found to be significant ( $p < .01$ ); the objective measure of support was not. The researchers combined the two objective measures and reported 2.3 percent of variance explained. Both of the subjective measures (stress and support) were significant ( $p < .01$ ) and combined explained 8.3 percent of the variance. The researchers point out that both subjective and objective indicators of event stressfulness and social support were predictive of CSR.

The following three studies all originated out of the WRAIR, which is the US Army's medical research branch of MEDCOM. In their review of WRAIR research, Britt, et al. (2004) state, "Researchers at the WRAIR have examined the role of leadership as a predictor of stress, as a buffer against the negative effects of stress and, as a variable that predicts or enables variables that have been found to decrease the adverse



effects of stress” (p. 541). The Neuropsychiatry branch of the WRAIR is staffed by uniformed research psychologists and social workers. Castro (in press) states “that the military scientist plays a critical role in providing scientifically valid findings to inform the commander when making decisions on how to improve soldier and unit readiness” (p.2). The military literature terms organizational supervisory support as leader supportive behaviors (Bliese, Halverson, & Schriesheim, 2002). As noted in the introduction to this section, Manning (1991) proposes that caring and competent leadership in the military is conceptually equivalent to the concept of social support in non-military settings. The following studies were conducted in peacekeeping or training situations. Given that the participants are drawn from the US Army, and that these studies focus on leader support as a moderator of military stressors, these studies may be the most pertinent to this review.

Bliese and Castro (2001) investigated whether the perception of Non-Commissioned Officers’ (NCOs) (soldiers’ immediate supervisors) supportive behaviors moderated the relationship between the stress of occupational demands and the psychological strain. Their cross sectional survey data was collected from 1538 lower enlisted (Privates through Specialists) male soldiers from 53 Company sized elements. All of the soldiers were members of the same Brigade Combat Team while preparing for a training exercise.

The researchers measured occupational demand by using the role overload scale from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). An example item is “I have so much work to do, I cannot do everything well.” Soldiers responded on a point scale whether they strongly disagreed

through strongly agreed. Organizational support was measured by three items: 1) The NCOs in my unit are interested in my personal welfare, 2) The NCOs in my unit let soldiers' know when they have done a good job, and 3) The NCOs in my unit are interested in what I think and how I feel about things. In this study, organizational support was treated as a contextual variable. To support this conceptualization Bliese and Halverson (2001) state "NCO support is assumed to be a shared environmental variable that measurably differs across the 53 companies" (p. 67). This was established by "meaning" the within company ratings of social support. Psychological strain was measured using the General Severity Index of the Brief Symptom Inventory (Derogatis & Melisaratos, 1983).

Step 1 of the multi-level analysis found that NCO support had a significant, negative main effect to psychological strain. The final step tested whether NCO support was a significant predictor of the variation (between companies) in the role overload psychological strain slope. This suggests that units with high NCO support (taken as a contextual variable) will have lower levels of individual psychological strain compared to units with lower NCO support, who will have higher psychological strain.

Bliese, et al. (2002) investigated whether supportive leadership buffered the relationship between the subject's perception of task significance and their self reports of hostility. The researchers used a standard multiple regression statistical analysis, or individual level analysis. The authors point out that individual level analysis fails to include contextual variables, such as shared with-in group exposures like leadership behaviors. In other words, individual analysis fails to assess the amount of variance in any one individual's response that can be explained by group membership. The sources

of the data were surveys from 2042 US Army soldiers across 49 US Army Companies deployed to Haiti for Operation Restore Democracy in 1994. The sample was predominately male (95%).

The researchers assessed the strain of task significance. The moderator (social support), which the researchers labeled “leadership climate”, was assessed using 11 items. Examples of the questions are: “My officers are interested in my personal welfare,” “My NCOs are interested in what I think and how I feel about things.” The strain, hostility, was assessed using the hostility subscale of the BSI (Derogatis & Spencer, 1982). The scale asks the subjects to report their past actions, such as getting into arguments in the last week. Responses were on a five-point Likert scale ranging from “None” to “Extreme.”

Using a hierarchical regression analysis, the researchers found that both task significance and leadership climate were significantly related to self-reports of hostility. However, when the researchers evaluated whether leadership buffered the task-significance relationship to hostility, findings were insignificant. The results provided no support for the hypothesis that leadership climate (social support) buffers the strain stressor relationship. Of particular note is that the findings were not significant with such a large sample which provided sufficient power to detect even small interactions. The researchers further analyzed the data by estimating the non-independence and reliability of group (company) mean differences. The researchers found that group membership significantly related to individual responses, group means reliably differed on the variables of interest, and leadership climate had a reasonable level of average within-

group agreement. These findings create the basis for the following articles that use multi-level statistical analysis on the same data base.

Bliese and Halverson (2002) used the above database and the multi-level statistical analysis technique of random group re-sampling (RGR) to investigate whether a group level model of stress buffering was viable. Using the group level perspective they proposed that the average perceptions of leadership climate (social support) within the 49 US Army companies moderated the relationship between task significance and unit hostility. Using an unweighted group means analysis, they found significant buffering effects. They then analyzed the data with RGR to see whether the effects were a result of aggregation effects (grouping effects) or whether the effects were a function of group level properties of the data (group effects). For the purpose of this discussion a simple description is given (for a detailed exposition on how RGR works see Bliese & Halverson, 2002).

RGR randomly assigns individuals to false groups (for the purpose of analysis) that contain the same number of individuals. The false groups outcome score is averaged and another regression is conducted. If the false groups demonstrate the same relationships among variables as real groups, then it provides evidence that the findings are not the result of group effects, but rather grouping effects. However, if the random reassignment results in dissimilar findings, then this provides evidence that interactions among variables in the actual groups are a result of group effects and not grouping effects. The researchers found the interaction was related to the group level properties of the data, and not the by product of the aggregation process. Only in actual groups were significant interaction results found. This provides support for the hypothesis that at the

group level, average perception of support moderated the average perceptions of task significance and average levels of hostility (in this case, the unit's stress of performing tasks of low significance will be ameliorated against the strain of hostility when leadership of the group is supportive).

Gavin and Hofmann (2002) used another method of multi level analysis, Hierarchical Linear Modeling (HLM), to evaluate the same hypothesis with the same data as the above referenced article. For the purpose of this discussion a simple description is provided (for an in-depth discussion of HLM see Bryk & Raudenbush 2002; Gavin & Hofmann, 2002).

HLM can be used to assess the impact of both individual (e.g., individual perception of leadership support) and group (e.g., group perception of leadership support) level predictors on an individual level outcome. HLM is also used to assess the moderating effects of group level variables on relationships between individual level variables. HLM is particularly useful in this analysis. The researchers are interested in predictors of individual hostility in organizations. HLM allows researchers to assess individual strains (e.g., task significance) and group level moderators (e.g., leadership support) on individual strains (e.g., hostility).

Gavin and Hofmann (2002) found that leadership climate (aggregated social support) moderated the relationship between an individual's perceived task significance and their experienced hostility. The amount that leadership moderated the relationship between an individual's perceived task significance and their experienced hostility varied significantly between groups. The shared leadership climate predicted this variability. In

companies with higher supportive leadership the effects of task significance were reduced in individuals.

### **Summary of the Literature Review**

The literature review examined both conceptual and empirical research findings concerning combat stressors, and leadership support to operationally define key constructs and to guide the development of a conceptual model. The literature review disclosed a number of issues related to combat stressors and their effect on post combat aggression and violence.

First, there are no studies that have examined the relationship between combat stressors, attachment style (based on adverse childhood experiences), leader support and post-combat aggression and violence. Second, there is only one related study that investigates the relationship between combat stressors and post-combat violence. The study found a significant relationship. However, although interesting, the study does not provide any information on how to reduce post-combat violence other than by avoiding combat stressors. This seems insufficient; more knowledge about this area is needed. Only with increased understanding will potential interventions and organizational changes be possible. Third, the majority of social support studies that investigate organizational supervisory support are conducted at the individual level. As discussed in the attachment theory section, some individuals are less receptive to support or more hostile to supervisors. From this point of view, ratings of actual support may be biased by the individual. Some organization support studies have treated leader support as a contextual variable by aggregating the group's leader support score to the mean. This

approach, averaging group scores, is thought to potentially be a more accurate measure of actual leader support. This is a key point. For this reason, this study will use a multiple regression of the aggregated group scores to evaluate whether group membership matters, in the sense that group membership means exposure to the same level of leader support.

### **Review of Conceptual Model**

Lazarus and Folkman's (1984) transactional model of stress is the basis for this model. It is used to explain the stressor strain relationship. Transactional stress theory conceptualized strain as the result of an imbalance between the demands of a person's environment and his or her available resources to respond. First the individual appraises the situation as to whether it is a threat or not. Second the individual appraises his or her resources to cope with the stressor. If coping strategies fail to alleviate the stressor the individual will experience strain. Bliese and Castro's (2003) The SAM is also used to develop the conceptual model. The SAM provides the additional component of organizational moderators as contextual variables, which alleviate or buffer the stressor in its relationship to strain.

Leader support, known in civilian organizational stress literature as social support, is conceptualized as an organizational contextual moderator of the stressor strain relationship. Support from supervisors has been found to buffer individual's strain in reaction to the stressor of work place violence. There are numerous types of social support described in the literature; however, what appears to be salient is that perceived support buffers better than actual support. This issue supports the conceptualization of leader support as a contextual variable. This means that the average group-score for

leader support may be a more accurate measure of perceived leader support than individual scores.

## Hypotheses

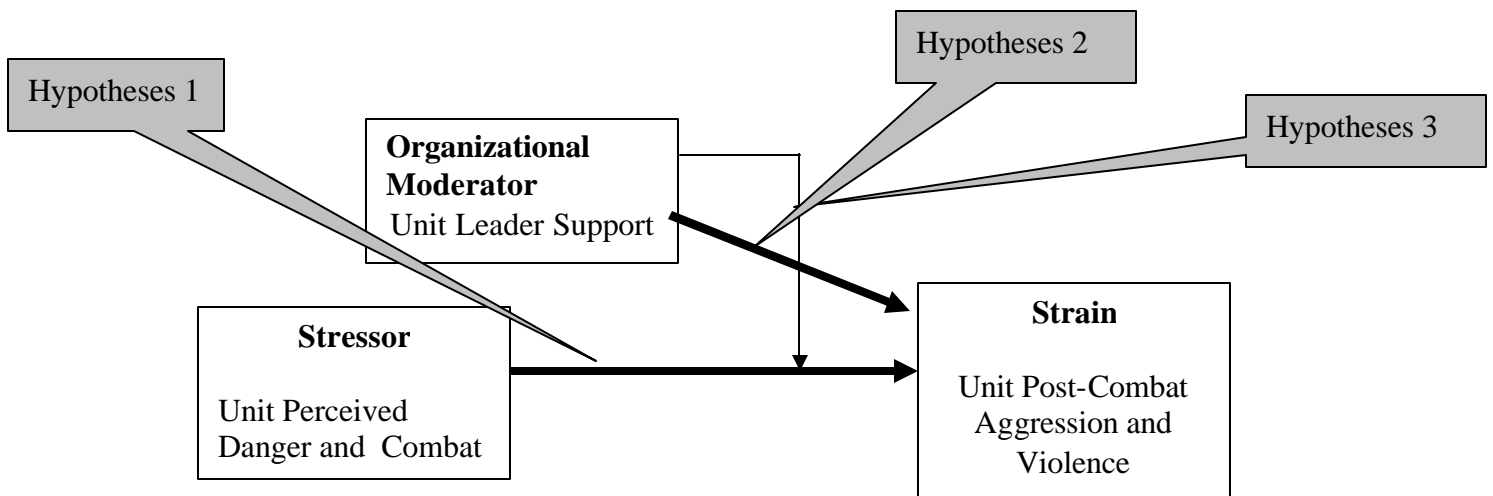
Three hypotheses will be tested in this study.

H1: Units with high perceived combat experience (UPDD and UCE) will report more post-combat aggression and violence than units with low perceived combat experience.

H2: Units with high unit leader support (ULS) will report less post-combat aggression and violence (AG) than units with low unit leader support.

H3: Unit leader support (ULS) will moderate the relationship between unit combat exposure (UCE) and post-combat aggression and violence (AG).

Figure 2.  
Conceptual model with hypotheses illustration.





## CHAPTER 3

### METHODOLOGY

#### **Introduction**

This study attempts to answer the primary research question: “at the company level, what are the effects of supportive leader behaviors on the relationship between combat experience and post-conflict aggression and violence?” This study is a secondary analysis of a portion of the Land Combat Study (LCS) conducted by research personnel at WRAIR. Permission to use the data for this study was provided by the Commanding Officer of WRAIR. The data were collected from active duty soldiers (N=7650) assigned to five combat brigades deployed to Operation Iraqi Freedom in 2003 and 2004. The surveys were administered to soldiers at their home stations approximately three to four months post combat. The responses from the soldiers of the 1<sup>st</sup> Brigade, 3<sup>rd</sup> Infantry Division (ID) were collected in December 2003 following their eight-month combat deployment to Iraq. The 3<sup>rd</sup> ID spearheaded early ground combat operations in Iraq, March through May 2003. The responses from the soldiers of the 82<sup>nd</sup> Airborne Division were collected in the spring and summer of 2004, following their 12-month combat deployment in Iraq. The responses from the soldiers of the 101<sup>st</sup> Airborne (Air Assault) Division were collected in May 2004, following their 12 months of combat operations in Iraq.

The three-month post combat interval allowed time for soldiers to take leave, transition to garrison duty, and afforded soldiers the chance to seek mental health and medical treatment if needed. An overview of the original study is provided as background information (Hoge et al., 2004).

For this study, the data was reviewed and soldiers with missing responses were removed from the data set (N=5766). The remaining 5766 soldiers reported being assigned to one of 116 identified company level groups. Group histograms were developed and reviewed for normalcy. Four groups were discarded based on atypical distribution of perception of unit leader support scores (see Appendix E.). This reduced the data set (N=5435) and number of groups to 112. The number of members per group ranges from two to 151, with an average of 50 members per group.

### **Background of the Original Study**

The LCS is a longitudinal assessment of Soldiers and Marines deployed in support of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). The survey is titled: “Impact of PERSTEMPO and deployment experiences on the mental health and functioning of soldiers and their families.” The LCS includes data from over 40,000 anonymous surveys. The surveys have been collected at various points in the deployment cycle (pre-deployment, during deployment in Iraq/Afghanistan, and three-, six- and twelve-months post deployment) (Castro & Cox, 2005).

Units were selected based on their participation in combat. WRAIR personnel initially coordinated with Brigade level staff to establish collection dates and subordinate units. The Brigade staff tasked their subordinate units to provide specific numbers of soldiers to be surveyed at designated locations. The LCS uses a non-probability sampling method combining both purposive and availability sampling techniques. Hoge, et al. (2004), reporting from the same data, found that 58 percent of the soldiers from the selected units were available to attend the data collections. Hoge, et al. (2004) further

stated that most soldiers not attending the briefings were unavailable because of their rigorous work and training schedules. Hoge and colleagues (2004) assessed that the LCS sample was representative of all active duty Army personnel deployed to OIF by comparing participant's demographic characteristics to all Army personnel having been deployed to OIF using the Defense Medical Surveillance System.

There are three primary goals of the LCS: 1) identify the impact of combat on the behavioral health of soldiers, marines and families, 2) provide leaders feedback on soldiers perceptions of current well being, and 3) determine effective behavioral health prevention and early intervention procedures to protect soldiers and marines from the stressors of combat (Castro & Cox, 2005). The LCS took soldiers approximately 45 minutes to complete, and contained 243 questions. The LCS's components identify the prevalence of mental health problems by asking about current symptoms (anxiety disorders, depressive disorders, PTSD, alcohol and illegal drug abuse, health risk behavior and significant marital dysfunction) in soldiers deployed in support of OEF and OIF. Additionally, the LCS collected data on combat experiences as well demographic information and soldier's family mental health history. Researchers collected data with the intention of identifying potential moderators of the stressor strain relationship (social support, leadership, cohesion). The LCS also collected data on perception and use of mental health services. WRAIR personnel included preexisting instruments, modified preexisting instruments, and developed other instruments for inclusion in the LCS.

With the assistance of Brigade level staffs, WRAIR personnel coordinated with local commanders to establish data collection times and locations. Unit leaders assembled the soldiers in areas near their workplaces at times determined by them. For example, one

group of 300 soldiers were surveyed in their unit chapel and another group of ten soldiers were surveyed in their maintenance area. WRAIR personnel gave a short recruitment briefing and obtained written informed consent that contained statements about the purpose of the survey and that participation was voluntary.

To ensure anonymity, soldiers were given a manila envelope with two consent forms. Soldiers kept one copy for themselves, then filled out the other and returned it in the manila envelope. Soldiers were instructed that if they did not want to participate in the survey, they should return a blank consent form to the manila envelope. All consent envelopes were collected prior to soldiers beginning the survey. Consent forms remained separated from self-report instruments through the use of separate storage containers. This process had the effect of ensuring the self-report data were anonymous. The consent forms with personal identification data were maintained separately from instruments which did not contain personal identification. The sealed envelope process also allowed soldiers to refuse participation in the survey without being identified by researchers, leaders or peers.

### **Instrumentation**

The data used for this study, is a component of the LCS. The LCS was designed to be a multi-dimensional survey. For the purpose of this study, components of the LCS were selected to measure concepts of interest (Appendices A-D): combat experience, appraisal of danger of combat experience, leader support and aggression and violence.

This study creates unit level variables by aggregating individual soldier's scores within a unit (US Army Company). In the case of combat experience, military

researchers have found the relationship between combat stressors and combat strain is best predicted by assessing unit level variables (US Army, 1994). Klein and colleagues (1994) suggested that aggregating individual scores to make group level measures is appropriate when items direct the respondent's attention to group level variables. Gavin and Hoffman (2002) suggested that leadership behaviors can be best characterized as a group level variable. The underlying assumption is individual members of a given company, with common leaders, are exposed to similar leadership environment in terms of leader behaviors and actions. This treatment is consistent with Shamir and colleagues (1998) aggregation decision based on the argument that leaders often engage in behaviors which are not directed toward specific individuals but toward the unit as a whole.

For conceptual clarity, the unit is defined as the soldier's "company." Companies are the lowest level of command where the commander retains judicial authority over the soldiers (Bliese & Castro, 2000; Jex & Bliese, 1999). Typically, companies are commanded by a Captain (pay grade O-3) and First Sergeant (pay grade E-8). Companies are normally comprised of three or four subordinate platoons of soldiers, with a platoon leader (officer) and a platoon sergeant (NCO) as their leaders. Each platoon is typically comprised of three or four squad-sized elements with an NCO assigned as the squad leader.

## **Predictor Variables**

**Level of Unit Combat Exposure (UCE) (Appendix A.)** The stressor, combat exposure, was measured with 11 combat specific experience questions. Soldiers responded with one of the following responses: (1) never, (2) one time, (3) two to four

times, (4) five to nine times, (5) ten or more times. For example, soldiers were asked whether they had: been attacked/ambushed, received small arms fire, engaged in hand-to-hand combat, or been responsible for the death of an enemy combatant. Total scores were obtained by summing the values for each item, with total scores ranging from 0 to 65. Higher scores indicate higher levels of combat exposure. WRAIR personnel developed these items with the assistance of combat veterans who characterized the types of combat situations faced in OIF. Using criteria provided by Springer, Abell, & Nugent (2000), these items have acceptable psychometric properties, with a Cronbach's reliability coefficient of .81, for decision making with individuals. Unit soldier's scores were aggregated to create the unit level variable.

**Level of Unit Perceived Danger (UPD) (Appendix B.)** In keeping with Lazarus and Folkman's (1984) emphasis on the appraisal of stressors in understanding the relationship between stressors and strain, a question about perception of danger during combat was asked. Respondents were asked how often they thought they were in danger of being injured or killed. Subjects responded (1) never, (2) once or twice, (3) sometimes, (4) many times. This question was developed by WRAIR personnel. Total scores range from 1-4, with higher scores indicating higher levels of appraised stress based on combat exposure. Unit's soldier's scores were aggregated to create the unit level variable.

**Level of Unit Leader Support (ULS) (Appendix C.)** A combination of four items was used to assess the degree to which individuals perceived their unit leaders to be supportive. Soldiers were asked to rate how often unit officers behaved in specified manners. Soldiers could respond (1) never, (2) seldom, (3) sometimes, (4) often, (5) always. As previously described, social support or leader support behavior is a four

dimensional construct consisting of: instrumental, emotional, appraisal and informational (House, 1981). *Instrumental support* is conceptualized as provision of resources and measured by asking whether “officers try to look good to higher ups by assigning extra missions or details.” Because this would result in decreased resources available to soldiers, it is reverse-coded. *Emotional support*, which is conceptualized to enhance self esteem, is measured by asking whether unit Officers “embarrass soldiers in front of other soldiers.” Because this leader behavior would seem to lead to decreased self-esteem, this item is also reverse coded. *Appraisal support* is providing feedback about personal functioning directed at enhancing self-esteem. Appraisal support is measured with the item asking soldiers whether “unit officers tell soldiers when they have done a good job.” *Informational support* is giving information the receiver can use for coping with problems. To measure informational support soldiers were asked whether their “officers exhibit clear thinking and reasonable action under stress.” The multidimensional concept “leader support” is measured by adding the item scores together. The total possible score range is -8 through +8, with higher scores denoting the individual’s perception of greater leader support. These items were previously used by WRAIR personnel and have acceptable psychometric properties at the individual level with Cronbach’s reliability coefficients ranging from .79 to .83 (Jex & Bliese, 1999; Manning & Fullerton, 1988). Unit’s soldier’s scores were aggregated to create the unit level variable.

## **Dependent Variable**

**Level of Unit Post Combat Aggression and Violence (UPCAV) (Appendies D through I.)** The dependent variable “aggression and violence” is measured with three

questions from the Revised Conflict Tactics Scale (CTS2) (Strauss et al., 1996). The most frequent application of the CTS2 has been to obtain data on physical assaults on a partner (Straus et al., 1996); it is also primarily used to assess participant's levels of violence (Fetsch & Schultz, 2004). Although the CTS2 was designed to measure aggression and violence in the family, its list of behaviors is generalizable to other contexts such as the workplace and other non-family relationships (Boone & Flint, 1998; Greenberg & Barling, 1998). Based on qualitative research conducted during the design of the Conflict Tactics Scale (CTS), items are hierarchically ordered from most socially acceptable through least socially acceptable (Straus et al., 1996). The CTS2 essentially operationalizes the range of conflict related behaviors (Newton, Donaldson-Connelly, & Landsverk, 2001). This study focuses on three factors, in order of severity as outlined by Straus, et al. (1996): 1) minor psychological aggression, 2) severe psychological aggression, and 3) severe physical aggression. Soldiers are asked about their aggressive and violent actions during the last month. Soldiers can respond (1) never, (2) once/twice, (3) sometimes, (4) often, (5) very often.

Because intelligent researchers may disagree with a single approach to measuring unit post-combat aggression and violence with the available LCS questions, six different combinations of three questions from the LCS were used. The first measures minor aggression (Appendix D) by asking soldiers to report whether they have angrily "yelled or shouted at someone?" Possible scores ranged from 0 through 4. The second measure (Appendix D), severe aggression, is measured with the item asking soldiers whether they have "threatened someone with violence?" Possible scores range from 0 through 4. The third measure (Appendix F) severe assault is measured by asking soldiers how often they



“get into a fight with someone and hit the person?” Possible scores ranged from 0 through 4, with higher scores representing more violent behaviors. The fourth measure attempts to combine the above mentioned variables into a single measure (Appendix G), by summing the individual variable scores. The fifth measure (Appendix H) combines the 3 variables, but weights and sums the scores. Weighting is based on the increasing intensity and dangerousness of the responses, from minor aggression through severe assault. Finally, the sixth measure (Appendix I) weights the responses the same as the fifth measure, but only takes the highest score from the three variables.

Strauss and colleagues (1996) report estimated internal consistency reliability scores as .79 for psychological aggression and .86 for physical assault on the CTS2. At the aggregated level, this study’s adapted measures have acceptable psychometric properties for nomothetic research with a Cronbach’s standardized alpha reliability coefficient from .63 to .68.

## **Analysis Strategy**

### **Multiple Regression**

The preferred strategy for analyzing moderating effects is to use multiple regression techniques (Cohen & Cohen, 1983; Cohen & Willis, 1985). Multiple regression is a statistical technique used to analyze the relationship between a single dependent variable and multiple independent or predictor variables. This study will use multiple regression to account for the variance in an ordinal dependent variable (Unit Post Combat Aggression Violence), based on linear combinations of ordinal independent variables (Unit Combat Exposure, Unit Leader Support). Multiple regression will be used

to test the proposed hypotheses by establishing that a set of independent variables (Unit Combat Exposure, Unit Leader Support) explains a proportion of the variance in a dependent variable (Unit Post Combat Aggression Violence) at a significant level (significance test of the coefficient of determination,  $R^2$ ), and can establish the relative predictive importance of the independent variables (comparing beta weights).

Multiple regression is one of a number of multivariate techniques available to researchers and is generally accepted among behavioral science researchers. Multivariate techniques are powerful analytical tools. To utilize this power the researcher must first examine the data to detect, evaluate and deal with missing data, outliers and influential cases. Further, because of the complexity of the relationships and the complexity of the analyses, it is important to determine whether the data meets the relevant assumptions of multiple regressions. The researcher must be aware of any assumption violations and their implications for the estimation process or the interpretation of the results (Hair, Anderson, Tatham & Black, 1998). According to Hair, et al. (1998), there are several assumptions that the data must meet prior to the use of multiple regression. These assumptions include: 1) normality, 2) homoscedasticity, 3) linearity and, 4) absence of correlated errors.

The assumption of normality is fundamental to multiple regression. The normality assumption postulates that error, represented by the residuals, should be normally distributed for each set of independent values. A histogram of standardized residuals should show a roughly normal curve. A more reliable alternative for the same purpose is the normal probability plot. The normal probability plot compares the cumulative distribution of the actual data to the cumulative distribution of a normal distribution. The

normal distribution is represented with a straight 45-degree line. When the actual data distribution is normal, the line that represents it will closely follow the diagonal line. If the actual data distribution greatly varies from the normal distribution, resulting statistical tests are invalid. The central limit theorem assumes that even when error is not normally distributed, when sample size is large, the sampling distribution of the beta coefficient will still be normal. Therefore violations of this assumption usually have little or no impact on substantive conclusions for large samples, but when sample size is small, tests of normality are important.

The next assumption is homoscedasticity, which addresses the dependence relationships between variables. It assumes that dependent variables have equal levels of variance across the predictor variables. With metric variables, the variance of residual error should be constant for all values of the independent(s). When the variances are not constant, it causes predictions to be better at some levels of the independent variable than at others (Hair et al., 1998). This can result in hypothesis tests being too conservative or too sensitive. Additionally, when the homoscedasticity assumption is violated "conventionally computed confidence intervals and conventional t-tests for OLS estimators can no longer be justified" (Berry, 1993, p.81). Nonconstant error variance can indicate the need to respecify the model to include omitted independent variables. Lack of homoscedasticity may mean (1) there is an interaction effect between a measured independent variable and an unmeasured independent variable not in the model; or (2) that some independent variables are skewed while others are not.

The assumption of linearity is that there is a straight line relationship based on a constant unit change (slope) of the dependent variable for a constant unit change of the

independent variable. This relationship is based on correlational measures of association. Because only linear associations between variables are represented in correlations, nonlinear effects are not represented in the correlational value. This can lead to an underestimation of the strength of the relationship. That is, R-square will underestimate the variance explained overall and the beta coefficients will underestimate the importance of the variables involved in the non-linear relationship. To assess for linearity, simple regression analysis will be run and residuals will be examined. Any nonlinear portion of the relationship will show up in the residuals (Hair et al., 1998). As a general rule, nonlinearity is generally not a problem when the standard deviation of the dependent variable is more than the standard deviation of the residuals.

It is important to ensure that any prediction errors are uncorrelated with each other. The assumption of the absence of correlated errors infers that there is no unexplained systematic relationship within the dependent variable. If such a relationship does exist, then there is no confidence that prediction errors are independent. This would mean that there is another factor affecting the results, but it is not included in the model. Faulty data collection methods are the most common source of violations of the assumption that errors are uncorrelated. To identify correlated errors, researchers must identify potential causes. When researchers identify violations, they should attempt to identify the previously unidentified factor that is affecting the results and include it in the model.

Although not considered an assumption, the issue of multicollinearity must also be dealt with. Strong correlations between independent variables and the dependent variable are desirable. However, multicollinearity or a high correlation between any

single independent variable with a set of other independent variables is not desirable. Multicollinearity confounds the ability to understand the effects of each individual variable. It results in larger portions of shared variance and smaller portions of unique variance. Multicollinearity can be identified by examining the correlation matrix for the independent variables. The existence of high correlations usually indicates problems with multicollinearity. Because it can also be the effect of two or more independent variables, it is important to examine the tolerance value, which reports the amount of variability of the selected independent variable not explained by other independent variables. There are numerous remedy options available.

### **Proposed Model**

The data meets the two requirements for multiple regression: 1) data is metric (following the convention of treating ordinal data as metric) and 2) independent and dependent variables have been identified (based on literature review). Standard multiple regression is an appropriate technique for analyses of the relationships between the independent and dependent variables of interest in this study. Standard multiple regression is a way of computing OLS regression by entering independent variables (UPD, UCE, ULS and uce\*uls) into the regression equation at the same time. Simultaneous input of variables into the regression is the preferred method when there is no theoretical support for step-wise entry. Because of the cross-sectional nature of the data and the exploratory choice of variables, simultaneous entry will be used in this study.  $R^2$  and  $(r)$  measure the strength of the relationship between the set of independent variables and the dependent variable. An  $F$  determines whether the relationship can be generalized to the population. T-tests are

used to evaluate the individual relationship between each independent variable and the dependent variable. Interaction terms will be added to the model to incorporate the joint effect of two variables (ex. Unit perceived combat exposure and unit leader support) on the dependent variable (Unit post combat aggression and violence) over and above their separate effects. Interaction terms will be made into interactional variables, centered (Cohen, Cohen, Aiken & West, 2003) ( $uce \times uls$ ) and added to the model as cross products, and placed after the centered simple "main effect" independent variables.

### **Relationship between Proposed Model and Study Hypotheses**

H1: Units with high perceived combat experience (UPDD and UCE) will report more post-combat aggression and violence than units with low perceived combat experience. This hypothesis will be formally tested by examining the regression coefficients B1 and B2 in the following equation:

$$AG = B0 + B1(UPDD) + B2(UCE) + e$$

H2: Units with high unit leader support (ULS) will report less post-combat aggression and violence (AG) than units with low unit leader support. This hypothesis is formally tested by examining the regression coefficient B1 in the following equation:

$$AG = B0 + B1(ULS) + e$$

H3: Unit leader support (ULS) will moderate the relationship between unit combat exposure (UCE) and post-combat aggression and violence (AG). This hypothesis is formally tested by examining the regression coefficient B3 in the following equation:

$$AG = B0 + B1(uce) + B2(uls) + B3(uce \times uls) + e$$

## **CHAPTER 4**

### **FINDINGS**

This section presents an overview of the characteristics of the study sample, characteristics of the study instruments and concludes with the results of the hypotheses testing regression procedures described in the last chapter.

#### **Individual Demographic Characteristics**

The sample consisted of 5435 personnel assigned to the 82<sup>nd</sup> Airborne (N=3420), 101<sup>st</sup> Airborne (N=1312) and 3<sup>rd</sup> Infantry Divisions (N=703). The average respondent was between 20-24 years old (SD = .873). Most respondents described themselves as male (98.5%) and white (72.3%). People of Hispanic descent were the next largest group of respondents (11.7%) followed by African Americans (8.9 %), other (3.8 %) and Asian/Pacific Islander (3.2%). Junior enlisted soldiers (pay grade E1 -E4) represented the majority of respondents (60%), followed by non-commissioned officers (pay grade E5 -E9) (33%), officers (6%), and warrant officers (8%). Most respondents had obtained a high school diploma (97%), of which 47% had at least some college.

#### **Group Demographic Characteristics**

The sample consisted of 112 U.S. Army Companies from the 82<sup>nd</sup> Airborne (N=63), 101<sup>st</sup> Airborne (N=29) and the 3<sup>rd</sup> Infantry Division (N=20). The average group age was 20 to 24 years old. However, two groups had an average age of 18 to 19 years old range and seven groups had an average age of 25 to 30 years old. The company was predominately white (70%) and male (97.9%). Company ethnicity was based on the

dichotomous white versus non-white percentage. Groups ranged from 35 percent white to 100 percent white. Company gender was based on percentage of males in the company. Groups ranged from 74 percent male to 100 percent male; 92 percent of all companies were entirely male. For all companies, the mean education level was high school diploma. Two of the groups mean level of education was GED and nine other groups had a mean education level of some college.

During preliminary analysis, demographic variables were considered and evaluated for inclusion in the analysis, but were omitted based on the following considerations. The primary focus of the study is on the organizational variable unit leader support, not the more individually oriented receptivity to unit leader support. Because of the aggregation techniques used in the study, it is questionable how helpful aggregated demographic data would be in distinguishing the impact of unit combat exposure and unit leader support on the level of unit post-combat aggression. In the case of age, education, and rank the data further complicates interpretation by its ordinal nature. Preliminary analysis found the demographic sub-category “Hispanic” (the percentage of unit soldiers who reported being Hispanic) as the only demographic variable that consistently remained significant. Interpretations of this finding, that a higher percentage of Hispanics had a negative relationship to the level of unit post-combat aggression and violence, was interesting but difficult to interpret. Are Hispanic soldiers more receptive to unit level of leader support, are Hispanic soldiers less violent, or is there a special effect of having more Hispanic soldiers in a unit which results in reduced post-combat aggression and violence? All of these questions would be better answered in a follow up study less prone to committing an ecological fallacy. For these



reasons, aggregated individual demographic variables were not used in the following regressions.

## Results of the Analysis

For the purpose of describing the data used to test the hypothesis's described in this study. Table 1 contains the descriptive statistics for all variables included in the analysis of hypothesis's 1, 2 and 3.

Table 1. Descriptive Statistics for Variables used in this Study

<b>Descriptive Statistics</b>				
Variable	Mean	Std. Deviation	N	
Unit Perceived Danger	1.2852	0.31866	112	
Unit Combat Exposure	7.3784	2.69251	112	
Unit Leader Support	0.4148	1.7794	112	
unit combat exposure X unit leader support	0.4168	3.39956	112	
Minor Aggression	2.0224	0.33819	112	
Severe Aggression	0.8694	0.30973	112	
Severe Assault	0.3394	0.18628	112	
Aggression and Violence (Non-Weighted Score)	3.2312	0.72726	112	
Aggression and Violence (Weighted Score)	6.1449	1.73739	112	
Aggression and Violence (Maximum Weighted Score)	4.0288	0.90392	112	

## Hypothesis 1

Hypothesis 1 postulated a positive relationship between level of unit combat experience (the combination of level of unit perceived danger and level of unit combat exposure) and level of post-aggression and violence. This hypothesis is investigated by evaluating the significance and direction of the overall model.

## Minor Aggression

Pearson's correlations were conducted to determine which variables were related to minor aggression at the bivariate level. The variables level of unit perceived danger and level of unit combat exposure were included (see Table 2). The Pearson's correlation coefficients calculated for the relationship between predictor variables and minor aggression indicated a moderate positive correlation for level of unit perceived danger ( $r=.343$ ,  $p<.01$ ) and level of unit combat exposure ( $r=.271$ ,  $p<.01$ ).

Table 2. Pearson Correlations of Predictor Variables and Level of Minor Aggression as the Dependent Variable

		Mild Aggression	UPD	UCE
Pearson Correlation	Mild Aggression	1	0.343	0.271
	Unit Perceived Danger	0.343	1	0.84
	Unit Combat Exposure	0.271	0.84	1
Sig. (1-tailed)	Mild Aggression		0.001	0.002
	Unit Perceived Danger	0.001		0.001
	Unit Combat Exposure	0.002	0.001	
N	Mild Aggression	112	112	112
	Unit Perceived Danger	112	112	112
	Unit Combat Exposure	112	112	112

A multiple regression analysis was conducted to determine the effects of the independent variables on respondent group's level of post-combat minor aggression. The independent variables were level of unit perception of danger and level of unit combat exposure. Based on the exploratory nature of the study, variables were entered simultaneously as predictors of minor aggression (see Table 3). The overall effect for the model was significant ( $F(7.359) = 12.695$ ,  $p<.001$ ) with a moderate  $R$  of .359

Table 3. Regression Analysis Testing Independent Variables and the Level of Minor Aggression as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(Constant)	1.541	0.131		11.728	0.001
Unit Perceived Danger	0.417	0.176	0.393	2.372	0.019
Unit Combat Experience	-0.007	0.021	-0.059	-0.356	0.723
<b>Overall Model: F= 7.359*</b>					
<b>R= .359, R<sup>2</sup>=.119</b>					

\*p<0.01

As shown in Table 3, the overall model was a significant predictor of post-combat minor aggression. However, only level of unit perceived danger was a significant individual predictor ( $p<.05$ ) of unit level post-combat minor aggression. These findings provide support for this study's first hypothesis that units with high levels of combat experience have more post-combat minor aggression.

### Severe Aggression

Pearson's correlations were conducted to determine which variables were related with severe aggression at the bivariate level. Both level of unit perceived danger and level of unit combat exposure were included (see Table 4). The Pearson's correlation coefficients calculated for the relationship between predictor variables and severe aggression indicated a moderate positive correlation for level of unit perceived danger ( $r=.288$ ,  $p<.01$ ) and for level of unit combat exposure ( $r=.336$ ,  $p<.01$ ).

Table 4. Pearson Correlations of Predictor Variables and Level of Severe Aggression as the Dependent Variable

		Severe Aggression	UPD	UCE
Pearson Correlation	Severe Aggression	1	0.288	0.336
	Unit Perceived Danger	0.288	1	0.84
	Unit Combat Exposure	0.336	0.84	1
Sig. (1-tailed)	Severe Aggression		0.001	0.001
	Unit Perceived Danger	0.001		0.001
	Unit Combat Exposure	0.001	.001	
N	Severe Aggression	112	112	112
	Unit Perceived Danger	112	112	112
	Unit Combat Exposure	112	112	112

A multiple regression analysis was conducted to determine the effects of the independent variables on respondent groups' post-combat severe aggression (see Table 5). The overall effect for the model was significant ( $F(8.684) = 10.649, p < .001$ ) with a moderate  $R$  of .441.

Table 5. Regression Analysis Testing Independent Variables and the Level of Severe Aggression as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(Constant)	0.881	0.027		32.793	0.001
Unit Perceived Danger	0.039	0.01	0.341	3.918	0.001
Unit Combat Experience	-0.037	0.025	-0.14	-1.472	0.144
<b>Overall Model: F= 8.684*</b>	-0.028	0.009	-0.311	-3.298	0.001
<b>R=.441, R<sup>2</sup>=.192</b>					

\* $p < 0.01$

As shown in Table 5, the overall model was a significant predictor of post-combat severe aggression. However, only level of unit perceived danger was a significant individual predictor ( $p < .01$ ) of unit level post-combat severe aggression. These findings provide support for this study's first hypothesis that units with high levels of combat experience have more post-combat severe aggression.

## Severe Assault

Pearson's correlations were conducted to determine which variables were related to severe assault at the bivariate level. The variables level of unit perceived danger and level of unit combat exposure were included (see Table 6). The Pearson's correlation coefficients calculated for the relationship between predictor variables and severe assault found a moderate positive correlation with unit perceived danger ( $r=.245$ ,  $p<.01$ ) and unit combat exposure ( $r=.258$ ,  $p<.01$ ).

Table 6. Pearson Correlations of Predictor Variables and Level of Severe Assault as the Dependent Variable

		Severe Assault	UPD	UCE
Pearson Correlation	Severe Assault	1	0.245	0.258
	Unit Perceived Danger	0.245	1	0.84
	Unit Combat Exposure	0.258	0.84	1
Sig. (1-tailed)	Severe Assault		0.005	0.003
	Unit Perceived Danger	0.005		0.001
	Unit Combat Exposure	0.003	0.001	
N	Severe Assault	112	112	112
	Unit Perceived Danger	112	112	112
	Unit Combat Exposure	112	112	112

A multiple regression analysis was calculated to predict group's level of severe aggression (see Table 7). As shown in Table 7, the overall effect for the model was significant ( $F(4.051) = 3.852$ ,  $p<0.050$ ) with a moderate R of .263.

Table 7. Regression Analysis Testing Independent Variables and the Level of Severe Assault as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(Constant)	0.176	0.074		2.368	0.02
Unit Perceived Danger	0.058	0.1	0.099	0.579	0.564
Unit Combat Experience	0.012	0.012	0.175	1.027	0.307
<b>Overall Model: F= 4.051*</b>					
<b>R=.263, R<sup>2</sup>=.060</b>					

\* $p<0.05$ .

As shown in Table 7, the overall model was a significant predictor of post-combat severe assault. However, none of the independent variables were significant on their own. The significance of the overall model provides support for this study's first hypothesis that units with high levels of combat experience have more post-combat severe assault.

### **Aggression and Violence (Non-Weighted Score)**

Pearson's correlations were conducted to determine which variables were related to the non-weighted level of aggression and violence score at the bivariate level. The variables level of unit perceived danger and level of unit combat exposure were included (see Table 8). The Pearson's correlation coefficients calculated for the relationship between predictor variables and aggression and violence found a moderate positive correlation with level of unit perceived danger ( $r=.345$ ,  $p<.01$ ) and level of unit combat exposure ( $r=.335$ ,  $p<.01$ ).

Table 8. Pearson Correlations of Predictor Variables and Level of Aggression and Violence (Non-Weighted Score) as the Dependent Variable

		A&V	UPD	UCE
Pearson Correlation	Aggression and Violence	1	0.345	0.335
	Unit Perceived Danger	0.345	1	0.84
	Unit Combat Exposure	0.335	0.84	1
Sig. (1-tailed)	Aggression and Violence		0.001	0.001
	Unit Perceived Danger	0.001		0.001
	Unit Combat Exposure	0.001	0.001	
N	Aggression and Violence	112	112	112
	Unit Perceived Danger	112	112	112
	Unit Combat Exposure	112	112	112

A multiple regression analysis was calculated to predict group's level of aggression and violence (see Table 9). The overall effect for the model was significant ( $F(7.886) = 58.709, p < .001$ ) with a moderate R of .355.

Table 9. Regression Analysis Testing Independent Variables and the Level of Aggression and Violence (Non-Weighted Score) as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(Constant)	2.291	0.281		8.14	0.001
Unit Perceived Danger	0.494	0.376	0.216	1.311	0.193
Unit Combat Experience	0.041	0.045	0.154	0.931	0.354
<b>Overall Model: <math>F=7.886^*</math></b>					
<b><math>R=.355, R^2=.126</math></b>					

\*  $p < 0.01$

As shown in Table 9, the overall model was a significant predictor of post-combat aggression and violence. However, neither of the independent variables reached significance on their own. The significance of the overall model provides support for this study's first hypothesis that units with high levels of combat experience have more post-combat aggression and aggression (using the non-weighted summed score).

### **Aggression and Violence (Weighted Score)**

Pearson's correlations were conducted to determine which variables were related to the level of aggression and violence (weighted) at the bivariate level. The variables level of unit perceived danger and level of unit combat were included (see Table 10). The Pearson's correlation coefficients calculated for the relationship between predictor variables and aggression and violence found a moderate positive correlation with level of unit perceived danger ( $r=.329, p < .01$ ) and level of unit combat exposure ( $r=.358, p < .01$ ).

Table 10. Pearson Correlations of Predictor Variables and Level of Aggression and Violence (Weighted Score) as the Dependent Variable

		A&V	UPD	UCE
Pearson Correlation	Aggression and Violence	1	0.329	0.358
	Unit Perceived Danger	0.329	1	0.84
	Unit Combat Exposure	0.358	0.84	1
Sig. (1-tailed)	Aggression and Violence		0.001	0.001
	Unit Perceived Danger	0.001		0.001
	Unit Combat Exposure	0.001	0.001	
N	Aggression and Violence	112	112	112
	Unit Perceived Danger	112	112	112
	Unit Combat Exposure	112	112	112

A multiple regression analysis was calculated to predict group's level of post-combat aggression and violence (see Table 11). The overall effect for the model was significant ( $F(8.202) = 335.054, p < .001$ ) with a moderate R of .362.

Table 11. Regression Analysis Testing Independent Variables and the Level of Aggression and Violence, (Weighted Score) as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(Constant)	4.147	0.671		6.185	0.001
Unit Perceived Danger	0.533	0.897	0.098	0.594	0.553
Unit Combat Experience	0.178	0.106	0.276	1.676	0.097
<b>Overall Model: F= 8.202*</b>					
<b>R=.362, R<sup>2</sup>=.131</b>					

\*  $p < 0.01$

As shown in Table 11, the overall model was a significant predictor of post-combat aggression and violence. However, neither of the independent variables reached significance on their own. The significance of the overall model provides support for this study's first hypothesis that units with high levels of combat experience have more post-combat aggression and violence (using weighted score).



### Aggression and Violence (Maximum Weighted Score)

Pearson's correlations were conducted to determine which variables were related to the weighted with maximum score of level of aggression and violence at the bivariate level. The variables level of unit perceived danger and level of unit combat exposure were included (see Table 12). The Pearson's correlation coefficients calculated for the relationship between predictor variables and the level of aggression and violence found a moderate positive correlation with the level of unit perceived danger ( $r=.357, p<.01$ ) and the level of unit combat exposure ( $r=.369, p<.01$ ).

Table 12. Pearson Correlations of Predictor Variables and Level of Aggression and Violence (Maximum Weighted Score) as Dependent Variable

		A&V	UPD	UCE
Pearson Correlation	Aggression and Violence	1	0.357	0.369
	Unit Perceived Danger	0.357	1	0.84
	Unit Combat Exposure	0.369	0.84	1
Sig. (1-tailed)	Aggression and Violence		0.001	0.001
	Unit Perceived Danger	0.001		0.001
	Unit Combat Exposure	0.001	0.001	
N	Aggression and Violence	112	112	112
	Unit Perceived Danger	112	112	112
	Unit Combat Exposure	112	112	112

A multiple regression analysis was calculated to predict group's level of aggression and violence (see Table 13). The overall effect for the model was significant ( $F(9.143) = 90.695, p<.001$ ) with a moderate R of .379.

Table 13. Regression Analysis Testing Independent Variables and the Level of Aggression and Violence (Maximum Weighted Score) as Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(Constant)	2.864	0.346		8.272	0.001
Unit Perceived Danger	0.454	0.463	0.16	0.981	0.329
Unit Combat Experience	0.079	0.055	0.234	1.436	0.154
<b>Overall Model: F=9.143 *</b>					
<b>R= .379, R<sup>2</sup>=.144</b>					

\* p<0.01

Identical to the other combined measures of post-combat aggression and violence, the overall model was a significant predictor of post-combat aggression and violence. However, neither of the independent variables reached significance on their own. As with the other combined measures, the significance of the overall model provides support for this study's first hypothesis that units with high levels of combat experience (the combination of level of unit perception of danger and level of unit combat exposure) have more post-combat aggression and violence (using the maximum weighted score).

## Hypothesis 2

Hypothesis 2 postulates an inverse relationship between level of unit leader support and level of unit post-combat aggression and violence. Pearson's correlations were conducted to determine whether level of unit leader support was related to mild aggression, severe aggression, severe assault, and all three composite scorings for aggression and violence. Level of unit leader support was not significantly related to any of the outcome measures, resulting in a decision to fail to reject the null hypothesis.

### Hypothesis 3

Hypothesis 3 primarily focuses on the effect of the interaction variable level of unit combat exposure and level of unit leader support. As previously stated, the individual variables level of unit combat experience and level of unit leadership were centered, per Cohen, et al. (2003), then multiplied to create the interaction variable. Because the interaction variable is a construct of two other variables, the correlations for the interaction variable are meaningless, and therefore will not be discussed. Additionally, because the interaction variable is the primary focus of this hypothesis, neither level of combat exposure or level of unit leader support will be discussed in detail.

### Mild Aggression

A multiple regression analysis found a negative association ( $p < .01$ ) between the interaction variable (level of unit combat exposure and level of unit leader support) and post-combat severe aggression (see Table 14). The overall effect for the model was significant ( $F(5.976) = 12.695, p < .001$ ) with a moderate  $R$  of .377.

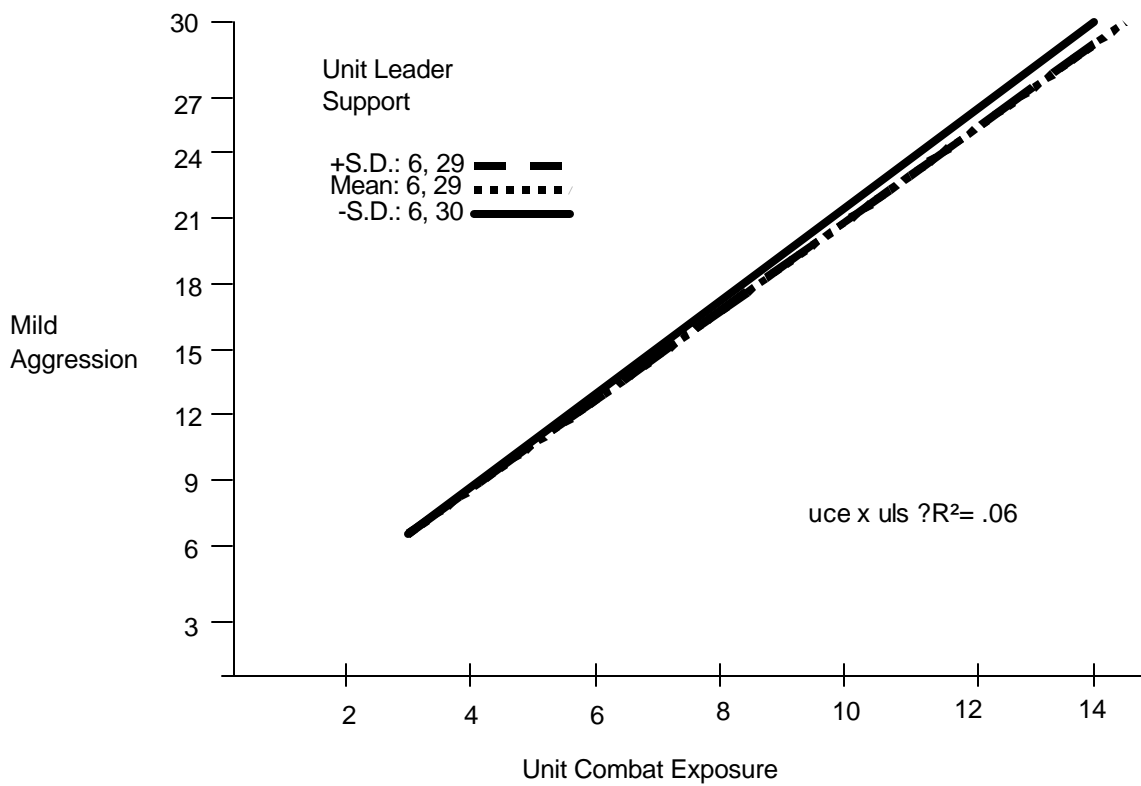
Table 14. Regression Analysis Testing Interaction Variable (unit combat exposure x unit leader support) and the Level of Minor Aggression as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(constant)	2.034	0.03		67.181	0.001
unit combat exposure	0.033	0.011	0.264	2.933	0.004
unit leader support	-0.009	0.028	-0.033	-0.332	0.74
unit combat exposure X unit leader support	-0.027	0.01	-0.274	-2.813	0.006
<b>Overall Model: F= 5.976*</b>					
<b>R=.377, R<sup>2</sup>=.142</b>					

\* $p < 0.01$

Based on the significance of the interaction, Tate (1998) suggests plotting the effect of each independent variable on the outcome variable to demonstrate the interaction effect. Figure 3 indicates that as the level of unit combat exposure increases, the effect of increased level of unit leader support reduces post-combat mild aggression.

Figure 3. The Effects of Both Level of Unit Combat Exposure and Level of Unit Leader Support on Post-Combat Mild Aggression



### Severe Aggression

A multiple regression analysis found a negative association ( $p < .01$ ) between the interaction variable (level of unit combat exposure and level of unit leader support) and

post-combat severe aggression (see Table 15). The overall effect for the model was significant ( $F(8.684) = 10.649, p < .001$ ) with a moderate  $R$  of .441.

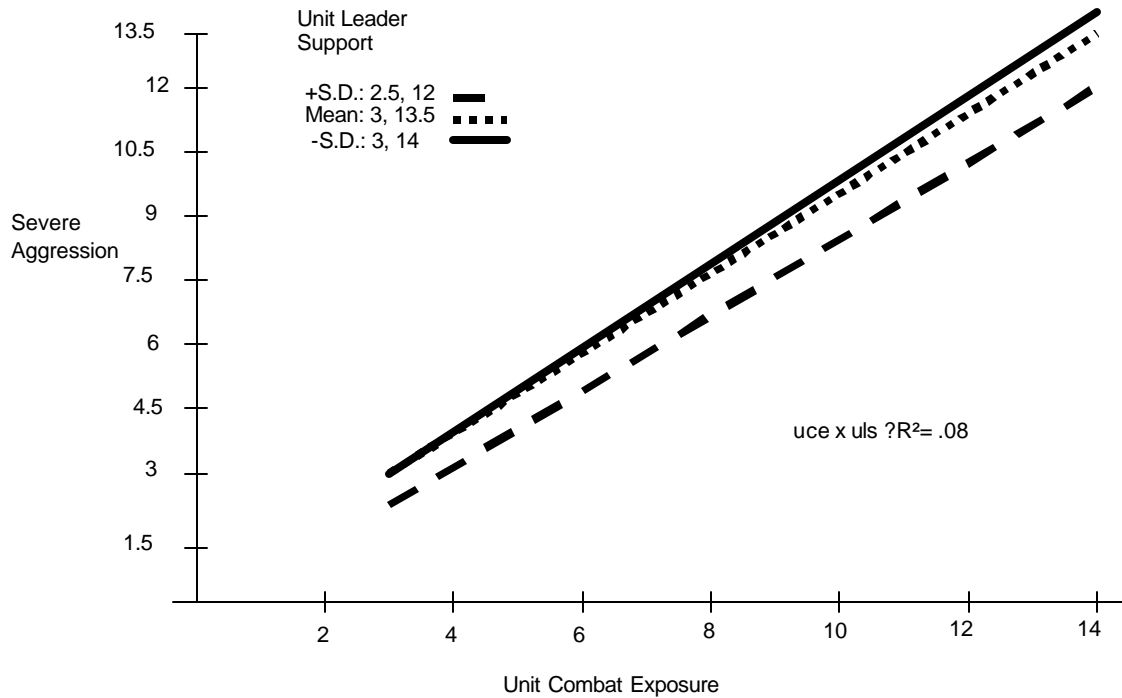
Table 15. Regression Analysis Testing Interaction Variable (unit combat exposure x unit leader support) and the Level of Severe Aggression as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(constant)	0.881	0.027		32.793	0.001
unit combat exposure	0.039	0.01	0.341	3.918	0.001
unit leader support	-0.037	0.025	-0.14	-1.472	0.144
unit combat exposure X unit leader support	-0.028	0.009	-0.311	-3.298	0.001
<b>Overall Model: <math>F = 8.684^*</math></b>					
<b><math>R = .441, R^2 = .194</math></b>					

\* $p < 0.01$

Figure 4 indicates that as the level of unit combat exposure increases, increased level of unit leader support reduces post-combat severe aggression.

Figure 4. The Effects of Both Level of Unit Combat Exposure and Level of Unit Leader Support on Post-Combat Severe Aggression



## Severe Assault

A multiple regression analysis found a negative association ( $p < .05$ ) between the interaction variable (level of unit combat exposure and level of unit leader support) and post-combat severe assault (see Table 16). The overall effect for the model was significant ( $F(3.047) = 3.852, p < .05$ ) with a moderate  $R$  of .279.

Table 16. Regression Analysis Testing Interaction Variable (unit combat exposure x unit leader support) and the Level of Severe Assault as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(constant)	0.342	0.017		19.782	0.001
unit combat exposure	0.018	0.006	0.263	2.819	0.006
unit leader support	-0.012	0.016	-0.076	-0.747	0.457
unit combat exposure X unit leader support	-0.006	0.006	-0.114	-1.126	0.263
<b>Overall Model: <math>F = 3.047^*</math></b>					
<b><math>R = .279, R^2 = .078</math></b>					

\* $p < 0.05$ .

## Aggression and Violence (Non-Weighted Score)

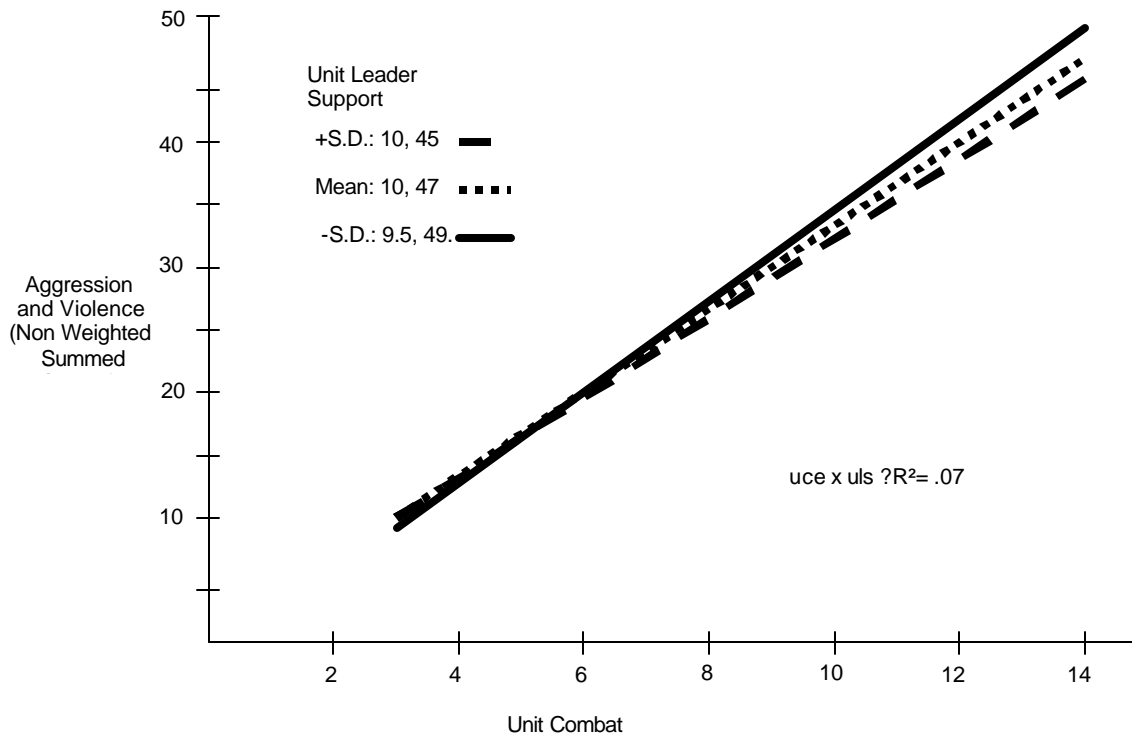
A multiple regression analysis found a negative association ( $p < .01$ ) between the interaction variable (level of unit combat exposure and level of unit leader support) and post-combat severe assault (see Table 17). The overall effect for the model was significant ( $F(8.056) = 58.709, p < .001$ ) with a moderate  $R$  of .428. The interaction variable level of unit combat exposure and level of unit leader support was also significant ( $p < .01$ ), which indicates that as combat exposure increases, higher levels of unit leader support are associated with lower levels of post-combat aggression and violence, as depicted in Figure 5.

Table 17. Regression Analysis Testing Interaction Variable (unit combat exposure x unit leader support) and the Level of Aggression and Violence (Non-Weighted Score) as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(constant)	3.257	0.064		51.254	0.001
unit combat exposure	0.091	0.024	0.335	3.821	0.001
unit leader support	-0.058	0.059	-0.094	-0.984	0.327
unit combat exposure X unit leader support	-0.062	0.02	-0.289	-3.041	0.003
<b>Overall Model: F= 8.055*</b>					
<b>R=.428, R<sup>2</sup>=.183</b>					

\*p<0.01

Figure 5. The Effects of Both Level of Unit Combat Exposure and Level of Unit Leader Support on Post-Combat Aggression and Violence (Non-Weighted Score)



**Aggression and Violence (Weighted Score)**

A multiple regression analysis was conducted to determine the effect of the interaction variable level of unit combat exposure and level of unit leader support on respondent group’s level of post-combat aggression and violence (see Table 18). The overall effect for the model was significant ( $F(7.658) = 335.054, p < .001$ ) with a moderate R of .419. The interaction variable level of unit combat exposure and level of

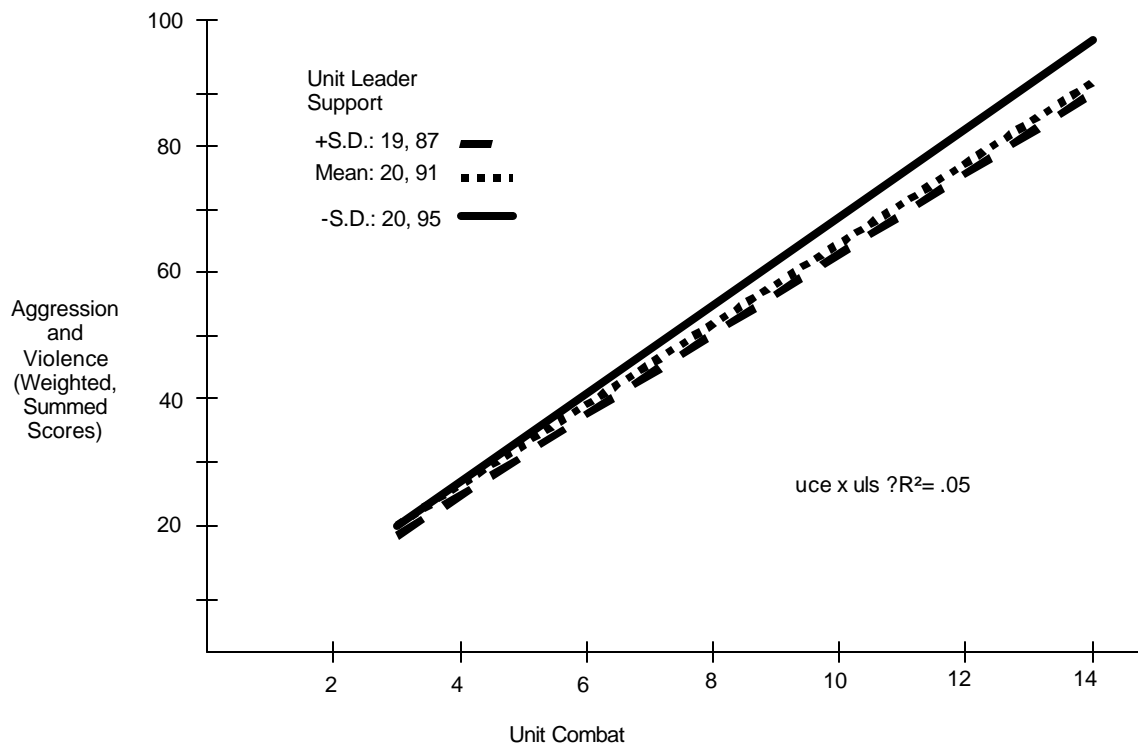
unit leader support was also significant ( $p < .01$ ). This indicates that as combat exposure increases, higher levels of unit leader support are associated with lower levels of combat aggression and violence, as depicted in Figure 6.

Table 18. Regression Analysis Testing Interaction Variable (unit combat exposure x unit leader support) and the Level of Aggression and Violence (Weighted Score) as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(constant)	6.195	0.152		40.627	0.001
unit combat exposure	0.231	0.057	0.358	4.061	0.001
unit leader support	-0.116	0.142	-0.078	-0.815	0.417
unit combat exposure X unit leader support	-0.121	0.049	-0.237	-2.484	0.015
<b>Overall Model: F= 7.658*</b>					
<b>R=.419, R<sup>2</sup>=.175</b>					

\* $p < 0.01$

Figure 6. The Effects of Both Level of Unit Combat Exposure and Level of Unit Leader Support on Post-Combat Aggression and Violence (Weighted Score)





### Aggression and Violence (Maximum Weighted Score)

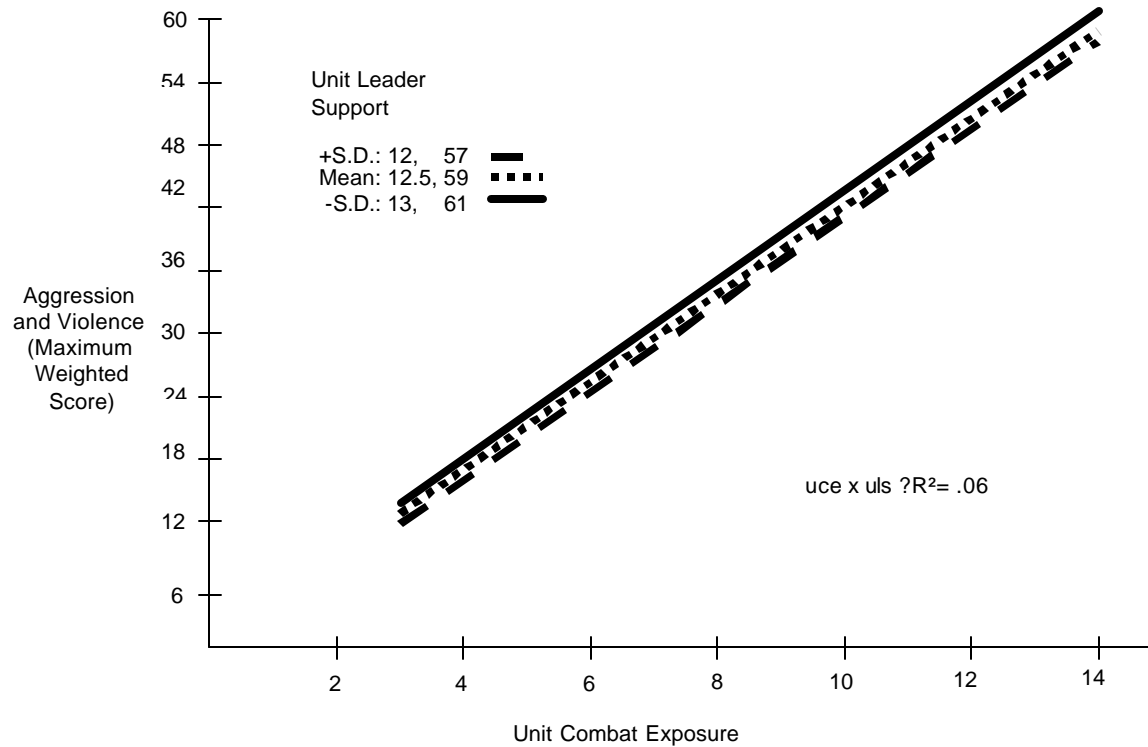
A multiple regression analysis was conducted to determine the effect of the interaction variable level of unit combat exposure and level of unit leader support on respondent group's level of post-combat aggression and violence (see Table 19). The overall effect for the model was significant ( $F(9.178) = 90.695, p < .001$ ) with a moderate  $R$  of .451. The interaction variable level of unit combat exposure and level of unit leader support was also a significant ( $p < .01$ ). This indicates that as combat exposure increases, higher levels of unit leader support are associated with lower levels post-combat aggression and violence, as depicted in Figure 7.

Table 19. Regression Analysis Testing Interaction Variable (unit combat exposure x unit leader support) and the Level of Aggression and Violence (Maximum Weighted Score) as the Dependent Variable

Predictor Variable	B	S.E. B	Beta	t	sig.
(constant)	4.059	0.078		52.042	0.001
unit combat exposure	0.122	0.029	0.365	4.208	0.001
unit leader support	-0.044	0.073	-0.057	-0.602	0.549
unit combat exposure X unit leader support	-0.074	0.025	-0.277	-2.947	0.004
<b>Overall Model: F= 9.178*</b>					
<b>R=.451, R<sup>2</sup>=.203</b>					

\* $p < 0.01$

Figure 7. The Effects of Both Level of Unit Combat Exposure and Level of Unit Leader Support on Post-Combat Aggression and Violence Aggression and Violence Aggression and Violence (Maximum Weighted Score)



### Summary of Results

This study examined 112 US Army companies assigned to one of three active duty combat infantry divisions. Multiple regression analyses were used to determine the extent to which group level variables (unit perception of danger, unit combat exposure, unit leader support and the interaction of unit combat exposure and unit leader support) predicted the level of post-combat aggression and violence.

The results of the multiple regressions supported the first hypothesis that higher levels of unit combat experience (as tested by the overall model of level of unit perception of danger and level of unit combat exposure) were associated with increased levels of post-combat minor aggression, severe aggression, severe assault and all three

combined measures of aggression and violence. The null hypothesis was rejected and Hypothesis 1 was supported.

The second hypothesis, that the main effect of the level of unit leader support would be negatively associated with level of unit post-combat aggression and violence, was not supported. However, the third hypothesis was supported. The level of unit leader support was found to buffer the level of unit combat exposure and reduce post-combat minor aggression, severe aggression, and all of the combined measures of aggression and violence. In each of the above mentioned measures, as the level of unit combat exposure increased, the increased levels of unit leader support resulted in less post-combat aggression and violence. Only in the case of severe assault was the interaction variable non-significant.

Although support for weighting the aggression and violence measures could not be found in the literature, all three techniques for combining the measures of post-aggression and violence (non-weighted score, weighted score, and maximum weighted score) resulted in similar findings.

## CHAPTER 5

### DISCUSSION & IMPLICATIONS

#### **Discussion**

The conceptual model for this study is based on the theoretical constructs of Lazarus and Folkman's (1984) transactional stress theory, Bliese and Castro's (2003) Soldier Adaptation Model and Cobbs (1976) conception of the effects of social support. Basically, stressors and the perception of those stressors can be moderated by organizational factors such as leader support. Thus, three hypotheses were tested in this study to establish support for the theoretical constructs of the conceptual model. The first hypothesis was concerned with the effect of unit combat experience on unit post-combat aggression and violence. The second hypothesis sought to examine the extent to which unit leader support had a main effect on the relationship between unit combat experience and unit post-combat aggression and violence. The final hypothesis examined the extent to which unit leader support had a buffering effect on the relationship between unit combat exposure and unit post-combat aggression and violence. For the sake of lucidity, the discussion will begin with the most unexpected findings.

#### **The Buffering Effect of Unit Leader Support with Unit Combat Experience on Aggression and Violence**

This study investigated whether the organizational variable, level of unit leader support, moderated or buffered units from the potentially negative effects of unit combat experience. Evidence for this supposition derives from the demonstration of a statistical effect of stress X support, represented by a statistical interaction in which those who

receive more social support have a weaker positive stressor strain relationship. This potentially demonstrates that unit leader support weakens the relationship between stressors and strains. Another way of conceptualizing the buffering effect of leader support is that the effect is conditional on the presence of a stressor, in this case combat exposure. Therefore, this study's conceptual model hypothesized that units with high levels of unit leader support and combat exposure would report less post-combat aggression and violence. The findings of the current study support this position by demonstrating a significant negative relationship between the levels of leader support, combat exposure and all the measures of post-combat aggression and violence except severe assault.

The results of the current study offer further support to the existing literature correlating the buffering effect of leader support on the relationship between stressors and strains, or in this case combat exposure and post-combat aggression and violence. The results of previous investigations of the buffering effect of leader support on soldiers found it significantly related to decreased hostility (Bliese & Halverson, 2002), psychological strain (Bliese & Castro, 2000), and Combat Stress Reactions (Solomon et al., 1986). This study's finding that the interaction of unit leader support and combat exposure accounted for between 5 percent and 8 percent of the variance is similar in magnitude to civilian occupational stress studies that investigated the buffering effects of organizational support on violence in the workplace (Leather et al., 1998; Schat & Kelloway, 2003).

This study's findings on the buffering effect of leader support versus the direct effect of leader support may seem to contradict each other. This is not necessarily so. A

quick review of the theoretical differences between the buffering effect and the main effect of support may help distinguish this occurrence. The main effect of support posits that in all environments (regardless of the presence of stressors), leader support would result in reduced strain. The buffering effect theorizes that only in an environment where stressors are present does leader support effectively reduce strain. Pertaining to the main effect, this study found that increased unit leader support was not a significant predictor of higher aggression and violence. Specific to the buffering effect, this study found that the more unit combat was experienced with higher levels of unit leader support, aggression and violence decreased (consistent with the hypothesis). So leader support alone does not have an effect on post-combat aggression and violence, but leader support in the presence of combat decreases post-combat aggression and violence. (The correlational nature of this study precludes more conclusive casual inferences.) The possible reasons for this have been previously discussed; suffice it to point out the findings are not necessarily opposed as they result from different situations.

### **The Main Effect of Unit Leader Support on Aggression and Violence**

This study investigated whether the organizational variable unit leader support provided a beneficial effect irrespective of whether a unit is under stress or not. It was hypothesized that higher levels of unit leader support would predict lower levels of post-combat aggression and violence. The level of unit leader support as a direct effect was not significant in predicting levels of post-combat aggression and violence.

This finding is incongruent with the general findings of studies on the direct effect of social support (e.g. Beehr, 1995; Cohen & Willis, 1985; Viswesvaran et al., 1999).

Those studies generally found a weak but negative relationship between social support and psychological strain. Data coding was rechecked and the findings of this study re-verified. The following discussion will intertwine reviews of published military leader support studies with this study's methodology in an attempt to better understand the lack of supportive findings in the current study.

Bliese and Halverson (2002) conducted a methodologically similar (purposive sampling strategy based on soldier availability, large active duty sample, survey research, similar measure of leader support, variables measured at the group level), study which examined the main effect of group perception of leader support on unit hostility. They evaluated data from 49 US Army companies deployed on the non-combat operation Uphold Democracy to Haiti in 1994. They found evidence for the main effect of leader support. Units that perceived their leaders to be supportive had lower levels of hostility than units which perceived their leaders as less supportive (mean square= .81,  $F=5.33$ ,  $p<.05$ ). Bliese and Halverson's choice to measure psychological strain as an outcome variable for leader support is in keeping with published social support literature (e.g., Beehr, 1995; Bliese & Castro, 2000; Cohen & Willis, 1985; Solomon, Mikulincer & Hobfoll, 1986; Viswesvaran et al., 1999). This study's outcome variable, a behavioral strain, has not been previously investigated. The difference between outcome variables, psychological strain (supported in the literature) versus behavioral strain (not identified in the literature) may provide some explanatory support for the difference in findings between this study and those found in the literature.

Another example of a similar methodological study (purposive sampling strategy based on soldier availability, large active duty sample, survey research, similar measure

of leader support, variables measured at the group level) which found leader support to decrease psychological strain was Bliese and Castro's (2000) study of soldiers preparing to go on a training exercise. They found NCO support was negatively related to psychological strain. Specifically, army companies with high NCO support had, on average, lower levels of psychological strain than did companies with low NCO support ( $\beta = .054, p < .01$ ). Similar to Bliese and Halverson's (2003) study, Bliese and Castro used psychological strain as an outcome measure. The earlier discussion pertaining to the choice of psychological strain versus behavioral strain is equally cogent, but will not be restated. The main difference between Bliese and Castro's (2000) study and this study is the level of leadership investigated. NCOs act as soldier's direct supervisors, and therefore control much of soldier's day to day activities. The point of this comparison is to point out that Bliese and Castro's (2000) study and this study, though seemingly similar (investigating the effect of leader support at the unit level) are quite different in important aspects that may have contributed to different outcomes.

Solomon, Mikulincer and Hobfoll (1986) also found support for the main effect of leader support. Their study carefully matched 382 Israeli soldiers who developed Combat Stress Reactions (CSR) in the Lebanon War, with 334 Israeli soldiers who had participated in the same frontline combat units but did not develop CSR. Battle intensity was assessed by asking soldiers how threatening they perceived their battle experiences were. Perception of leadership support was measured using an adapted version of the Military Company Environment Inventory (Moos, 1973) and like the current study focused on officer support. Their study found that there was a significant difference between groups. Soldiers who suffered from CSR reported that their officers were less



supportive both emotionally and instrumentally than soldiers not suffering from CSR. The Solomon, et al. study was methodologically strong and differs in important conceptual ways from the current study. First, their study used individuals as the unit of analysis. Their strategy focuses on the individual's perception of leader support versus the current study's strategy of using the group as the unit of analysis. The current study assumes that the group average score is mathematically a better measure of the actual leader support in the group, versus any individual score. This is an important distinction, especially considering the Solomon, et al. focus on CSR soldiers versus non-CSR soldiers. The reasoning for this argument is that soldiers who have CSR may be more prone to blame lack of leader support as being partially responsible for their CSR. If this is the case for at least some CSR soldiers, then the Solomon, et al. findings speak more to the perceptions of CSR and non-CSR soldiers and not about the role of leader support in the development of CSR.

Comparing the current study to published studies with positive findings does not tell the whole story. It is important to clarify limitations inherent in this study. The data were collected from subjects at one time point. Because the data are cross sectional and correlational in nature, the causality of the examined relationships is suspect. Cross-sectional studies are inherently vulnerable to threats to internal validity. Plausible alternative explanations for the relationships observed can not be ruled out because there is no matched control group.

As discussed above, there are numerous methodological differences which may explain the difference in findings. The above studies evaluate the effect of the level of leader support on psychological strain. Behavioral strain or aggression and violence may

be better conceptualized as behaviors than psychological outcome and therefore better regulated than attitudinal outcomes.

This study's finding that the main effect of leader support is not a significant predictor of post-combat aggression and violence should not be seen as implying that in the absence of combat leader support is not important. For example, it would be short sighted to suggest that leaders should only be supportive during combat. The bigger picture appears to be that leader support is especially important during times of increased stressors.

### **Unit Combat Experience and Aggression and Violence**

An additional finding that merits discussion is that the level of combat experience was a significant predictor of the level of post-combat aggression and violence. Derived from the theoretical premise of the Lazarus and Folkman (1984) transactional model of stress, this study's conceptual model posited that both stressors and perception of stressors are critical in determining an individual's stress response. This study sought to test this at the group level by including the group's mean rating of both combat exposure and perception of danger. It was thus hypothesized that groups that report increased levels of combat exposure and increased perception of danger would report increased levels of post-combat aggression and violence. The results of the current study provide support for combat exposure and perceived danger as significant predictors for post-combat aggression and violence.

In this study, the individual predictor variable level of unit combat exposure was not a significant predictor of the level of minor aggression, severe aggression, severe

assault or any of the combined aggression and violence measures. This finding is contrary to Beckham, Feldman and Kirby's (1998) results, which found combat exposure as significantly related to interpersonal violence in 151 help-seeking Vietnam combat veterans ( $\beta=.05$ ,  $p<.05$ ). Numerous methodological differences exist. Beckham, et al. (1998) relied on 20 year post-combat, unsubstantiated self reporting of combat exposure from help-seeking respondents. Additionally, Beckham, et al. (1998) used the Combat Exposure Scale (Keene et al., 1988) and a modified version of the Conflict Tactics Scale (CTS) (Strauss et al., 1996), both differing from the measures used in this study. It must also be pointed out that Beckham and colleagues investigated the effect of combat exposure on individuals, as opposed to its effect on groups.

Prigerson, Maciejewski and Rosenheck (2002) also found that combat exposure contributed significantly to current spouse or partner abuse ( $\beta=.012$ ,  $p<.05$ ). Their study was derived from the National Comorbidity Survey (NCS), which included 179 respondents who reported that they had been exposed to combat. The Prigerson, et al. (2002) study also differs from this study in important ways that may account for opposing findings. First, their combat exposure measure was dichotomous, in that it only asked whether subjects had participated in combat or not. There is no ability to ascertain the level of combat exposure. Second, their study focused specifically on spouse and partner abuse, instead of the more global outcome of aggression and violence. Finally, their study looked at the individual level and did not factor in any organizational level variables.

As opposed to the level of combat exposure, the current study found that unit level perception of danger significantly predicted minor and severe aggression. This seems to lend credence to Lazarus and Folkman's (1984) notion that the individual's

perception of the stressor is the primary factor in the stressor-strain relationship. These findings seem to concur with Solomon, Mikulincer and Hobfoll (1987), who measured the contribution of objective and perceived measures of combat experience to Combat Stress Reactions (CSR) in Israeli combat veterans of the Lebanon War. They found that although objective measures of combat exposure were significant (accounting for 1.8% of variance), perceived danger was the most important factor discriminating between CSR and non-CSR soldiers (6.2 % of the variance explained). It is important to note the differences in the two studies; Solomon and colleagues focused on the individual level as opposed to the group level. Even so, both studies provide at least cursory support for Lazarus and Folkman's (1984) conceptualization of the importance of perception in the stressor-strain relationship.

### **Implications for Theory**

The conceptual model for this study is based on the theoretical constructs of Lazarus and Folkman's (1984) transactional stress theory. Lazarus and Folkman (1984) specifically defined stress as "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. 21). The findings of this study provide partial support for the theory's position that appraisal plays the major role in stress. This study found that a unit's level of perception of danger is a significant predictor of the level of post-combat minor and severe aggression, whereas a unit's reported level of combat exposure was not. However, in subsequent analysis of the levels of severe assault and combined measures

of aggression and violence neither the levels of unit perception of danger nor unit combat exposure significantly predicted the strain of post-combat aggression and violence.

The main effect of the level of unit leader support was not a significant predictor of any of the measures of post-aggression and violence. However, the interaction between unit leader support and unit combat exposure, the buffering effect, was found to be a significant predictor of decreased levels of post-combat aggression and violence (but not severe assault when measured alone). This finding also supports Bliese and Castro's (2003) conceptualization of organizational factors as moderators of the stress-strain relationship.

Cobb (1976) theorized that social support has a main or direct effect on strain such that when support is evident, strain will be reduced regardless of the amount of stressors present. This study found evidence that the level of unit leader support did not have a direct effect on the level of post-combat aggression and violence. Studies that examined the main effect of leader support used psychological outcome measures as opposed to the behavioral outcome measures used in this study. Further research is necessary to increase the understanding of this outcome. This is a potentially important area for future social support theory development.

This study did provide support for the buffering effect of leader support. As the only study which investigated the moderating effect of the level of unit leader support on the levels of combat exposure and post-combat aggression and violence, these findings offer support for the theory. Demonstrating that leader support in combination with combat exposure can decrease the behavioral strain of post-combat aggression and violence provides evidence of the viability of the theory in this area.

## **Implications for Practice**

Since the beginning of combat operations initiated post 11 September 2002, the Army has deployed about half of its active duty soldiers as well as large numbers from the Army Reserve and National Guard. During combat operations Social Work Officers 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 increase the knowledge base of the effects of participation in combat on post-combat aggression and violence. Whereas combat has been widely assumed to result in post-combat aggression and violence, this study has revealed that the relationship between combat and post-combat aggression and violence may be affected by organizational factors such as leader support. This finding has important implications for practice in a number of ways.

Severe assault may be the component of violence of most interest to leaders and social workers dealing with post-combat violence. The finding that unit level “severe assault” was not significantly related to either the direct effect of leader support or the buffering effect of leader support suggests that severe assault may not result from the organizational factors studied. It appears that the factors that contribute to soldiers’ level of post-combat severe aggression perhaps lie elsewhere. Those interested in preventing soldier post-combat violence (such as social workers, law enforcement and leaders) may need to focus on individual factors that contribute to violence. Even though unit leaders may not be responsible for contributing to soldiers’ severe assault through their

supportive leadership style, unit leaders are still responsible to identify soldiers with anger management issues and ensure that these soldiers receive available prevention treatment. In keeping with Army regulations, leaders should use a command referral for these soldiers. Command referrals are used to ensure that identified soldiers receive a mental health assessment. The Army routinely offers individual counseling, anger management and psycho-educational counseling.

Like severe assault, mild and severe aggression can also be harmful. In this study both mild and severe aggression were related to the buffering effect of the level of unit leader support. When screening soldiers for aggression, social workers should attempt to ascertain information concerning the unit's leader support for indications of potential unit aggression post-combat.

The finding that the level of unit leader support buffers combat exposure, resulting in reduced levels of post-combat aggression and violence, may be the most important finding related to practice. Unit leaders need to be informed that with increased combat exposure, their supportive leadership is particularly essential in reducing the level of post-combat aggression and violence. Based on this finding, social workers should gather information on the amount of combat a unit has participated in and the level of leader support when attempting to prevent or decrease a unit's post-combat aggression and violence. Units that participate in combat, but have low leader support may be a higher priority for post-combat aggression and violence interventions.

All of the above practice implications highlight the importance of social workers being aware of a unit's leadership climate and combat experience. This emphasizes the importance of the social worker's role of consultant to commanders. The Army defines

consultation as liaison, prevention advice, education programs, planning and stress control interventions to supported unit commanders and staff. An effective consultation relationship with commanders is based on the social worker's proximity and availability. Social workers should encourage leaders to be vigilant and proactive about command referrals for soldiers with anger management issues.

### **Implications for Policy**

This study provides support for the US Army's command policy that unit leaders must do two things: 1) accomplish the mission; and 2) take care of soldiers (US Army, 2004). This study has focused on the taking care of soldiers through supportive leadership, especially during combat. Soldiers with supportive leadership during combat have lower levels of aggression and violence upon return from combat. It can be deduced that these units might be more capable of accomplishing their mission upon return because they might be less aggressive and violent at home station.

This study also informs the leader training; primarily it demonstrates that there is a relationship between leader support and post-combat aggression and violence. It is the first to demonstrate such a relationship. Based on this evidence training should continue to emphasize the importance of leader support, especially in combat.

The technique used in this study, aggregating variables to the unit level, supports group level measurements of organizational factors. The influence of individual perspective can not be ruled out, but having significant findings for group level organizational factors demonstrates that important relationships between organizational factors and organizational behaviors. This provides initial support for using group level



measurements in both assessing specific contextual factors and their effects. This study also demonstrates the importance of identifying and understanding a unit's leadership climate. This information can best be gathered at the unit level. The Army currently has an instrument to assess a unit's command climate, titled the Command Climate Survey. The instrument is designed as a self-contained stand-alone tool for the commander to assess the climate in their unit focusing on leadership, leader accessibility, leader concern for families, and leader concern for soldiers. The Command Climate Survey is currently strictly used at the discretion of unit commanders for their own purposes. The need to understand a unit's climate may warrant either the incorporation of the command climate survey or the development of a similar instrument that social workers can use to assess unit organizational factors. This could potentially provide information from which Army social workers and other mental health practitioners can base interventions designed to decrease post-combat aggression and violence.

### **Implications for Further Research**

This study should be considered a first step in future research of the impact of combat experience and leadership support on group level post-combat aggression and violence. Future research would benefit from rigorous scientific methods including the use of a probability sampling method. Units that are identified for deployment to combat operations could be randomly selected from all the units known to be going to combat. This would decrease the risk of selection bias inherent in the current study. Additionally, identification of comparison groups that have a low probability of combat deployment could be used to compare findings. With the high rate of unit deployment to combat

operations currently under way, this could potentially be problematic, but would still increase confidence in findings.

Future studies should be prospective and longitudinal. Gathering data prior to deployment in an attempt to gather baseline data on the dependent variable would increase confidence in any finding produced. Rubin and Babbie (2001) point out that longitudinal studies are valuable in assessing whether a specific attribute increases the risk of developing later problems. A longitudinal study of groups with data collections at pre-combat deployment, during combat deployment, and three month post-combat deployment may be ideal.

Future studies would also benefit from using more robust measures of the independent and dependent variables. Aggression and violence would be better measured by including the whole Conflict Tactics Scale (Murray et al., 1996). Research literature contains numerous factor analysis validity studies and test re-test findings of the whole CTS. Additionally, a broader measure of leader support, similar to the Command Climate Survey, may increase the content validity of findings related to the construct of leader support.

Another example of strengthening the measurement of variables in future research is using additional external measures. Future studies should collect aggression and violence prevalence data from leaders and law enforcement officials about reported incidents by soldiers within the selected units. By triangulating respondent's survey responses to reports of actual incidents, concurrent criterion validity could be assessed. Leader support is another variable on which further data collection would be beneficial.

Data could also be collected from the unit leader's superiors and staff. This would provide a measure to assess inter-rater reliability.

Future research needs to examine other organizational issues, such as the effect of Non-Commissioned Officer support and or peer support. Non-Commissioned Officers and peers have more direct contact with soldiers than officers. Similarly, unit cohesion, unit esprit de corps, unit casualty rates, unit leadership style, unit leadership justice, unit morale are all areas that may contribute to a better understanding of organizational factors effects on post-combat aggression and violence.

When feasible, future studies should use the advanced statistical analysis strategies incorporating multi-level modeling. Multi-level models, referred to as random coefficient models or hierarchical linear models (HLM), provide the flexibility and analytical properties to analyze complex data structures incorporating data at both the individual level and unit (group) level. HLM corrects the problem of underestimated standard errors by permitting the analyst to incorporate unique random effects for each unit. Hoffman (1997) posits that HLM models take into account both the individual's and group's residual error, while recognizing the partial interdependence of individuals within their particular group. HLM allows the analyst to simultaneously examine relationships by using two models: one models relationships within each unit, and a second models how the relationships within each unit vary between units (Hoffman, 1997, Bryk & Raudenbush, 2002). It would appear that a multi-level model analysis would be the next logical step in reanalyzing the data used in this study to see whether the findings would be replicated.

## **Conclusion**

The United States government's response to the terrorist attacks on 11 September 2001 has resulted in two wars. Not since the Viet Nam War have so many US Army soldiers participated in combat operations. Based on the assumption that these wars will not be concluded in the near future, there is a strong likelihood that increasing numbers of soldiers, marines, seamen and airmen will participate in the dangerous environment of combat. Understanding the deleterious effects of combat and factors which decrease the likelihood that combat veterans will return from combat aggressive and violent should be a priority of the military researchers and mental health practitioners.

Military social workers, specifically Army social work officers for the past 50 years, have provided services developed to assist combat veterans in their transition to the home front. Their mandate is clear, provide services that strengthen and enhance the well being of soldiers and families. This is particularly important while our nation is at war. Despite the limitations previously described, this study provides evidence that leader support might affect soldiers' aggression and violence. Social workers should use this information to provide leader consultation emphasizing the potential impact of leaders on their soldiers' post-combat aggression and violence.

## APPENDICES

### Appendix A. Unit Combat Exposure (UCE))

<b>How often did you experience the following during the most recent deployment</b>	Never	One Time	Two to Four Times	Five to Nine Times	Ten or More Times
Receiving small arms fire	0	1	2	3	4
Shooting or directing fire at the enemy	0	1	2	3	4
Calling in fire on the enemy	0	1	2	3	4
Engaging in hand-to-hand combat	0	1	2	3	4
Being wounded/injured	0	1	2	3	4
Receiving incoming artillery, rocket or mortar fire	0	1	2	3	4
Being directly responsible for the death of an enemy combatant	0	1	2	3	4
Having a member of your own unit become a casualty	0	1	2	3	4
Had a buddy who was shot or hit near you	0	1	2	3	4
Had close call, dud, hit in protective gear, equipment shot off	0	1	2	3	4
Improvised explosive device (IED)/booby trap exploded near you	0	1	2	3	4

**Appendix B.**  
**Unit Perceived Danger (UPD)**

<b>During the most recent deployment, how often were you in danger of being injured or killed?</b>	<b>Never</b>	<b>Once or twice</b>	<b>Sometimes</b>	<b>Many times</b>
<b>Scoring</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>

**Appendix C.  
Unit Leader Support (ULS)**

<b>Thinking about your unit, rate how often the following occurs in your unit. Officers...</b>	Never	Once / Twice	Some- times	Often	Very Often
Tell soldiers when they have done a good job?	0	1	2	3	4
Embarrass soldiers in front of other soldiers?	0	-1	-2	-3	-4
Try to look good to higher-ups by assigning extra missions or details to soldiers?	0	-1	-2	-3	-4
Exhibit clear thinking and reasonable action under stress.	0	1	2	3	4

**Appendix D.**  
**Unit Post-Combat Minor Aggression**

<b>How often in the past month did you.....</b>	Never	Once /Twice	Some- times	Often	Very Often
Get angry at someone and yell or shout at them?	0	1	2	3	4



**Appendix E.**  
**Unit Post-Combat Severe Aggression**

**How often in the past month did you.....**

Threaten someone with physical violence?

Never	Once / Twice	Some-times	Often	Very Often
0	1	2	3	4

**Appendix F.**  
**Unit Post-Combat Severe Assault**

<b>How often in the past month did you.....</b>	Never	Once /Twice	Some -times	Often	Very Often
Get into a fight with someone and hit the person?	0	1	2	3	4

**Appendix G.**  
**Unit Post-Combat Aggression and Violence (Non-Weighted Score)**

<b>How often in the past month did you.....</b>	Never	Once /Twice	Some -times	Often	Very Often
Get angry at someone and yell or shout at them?	0	1	2	3	4
Threaten someone with physical violence?	0	1	2	3	4
Get into a fight with someone and hit the person?	0	1	2	3	4

**Appendix H.**  
**Unit Post-Combat Aggression and Violence (Weighted Score)**

<b>How often in the past month did you.....</b>	Never	Once /Twice	Some -times	Often	Very Often
Get angry at someone and yell or shout at them?	0	1	2	3	4
Threaten someone with physical violence?	0	5	6	7	8
Get into a fight with someone and hit the person?	0	9	10	11	12

**Appendix I.**  
**Unit Post-Combat Aggression and Violence (Maximum Weighted Score)**

<b>How often in the past month did you.....</b>	Never	Once /Twice	Some -times	Often	Very Often
Get angry at someone and yell or shout at them?	0	1	2	3	4
Threaten someone with physical violence?	0	5	6	7	8
Get into a fight with someone and hit the person?	0	9	10	11	12

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