Validation of a Measure of Non-Commissioned Officer Leadership

Prepared for Walter Reed Army Institute of Research by:

J. Alison Dezsofi

Robert R. Sinclair

Portland State University

Department of Psychology

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Address correspondence concerning the scientific aspects of this report to:
Robert R. Sinclair
Clemson University
418 Brackett Hall
Clemson, SC
29634
rsincla@clemson.edu

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This report investigated the validity of the Non-Commissioned Officer Leadership Scale (NCOLS) in a sample of U.S. Army soldiers three months after returning from combat deployment to Iraq.

15. SUBJECT TERMS Of the three facets of leadership represented in the scale, supportive leadership was the strongest predictor of physical and psychological health, well-being, and readiness.

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Abstract

This report investigated the validity of the Non-Commissioned Officer Leadership Scale (NCOLS) in a sample of U.S. Army soldiers three months after returning from combat deployment to Iraq. The findings are summarized below:

1) The Non-Commissioned Officer Leadership scale demonstrated good psychometric properties, including a three-factor structure and high internal consistency. The facets of leadership represented by the scale were labeled supportive, counterproductive, and advocacy leadership.

(2) There was substantial variability in the Non-Commissioned Officer Leadership Scale scores, indicating that the scale captures differences in soldiers' perceptions of their NCOs.

(3) NCO leadership predicted various facets of military readiness, including unit morale, cohesion, readiness, personal morale, and perceived role overload. Supportive leadership predicted all of the readiness outcomes except role overload. Both counterproductive leadership and a lack of advocacy leadership predicted higher role overload, and reduced personal and unit morale.

(4) NCO leadership predicted a majority of the health and well-being outcomes included in this study. Most notably, soldiers who reported that their leaders engaged in supportive, rather than counterproductive, behaviors also reported fewer symptoms of Posttraumatic Stress Disorder (PTSD). A similar relationship was found between NCO leadership and reports of anxiety, depression, and ratings of overall health. NCO leadership was somewhat less predictive of physical distress: advocacy leadership was associated with decreased cardiovascular distress, and counterproductive leadership was related to increased headache, joint, and back pain. Missed workdays and sick call visits did not seem to be related to NCO leadership.

(4) Soldiers' ratings of their NCOs did not predict combat stressors.

(5) After controlling for differences in exposure to potentially traumatic combat stressors, the NCO leadership scale provided incremental validity in predicting readiness, health and well-being.

(6) NCO leadership does not appear to moderate the relationships between combat stressors and soldier health, readiness, and well-being outcomes.

The results of this study provide psychometric evidence in support of the Non-Commissioned Officer leadership scale.

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Acknowledgements

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The US Army's philosophy regarding leadership is that leaders are developed, not born (Ruvolo, Peterson, & LeBoeuf, 2004). The Army also recognizes that effective leadership is essential to military success. As such, leadership has been a significant area of study by military psychologists. Results from a large body of research show that leader behaviors are indeed relevant to many indicators of military effectiveness, such as combat performance, unit cohesion, and retention (e.g., Britt, 1998). Further, other studies have highlighted the important role that small unit leaders play in military effectiveness (Bartone & Kirkland, 1991). More recently, military psychologists have begun to consider the influence of leadership, particularly that of the junior officers and non-commissioned officers (NCOs), on soldier health and well-being outcomes (Britt, Davison, Bliese, & Castro, 2004).

Several factors have stimulated the U.S. Army's increased emphasis on developing competent, independent junior officers and non-commissioned officers (NCOs). Changing trends in warfare, which began in Vietnam and have continued to present day conflicts in Iraq and Afghanistan, demand more of individual soldiers, units, and their leaders. For example, modern warfare requires units to be widely dispersed, more isolated, and therefore to function more independently of senior leadership. Units are commonly confronted by hostile civilians (Adler, Litz, & Bartone, 2003), paramilitary groups, and other combatants who may be dressed as civilians, forcing small units to make complex decisions regarding the use of force. U.S. soldiers also must be able to respond to non-traditional combat tactics, such as improvised explosive devices (Adler et al., 2003), and be skilled in the use of increasingly complex and rapidly evolving technology (Hunt & Phillips, 1991). Further, the involvement of the U.S. military in simultaneous humanitarian and combat missions, concurrent with growing attrition rates, has increased the frequency and duration of deployments. This phenomenon of increasing work demands for military personnel, combined with reduced organizational resources in which to meet those demands, is referred to as operations tempo (OPTEMPO; Castro, Adler, & Bienvenu, 1998)). In response to these trends, the U.S. Army has changed its mission philosophy toward building a force comprised of flexible, skilled, independent, small units with highly competent unit leaders (Bartone & Kirkland, 1991; Hunt & Phillips, 1991).

The organizational literature on job stress suggests that stressors such as high workload (e.g., frequent deployments) and organizational constraints (e.g., reduced funding) are potent predictors of various undesirable organizational and individual outcomes, such as withdrawal behaviors, suppressed immune functioning, cardiovascular disease, and mental illness (e.g., Britt, Davison, Bliese, & Castro, 2004; Landsbergis, Schnall, & Baker, 2004; Wang, Lawler, Walumbwa, & Shi, 2004). The literature also suggests that leadership may buffer individuals from the effects of job demands, thereby promoting individual, team and organizational performance (Bliese & Castro, 2000). In this context, continued research on the role of leadership on soldier readiness and health outcomes is clearly warranted. The present study seeks to examine the influence of NCOs, as front-line supervisors, on soldiers' experiences of occupational stress, health, and well-being.

Soldier Adaptation Model

The Soldier Adaptation Model (SAM) was developed by the U.S. Army as a metatheoretical framework for guiding military stress research (Bliese & Castro, 2003). As a meta-theory, the SAM allows for the study of the complex, interactive relationships present in a variety of military environments (e.g., combat, garrison). Stressors are the first component of the SAM, and represent any factors present in a military environment that make demands on the coping resources of the soldier. Moderators, the second component of the SAM, are personal or situational variables that serve to attenuate or ameliorate the effects of stressors. Because it is sometimes impossible to remove or reduce stressors in a military context, moderators take on increased importance within this framework. For example, it is more feasible to intervene with a leader who is struggling with the increased responsibilities of a combat deployment than it is to reduce the likelihood that infantry soldiers will witness violence while on patrol. The third component of the SAM is strain, which Bliese and Castro (2003) defined as measurable health, attitude, or performance outcomes. Of particular interest to military researchers are psychological health outcomes such as Posttraumatic Stress Disorder (PTSD), depression and anxiety. Typical attitudinal outcomes include affective commitment, personal and unit morale, cohesion, and readiness. Examples of general performance outcomes include the APFT score and performance reviews.

Stress and Combat

Contemporary research conceptualizes stress as a transactional process involving a primary and secondary appraisal. A stressor may be described as any stimulus that taxes or exceeds an individual's coping resources, such as a firefight during combat (Adler, et al., 2003). When confronted with a stressor, soldiers engage in primary appraisal, through which they determine whether a stressor is benign, challenging, or threatening. Once the nature of the stressor has been appraised, secondary appraisal occurs, during which soldiers assess their coping resources and options.

According to Lazarus and Folkman (1984), four characteristics of stressors determine their stressfulness: novelty, predictability, ambiguity, and temporal factors. Novelty refers to the relative uniqueness of the stressor to the individual, such that as novelty increases, so does the demand on the individual. For example, a soldier with prior combat experience in the Middle East may experience subsequent combat deployments as less demanding than an inexperienced soldier on his or her first wartime deployment. Adler et al. (2003) note that novel stimuli are likely to be perceived as more stressful when they are appraised as potentially harmful or threatening. The second characteristic, predictability, refers to the degree to which the individual can anticipate their experiences. For example, does the soldier know what job s/he will be performing once s/he is deployed? Ambiguity refers to the degree to which the soldier has adequate information about the stressor. If the information is inadequate, the stressor is ambiguous, thereby intensifying the experience of stress. Finally, temporal factors refer to the imminence, duration, and temporal uncertainty associated with a stressor. Imminence refers to the soldier's ability to anticipate when a stressor will be experienced, wherein stressors in the near future are more stressful. Duration is defined as the amount of time the stressor is experienced, such as the length of a soldier's assignment to patrol duty. Temporal uncertainty refers to the degree of confidence the soldier has that a stressor will

be experienced for a certain period of time. Unknown length of deployment would qualify as a stressor high in temporal uncertainty. In the SAM, stressors appraised as potentially harmful or threatening, high in novelty, ambiguity, imminence and temporal uncertainty are the most stressful, and the most likely to result in strain.

Adler et al. (2003) categorize military stressors as potentially traumatic, nontraumatic, or environmental. Examples of potentially traumatic combat stressors include the threat of snipers, mortar attacks, land mines, accidents, assaults, uncontrolled mobs and conflicts at checkpoints. According to Lazarus and Folkman (1984), these stimuli would be stressful because they are high in novelty, ambiguous, and high in temporal uncertainty. Research also suggests that body handling, witnessing violence, and seeing injured women and children can serve as traumatic stressors for soldiers deployed on combat missions (Litz, Gray, & Bolton, 2003).

The negative consequences of exposure to traumatic events are well-established in both military and civilian populations (Adler et al., 2003; Harleman, 1998; Hoge et al., 2004). Mental health outcomes associated with trauma include Posttraumatic Stress Disorder, depression, anxiety, and Acute Stress Disorder (e.g., Harvey & Bryant, 2002; Mikulincer & Solomon, 1989). Important physical health outcomes associated with trauma, aside from injury, include cardiovascular distress and somatic complaints (Belkic, Emdad, & Theorell, 1998; Zatzick, Russo, & Katon, 2003).

Examples of nontraumatic combat stressors include daily hassles, lack of privacy, boredom and interpersonal tensions. Research on daily hassles indicates that they are a significant source of stress related to a variety of negative health outcomes, such as reduced life satisfaction and symptoms of physical and psychological distress (Hart, 1999; Kohn, 1991). In the context of the SAM, these outcomes represent strain, and have a negative impact on soldier health and readiness.

Environmental stressors common during a combat deployment include temperature extremes, and difficulty communicating home to family and friends, rejection by the local population, sleep deprivation, caloric restriction, and a lack of meaningful work (Adler et al., 2003). According to the SAM, leadership is also a part of the soldier's environment and may be the most important moderator in stressor-strain relationships. Specifically, high quality leaders may buffer soldiers from the stress of combat deployments, thereby attenuating negative health, attitude and performance outcomes associated with military combat stressors.

Demand-Control-Support Model

Karasek's (1979) demand-control (DC) model is perhaps the most frequently used model in occupational stress research, and provides one theoretical account of the mechanisms proposed by the SAM. According to the demand-control model, the psychological work environment can be characterized by job demands and job control. Job demands can be classified as physical, social, or organizational features of a job that required sustained effort on the part of an employee, such as physical demands or workload (Bakker, Demerouti, & Euwema, 2005). Job control can be defined as a worker's perceived influence over their work. Researchers often conceptualize control as a multidimensional construct consisting of perceived autonomy, decision latitude, and skill variety. The strain hypothesis emerged from the DC model, and posits that high strain jobs are characterized as high in demands and low in control (Karasek, 1979).

Occupational stress researchers have operationalized strain in the DC model using measures of burnout, high blood pressure, and (low) job satisfaction (de Lange, Taris, Kompier, Houtman, & Bongers, 2003).

A substantial body of research has provided evidence that social support from supervisors and coworkers moderates the relationships between job demands, control, and various worker health outcomes (de Lange et al., 2003). This evidence led Johnson and Hall (1988) to expand the DC model into the demand-control-support (DC-S) model. Consistent with the SAM, the demand-control-support model suggests that high levels of social support attenuate strain in jobs characterized by high demands and low control (de Lange, et al., 2003). The DC-S model is particularly important with regard to current combat operations in Iraq and Afghanistan because it suggests that the quality of supervisor support (e.g., from Non-Commissioned Officers) may be a powerful predictor of soldier health outcomes.

Leader-Member Exchange Theory

Although theories of leadership do not explicitly address the influence of leadership on their followers' health, this relationship is implied throughout the organizational research literature. For example, research on the effects of social support on worker health outcomes often includes subscales measuring perceived support from a supervisor (e.g., Leather, Lawrence, Beale, Cox, & Dickson, 1998). This suggests that satisfaction with the relationship with one's leader may influence employee health. Therefore, leadership theories that include the notion of quality of relationships with a leader may be useful in testing the influence of leadership on health.

Leader-Member Exchange theory (LMX) was developed to explain follower compliance to leaders, and emerged from Social Exchange Theory (Bass, 1990). In LMX theory, the leader-follower relationship is conceptualized as a social exchange-based or transactional relationship that develops informally between the leader and follower, resulting in unique relationships for each dyad (van Dierendonck, Haynes, Borrill, & Stride, 2004). Early in the relationship, the leader and follower negotiate role expectations, resulting in follower compliance in exchange for the leader's assistance in providing the follower with direction toward attaining mutually beneficial goals (Bass, 1990).

Dienesch and Liden (1986) suggest that the LMX relationship is three dimensional, consisting of perceived contribution to the exchange, loyalty, and affect. A high quality LMX relationship is characterized by a high degree of reciprocity, mutuality, and trust (Rousseau, 1997). Alternately, low quality LMX relationships can be described as low in these qualities, and have been linked to poor performance outcomes, such as low safety behaviors (Hofmann, Morgeson, & Gerras, 2003). In the context of a combat deployment, reduced safety behaviors place not only the individual soldier, but an entire unit, at risk of injury.

Trust in leadership is also addressed in LMX theory. In a study of trust in management, Dirks and Ferrin (2002) found that higher levels of trust in leaders, particularly immediate supervisors, were associated with greater organizational citizenship behaviors, retention intentions, organizational commitment, job performance and satisfaction. Dirks and Ferrin (2002) posit that employees who trust their supervisors do not need to divert energy away from their jobs to make sure they are "covering their

backs," and are able to use that energy for job performance. Alternately, supportive supervision, which is necessary for high quality LMX relationships, may allow for higher follower performance because supportive leaders buffer employees from the effects of work demands. For instance, Non-commissioned Officers may engage in upward influencing tactics with their immediate supervisors to secure better equipment, assignments, or time off for their soldiers, thereby alleviating some of the common stressors of a combat deployment. Therefore, in the military context, high quality LMX relationships may result in better soldier health and well-being, combat performance, morale, unit readiness, and cohesion.

The Present Study

Psychometric Properties of the Non-Commissioned Officer Leadership Scale

The first purpose of the present investigation was to gather basic reliability and scale validity evidence for the Non-Commissioned Officer Leadership Scale developed by researchers at Walter Reed Army Institute of Research (WRAIR). Specifically, we investigated the internal consistency reliability and factor structure of the scale. Our primary goal for these analyses was to examine the general psychometric quality of the scale and to ascertain whether the initially proposed set of items required any further refinements.

Research Questions

The second purpose of this report was to investigate several research questions that provide additional evidence regarding the construct validity and possible future applications of the scale. These analyses investigated individual differences in perceptions of NCO leadership three months following a combat deployment, in the context of Leader-Member Exchange theory (Graen, 1976), Demand-Control-Support model (Karasek, 1979), and the Soldier Adaptation Model (Bliese & Castro, 2003).

Leader-Member Exchange theory posits that leaders develop unique relationships with each of their followers that influence performance and attitude outcomes. The Soldier Adaptation Model, which incorporates the Demand-Control-Support model, provides an integrative framework for military stress research. In this model, the supportive facets of NCO leadership serve as potential buffers between deployment-related stressors and health outcomes. Given these theoretical perspectives, we expect supportive, higher quality leadership to predict lower soldier stress, better health and well-being, and higher levels of readiness. Additionally, we expect higher quality leadership to buffer the stress-strain relationship, such that stress has fewer deleterious effects on soldiers who report more supportive and fewer counterproductive leader behaviors.

Research Question 1: What is the factor structure of the NCO leadership scale?

To address this question, we investigated the psychometric properties of the NCO leadership scale as described above.

Research Question 2: Does NCO leadership predict soldier readiness, health, and well-being outcomes?

To address this research question, we investigated the relationships between facets of NCO leadership, and readiness and health outcomes of primary interest to military planners. Prior research indicates that supportive supervision is associated with better mental health outcomes (e.g., de Lange et al., 2004). Alternately, abusive supervision has been associated with a variety of undesirable outcomes, including lower job and life satisfaction, lower affective commitment, and higher psychological distress (Tepper, 2000). Further, a lack of trust in supervisors is associated with higher levels of burnout, psychological strain, and work-family conflict (Harvey, Kelloway, & Duncan-Leiper, 2003). Therefore, we expected that supportive and advocacy leadership would be associated with better mental and physical health, while counterproductive leadership would be associated with symptoms of psychological strain.

Research Question 3: Does NCO leadership predict soldiers' reports of combat stressors?

We explored the relationship between NCO leadership and soldiers' reports of potentially traumatic combat stressors. Soldiers who experience a greater frequency and intensity of combat stress may view their NCOs as unable to effectively protect the unit from unnecessary danger, leading to general perceptions of less effective leadership. Additionally, combat stressors may be more salient to soldiers who perceive their leaders as untrustworthy or lacking integrity. As such, we expected to find that NCO leadership predicted soldiers' reports of combat stressors.

Research Question 4: Does NCO leadership predict readiness, health, and well-being outcomes after controlling for combat stressors?

An important consideration in the investigation of the validity of the NCO leadership scale is whether it explains any unique variance in outcomes, after accounting for combat stressors. Because combat stressors have known associations with outcomes such as PTSD, depression, anxiety, and physical distress, they are a logical control for an examination of unique variance accounted for by NCO leadership. If leadership does indeed contribute to soldier health and well-being outcomes like PTSD, leadership training could be revised to reflect this understanding in order to promote soldier health.

Research Question 5: Does NCO leadership moderate the relationships between combat stressors and soldier readiness, health, and well-being outcomes?

Our final research question is based on a large body of research designed to test the Demand-Control-Support model (see de Lange et al., 2003) by examining the interactive relationship between supervisor support and job demands on follower performance, attitude and health outcomes. Further, this research question may lend support to the notion that leadership influences adaptation to stressful environments (Britt et al., 2004). We expect to find that the supportive facets of NCO leadership will buffer the relationship between combat stressors and health and well-being outcomes.

Specifically, the relationship between combat stressors and health and well-being will be weaker for soldiers with supportive supervisors.

Method

Participants

Survey data were collected in 2004 from three samples of U.S. Army soldiers (*N* = 6,576) assigned to Airborne and Air Assault Divisions. Although soldiers were recruited from different Divisions, they perform similar jobs within these divisions. For the purposes of this study, we analyzed the data collected from junior enlisted personnel (pay grades E1-E6) who had deployed during Operation Iraqi Freedom, resulting in a total sample size of 5,249. Study participants were primarily Caucasian (70.7%) and male (98.4%). Approximately 60% of the sample were between the ages of 20 and 24 years of age. About half the participants were high school graduates (51.9%), or had some college education (31.5%). More than half of the sample was married (58.5%). Average military tenure was just over 4 years (SD = 4.28), and 48.1% had deployed at least twice in the past two years. Pay grades E1-E4 comprised most of the sample (67.2%), and E5-E6 made up the remaining 32.8%. Personal and work-related data representing these participants is available in Table 1. Data on deployment characteristics are available in Table 2.

Table 1

Characteristics of Research Participants

Variable	*N*	*%*	Variable	N	**%**
Ethnicity			*Rank*		
Caucasian	3714	70.7%	E1-E4	3530	67.2%
African American	434	8.3%	E5-E6	1720	32.8%
Hispanic	688	13.1%			
Asian/Pacific Islander	158	3.0%			
Other	207	3.9%			
Age			*Military Tenure*		
(Mean = 24.5, SD = 9.6)			(Mean = 4.23, SD = 4.28)		
18-19 years	317	6.0%	0 – 5 years	4095	78.0%
20-24 years	3167	60.3%	6 – 10 years	717	13.7%
25-29 years	1157	22.0%	11-19 years	351	6.7%
30-39 years	583	11.1%	20 or more years	76	1.4%
40 years or older	22	0.4%			
Education			*Marital Status*		
Some High School	29	0.6%	Single	2720	58.5%
GED	354	6.7%	Married	1926	41.5%
High School Graduate	2725	51.9%			
Some College	1652	31.5%			
Associate's Degree	193	3.7%	*Gender*		
Bachelor's Degree	204	3.9%	Male	5168	98.4%
Master's Degree	9	0.2%	Female	67	1.3%
Doctorate Degree	6	0.1%			

Table 2

Deployment Characteristics

Variable	N	%	Variable	N	%
Location of Last Deployment			*Total Deployments Past Two Years*		
Iraq	5070	96.6%	1	2723	51.9%
Afghanistan	61	1.2%	2	1839	35.0%
SW Asia	13	0.2%	3 – 4	494	9.4%
Other	23	0.4%	5 or more	194	3.7%
Deployments to Iraq			*Deployments to Korea*		
0	12	0.2%	0	481	9.2%
1	1386	26.4%	1	1739	33.1%
2	3736	71.2%	2	113	2.2%
3 or more	46	0.9%	3 or more	9	0.2%
Deployments to Kuwait			*Deployments to Bosnia/Kosovo*		
0	270	5.1%	0	528	10.1%
1	1743	33.2%	1	1701	32.4%
2	804	15.3%	2	57	1.1%
3 or more	52	1.0%	3 or more	5	0.1%
Deployments to Afghanistan					
0	405	7.7%			
1	1548	29.5%			
2	1467	27.9%			
3 or more	11	0.2%			

Measures

  Leadership. We measured Non-Commissioned Officer leadership using a 21-item scale (α = .93) developed at the WRAIR (Castro & McGurk, 2004). The NCOLS scale was designed to measure soldiers' perceptions of leader behaviors, including supportive behaviors (e.g., "are [NCOs in your unit] concerned about the safety of soldiers?"), advocacy behaviors (e.g., "[Do NCOs in your unit] Protect the unit from receiving too many taskings."), and counterproductive behaviors (e.g., "[Do NCOs in your unit] take care of their own needs before taking care of soldiers' needs?"). Psychometric properties of this scale are a central focus of this report and are described below.

  Combat Stressors. We used a 33-item (α = .93) combat stressors scale that was modified at WRAIR, and based on a similar combat experiences scale by Adler, Dolan, and Castro (2000). The scale was designed to measure stressful, but common, combat experiences that are frequently associated with the development of adverse mental health outcomes such as PTSD. A 5-point response scale was used (1 = never to 5 = 10 or more

times). The items in the scale are designed to assess patrol experiences (e.g., clearing/searching homes or buildings), personal threat (e.g., receiving small arms fire), personal combat (e.g., being wounded or injured), and body handling and physical devastation (e.g., witnessing an accident which resulted in serious injury or death).

PTSD Symptoms. We assessed symptoms of posttraumatic stress disorder using the 17-item ($\alpha = .94$) PCL-C checklist (Weathers, Huska & Keane, 1991). These items are designed to measure PTSD symptoms consistent with the DSM-IV criteria (American Psychiatric Association, 1996), including persistent reexperiencing of the traumatic event (e.g., "repeated, disturbing dreams of the stressful event"), persistent avoidance of stimuli associated with the traumatic event (e.g., "avoiding thinking about or talking about the stressful experience or avoiding having feelings related to it"), general numbing (e.g., "feeling distant or cut of from other people"), and persistent increased arousal (e.g., "feeling jumpy or easily startled"). The checklist uses a 5-point response scale (1 = "not at all" to 5 = "extremely").

Major Depression. We measured symptoms of major depression using the Prime MD - PHQ-1 ($\alpha = .91$) developed by Spitzer, Kroenke, and Williams (1999). This 9-item self-assessment is based on the DSM-IV (American Psychiatric Association, 1994) criteria for major depression. Soldiers responded on a 4-point scale (1 = "not at all" to 4 = "nearly every day") to items such as: "Over the last 4 weeks, how often have you been bothered by: feeling down, depressed, or hopeless?"

Anxiety. Anxiety was measured using 4 items ($\alpha = .83$) from the Prime MD – PHQ-1 (Spitzer, Kroenke, & Williams, 1999). Items used a 4-point scale (1 = "not at all" to 4 = "nearly every day") and the stem, "Over the last 4 weeks**,** how often have you been bothered by any of the following problems?" Sample item: "feeling nervous, anxious, on edge, or worrying about a lot of different things."

Health Rating. We assessed a 5-point single item measure developed by Ware, Kosinski, Dewey, and Gandek (2001) to assess overall health. Participants were asked, "Overall, in the past month, how would you rate your health?" Responses ranged from 1 = "excellent" to 5 = "poor".

Physical Distress. We measured three facets of physical distress using a 12 item ($\alpha = .85$), 3-point scale (1 = "not bothered" to 3 = "bothered a lot") from the Prime MD – PHQ 1. Participants were asked, "During the last 4 weeks, how much have you been bothered by any of the following problems?" The three facets of physical distress included cardiovascular distress (e.g., "shortness of breath), gastrointestinal distress (e.g., "nausea, gas, or indigestion") and head, joint and back pain (e.g., "pain in your arms, legs, or joints).

Sick Call Visits. We measured the frequency of workdays missed due to illness with a 5-point single item measure developed by WRAIR for this study. Response options ranged from 0 – 4 , where 0, 1, and 2 reflected 0, 1 or 2 workdays missed, 3

represented 3 – 4 workdays missed, and 4 represented 5 or more workdays missed due to illness.

Unit Cohesion. We used a 3-item scale (α = .86) developed by Podsakoff and Mackenzie, (1994) to measure unit cohesion (sample item: "The members of my unit are cooperative with each other."). The 5-point scale ranged from 1 = "strongly disagree" to 5 = "strongly disagree."

Morale. We assessed soldiers' levels of personal morale and their perceptions of unit morale with 2 items (α = .67) taken from a 5-item scale adapted from Castro, Bievenu, Huffman, and Adler (2000; sample item: "Rate the following: Your personal morale"). A 5-point response scale was used (1 = "very low" to 5 = "very high").

Readiness. Perceptions of unit readiness were measured with a 4 item (α = .85), 5-point scale (1 = "strongly agree" to 5 = "strongly disagree") commonly used in military research (Marlowe et al., 1985). Items included questions such as, "I think the level of training in my unit is high."

Role Overload. We used a 3-item (α = .83) role overload scale modified by Thomas and Bliese (2000) for research at WRAIR (sample item: "I have so much work to do, I cannot do everything well"). Two of these items were adapted from the Michigan Organizational Assessment Questionnaire (MOAQ) Role Overload Scale (Cammann, Fichman, Jenkins, & Klesh, 1983). A 5-point response scale was used (1 = "strongly agree" to 5 = "strongly disagree").

Results

Research Question 1: What is the factor structure of the NCO leadership scale?

The purpose of this research question was to investigate the factor structure of the NCOLS. Exploratory factor analysis results and descriptive statistics for each of the items in the scale are shown in Table 3. Following recommendations by Russell (2002), we used iterative principal axis factoring with squared multiple correlations for the initial communality estimates. Inspection of the scree plot clearly indicated a three-dimensional structure, and the scale items show adequate to strong factor loadings. All items have moderate to high communalities except item 21, which was retained because of its content relevance. The three-factor solution explained 50.58% of the variance and the internal consistency was acceptable (α = .81). The reliabilities of the subscales are as follows: supportive leadership, α = .92; counterproductive leadership α = .75; and advocacy leadership α = .85. Subscale correlations and reliabilities are available in Table 3.

Figure 1 shows the distribution of responses for the Non-Commissioned Officer Leadership scale, as well as the mean and standard deviation. As is evident by the figure, scores were fairly normally distributed with a wide range of variability in soldiers' responses. Figures 2 – 4 display the distribution of scores for each of the NCO leadership subscales.

Psychometric Properties of the Non-Commissioned Officer Leadership Scale

Table 3
Item Level Descriptive Statistics and Factor Analysis Results – NCO Leadership

Item Description	Mean	SD	Λ	H²
Thinking about your unit, rate how often the following occur in your unit, NCOs:				
Supportive				
1. Tell Soldiers when they have done a good job.	2.90	.98	.66	.44
4. Exhibit clear thinking and reasonable action under stress.	3.20	.92	.70	.48
5. Ensure that all deserving Soldiers receive awards.	2.76	1.08	.70	.46
6. Set a single standard and expect everyone to meet it.	3.20	1.14	.60	.34
8. Treat all members of the unit fairly.	2.93	1.06	.72	.53
9. Are concerned about the safety of Soldiers.	3.69	1.08	.72	.60
10. Ensure that Soldiers do not assume unnecessary risks when conducting missions.	3.54	1.04	.70	.55
11. Ensure that the unit gets the equipment and resources necessary to accomplish the mission.	3.25	1.04	.65	.43
12. Ensure that the Soldiers have sufficient time to complete Expected tasks/missions.	3.05	.97	.70	.50
17. Provide clear guidance on how tasks and missions are to be accomplished.	3.23	.96	.72	.52
19. Are viewed by Soldiers as having physical courage.	2.97	1.02	.80	.60
20. Are viewed by Soldiers as having moral courage.	2.91	1.02	.83	.65
Counterproductive				
2. Embarrass Soldiers in front of other Soldiers.	3.25	1.05	.65	.42
7. Show favoritism to certain members in the unit.	3.29	1.15	.73	.53
3. Try to look good to higher-ups by assigning extra Missions or details to Soldiers.	3.40	1.21	.76	.53
16. Take care of their own needs before taking care of Soldiers' needs.	3.01	1.09	.58	.39
21. Avoid putting themselves in danger at all costs.	2.73	1.09	.33	.13
Advocacy				
13. Will tell higher-ups when the unit has been given too many tasks.	2.37	1.16	.80	.73
14. Protect the unit from receiving too many taskings.	2.34	1.08	.81	.77
15. Chip in to help Soldiers get the work done when the work tempo is high.	2.71	1.14	.76	.56
18. Fight for Soldiers even if it might harm their careers.	2.39	1.14	.73	.51
Total Variance Explained: 50.58%				
Scale Internal Consistency Reliability (α): .81				

Note. *λ represents standardized factor loadings from the confirmatory factor analysis and H² represents the communality values from the exploratory factor analysis.*

Table 4
NCO Leadership Scale Descriptives

	Mean	SD	1	2	3	4
1. Supportive Leadership	3.14	.75	(.92)			
2. Counterproductive Leadership	3.13	.80	-.53**	(.75)		
3. Advocacy Leadership	2.46	.94	.73**	-.50**	(.85)	
4. Scale Score	3.02	.53	.94**	-.31**	.82**	(.81)

Note. **$p < .01$. Values in parentheses represent scale reliabilities.
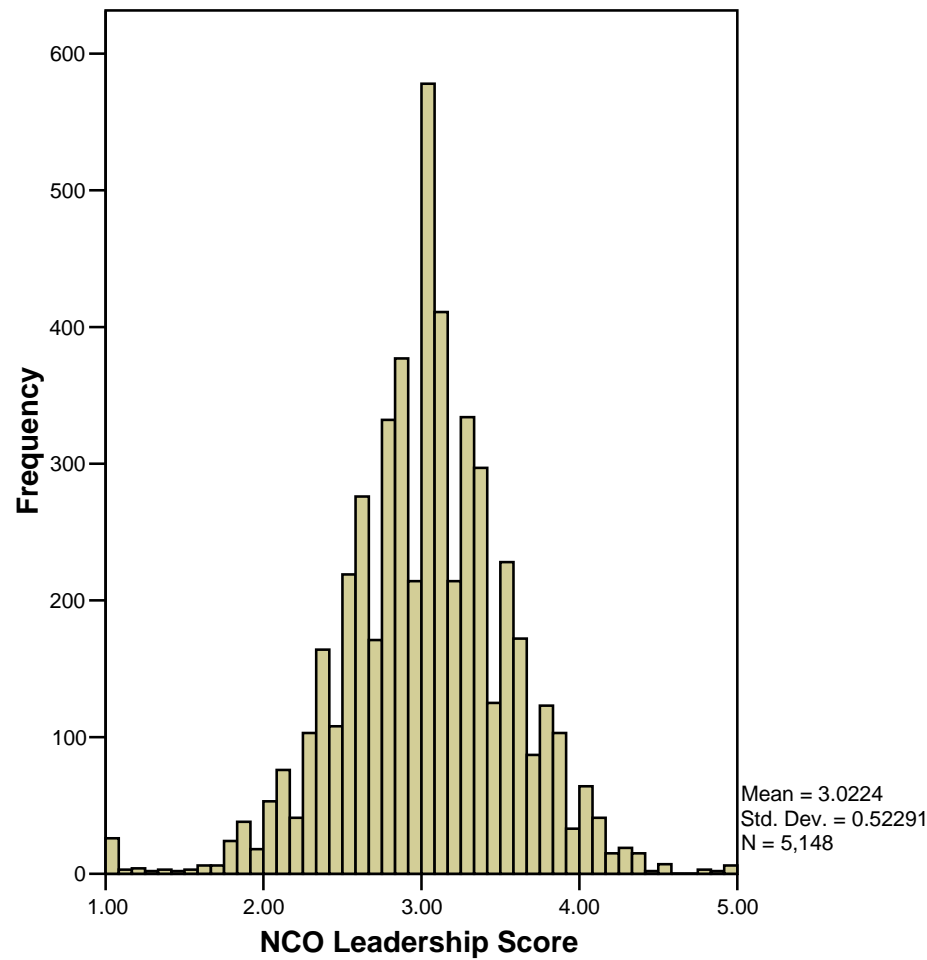
Figure 1

Mean = 3.0224
Std. Dev. = 0.52291
N = 5,148

Figure 2

Mean = 3.1352
Std. Dev. = 0.74913
N = 5,148

Figure 3

Mean = 2.457
Std. Dev. = 0.94022
N = 5,111

Figure 4

Mean = 3.1442
Std. Dev. = 0.78736
N = 4,882
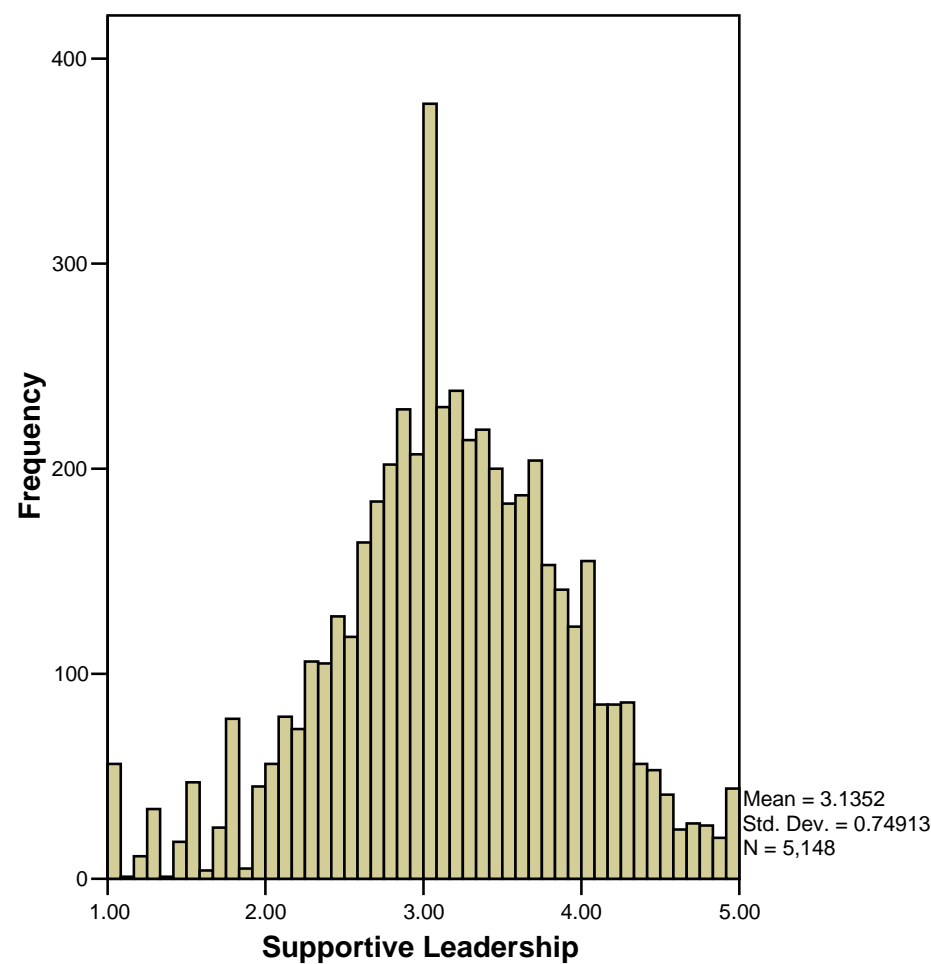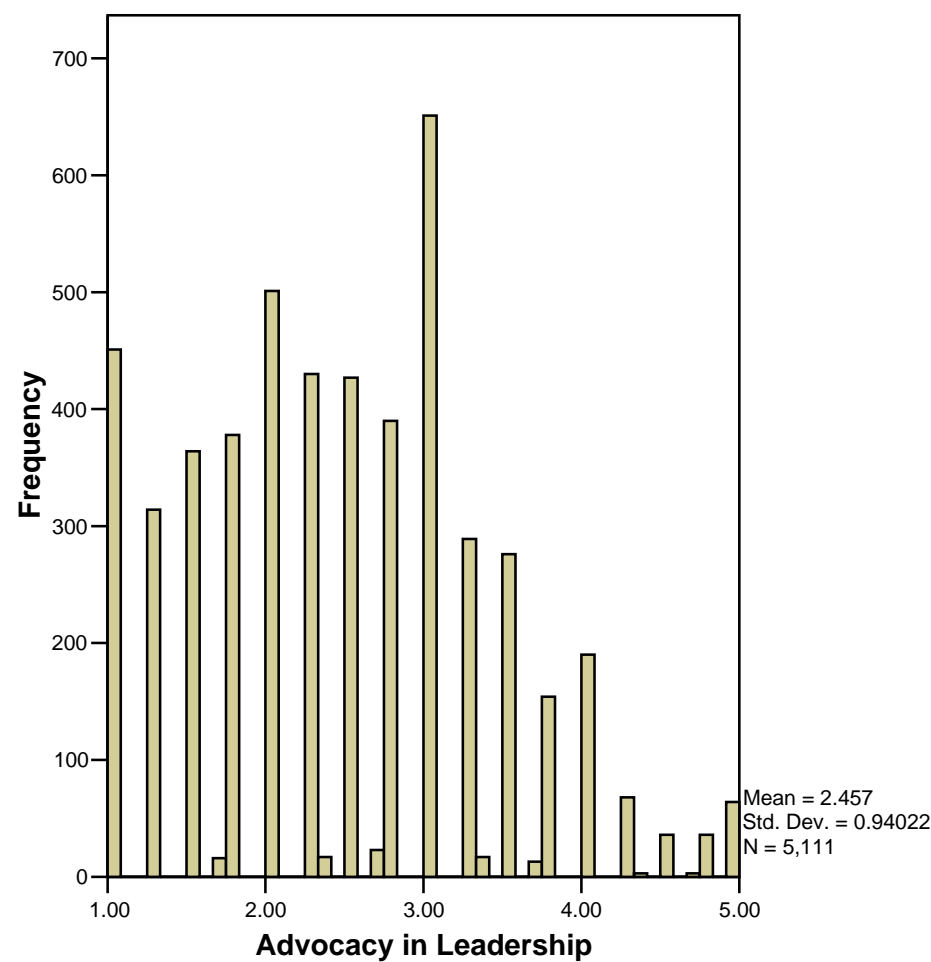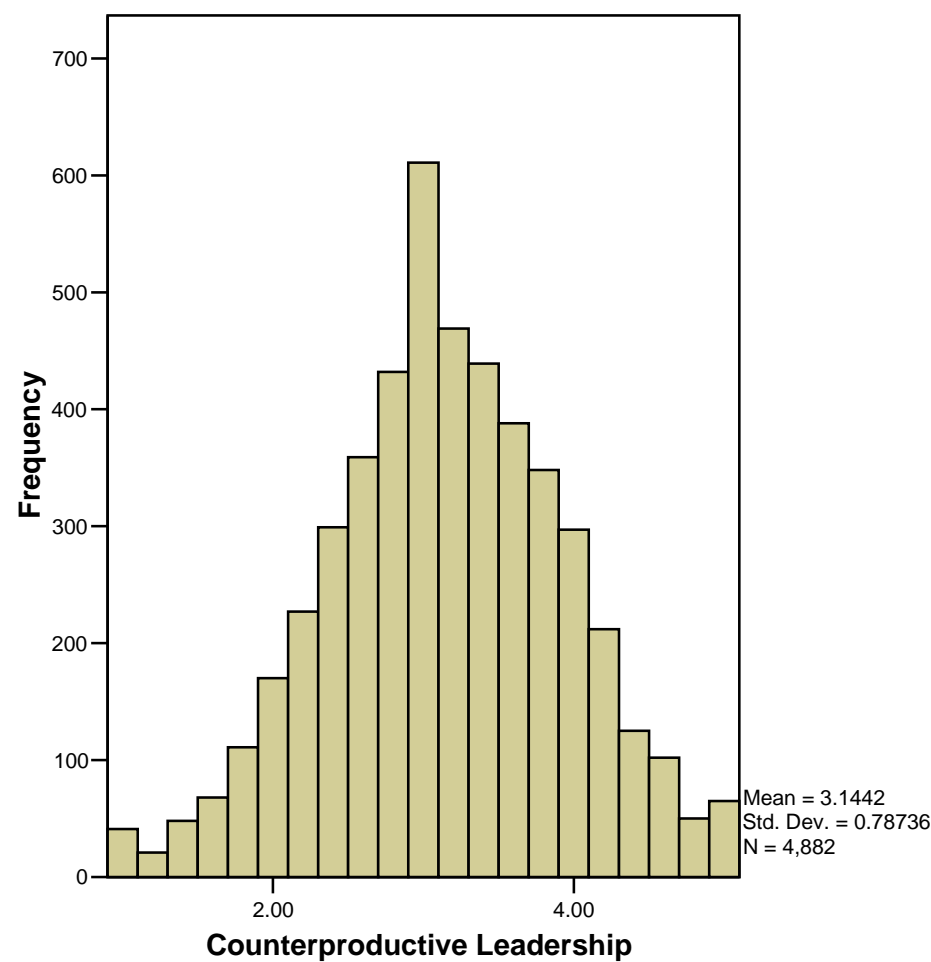
Research Question 2: Does NCO leadership predict soldier readiness and well-being outcomes?

The second research question concerns whether NCO leadership predicts soldier readiness and well-being outcomes. These outcomes are salient to military decision makers in part because of their influence on military effectiveness. We examined three facets of NCO leadership, including supportive leadership, counterproductive leadership, and advocacy leadership. The readiness outcomes we investigated were personal and unit morale, readiness, and cohesion, role overload, and retention intentions. Well-being outcomes included symptoms of PTSD, major depression, anxiety, and physical distress (cardiovascular, gastrointestinal, and headache, joint, and back pain). Tables 5 – 7 present the results of these regressions.

The NCOLS subscales predicted all of the readiness outcomes, accounting for 17 – 23% of the variance in readiness scores (see Table 4). Specifically, supportive leadership was associated with higher unit readiness, cohesion, and morale. Supportive leadership was also associated with positive feelings about the deployment experience, accounting for 12% of the variance in scores. Advocacy leadership had the strongest positive associations with morale, while counterproductive leadership was linked to reduced morale. Of the three facets of leadership in this study, counterproductive leadership had the strongest relationship to soldiers' perceptions of increased role overload. Further, counterproductive leadership was the only facet of leadership predictive of retention intentions, such that increased counterproductive leader behaviors were related to decreased intentions among soldiers to remain with the military as a career.

The NCOLS subscales also predicted most of our health and well-being outcomes, accounting for 2 - 11% of the variance in these measures. The strongest relationships were evident between leadership and mental health. Supportive leadership was linked to fewer symptoms of PTSD, major depression, and anxiety. Leadership advocacy behaviors were also related to fewer symptoms of major depression and anxiety. Counterproductive leadership was associated with increased PTSD symptoms, major depression, and anxiety. In all, the NCOLS subscales accounted for 8% of the variance in PTSD scores, 11% of the variance in symptoms of depression, and 10% of the variance in symptoms of anxiety.

The relationships between leadership and symptoms of physical distress were also significant, if somewhat smaller. Supportive leadership was associated with fewer reports of cardiovascular and gastrointestinal distress. Advocacy leadership was related to fewer reports of headache, joint and back pain. Counterproductive leadership was related to an increase in all three categories of physical distress. Overall, leadership accounted for 5% of the variance in cardiovascular distress, 5% of the variance in our single-item health rating, 4% of the variance in headache, joint, and back pain, and 3% of the variance in gastrointestinal distress scores. Only 1 – 2% of the variance in missed work days and sick call visits scores were predicted by the leadership factors.

Table 5

Regression Results for Leadership on Readiness Outcomes

	R^2	*B* (se)
Unit Readiness	.17**	
Support		.50 (.02)**
Counterproductive		.06 (.01)**
Advocacy		-.08 (.02)**
Unit Cohesion	.23**	
Support		.46 (.02)**
Counterproductive		-.06 (.01)**
Advocacy		-.02 (.01)
Unit Morale	.21**	
Support		.27 (.02)**
Counterproductive		-.12 (.02)**
Advocacy		.15 (.02)**
Role Overload	.11**	
Support		-.04 (.02)*
Counterproductive		.17 (.02)**
Advocacy		-.18 (.02)**
Retention Intentions	.15**	
Support		.03 (.04)
Counterproductive		-.12 (.03)**
Advocacy		.02 (.04)
Personal Morale	.19**	
Support		.25 (.02)**
Counterproductive		-.13 (.02)**
Advocacy		.11 (.01)**

Note. $*p < .05$, $**p < .01$.

Table 6

Regression Results for Leadership as a Predictor of Health Outcomes

	R^2	*B* (se)
PTSD	.08**	
Supportive		-.14 (.02)**
Counterproductive		.17 (.01)**
Advocacy		-.02 (.02)
Depression	.11**	
Supportive		-.15 (.02)**
Counterproductive		.17 (.01)**
Advocacy		-.07 (.01)**
Anxiety	.10**	
Supportive		-.08 (.02)**
Counterproductive		.18 (.01)**
Advocacy		-.11 (.02)**
Cardiovascular Distress	.05**	
Supportive		-.14 (.01)**
Counterproductive		.12 (.01)**
Advocacy		.02 (.01)
Gastrointestinal Distress	.03**	
Supportive		-.08 (.01)**
Counterproductive		.09 (.01)**
Advocacy		-.04 (.01)
Headache, Joint and Back Pain	.04**	
Supportive		-.03 (.01)
Counterproductive		.13 (.01)**
Advocacy		-.09 (.01)**

Note. *$p < .05$, ** $p < .01$.

Table 7

Regression Results for Leadership as a Predictor of Health and Readiness Outcomes

	R^2	*B* (se)
Health Rating	.05**	
Supportive		.19 (.02)**
Counterproductive		-.07 (.02)**
Advocacy		-.02 (.02)
Sick Call Visits	.02**	
Supportive		-.11 (.02)**
Counterproductive		.05 (.02)**
Advocacy		.02 (.02)
Missed Work Days	.01**	
Supportive		-.13 (.02)**
Counterproductive		.02 (.02)
Advocacy		.09 (.02)**
Positive Effects of Deployment	.12**	
Supportive		.34 (.02)**
Counterproductive		-.02 (.01)
Advocacy		-.01 (.02)

*Note. *$p < .05$, ** $p < .01$.

Research Question 3: Does NCO leadership predict soldiers' reports of combat stressors?

The third research question concerned the predictive power of NCO leadership on soldiers' reports of potentially traumatic combat stressors. Soldiers who experience intense and/or frequent traumatic combat stressors may perceive their leaders as ineffective. Alternately, traumatic stressors may be more salient to soldiers who perceive their NCOs as less trustworthy.

We measured potentially traumatic combat stressors using a scale developed by researchers at WRAIR. This scale was designed specifically for the study of soldier health and well-being in modern warfare. Item level descriptives and factor analysis results for the combat experiences scale are available in Table 8, and a summary table of subscale means, standard deviations, and correlations is available in Table 9.

Based on the results of our factor analyses and a rational sorting of the items, we decided on a four-factor solution (see Table 8). We labeled the factors Patrol Experiences, Personal Threat, Personal Combat, and Body Handling and Physical Devastation. The Patrol Experiences subscale includes items that tap into common events during patrol, such as witnessing violence or brutality. Personal Threat assess experiences that directly threaten a soldier's life, such as incoming mortar fire. The Personal Combat subscale relates to engaging in combat against an enemy, and the Body Handling and Physical Devastation subscale reflects the degree to which a soldier witnesses destruction or must handle bodies.

The communality values for the scale items were generally good. However, we included some items with lower communality values in the final solution because of their content relevance and unique contributions to the scale. The standardized factor loadings for most of the items were acceptable to excellent. Again, the items with lower factor loadings were kept due to their content relevance. Average scores for many of the potentially traumatic combat experiences were fairly low, with most soldiers reporting that they either never experienced a particular stressor, or experienced it only once. More common were reports of receiving mortar, artillery, or small arms fire, and being ambushed or disarming civilians.

Table 10 presents the results of regression analyses using supportive, counterproductive, and advocacy leadership as predictors for each combat stress factor. As can be seen in Table 10, our results indicate that NCO leadership accounts for about 1 - 2 % of the variance in soldiers' reports of combat stressors.

Table 8
Item Level Descriptive Statistics and Exploratory Factor Analysis Results for Combat Stressors

Item Description	Mean	SD	λ	H^2
How often did you experience the following during **the MOST RECENT DEPLOYMENT***?:*				
Patrol Experiences				
15 Disarming civilians	3.18	1.64	.85	.63
21 Clearing/searching homes or buildings	3.45	1.71	.84	.56
22 Clearing/searching caves or bunkers	1.96	1.41	.76	.43
38 Having hostile reactions from civilians	3.36	1.47	.72	
09 Witnessing violence within the local population or between ethnic groups	2.64	1.42	.66	.54
28 Seeing ill/injured women or children who you were unable to help	2.46	1.52	.64	.39
39 Being in threatening situations where you were unable to respond because of rules of engagement	2.62	1.53	.62	.46
55 Witnessing brutality/mistreatment toward non-combatants	1.60	1.13	.54	.30
37 Working in areas that were mined	2.19	1.47	.47	.28
03 Seeing destroyed homes and villages	3.93	1.37	.46	.39
36 Participating in demining operations	1.87	1.42	.32	.22
Personal Threat				
29 Receiving incoming artillery rocket or mortar fire	4.03	1.27	.85	.47
02 Being attacked or ambushed	3.43	1.39	.79	.57
48 Had a close call, dud landed near you	1.78	1.04	.53	.42
35 Receiving small arms fire	3.35	1.43	.50	.66
54 Improvised explosive device exploded near you	1.86	1.11	.48	.44
42 Having a member of your own unit become a casualty	2.28	1.16	.45	.36
Personal Combat				
41 Being responsible for the death of US or ally personnel	1.04	0.33	.78	.55
40 Being directly responsible for the death of a non-combatant	1.14	0.55	.70	.50
50 Had a close call, was shot or hit, but protective gear saved you	1.18	0.56	.69	.50
25 Being wounded/injured	1.21	0.57	.62	.42
19 Calling in fire on the enemy	1.34	0.86	.46	.29
51 Had a buddy shot or hit who was near you	1.37	0.73	.44	.48
30 Being directly responsible for the death of an enemy combatant	1.60	1.05	.38	.46
20 Engaging in hand to hand combat	1.37	0.89	.50	.38
18 Shooting or directing fire at the enemy	2.51	1.43	.47	.60
Body Handling and Physical Devastation				
34 Provided aid to the wounded	1.65	1.07	.94	.66
33 Saved the life of a soldier or civilian	1.30	0.78	.88	.61
05 Seeing dead bodies or human remains	2.86	1.35	.43	.63
06 Handling or uncovering human remains	1.75	1.09	.66	.58
10 Seeing dead or seriously injured Americans	2.34	1.16	.58	.65
08 Witnessing an accident which resulted in serious injury or death	2.09	1.16	.44	.52
11 Knowing someone seriously injured or killed	2.52	1.03	.38	.43
Total Variance Explained: 48.83%				
Scale Internal Consistency Reliability (α): .93				

Note. H^2 represents communality values and λ represents standardized factor loadings from the exploratory factor analysis.

Table 9

Combat Experiences Scale Descriptives

Scale	Mean	SD	1	2	3	4	5
1. Patrol Experiences	2.66	.96	(.86)				
2. Personal Threat	2.79	.85	.67**	(.77)			
3. Personal Combat	1.42	.50	.62**	.58**	(.77)		
4. Body Handling and Physical Devastation	2.08	.81	.66**	.67**	.65**	(.85)	
5. Combat Experiences Scale: Total Score	2.22	.68	.91**	.83**	.79**	.85**	(.93)

Note. **$p < .01$. Values in parentheses on the diagonal represent scale reliabilities.

Table 10

Regression Results for Leadership Predicting Combat Stress

	R^2	B (se)
Patrol Experiences	.02**	
Supportive		-.06 (.02)**
Counterproductive		.13 (.02)**
Advocacy		.04 (.02)
Personal Threat	.01**	
Supportive		-.01 (.02)
Counterproductive		.07 (.02)**
Advocacy		-.04 (.02)
Personal Combat	.01**	
Supportive		-.14 (.02)**
Counterproductive		.02 (.01)
Advocacy		.10 (.01)**
Body Handling and Physical Devastation	.01**	
Supportive		-.09 (.01)**
Counterproductive		.05 (.01)**
Advocacy		.05 (.01)*

*Note. *$*p < .05$, ** $p < .01$.

Research Question 4: Does NCO leadership predict readiness, health, and well-being outcomes after controlling for combat stressors?

Our fourth research question concerned the unique contribution of NCO leadership on readiness and well-being outcomes after statistically controlling for exposure to potentially traumatic combat stressors. This question was designed to test whether the NCOLS contributes meaningfully to studies of soldier readiness and health beyond other existing measures. Tables 11 – 26 summarize the results of these analyses.

Overall, leadership accounted for an additional 2 - 22% of the variance in readiness scores, beyond potentially traumatic combat stressors. The most notable results regarded supportive leadership, which was related to higher morale, unit readiness and unit cohesion. In these regressions, the respective changes in R-square were .19, .17 and .22, $p < .01$. Advocacy leadership was also related to lower perceived role overload, and increased morale. However, advocacy behaviors were also associated with reduced unit readiness. As expected, counterproductive leadership was associated with increased perceptions of role overload, reduced intentions to stay with the military as a career, and reduced unit cohesion, and morale.

Consistent with our other findings, NCO leadership explained an additional 2 – 13% of the variance in health and well-being scores, beyond the potentially traumatic combat stressors. Supportive leadership was associated with fewer symptoms of PTSD, major depression, and anxiety. Further, soldiers with supportive NCOs reported better overall health, a better deployment experience, and fewer symptoms of cardiovascular and gastrointestinal distress. Advocacy leadership was also related to fewer symptoms of PTSD, major depression, and anxiety. Further, advocacy leadership was associated with less gastrointestinal distress, and fewer complaints of headache, joint, and back pain. Also consistent with our other findings, counterproductive leadership was associated with increased PTSD, major depression, anxiety, and lower overall perceptions of the combat deployment as a positive experience, even after controlling for combat stressors. Moreover, counterproductive leadership was predictive of increased gastrointestinal distress, cardiovascular distress, and headache, joint, and back pain.

Table 11

Summary Table Presenting Incremental Validity Evidence for NCO Leadership in Predicting Readiness Outcomes, Controlling for Combat Stressors

	Role Overload	Personal Morale	Unit Morale	Unit Readiness	Unit Cohesion	Retention Intentions
Step 1 R^2	.03**	.03**	.04**	.01**	.01**	.01**
Step 2 ΔR^2	.10**	.17**	.19**	.17**	.22**	.02**
Supportive *B* (se)	-.04* (.02)	.25** (.02)	.26** (.02)	.50** (.02)	.50** (.02)	.05 (.04)
Counterproductive *B* (se)	.15** (.02)	-.11** (.02)	-.10** (.02)	.05** (.02)	-.07** (.01)	-.11 (.03)**
Advocacy *B* (se)	-.17** (.02)	.11** (.02)	.15** (.02)	-.08** (.02)	-.02 (.02)	.01 (.04)

Notes. Variables inserted at Step 1 Patrol Experiences, Personal Threat, Personal Combat, and Body Handling and Physical Devastation.
*$p < .05$, **$p < .01$.

Table 12

Regression Results for Leadership Predicting Role Overload, Controlling for Combat Stressors

	R^2	ΔR^2	B (se)
Step 1	.03**	.03**	
Patrol Experiences			.11** (.02)
Personal Threat			.08** (.02)
Personal Combat			-.09** (.02)
Body Handling and Physical Devastation			.06** (.02)
Step 2	.13**	.10**	
Patrol Experiences			.07** (.02)
Personal Threat			.06** (.02)
Personal Combat			-.07** (.02)
Body Handling and Physical Devastation			.07** (.02)
Supportive			-.04* (.02)
Counterproductive			.15** (.02)
Advocacy			-.17** (.02)

Note. *p < .05, ** p < .01.

Table 13

Regression Results for Leadership Predicting Personal Morale, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.03**	.03**	
Patrol Experiences			-.16** (.02)
Personal Threat			-.03 (.02)
Personal Combat			.01 (.02)
Body Handling and Physical Devastation			.01 (.02)
Step 2	.20**	.17**	
Patrol Experiences			-.11** (.02)
Personal Threat			-.02 (.02)
Personal Combat			.00 (.02)
Body Handling and Physical Devastation			.01 (.02)
Supportive			.25** (.02)
Counterproductive			-.11** (.02)
Advocacy			.11** (.02)

Note. *p < .05, ** p < .01.

Table 14

Regression Results for Leadership Predicting Unit Morale, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.04**	.04**	
Patrol Experiences			-.17** (.02)
Personal Threat			-.02 (.02)
Personal Combat			.05* (.02)
Body Handling and Physical Devastation			-.05* (.02)
Step 2	.23**	.19**	
Patrol Experiences			-.11** (.02)
Personal Threat			.01 (.02)
Personal Combat			.03 (.02)
Body Handling and Physical Devastation			-.05** (.02)
Supportive			.26** (.02)
Counterproductive			-.10** (.02)
Advocacy			.15** (.02)

Note. *$p < .05$, ** $p < .01$.

Table 15

Regression Results for Leadership Predicting Unit Readiness, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.01**	.01**	
Patrol Experiences			.08** (.02)
Personal Threat			.05* (.02)
Personal Combat			-.02 (.02)
Body Handling and Physical Devastation			-.08** (.02)
Step 2	.18**	.17**	
Patrol Experiences			.11** (.02)
Personal Threat			.04* (.02)
Personal Combat			.00 (.02)
Body Handling and Physical Devastation			-.07** (.02)
Supportive			.50** (.02)
Counterproductive			.05** (.02)
Advocacy			-.08** (.01)

Note. *p < .05, ** p < .01.

Table 16

Regression Results for Leadership Predicting Unit Cohesion, Controlling for Combat Stressors

	R^2	ΔR^2	B (se)
Step 1	.01**	.01**	
Patrol Experiences			.04 (.02)
Personal Threat			.03 (.02)
Personal Combat			-.01 (.02)
Body Handling and Physical Devastation			-.08** (.02)
Step 2	.23**	.22**	
Patrol Experiences			.09** (.02)
Personal Threat			.03 (.02)
Personal Combat			-.01 (.02)
Body Handling and Physical Devastation			-.07** (.02)
Supportive			.50** (.02)
Counterproductive			-.07** (.02)
Advocacy			-.02 (.01)

Note. *$p < .05$, ** $p < .01$.

Table 17

Regression Results for Leadership Predicting Retention Intentions, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.01**	.01**	
Patrol Experiences			-.10 (.04)**
Personal Threat			-.08 (.04)**
Personal Combat			.06 (.04)*
Body Handling and Physical Devastation			.13 (.04)**
Step 2	.04**	.02**	
Patrol Experiences			-.07 (.04)*
Personal Threat			-.08 (.04)**
Personal Combat			.06 (.04)*
Body Handling and Physical Devastation			.13 (.04)**
Supportive			.05 (.04)
Counterproductive			-.11 (.03)**
Advocacy			.01 (.04)

Note. *$p < .05$, **$p < .01$.

Table 18

Summary Table Presenting Incremental Validity Evidence for NCO Leadership in Predicting Health and Well-being, Controlling for Combat Stressors

	PTSD Symptoms	Depression	Anxiety	Cardiovascular Distress	Gastrointestinal Distress	Headache, Joint and Back Pain	Health Rating	Positive Effects of Deployment
Step 1 R^2	.17**	.07**	.08**	.05**	.03**	.04**	.01**	.01**
Step 2 ΔR^2	.06**	.09**	.07**	.04**	.02**	.03**	.04**	.13**
Supportive B (se)	-.10 (.02)**	-.13 (.01)**	-.06** (.02)	-.12 (.01)**	-.06 (.01)**	-.01 (.01)	.18 (.02)**	.35 (.02)**
Counterproductive B (se)	.14 (.01)**	.15 (.01)**	.15** (.02)	.11 (.01)**	.07 (.01)**	.11 (.01)**	-.06 (.02)**	-.03 (.01)*
Advocacy B (se)	-.04 (.02)*	-.08 (.01)**	-.12** (.02)	.01 (.01)	-.05 (.01)*	-.10 (.01)**	-.02 (.02)	-.01 (.02)

Note. Variables inserted at Step 1 Patrol Experiences, Personal Threat, Personal Combat, and Body Handling and Physical Devastation.

*p < .05, **p < .01.

Table 19

Regression Results for Leadership Predicting PTSD Symptoms, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.17**	.17**	
Patrol Experiences			.22 (.02)**
Personal Threat			.02 (.02)
Personal Combat			.11 (.02)**
Body Handling and Physical Devastation			.12 (.02)**
Step 2	.23**	.06**	
Patrol Experiences			.18 (.02)**
Personal Threat			.02 (.02)
Personal Combat			.12 (.02)**
Body Handling and Physical Devastation			.13 (.02)**
Supportive			-.10 (.02)**
Counterproductive			.14 (.01)**
Advocacy			-.04 (.02)*

Note. *p* < .05, ** *p* < .01.

Table 20
Regression Results for Leadership Predicting Depression, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.07**	.07**	
Patrol Experiences			.19 (.02)**
Personal Threat			-.02 (.02)
Personal Combat			.05 (.01)*
Body Handling and Physical Devastation			.07 (.02)**
Step 2	.16**	.09**	
Patrol Experiences			.15 (.01)**
Personal Threat			-.03 (.01)
Personal Combat			.06 (.01)**
Body Handling and Physical Devastation			07 (.02)**
Supportive			-.13 (.01)**
Counterproductive			.15 (.01)**
Advocacy			-.08 (.01)**

*Note. *p* < .05, **p* < .01.*

Table 21
Regression Results for Leadership Predicting Anxiety, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.08**	.08**	
Patrol Experiences			.23 (.02)**
Personal Threat			.01 (.02)
Personal Combat			.01 (.02)
Body Handling and Physical Devastation			.07 (.02)**
Step 2	.15**	.07**	
Patrol Experiences			.19 (.02)**
Personal Threat			-.01 (.02)
Personal Combat			.02 (.02)
Body Handling and Physical Devastation			.07 (.02)**
Supportive			-.06 (.02)**
Counterproductive			.15 (.01)**
Advocacy			-.12 (.02)**

Note. *p < .05, ** *p* < .01.

Table 22

Regression Results for Leadership Predicting Cardiovascular Distress, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.05**	.05**	
Patrol Experiences			.12 (.01)**
Personal Threat			-.05 (.01)*
Personal Combat			.14 (.01)**
Body Handling and Physical Devastation			.03 (.01)
Step 2	.09**	.04**	
Patrol Experiences			.09 (.01)**
Personal Threat			-.05 (.01)*
Personal Combat			.15 (.01)**
Body Handling and Physical Devastation			.03 (.01)
Supportive			-.12 (.01)**
Counterproductive			.11 (.01)**
Advocacy			.01 (.01)

Note. *$p < .05$, ** $p < .01$.

Table 23

Regression Results for Leadership Predicting Gastrointestinal Distress, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.03**	.03**	
Patrol Experiences			.13 (.01)**
Personal Threat			-.01 (.01)
Personal Combat			.03 (.01)
Body Handling and Physical Devastation			.05 (.01)*
Step 2	.06**	.02**	
Patrol Experiences			.11 (.01)**
Personal Threat			-.01 (.01)
Personal Combat			.04 (.01)
Body Handling and Physical Devastation			.05 (.01)*
Supportive			-.06 (.01)**
Counterproductive			.07 (.01)**
Advocacy			-.05 (.01)*

Note. *$p < .05$, ** $p < .01$.

Table 24

Regression Results for Leadership Predicting Headache, Joint, and Back Pain, Controlling for Combat Stressors

	R^2	ΔR^2	B (se)
Step 1	.04**	.04**	
Patrol Experiences			.18 (.01)**
Personal Threat			-.01 (.01)
Personal Combat			.02 (.01)
Body Handling and Physical Devastation			.03 (.01)
Step 2	.08**	.03**	
Patrol Experiences			.15 (.01)**
Personal Threat			-.01 (.01)
Personal Combat			.03 (.01)
Body Handling and Physical Devastation			.03 (.01)
Supportive			-.01 (.01)
Counterproductive			.11 (.01)**
Advocacy			-.10 (.01)**

Note. *$p < .05$, ** $p < .01$.

Table 25

Regression Results for Leadership Predicting Health Rating, Controlling for Combat Stressors

	R^2	ΔR^2	*B* (se)
Step 1	.01**	.01**	
Patrol Experiences			-.07** (.02)
Personal Threat			.02 (.02)
Personal Combat			-.05* (.02)
Body Handling and Physical Devastation			-.03 (.02)
Step 2	.05**	.04**	
Patrol Experiences			-.05* (.02)
Personal Threat			.02 (.02)
Personal Combat			-.05* (.02)
Body Handling and Physical Devastation			-.03 (.02)
Supportive			.18** (.02)
Counterproductive			-.06** (.02)
Advocacy			-.02 (.02)

*Note. *p < .05, ** p < .01.*

Table 26

Regression Results for Leadership Predicting Positive Deployment Outcomes, Controlling for Combat Stressors

	R^2	ΔR^2	B (se)
Step 1	.01**	.01**	
Patrol Experiences			.05 (.02)*
Personal Threat			.10 (.02)**
Personal Combat			-.02 (.02)
Body Handling and Physical Devastation			-.01 (.02)
Step 2	.15**	.13**	
Patrol Experiences			.09 (.02)**
Personal Threat			.10 (.02)**
Personal Combat			-.02 (.02)
Body Handling and Physical Devastation			-.01 (.02)
Supportive			.35 (.02)**
Counterproductive			-.03 (.01)*
Advocacy			-.01 (.02)

Note. *$p < .05$, **$p < .01$.

Research Question 6: Does NCO leadership moderate the relationships between combat stressors and soldier readiness and well-being outcomes?

The final research question concerned the possible moderating effects of NCO leadership on solider health and well-being outcomes. Specifically, supportive and advocacy behaviors were investigated as possible buffers between combat stress and health and well-being outcomes. To test these relationships, we conducted a series of hierarchical regressions in which combat stressors were entered in the first step, leadership variables were entered in the second step, and one interaction term was included in the third step for each of the outcomes of interest. Tables 27 - 29 contain the results of these analyses.

As is evident in the tables, none of the interaction effects accounted for 1% of the variance in health and well-being outcomes. As such, these analyses are of limited predictive utility for soldier health and well-being and are not interpreted in this report.

Table 27

Summary of Regression Analyses Examining Interactions between Combat Stressors and NCO Leadership on Health and Well-being Outcomes

	PTSD Symptoms	Mood	Cardio. Distress	G/I Distress	Headache, Joint and Back Pain
Step 1 R^2	.23**	.17**	.05**	.03**	.04**
Step 2 ΔR^2	.06**	.09**	.04**	.02**	.03**
Step 3 ΔR^2	.000-.001*	.00	.001*	.001-.002**	.00
Patrol Experiences X Supportive	.00	.00	.001*	.00	.00
Patrol Experiences X Counterproductive	.001**	.00	.00	.00	.00
Patrol Experiences X Advocacy	.00	.00	.001*	.00	.00
Personal Threat X Supportive	.001*	.00	.001*	.00	.00
Personal Threat X Counterproductive	.00	.00	.00	.00	.00
Personal Threat X Advocacy	.001*	.00	.00	.00	.00
Personal Combat X Supportive	.00	.00	.001**	.001**	.00
Personal Combat X Counterproductive	.00	.00	.00	.00	.00
Personal Combat X Advocacy	.001*	.00	.001**	.001**	.00
Body Handling X Supportive	.00	.00	.001**	.00	.00
Body Handling X Counterproductive	.00	.00	.00	.00	.00
Body Handling X Advocacy	.001*	.00	.001*	.00	.00

Note. *$p < .05$, **$p < .01$; variables in Step 1 include combat stressors; variables in Step 2 include combat stressors and leadership factors; values for the interaction terms represent standardized β weights.

Table   28

Regression Analyses Examining Interactions between Combat Stressors and NCO Leadership on Health and Well-being Outcomes

	Role Overload	Sick Call Visits	Missed Workdays	Health Rating
Step 1 R^2	.03**	.01**	.02**	.01**
Step 2 ΔR^2	.10**	.01**	.01**	.04**
Step 3 ΔR^2	.01**	.00	.01**	.00
Patrol Experiences X Supportive	.01*	.00	.00	.00
Patrol Experiences X Counterproductive	.01**	.00	.00	.00
Patrol Experiences X Advocacy	.00	.00	.00	.00
Personal Threat X Supportive	.00	.00	.00	.00
Personal Threat X Counterproductive	.00	.00	.00	.00
Personal Threat X Advocacy	.0	.00	.00	.00
Personal Combat X Supportive	.01**	.00	.01*	.00
Personal Combat X Counterproductive	.00	.00	.00	.00
Personal Combat X Advocacy	.00	.00	.00	.00
Body Handling and Physical Devastation X Supportive	.01**	.00	.01**	.00
Body Handling and Physical Devastation X Counterproductive	.00	.00	.00	.00
Body Handling and Physical Devastation X Advocacy	.00	.00	.01*	.00

Note. $*p < .05$, $**p < .01$; variables in Step 1 include combat stressors; variables in Step 2 include combat stressors and leadership factors; values for the interaction terms represent standardized β weights.

Table 29

Regression Analyses Examining Interactions between Combat Stressors and NCO Leadership on Readiness Outcomes

	Personal Morale	Unit Morale	Unit Readiness	Unit Cohesion
Step 1 R^2	.03**	.04**	.01**	.01**
Step 2 ΔR^2	.17**	.20**	.18**	.23**
Step 3 ΔR^2	00 - .001*	.00 -.001**	.00-.001**	.00-.001**
Patrol Experiences X Supportive	.00	.001*	.00	.00
Patrol Experiences X Counterproductive	.001*	.001**	.00	.00
Patrol Experiences X Advocacy	.00	.001*	.00	.00
Personal Threat X Supportive	.00	.001*	.001**	.001*
Personal Threat X Counterproductive	.00	.001**	.00	.00
Personal Threat X Advocacy	.00	.001*	.00	.00
Personal Combat X Supportive	.00	.001*	.00	.00
Personal Combat X Counterproductive	.001*	.001**	.001**	.001**
Personal Combat X Advocacy	.00	.001*	.00	.00
Body Handling and Physical Devastation X Advocacy	.00	.001**	.001*	.00
Body Handling and Physical Devastation X Counterproductive	.00	.001**	.00	.00
Body Handling and Physical Devastation X Advocacy	.00	.001*	.00	.00

Note. *p < .05, **p < .01; variables in Step 1 include combat stressors; variables in Step 2 include combat stressors and leadership factors; values for the interaction terms represent standardized β weights.

Conclusions

The results of this study provide psychometric evidence in support of the NCOLS. In accordance with our expectations, the results also show that NCO leadership is an important predictor of a variety of soldier readiness, health and well-being outcomes. The scale provided incremental validity in predicting these outcomes even when combat stressors were statistically controlled.

Of the three facets of leadership represented in the scale, supportive leadership was the strongest predictor of physical and psychological health, well-being, and readiness. Advocacy leadership, or upward-influencing tactics as described in LMX theory, emerged as a distinct factor from supportive leadership, and also predicted several health, well-being, and readiness outcomes. Advocacy behaviors were associated with fewer symptoms of anxiety, major depression, and headache, joint and back pain, less role overload, and increased morale. Additionally, soldiers' reports of counterproductive NCO leadership predicted lower readiness and poorer health and well-being outcomes. In particular, counterproductive leadership was associated with increased reports of PTSD symptoms, major depression, anxiety, and reduced morale and retention intentions.

Some limitations of this study should be noted. This research is cross-sectional and based upon self-report, and may be subject to common method variance issues (Lindell & Whitney, 2001). Soldiers were not surveyed during their combat deployments, but three months later. Cognitive limitations on memory recall may have influenced soldiers' perceptions of their NCOs. Further, this study was conducted using soldiers who performed similar jobs. Future studies of leadership in a more diverse (e.g., MOS) sample of military personnel may help to further explicate the relationships between leader behaviors and soldier health and readiness.

With regard to military readiness, our results suggest that NCOs should be trained to engage in both advocacy and supportive leadership. However, counterproductive behaviors must also be addressed. For example, public humiliation may be employed by some NCOs as a tactic to improve soldier performance, but our results suggest that this type of behavior may undermine performance and have detrimental effects on soldier health and retention intentions.

Leadership is an important element of a soldier's environment within the framework of the SAM. Thus, we expected leadership to influence soldier adaptation to a stressful combat deployment. We conceptualized adaptation to stress using measures of health and readiness following a deployment, and our results support the contentions of the SAM. While our tests of interactions between job demands, leadership perceptions, and outcomes failed to show indisputable evidence of moderation, soldiers with higher quality LMX relationships (through supportive and advocating leaders) also had better self-reported health and readiness three months after their combat deployment than soldiers who perceived a lack of support or the presence of counterproductive behaviors from their NCOs.

In sum, our results indicate that Non-commissioned Officers who are supportive, who advocate for their soldiers, and who avoid counterproductive behaviors promote the readiness, health, and well-being of their soldiers. The strength of the relationships between leadership and soldier functioning were such that developing a training focus for NCOs to engage in supportive and advocacy behaviors, while actively avoiding counterproductive behaviors, may substantially promote soldier health and readiness.

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