

Moderators of Psychological and Physical Health in a Military Assessment Center  
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Abstract

Reserve Officer Training Corps (ROTC) cadets supply the U.S. Army with 70% of its Officers. One important criterion the ROTC administrators use to evaluate and assign cadets to duty and branch status is the Advanced Camp. Advanced Camp is a 6-week evaluative assessment center that assesses cadets' individual and group leadership skills both in the field and in garrison. For researchers, this setting offers a controlled environment in which one can ascertain stress (e.g., role stressors) and its effects on critical outcomes such as performance. Stressors are not without their consequences in terms of adverse health effects, both psychological and physical (e.g., Beehr, 1995; Jex, 1998). As such, researchers are always searching for the often-elusive "buffering effect" (Cohen & Wills, 1985). In the present study, Advanced Camp provided a unique "real-world" opportunity to study: 1) the relationship between role stressors and health, both psychological and physical, and 2) individual difference moderators (buffers) of this link. Given the social context and evaluative setting of Advanced Camp, we posited the following: (a) role stress would be negatively related to psychological and physical health, (b) self-efficacy and extraversion would be positively related to psychological and physical health, and (c) self-efficacy and extraversion would buffer adverse health effects associated with role stress. Generally, hypotheses were supported. Implications of the study are discussed.

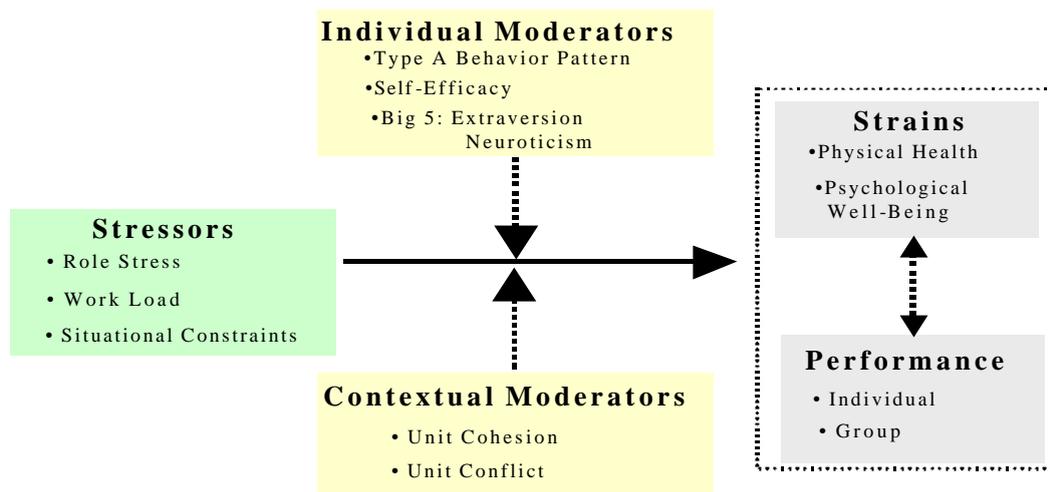
Introduction

Whether implicitly or explicitly, a working model guides all programmatic research. In terms of our work in the U.S. Army Medical Services Corps, the model depicted in Figure 1 has been used as a heuristic framework to study stress and its effects on soldiers and units. The WRAIR Stressor-Strain-Performance Model is an attempt to explicitly differentiate among stressors, moderators, and strains, and provide a theoretical framework for considering interrelationships among these three types of variables and their impact upon the ultimate criterion of interest to the military, performance. In the figure, the main categories (stressors, strains, moderators) are constant, but the specific elements of these variables vary by setting. In general, individuals exposed to stressful job conditions (stressors) experience high levels of strain such as poor psychological and physical well-being (see Beehr, 1995). This, in turn, may lead to performance decrement.

While there have been a number of studies that have modeled the relationships between stressors and health strains, few have clearly and reliably delineated the role that moderators play in attenuating this relationship. Building from the pioneering work of Cohen and Wills (1985), we have examined two classes of buffers, group-level and individual-level. Although recent innovations in multi-level modeling techniques have permitted the analysis of group-level variables in the stressor-strain context (e.g., Bliese & Britt, 2001; Jex & Bliese, 1999), the focus of the present paper will highlight two individual difference variables that have not been extensively examined as individual-level moderators of health strains. These individual

difference moderators are Bandura's (1986) self-efficacy and the "Big 5" personality factor of extraversion. The former has only been looked at very recently within a stressor-strain model; the latter, to our knowledge, has never been fully examined as a moderator in a stressor-strain model.

Figure 1. WRAIR Stressor-Strain-Performance Model



Self-efficacy reflects the overall confidence an individual has in his or her ability to produce desired outcomes (Bandura, 1986). The theory built around self-efficacy rests on the principle that all forms of behavioral change operate through a common mechanism: the alteration of an individual's expectations of personal mastery and success. According to Bandura (1977), the strength of one's belief that behavior can influence an outcome will be contingent upon the belief that one is capable of performing the behavior. Self-efficacy has been linked to performance management (e.g., Taylor, Locke, Lee, & Gist, 1984), training (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), and health outcomes where it has been identified as attenuating the relationship between work demands and blood pressure (Schaubroeck & Merrit, 1997). Moreover, Jex and Bliese (1999) found further support for the role of self-efficacy as a buffer of work stress on psychological strains. These studies are the exception in terms of the inclusion of self-efficacy within occupational stress and health research. Jex and Bliese recommend its application to occupational stress because self-efficacy may directly impact how employees cope with work stressors. Stated more succinctly, high self-efficacy individuals are more likely do something about stressors, whereas low self-efficacy individuals are more likely to worry about them. Thus, adverse health consequences of stress may likely be minimized for high self-efficacy individuals.

The second individual difference moderator in the model is extraversion, a dimension of personality that reflects sociability, gregariousness, assertiveness, and activeness (McCrae & Costa, 1985). Extraversion has emerged as a valid predictor of job performance (Barrick & Mount, 1991) and adaptive capacity (Piedmont and Weinstein, 1994). Similarly, Thomas, Dickson, and Bliese (2001) found that extraversion was predictive of assessment center performance for Army cadets, a role requiring social interaction and adaptive capacity. In

general, traits such as sociability and gregariousness are seen as strengths in settings that require a great deal of social interaction. Extraversion has also been directly linked to health as measured by subjective well-being (Hotard, McFatter, McWhirter, and Stegall, 1989). Hotard, et al. suggests this link exists because a key component of one's well-being includes successful interactions with others. Social relations satisfy ones' needs for approval, popularity, etc., thus extraverts are quite likely to have more social relationships. In terms of its application as a buffering variable within occupational stress research, we are unaware of any studies that have explicitly examined extraversion in this way.

In this study, we contribute to the present state of research in the occupational stress realm by focusing on a specific class of stressors, role stressors. Role stressors can be defined as conditions within the organization that require an adaptive response. The response may stem from conflict, ambiguity, or overload in terms of behavior expected of one occupying a particular role/position. We will examine the relationship between role stressors and both psychological and physical health. Moreover, we present self-efficacy and extraversion as predictors of depression and physical symptoms. The buffering role of self-efficacy has only recently been examined, thus we will attempt to replicate previous findings and then extend them by focusing on the buffering effects on role stress and depression and physical symptoms. To our knowledge, this study represents the first examination of extraversion as a buffer of role stress and depression and physical symptoms. The study's context should highlight the importance of role stress, and the direct and moderating effects of self-efficacy and extraversion on two specific health outcomes.

### Hypotheses

*H1: Role stress will be negatively related to health.*

*H2: Self-efficacy and extraversion will be positively related to health.*

*H3: Self-efficacy and extraversion will be significant moderators of the role stressor-health relationship such that these moderators will serve a buffering effect.*

### Method

The summer prior to their final year at University, all ROTC scholarship-contracted cadets are required to participate in an intensive, five-week leadership training and evaluation course called Advanced Camp. Held at Fort Lewis, WA, Advanced Camp has been designed in accordance with the pre-commissioning training philosophy of the U.S. Army. The philosophy develops cadet leadership through active coaching that builds skill and confidence to influence others, and fosters leader character by reinforcing the values, attributes, and skills desired in a U.S. Army leader. These identified characteristics stemmed from a job analysis of leader skills and behavior expected of high performing Second Lieutenants. Based on this analysis, the criteria for an evaluative assessment center was established by the Army's Cadet Command in order to teach, shape, train, and evaluate cadets. Advanced Camp is the final capstone exercise for cadets prior to University graduation, and to branch accession and commissioning in the US Army.

Performing well at Advanced Camp is extremely important for cadets. The better cadets perform at Advanced Camp, the more likely they are to be assigned to their preferred branch of the U.S.

Army (e.g., Infantry, Quartermaster), and granted their preference of Active or Reserve Duty. Therefore, it is not surprising that Advanced Camp performance is a source of some anxiety and stress for cadets. In addition to concerns about performance evaluation, the experience of Advanced Camp is potentially stressful in terms of its demands. Cadet Command notes that it is “intentionally tough and introduces stress...the days are long with considerable night training and no days off...throughout Advanced Camp cadets encounter physical and mental obstacles which challenge them as a person, soldier, and leader.” Because situational and role stressors are inherent, health can vary as a consequence, and because there is also likely to be a great deal of variability in terms of cadet individual differences in self-efficacy and extraversion, this environment provides an ideal testing ground for applied stress research.

Data were collected at two time points. First, a survey asking cadets to respond to demographic and individual difference questions, including self-efficacy and extraversion, was administered during the initial in-processing within the first 4 days of Advanced Camp. These survey responses were then paired with survey data collected on Day 26, asking cadets to rate their level of stress, strain, and health at that time. This two time-wave design makes the study more powerful in that it is not a “one-shot” cross-sectional appraisal. Moreover, although personality traits are argued to be stable, we felt it was best to measure these at time 1 prior to any training or assessment. We have summarized the measures assessing role stressors, health strains, and moderators in Table 1 below. Mean responses were calculated using a 5-point Likert-type response scale (1= Strongly Disagree to 5 =Strongly Agree) for all scales except the Physical Symptoms Checklist. The Checklist was calculated using a 4-point response scale ranging from 1= Never to 4= Very Often and then summed.

*Table 1. Detailed Summary of Measures and Descriptive Statistics*

Scale	Key Reference	Mean	SD	$\alpha$
Quantitative Overload	Cammann, Fichman, Jenkins, & Klesh (1983)	3.05	.88	.73
Qualitative Overload	Thomas (2000)	1.92	.57	.70
Role Clarity	Cammann, Fichman, Jenkins, & Klesh (1983)	3.78	.76	.81
Self-efficacy	Jones (1986)	4.16	.55	.70
Extraversion	Goldberg (1992)	3.59	.77	.90
Physical Symptoms	Halverson, Blies e, Moore, & Castro (1995)	30.89	6.80	---
Depression	Mirowsky (1996)	1.73	1.74	.91

## Results

Table 2 presents the correlations among all study variables. Consistent with Hypothesis 1, the relationships between role stressors and the health strains of depression and physical symptoms were in the anticipated direction. Correlations were significant at the .01 level and ranged in magnitude from .16 to .42. The tabled results also suggest that self-efficacy and extraversion were related to depression and physical symptoms in the expected direction. However, extraversion was not related to physical symptoms, thus 3 out of 4 zero-order correlations were significant, providing partial support for Hypothesis 2.

Table 2. Correlations between Study Variables

Variable	1	2	3	4	5	6	7
1 Quantitative Overload	----						
2 Qualitative Overload	.46**	----					
3 Role Clarity	-.18**	-.27**	----				
4 Self-efficacy	-.23**	-.35**	.17**	----			
5 Extraversion	-.14**	-.20**	.12**	.20**	----		
6 Depression	.42**	.36**	-.17**	-.30**	-.12**	----	
7 Physical Symptoms	.27**	.16**	-.06*	-.19**	-.02 NS	-.27**	----

Hypothesis 3 predicted that both self-efficacy and extraversion would attenuate the relationship between role stress and health. To test this hypothesis we conducted 12 moderated multiple regressions following procedures recommended by Aiken and West (1990). Hypothesis 3 was partially supported as eight of the twelve regressions revealed moderating effects. Moreover, the form of the interactions was consistent with that of a buffering effect for seven of eight regressions. As an example, Figure 2a shows that self-efficacy attenuated the relationship between quantitative role overload and self-reported physical symptoms. Cadets who perceived that they were overloaded with too much to do in too little time also reported more symptoms. However, when self-efficacy was factored in, cadets who reported high quantitative overload and high self-efficacy reported significantly lower symptoms than cadets who reported high overload but who were low in self-efficacy. However, contrary to our hypothesis, one of the eight significant moderated regressions revealed an anti-buffering effect. Figure 2b displays

Figure 2a. Buffering effect of Self-efficacy on the Relationship between Overload and Symptoms

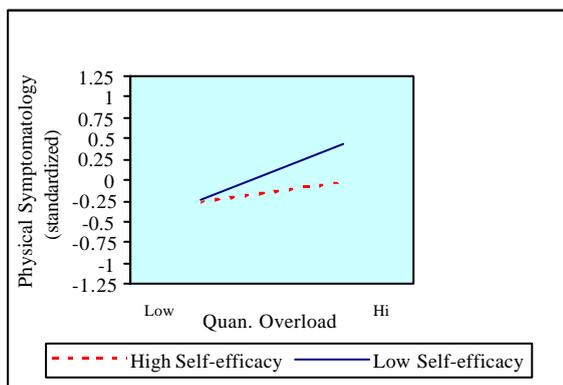
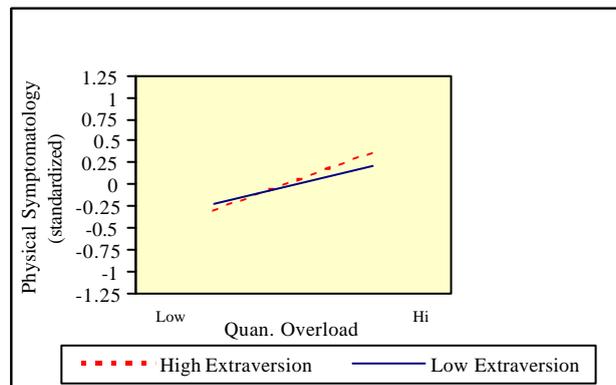


Figure 2b. Anti-buffering Effect of Extraversion on the Relationship between Overload and Symptoms



the role of extraversion as a moderator between quantitative role overload and physical symptoms. In this case, being high in extraversion actually exacerbated the link between overload and self-reported symptoms. We will return to this finding in the discussion.

## Discussion

One of the strengths of the present study was in its design that avoided the “one-shot cross-sectional” survey administration that plagues survey research in general. Support for the first hypothesis stemmed from the fact that there was good variability in cadets’ reports of role stress and their health-related symptoms, which supports the earlier notion of the inherently stressful nature of the applied assessment center. However, our chief interest was in how self-efficacy and extraversion, measured at baseline, moderated this relationship and related to health.

Jex and Bliese (1999) suggest that when one is higher in self-efficacy, this might act as a coping mechanism in terms of negating the effects of workplace stressors on health outcomes. Our results are consistent with their interpretation; we found that self-efficacy played the role of a buffer in the link between role stress and health. So the question becomes, “Does one base an intervention (e.g., behavioral modeling) on increasing self-efficacy as a means of inoculating against role demands?” We suggest that the answer is yes. Seligman (1991) offered a training strategy that employed social psychology by teaching individuals to make internal, stable, causal attributions for positive training and performance experiences, and external, specific, causal attributions for negative training and performance failures. Furthermore, Eden and Zuk (1995) conducted a clever quasi-experimental study that found that by increasing self-efficacy through an intra-person self-fulfilling prophecy technique, they decreased adverse health reactions and increased rated performance. Our findings consistently revealed an interaction between cadet’s efficacy disposition and their perception of role stress. Perhaps this is where military trainers and evaluators can make their impact, by training self-efficacy. These results suggest that training in self-efficacy not only raises training and performance expectations (e.g., Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), as well as health and performance (e.g., Eden & Zuk, 1995), but that it also may buffer deleterious health consequences that may stem from stressors.

In terms of extraversion, we found a direct relationship between extraversion and psychological health (as measured by depression) as expected. Thus, we replicated earlier work noting the link between extraversion and well-being. Extraversion performed similarly in terms of its buffering role between role stress and psychological health. As noted in the introduction, we are unaware of any other studies examining extraversion as a buffer of stress-strain relations. Thus, we are encouraged by these initial results. However, it must be noted that this finding may have been an artifact of the type of assessment center where the data were collected. In a very long and very competitive setting, cadets who got noticed by evaluators may have been more positively regarded in terms of their performance, initiative, or willingness to be a “team player”. A high “self-monitoring” cadet may have become aware of the positive halo of being noticed apart from the crowd and quickly adopted a “look at me” approach to their interactions with peers and administrators. Nonetheless, the observed buffering effect of extraversion at baseline did attenuate the relationship between role stress and adverse health 3 weeks later. This finding warrants closer study in the future to see if it is generalizable outside the military assessment center setting.

Lastly, an intriguing but counter-intuitive finding was that extraversion exacerbated the relationship between role overload and physical symptoms. This finding was unexpected but we

speculate that it may be a function of immunological and cognitive resources. If a cadet is feeling overloaded (e.g., being asked to do too much in too little time), this may deplete his/her immunological and cognitive capacity. If this same cadet is dispositionally extraverted, then self-reports of more physical symptoms may be a plausible consequence. This finding also points out that the health outcomes studied here are different domains: the psychological and the physical. The distinction between these two domains should be looked at more closely as it related to stress and dispositionally extraverted individuals. Obviously, this finding needs to be replicated and the role of extraversion in other settings needs to be tests as well.

Future research in this area should take advantage of a time-wave design and measure health across time. This could emphasize the state-dependent nature of well-being or depression that may be affected by exposure to role stress. Furthermore, an important component in the assessment center setting that should be capitalized on is the leadership performance ratings for cadets. Generally, this one key component in our model, performance, is very difficult to obtain, but very important for model development. This setting offers a method-independent means of linking rated leadership performance to the individual differences and the stress-strain process as it develops over time.

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