Self-Engagement, Stressors, and Health: A Longitudinal Study

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The authors examined whether engagement in a performance domain could buffer or exacerbate the consequences of different stressors. Soldiers completed measures of engagement in work, work demands (days training, work hours, and subjective work overload), and symptoms at two time periods. Engagement in work interacted with days training and work hours at Time 1 to predict health symptoms at Time 2 (after controlling Time 1 outcomes). Soldiers highly engaged in their jobs were less likely to report negative consequences under high levels of training/work hours in comparison to soldiers disengaged from their jobs. However, engagement in work interacted with work overload in the opposite manner, with high levels of engagement potentiating the relationship between overload and reports of health symptoms. Engagement in a domain appears to buffer individuals from stressors that do not undermine performance but may exacerbate the impact of stressors that compromise performing well in the domain.

Keywords: *engagement; stress; buffer; motivation; stressor; performance*

As individuals attempt to accomplish goals and to perform well in different domains, they frequently encounter stressors that have the capacity to influence their performance and health. A large body of research has shown that high levels of different types of stressors are associated with poor performance (S. Cohen, 1980; Jex, 1998), psychological problems (Adler & Matthews, 1994), and physical problems (S. Cohen & Williamson, 1991; O'Leary, 1990). Of course, research also has shown that not all individuals are equally affected by stressors and that some individuals are better able to cope with demands in ways that reduce the negative impact of stress (Bowers, Weaver, & Morgan, 1996).

Prior researchers have examined aspects of personality and the self-concept that appear to buffer individuals from the negative consequences of generic stressors. For example, Kobasa and her colleagues (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982) have found that individuals high in personality hardiness are less likely to report physical symptoms under conditions of stress, and Linville (1987) has shown that individuals high in self-complexity are less likely than those low in self-complexity to show poor health in the face of stressors. Although this research has been useful in examining how personality and aspects of the self-concept moderate the relationship between stress and health, we are aware of no research that has considered whether the moderating

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influence of identity differs depending on the type of stressor being considered. We argue that one important aspect of a stressor to be considered in the context of performance in different life domains is whether the stressor directly impedes or does not impede performance in the domain.

In the present research, we examine an individual's level of self-engagement in a performance domain as a determinant of reactions to stressors that impede or do not impede performance in the domain. The construct of self-engagement was derived from the Triangle Model of Responsibility (Schlenker, Britt, Pennington, Murphy, & Doherty, 1994) and is defined as individuals feeling a sense of responsibility for and commitment to a performance domain so that performance "matters" to the individual (Britt, 1999, 2003a, 2003b). Consider an example from the political arena. Presidents are frequently evaluated based on the extent to which they appear "engaged" in areas of concern or crisis (e.g., the Israel/Palestine peace process). A president who is engaged in a given crisis or concern appears to feel a sense of responsibility for the outcome of the crisis and also cares about the resolution of the crisis. When an individual is personally engaged in an activity, the self-system of that individual is activated and a part of their self-concept is invested in performance. Perceived responsibility for performance in a given domain is therefore inextricably linked to outcomes in that domain mattering to the individual (see Schlenker et al., 1994).

If an individual is personally engaged in doing well in a given performance domain (i.e. the identity of the individual is invested in performance; see Crocker & Wolfe, 2001), then the individual should devote increased attentional resources and effort to performing well (see Britt, 2003b; Kahn, 1990; May, Gilson, & Harter, 2004). Such increased attention on identity-relevant tasks should have the effect of reducing the negative impact of work demands that do not impede performance (Britt & Bliese, 2003). For example, if an employee is personally engaged in a given project at work, that employee should become absorbed in the project (Csikszentmihalyi, 1990) and will be less likely to be bothered by having to work longer hours or spending more time training for his or her job. This would have the net effect of buffering the individual from the negative consequences of more work demands, such as working more hours and spending more days training. However, consider an individual who is relatively disengaged from his or her work. These individuals do not have an investment in performance and are therefore less likely to focus their efforts and attention on work-relevant performance. For these individuals, working longer hours and spending more time training would be sources of stress that might be prospectively related to increases in physical and psychological symptoms (Sparks, Cooper, Fried, & Shirom, 1997).

Although being personally engaged in an activity may buffer individuals from the negative consequences of demands that do not impede performance, consider how engagement might influence an individual's reactions to stressors that threaten performance in a domain. For example, imagine the employee who is working on a project but feels that other demands at work are interfering with his or her ability to finish the project. In this case, being personally engaged in the activity would be expected to exacerbate the negative consequences of feeling overloaded at work. When individuals are personally engaged in a performance domain, the outcomes of performance have a greater impact on the individual's identity because the individual feels a greater sense of personal responsibility for performance (Britt, 1999; Schlenker et al., 1994). Therefore, stressors that have the capacity to undermine superior performance may have particularly negative consequences for individuals who are personally engaged in the performance domain (see Britt, 1999; Pomerantz, Saxon, & Oishi, 2000).

One advantage of predicting that self-engagement will moderate the stressor-strain relationship in different ways depending on the nature of the stressor is that finding such a pattern helps to rule out correlates of engagement as the reason for moderation. For example, there is a moderate relationship between people believing they have the skills do to well in a domain and reporting higher levels of engagement in that domain (Britt, Thomas, & Dawson, 2005). However, one would predict that beliefs in one's competence in a performance domain would likely buffer individuals from the negative consequences of stressors that both impede and do not impede performance in the domain. Therefore, finding the unique pattern that engagement buffers individuals from demands that do not impede performance but exacerbates the consequences of demands that impede performance would provide more confidence in engagement as the construct responsible for the moderation.

In the present research, we examined personal engagement in a performance domain as a buffer and potentiator of the health consequences of stressors among U.S. Army soldiers who were stationed in Europe. Three stressors related to the workload of soldiers were assessed: work hours, days spent on training exercises, and subjective work overload. The idea that long work hours is a stressor that can affect the health of individuals has been researched for more than 40 years.

Dating back to 1960, Buell and Breslow (1960) reported a higher incidence of coronary heart disease in men working more than 48 hours a week. More recently, working long hours has been associated with increases in health complaints (Tummers, Landeweerd, & van Merode, 2002) as well as psychological distress (Bliese & Halverson, 1996). In terms of days spent away from one's home training for work-related purposes, Caldwell and Gilreath (2002) noted that traveling away from home may contribute to poor sleep quality, which is related to feelings of fatigue among U.S. Army aviators and crew members. Within the military, being involved in deployments and training exercises has been considered a major part of "OPTEMPO," defined as the high level of workload required by soldiers when they work long hours and travel frequently. This high level of activity has been reported as a major reason for soldiers deciding to leave the Army (Castro & Adler, 2000). Finally, researchers also have found that perceptions of work overload have been linked with a number of negative outcomes, including anxiety, depression, and physical symptoms (Cooper & Roden, 1985; Spector & Jex, 1998).

Although prior research has demonstrated consistent relationships between these stressors and measures of health and well-being, one problem with prior studies is that most are cross-sectional in nature. Therefore, it is unclear whether the stressors contribute to poor health and well-being or whether some third variable might be responsible for both reporting stressors and negative outcomes (see Zapf, Dormann, & Frese, 1996). In the present research, we conducted a longitudinal study examining whether multiple stressors would predict health and well-being at Time 2 after controlling for the outcome measures at Time 1 (Spector, Zapf, Chen, & Frese, 2000).

Once researchers adopt a longitudinal research design to investigate the relationship between stress and outcome measures, various models exist for how stressors are related to the outcomes. In an important article, Garst, Frese, and Molenaar (2000) proposed several theoretical models for how relationships between stressors and strains unfold over time. The stressor-strain trend model is the one most relevant to the present research. According to this model, individuals may gradually show strain after exposure to different work stressors. Garst et al. (2000) cite time pressure at work as an example of a stressor that might follow this model, with individuals needing to be exposed to time pressure for a while before showing signs of strain. Indeed, much of the research on work hours as a stressor makes the assumption that working long hours will predict future health symptoms (Sparks et al., 1997). This model is also guiding the present research, as we examine training days, work hours, and work overload as predictors of psychological and physical health 3 months later.

The primary focus of the present research is how self-engagement in work at Time 1 moderates the longitudinal relationships between different types of stressors assessed at Time 1 and the outcome measures assessed at Time 2. We hypothesize that engagement in work will buffer soldiers from the negative consequences of high work hours and days training. When individuals high in engagement encounter these types of stressors that do not directly impede job performance, they should become even more absorbed in accomplishing work-related tasks, increasing their effort at performing well (Brown & Leigh, 1996; Lydon & Zanna, 1990). This increased effort and attentional absorption should decrease the negative impact of these stressors so that individuals high in engagement should report few psychological and physical health symptoms at Time 2 even when working long hours and being away for many training days at Time 1. Those low in engagement are relatively detached from their work and should therefore report worse psychological and physical health when working long hours or being away for many days of training. Britt and Bliese (2003) found in a cross-sectional study that high levels of self-engagement in work buffered soldiers from the negative consequences of environmental, family, and unit-related stressors that presumably did not directly impede job performance.

Although personal engagement in work should act as a buffer against the negative effects of working long hours and being away often for training, consider the stressor of work overload. Work overload refers to a feeling that one has so many tasks to accomplish that one cannot do any given task well (Spector & Jex, 1998). Therefore, individuals reporting high work overload likely believe that they are not able to perform each individual task at a high level of performance. Feelings of high work overload should be especially problematic for individuals who are engaged in their work (Peters & O'Connor, 1980). Britt (1999) found that perceptions of job performance were more strongly related to stress and depression when soldiers reported high rather than low engagement in work. This leads to the prediction that personal engagement in work should potentiate the relationship between work overload assessed at Time 1 and physical and psychological health assessed at Time 2.

METHOD

Participants and Procedure

Participants (N = 176) were soldiers currently working at their home station (in garrison). The participants were 89% male and 11% female; 49% of the participants

TABLE 1: Means, Standard Deviations, and Correlations Among the Measured Variables

Variable	M	SD	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Engagement in work (T1)	3.72	0.85	—							
2. Hours of work (T1)	10.26	2.45	.08	—						
3. Days training (T1)	3.88	2.67	.03	.21**	—					
4. Work overload (T1)	3.05	0.82	.22**	.17*	.16*	—				
5. Well-being (T1)	2.33	0.33	–.36**	.05	.03	.08	—			
6. Well-being (T2)	2.43	0.39	–.28**	.01	.12	–.03	.38**	—		
7. Health (T1)	1.40	0.36	–.23**	–.05	.05	.09	.31**	.13	—	
8. Health (T2)	1.44	0.48	–.29**	.09	.12	.02	.23**	.37**	.54**	—

NOTE: *N*s range from 166 to 172. T1 = Time 1; T2 = Time 2.
*$p < .05$. **$p < .01$ (two-tailed).

were White, 26% were African American, 18% were Hispanic American, 3% were Asian American, and 4% indicated "other" for their ethnicity. The average age of the sample was 26. The rank breakdown of the sample included 58% junior enlisted (private [PVT] to specialist [SPC]), 38% noncommissioned officers (sergeant [SGT] to sergeant major [SGM]), and 4% officers. The marital breakdown of the sample was 44% single, 46% married, and 10% separated or divorced. The soldiers came from both combat units and units that provided support to combat units and were stationed at U.S. bases in either Germany or Italy.

Participants were assessed at two time periods: from October to December 2000 and from January to March 2001. Participants were only included in the analyses if they were assessed at both time periods.[1] Questionnaires were completed while the soldiers were working at their home station. The questionnaires were generally administered in large, company-size groups. The measures and sample used in the present article were taken from a larger longitudinal project (where multiple units were surveyed on eight different occasions) on the impact of a high operational tempo on soldiers (see Castro, Adler, & Bienvenu, 1998). The data analyzed here have not been published elsewhere.

Materials

Measures of workload. Participants responded to a number of questions designed to assess relatively objective aspects of their workload. Two measures that were not severely skewed included the number of days the soldiers had been on a training exercise in the last 6 months (which we refer to here as "training days") and the number of hours the soldiers reported working per day during the past week (typically a 5-day work week, which we refer to as "work hours"). Even though the training days measure was not severely skewed, there was a moderate positive skewness to the measure (e.g., 1 *SD* below the mean number of training days for soldiers would have resulted in a negative number). Therefore, we subjected the training days variable to a square root transformation (see Fazio, 1990), creating a variable that more closely approximated a normal distribution. This is important to remember when interpreting the mean and standard deviation for this variable (see Table 1). Therefore, the average number of training days for soldiers was 15 for Time 1 and 13 for Time 2. It is worth noting that training exercises in the Army typically occur away from the soldier's home station and involve family separation, uncomfortable physical environments (e.g., living in tents, adverse weather conditions), and a wide range of tasks being trained depending on the unit and purpose of the training.

We assessed subjective levels of work overload using a three-item scale developed by Cammann, Fichman, Jenkins, and Flesh (1983). Participants responded on a 5-point scale anchored by *strongly disagree* and *strongly agree*, with sample items including "I have so much work to do I cannot do everything well" and "I never seem to have enough time to get everything done." The alpha for work overload was .78 for Time 1 and .83 for Time 2.

Self-engagement in work was assessed with a four-item scale that was a modified version of a scale that has been used in past research (Britt, 2003a; Britt, Adler, & Bartone, 2001). The items assessed how responsible and committed an individual feels for his or her job performance ("I feel responsible for my job performance" and "I am committed to my job") and how much job performance matters to the individual ("How well I do in my job matters a great deal to me" and "How I do in my job influences how I feel"). Participants responded to these items on a 5-point scale anchored by *strongly disagree* and *strongly agree*. Prior research has provided evidence for the convergent validity of a modified version of the scale because the measure correlates with aspects of the work environment that should be related to engagement in work, such as job clarity and job control (Britt, 1999). Furthermore, past research has indicated that a similar measure of engagement in work contributed to a latent variable of meaningful work that predicted whether sol-

diers reported deriving benefits from a military operation (Britt et al., 2001). The Cronbach's alpha for the scale in the present research was .91 for both Time 1 and Time 2.

Outcome measures. The outcome measures for the present research included measures of well-being and physical symptoms. Well-being was measured with the General Health Questionnaire (GHQ; Goldberg, 1972), which is designed to assess the individual's overall level of psychological functioning. Participants are asked how often they have felt certain ways (on a 4-point scale anchored by *no more than usual* and *much more than usual*) in the past 2 weeks. Sample items from the scale include, "Been able to concentrate on whatever you're doing," "Lost much sleep over worry," and "Been feeling unhappy and depressed." Higher numbers indicate lower well-being. The Cronbach's alpha for the scale in the present research was .70 for Time 1 and .75 for Time 2. The 12-item version of the GHQ has been extensively validated (Goldberg et al., 1997).

Physical health symptoms were assessed with a scale that has been used in past research (Bliese & Halverson, 1996; Britt & Adler, 1999). Participants are asked how often (on a 4-point scale anchored by *not at all* and *very often*) they have experienced 24 physical health symptoms during the past month. Sample items include, "head colds," "constipation," "headaches," "back problems," and "stomach intestinal upset." Given that total number of physical symptoms is best viewed as an effect variable (with the number of symptoms defining the latent variable of physical symptoms), calculating a Cronbach's alpha for this scale is inappropriate.

RESULTS

Correlations Among the Measured Variables

Table 1 provides the means, standard deviations, and correlations among all of the measured variables at Time 1 and Time 2. In general, the correlations between the different demands were modest. The two "objective" measures of demands, work hours and training days, were modestly related to each other and to perceptions of work overload at Time 1. Of interest, the correlations between the measures of workload and work overload with the outcome measures were nonsignificant. This finding especially highlights the likelihood that other variables may moderate the workload/health relationship. Engagement in work at Time 1 was positively correlated with perceptions of work overload at Time 1 and was negatively correlated with well-being and physical symptoms at Time 1 and Time 2. The correlations among the outcome measures were only moderate. The test-retest correlations for the outcome measures from Time 1 to Time 2 also were moderate.

Moderated Multiple Regression Tests: Training Days at Time 1 as a Work Stressor

We conducted two moderated multiple regressions to examine whether engagement in work would interact with training days at Time 1 to predict the outcome measures of well-being and physical symptoms at Time 2. The interaction term was created by multiplying engagement in work with training days after mean centering the predictors (mean centering was done for all of the regressions reported; J. Cohen, Cohen, West, & Aiken, 2003). In addition to including the main effects of engagement in work and training days, we also included the Time 1 measure of each outcome measure before entering the interaction term between engagement in work and training days, therefore testing whether the interaction term predicted variance in the Time 2 outcome variable after controlling for the outcome variable at Time 1. This provides a strong test for engagement in work as a moderator, basically addressing whether the interaction accounts for changes in the outcome measure from Time 1 to Time 2.

A moderated multiple regression was conducted with well-being at Time 2 as the outcome variable and the predictors being the following Time 1 variables: well-being, engagement in work, training days, and the interaction term between engagement in work and training days. The first section of Table 2 reveals that after controlling for well-being at Time 1 and the other main effect predictors, the interaction term between engagement in work and training days was highly significant. The interaction between engagement in work and training days accounted for an additional 7% of the variance in well-being at Time 2. The first graph in Figure 1 plots the interaction by substituting values of 1 *SD* from the mean for each predictor to define "high" and "low" values on the predictors, as recommended by J. Cohen et al. (2003). The mean for Time 1 well-being was used in the regression for each predicted data point.

As seen in the graph, the results supported the hypothesis that engagement in work would serve as a buffer against the adverse consequences of a high number of training days. When training days at Time 1 were low, well-being at Time 2 tended to be high, irrespective of engagement in work. However, when training days at Time 1 were high, those high in engagement in work still showed high well-being at Time 2, whereas those low in engagement in work exhibited poor well-being at Time 2. This interpretation of the interaction was supported by simple slopes analyses (J. Cohen et al., 2003). The slope relating engagement to well-being was significant when training days were high, $t(170) = -4.43$, $p < .01$, but was not significant when training days were low, $t(170) = .786$, *ns*. Additional tests of simple slopes revealed that the slope relating training to well-being was significant

TABLE 2: Moderated Multiple Regressions of Training Days at Time 1 and Engagement in Work at Time 1 as Predictors of the Outcome Measures

Predictor	*Unstandardized* B	SE	df	t *Value*	p *Value*
Outcome variable: Well-being at Time 2					
Intercept	1.513	.196	170	7.733	.000
Well-being (T1)	0.391	.083	170	4.709	.000
Training days (T1)	0.016	.010	170	1.625	.106
Engagement in work (T1)	–0.071	.032	170	–2.207	.029
Training Days × Engagement	–0.039	.009	170	–4.106	.000
Outcome variable: Physical symptoms at Time 2					
Intercept	0.480	.122	170	3.930	.001
Physical symptoms (T1)	0.691	.085	170	8.129	.000
Training days (T1)	0.018	.011	170	1.612	.109
Engagement in work (T1)	–0.089	.036	170	–2.500	.013
Training Days × Engagement	–0.052	.011	170	–4.751	.000

NOTE: T1 = Time 1.

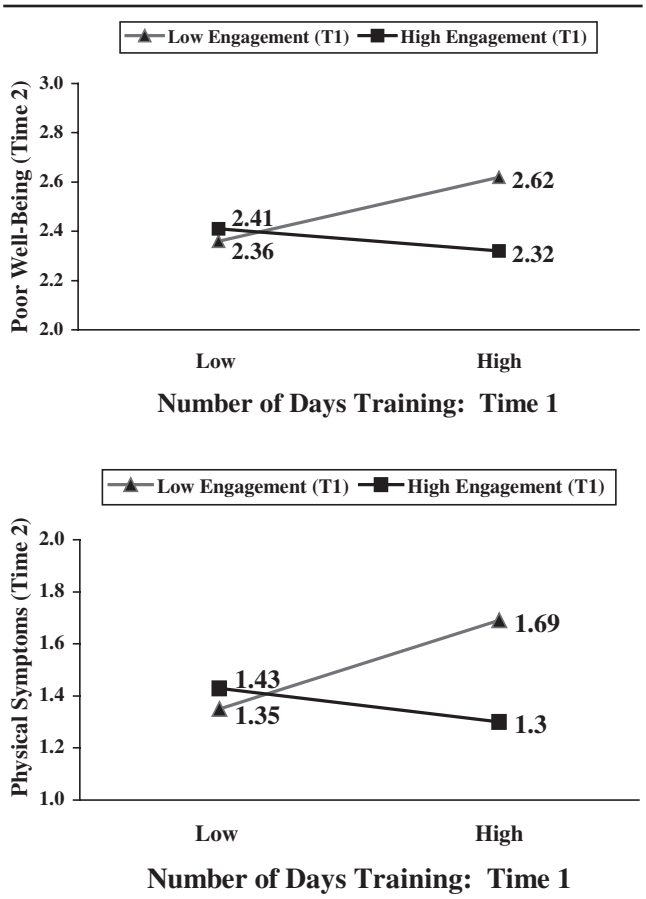

Figure 1 Engagement in work as a moderator of the relationship between training days and well-being and physical symptoms.
NOTE: T1 = Time 1.

for those low in engagement, $t(170) = 4.02$, $p < .01$, but was not significant for those high in engagement, $t(170) = -1.31$, *ns*.

A second moderated multiple regression was conducted with physical symptoms at Time 2 as the outcome variable and the predictors being the following Time 1 variables: physical symptoms, engagement in work, training days, and the interaction term between engagement in work and training days. The second section of Table 2 reveals that after controlling for physical symptoms at Time 1 and the other main effect predictors, the interaction term between engagement in work and training days was again highly significant. The interaction accounted for an additional 8% of the variance in physical symptoms at Time 2. The second graph in Figure 1 plots the interaction.

As seen in the graph, the results provide further support for the hypothesis that engagement in work would serve as a buffer against the adverse consequences of a high number of training days. Again, when training days at Time 1 were low, reported physical symptoms at Time 2 tended to be low, irrespective of engagement in work. However, when training days at Time 1 were high, those soldiers high in engagement reported fewer symptoms than did those soldiers low in engagement. This interpretation also is supported by simple slopes analyses. The slope relating engagement to physical symptoms was significant when training days were high, $t(170) = -2.67$, $p < .05$, but was not significant when training days were low, $t(170) = .09$, *ns*. Additional tests of simple slopes revealed that the slope relating training to well-being was not significant for those low, $t(170) = 1.26$, *ns*, or high, $t(170) = -1.34$, *ns*, in engagement.

Moderated Multiple Regression Tests: Work Hours at Time 1 as a Work Stressor

The two multiple regressions for work hours are presented in Table 3. Again, in each regression, the Time 1 outcome variable was entered into the regression equation, along with the individual predictors, before assessing the significance of the Engagement in Work × Work Hours interaction. As seen in Table 3, the interaction between engagement in work and work hours was marginally significant for well-being and highly significant

TABLE 3: Moderated Multiple Regressions of Work Hours at Time 1 and Engagement in Work at Time 1 as Predictors of the Outcome Measures

Predictor	*Unstandardized* B	SE	df	t *Value*	p *Value*
Outcome variable: Well-being at Time 2					
Intercept	1.522	.207	168	7.345	.000
Well-being (T1)	0.390	.088	168	4.427	.000
Work hours (T1)	–0.001	.011	168	–0.056	.956
Engagement in work (T1)	–0.063	.034	168	–1.831	.069
Work Hours × Engagement	–0.022	.013	168	–1.765	.079
Outcome variable: Physical symptoms at Time 2					
Intercept	0.468	.122	168	3.838	.000
Physical symptoms (T1)	0.705	.085	168	8.295	.000
Work hours (T1)	0.028	.053	168	2.272	.024
Engagement in work (T1)	–0.090	.036	168	–2.489	.014
Work Hours × Engagement	–0.065	.014	168	–4.690	.000

NOTE: T1 = Time 1.

for physical symptoms. The interaction accounted for 8% of the variance in physical symptoms.

The interaction for physical symptoms is presented in Figure 2 (the pattern for well-being was similar) and provides further support for engagement in work as a buffer against the negative effects of a high workload. When work hours at Time 1 were low, both those soldiers high and low in engagement in work reported low levels of physical symptoms at Time 2. However, when work hours were high at Time 1, those soldiers low in engagement in work reported more physical symptoms than those soldiers high in engagement in work, who did not show an increase in symptoms under high work hours. These interpretations also are supported through simple slopes analyses. The slope relating engagement to physical symptoms was significant when work hours were high, $t(168) = –5.18$, $p < .01$, but was not significant when work hours were low, $t(168) = 1.36$, *ns*. Further simple slope tests revealed that the slope relating work hours to physical health symptoms was significant for those low in engagement, $t(168) = 4.92$, $p < .01$, but was not significant for those high in engagement, $t(168) = –1.62$, *ns*.

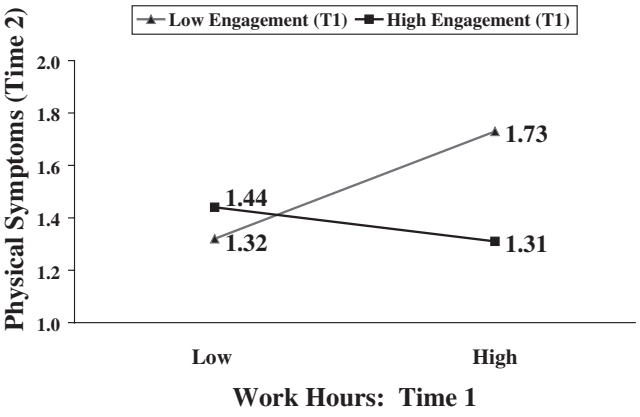

Figure 2 Engagement in work as a moderator of the relationship between work hours and physical symptoms.
NOTE: T1 = Time 1.

Moderated Multiple Regression Tests: Work Overload as a Work Stressor

We conducted the same analyses for work overload as were conducted for training days and work hours. As seen in Table 4, work overload interacted with engagement in work at Time 1 to predict variance in physical symptoms at Time 2 after controlling for physical symptoms at Time 1. The interaction accounted for 2.4% of the variance in physical symptoms. The interaction was not significant for well-being. The interaction for physical symptoms is depicted in Figure 3 and indicates a pattern opposite to that found with the work demands that did not impede job performance. For this stressor, engagement predicted physical symptoms only when work overload was low, $t(169) = –3.16$, $p < .01$. When work overload was high, those who were high in job engagement reported just as many physical symptoms as those low in job engagement, $t(169) = –.01$, *ns*. In addition, the results showed that the slope relating work overload to health symptoms was marginally significant for those highly engaged in their work, $t(169) = 1.95$, $p < .06$, but not for those disengaged from their work, $t(169) = –.80$, *ns*. These results indicate that engagement in work potentiated the relationship between work overload and physical symptoms for engaged individuals but not for disengaged individuals.

An Alternative Explanation for the Findings

The moderating effects revealed in the present results are hypothesized to be a function of personal engagement in the work domain. Prior cross-sectional research also has shown that confidence in unit functioning can buffer individuals from the negative effects of work stressors (Jex & Bliese, 1999). Given that we assessed per-

TABLE 4: Moderated Multiple Regressions of Work Overload at Time 1 and Engagement in Work at Time 1 as Predictors of the Outcome Measures

Predictor	*Unstandardized* B	SE	df	t *Value*	p *Value*
Outcome variable: Well-being at Time 2					
Intercept	1.659	.220	169	7.548	.000
Well-being (T1)	0.326	.093	169	3.495	.001
Work overload (T1)	–0.006	.034	169	–0.187	.852
Engagement in work (T1)	–0.059	.037	169	–1.607	.110
Work Overload × Engagement	0.037	.028	169	1.352	.178
Outcome variable: Physical symptoms at Time 2					
Intercept	0.480	.131	169	3.666	.000
Physical symptoms (T1)	0.679	.091	169	7.493	.000
Work overload (T1)	0.028	.039	169	0.718	.473
Engagement in work (T1)	–0.065	.042	169	–2.517	.013
Work Overload × Engagement	0.077	.032	169	2.433	.016

NOTE: T1 = Time 1.

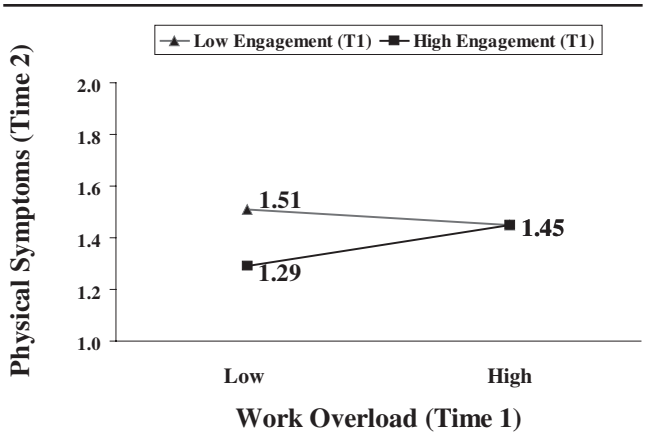

Figure 3 Engagement in work as a moderator of the relationship between work overload and physical symptoms.
NOTE: T1 = Time 1.

ceptions of unit functioning in the present research (e.g., "I have real confidence in my unit's ability to perform its mission"), we wanted to examine whether the buffering effects of self-engagement obtained in the present study remained when we controlled for the main effect of confidence in unit functioning at Time 1 and the interaction between each demand and confidence in unit functioning at Time 1.

Therefore, we first examined whether Time 1 confidence in unit functioning interacted with a work demand to predict a Time 2 health outcome. Results of these analyses revealed that confidence in unit functioning interacted with work hours to predict Time 2 physical symptoms, $t(168) = -3.01$, $p < .01$, and interacted with training days to predict Time 2 physical symptoms, $t(170) = -4.54$, $p < .001$. We then examined whether the previous interactions between engagement and the work demand would remain significant when controlling for confidence in unit functioning and the interaction between confidence in unit functioning and the work demand. The interaction between engagement and work hours remained a significant predictor of Time 2 physical symptoms, $t(166) = -3.58$, $p < .001$, and the interaction between engagement and training days remained a significant predictor of Time 2 physical symptoms, $t(168) = -2.732$, $p < .01$. Therefore, the results of the present study were not a function of unit confidence.

DISCUSSION

The results of the present research provide strong support for engagement as a moderator of the relationship between current stressors and future psychological and physical health. In addition, the results emphasize how the moderating influence of engagement differs depending on the performance-impeding nature of the stressor. In discussing the implications of the results, we first address engagement as a buffer against the effects of stressors that do not proximally impede performance. We then turn to the findings of engagement as a potentiator of the relationship between stressors that are likely to impede performance and future health. We then discuss the limitations of the research.

Engagement as a Moderator of Stressors That Do Not Impede Performance

The results indicated that engagement in work buffered soldiers from the effects of two demands relevant to their workload: training days and work hours. After controlling for the Time 1 measure of health, engagement interacted with the two measures of workload to predict well-being and physical symptom severity at Time 2. The pattern revealed in these interactions involved work hours and training days being related to later symptoms for individuals who were relatively disen-

gaged from their work, whereas no such relationship was observed for individuals engaged in their work. When soldiers reported working longer hours or spending more days training, those who were engaged in their work reported higher well-being and less physical symptom severity. The longitudinal nature of our design provided a strong test of the buffering effects for stressors that do not impede performance. The findings were obtained even after controlling for the appropriate Time 1 outcome measures, indicating that the interaction between engagement in work and objective measures of workload predicted changes in psychological and physical health.

Although the buffering effect of engagement for the relationship between work hours and well-being only approached significance, it is worth noting that soldiers reported their average work hours within the time span of the past week. We chose this time frame to facilitate a more accurate recall of work hours. Despite the fact that we did not ask about work hours over a longer period of time (e.g., 2 months), we still found evidence of the buffering effects of engagement for this measure of workload. It is also worth considering the extent to which work hours is a more controllable demand than training load; that is, soldiers may work more hours because they are being required to by their supervisors or because they are more motivated and want to spend more hours at work. Although both of these sources of variability are likely present, prior research has emphasized work hours as an externally imposed demand (Sparks et al., 1997). In addition, Bliese and Halverson (1996) found meaningful unit-level differences in work hours, indicating that to a certain extent individual reports of work hours are influenced by external demands that face the soldier's unit. Finally, the correlation between engagement in work and reported work hours was not significant in the present research, again arguing for reports of work hours reflecting more of an external influence.

These results also extend cross-sectional research with deployed soldiers by Britt and Bliese (2003), who found engagement in work worked as a buffer against the negative effects of subjective stressors on psychological health, where participants rated the degree to which various factors were causing them stress on the deployment. In the present research, we used more objective measures of stress, simply asking participants to report how many days they had spent training and how many hours they had worked per day. In the present research, we also showed the consequences of engagement in work for multiple outcome measures, including psychological and physical health. Finally, in the present research, we used a longitudinal design to provide more compelling evidence that possessing high engagement in work at an initial time period would protect individuals from the future negative effects of a high workload.

Given the demonstration of significant buffering effects for engagement in work in relationships to more objective indexes of workload, an important question to address is the reason for the effects. One distinct possibility is that individuals who are engaged in their jobs view the measures of workload examined in the present research in a much different manner than do those who are disengaged. Individuals who are highly engaged in a given domain are committed to successful performance and therefore should be drawn to experiences that allow superior performance to be achieved (Britt, 1999; Crocker & Wolfe, 2001). These highly engaged individuals may therefore perceive a higher number of training days and work hours as experiences that will allow them to perform better and may perceive such experiences as opportunities that they would pursue even if they were not imposed. Furthermore, individuals who are engaged in their jobs also have been found to derive more meaning from their work (Britt et al., 2001). Therefore, it may be the case that the more time highly engaged individuals spend training and working, the more meaning they will derive. Some support for these ideas can be found in the interesting trend for those highly engaged in their jobs to report better psychological and physical health at Time 2 when they were doing more training and working longer hours at Time 1.

Individuals who are low in engagement in work may perceive higher levels of workload as placing further demands on them to perform a job that they are already detached from. These individuals may approach a higher number of days training and higher working hours as taking time away from tasks in which they would rather be engaged and as being imposed on them and outside of their own control. Therefore, the greater the amount of training and the higher the number of work hours, the more they are doing a job that they really do not care about, leading to more negative outcomes at a future time period.

Engagement as a Moderator of Stressors That May Impede Performance

Although being highly engaged in work buffered individuals from the negative consequences of high levels of objective workload, results indicated that engagement did not buffer individuals from perceptions of work overload assessed at Time 1 and physical symptoms assessed at Time 2. Individuals who are personally engaged in a domain have their identity staked on successful performance and therefore care about doing well (Britt, 1999; Schlenker et al., 1994). Therefore, believing that one is overloaded with tasks and responsibilities should be especially troubling for highly engaged

individuals. The results indicated that only individuals highly engaged in work showed a positive relationship between being overloaded and physical symptoms assessed 3 months later.

Other areas of research have revealed conceptually similar findings. Jex and Adams (in press) examined the relationship between role stressors and job satisfaction as a function of job involvement (a construct similar to engagement in work) among nonfaculty employees of a medium-sized, Western university. These authors found that the relationships between role ambiguity (being unclear about what one was expected to do in one's job) and job satisfaction, and between role conflict and job satisfaction, were much stronger for employees reporting high job involvement. Individuals highly involved in their jobs reported much lower job satisfaction when these stressors were high and much higher job satisfaction when these stressors were low. Britt (1999) also found that engagement in work magnified the effects of perceived success or failure at work on measures of depression and stress so that whether individuals think they are doing well or poor at their job matters much more for individuals highly engaged in their job.

Self-Engagement as a Moderator of Different Stressors

To our knowledge, the present investigation is the first to find an identity moderator that buffers individuals from the negative consequences of certain types of stressors but potentiates the effects of other stressors. The present findings indicate the importance of considering the nature of the stressor in understanding whether identity-relevant motivation will protect individuals from the negative consequences of the stressor or exacerbate these consequences. The results of the present research indicate that whether engagement serves as a buffer or exacerbator of stressful conditions depends on the nature of the stressor under investigation. When the stressor is clearly performance impeding, engagement appears to potentiate the impact of the stressor. However, when the stressor being examined does not impede performance in the domain (i.e., when they are working longer hours or training for their job), individuals high in engagement, in part as a function of their high-level attention devoted to the mechanics of performing their job (see Csikszentmihalyi, 1990), are less affected by the stressor.

This unique pattern of moderating effects also helps to isolate the source of moderation as involving personal engagement in a particular domain rather than correlates of engagement such as ability or confidence. Confidence may serve as a buffer against work-related stressors that do not impede performance but would not be theoretically expected to potentiate the relationship between performance-impeding stressors and health outcomes. Finally, additional evidence for personal engagement in work as responsible for the pattern of findings was obtained in the analyses we conducted with confidence in unit functioning. The moderating effects of engagement in work remained even when controlling for soldiers' confidence in their unit functioning.

Limitations

The main limitation of the present research was the use of self-report measures to assess all of the constructs that were examined. Although this invites the criticism that a same-source bias may be operating in our results, we believe that the use of self-report was the most direct manner of assessing our variables of interest. Self-perceptions of stressors and outcomes have frequently been used in research on the relationship between stress and health (see, e.g., Beehr & Newman, 1978; Jex, 1998; McGrath, 1976). Also, in the present research, our measures of workload were assessed in both an objective and subjective manner—participants reported the number of days they spent training or the average number of hours they worked the previous week as well as indicated the subjective stressfulness of work overload and organizational constraints. Finally, we would argue that the method of assessing stress and health-related outcomes is not as critical as employing a longitudinal design to control for key variables at Time 1 in predicting Time 2 outcomes (see Spector et al., 2000). We feel it is unlikely that the theoretically predicted pattern of stress-buffering and stress-exacerbation found in the present research, obtained after controlling for Time 1 outcome measures, could be explained solely by confounds such as same-source bias.

A second limitation to address is the extent to which the results of the present study, found with U.S. Army soldiers, will generalize to individuals in other occupations and performance domains. Perhaps the aspect of the present study most unique to soldiers is the measure of days spent on training exercises, where military personnel must often spend weeks away from home. Training exercises are probably more different from their civilian equivalents because of the physical environment in which soldiers train. Of importance, some of the patterns in the present research are conceptually similar to those obtained with civilian individuals (Jex & Adams, in press).

Conclusions

In summary, the present research revealed that high levels of self-engagement in performance domains can buffer individuals from stressors that do not impede performance but may potentiate the effects of stressors that compromise performance. Future research on the role of identity in the stressor-strain relationship may eluci-

date how multiple aspects of identity influence how individuals respond to different types of stressors.

NOTE

1. Participants were only included if they were present at both time periods of data collection; 492 soldiers participated in the Time 1 data collection and 176 of these soldiers (36%) completed the Time 2 assessment. The main determinant of whether soldiers were included in the longitudinal sample was whether they were physically present in the unit at the Time 2 data collection. Many soldiers were either deployed, on training exercises, or had moved to a new duty station in between the Time 1 and Time 2 data collection periods. The longitudinal sample is similar to the Time 1 sample in terms of age, gender, ethnicity, and rank. In addition, we compared the longitudinal sample with the overall sample on the Time 1 measures. There were only small differences between the overall Time 1 sample and the longitudinal sample on work hours (M = 10.77 vs. 10.29, respectively), training days (M = 4.84 vs. 3.89), work overload (M = 3.01 vs. 3.08), well-being (M = 2.341 vs. 2.339), and physical symptoms (M = 1.389 vs. 1.3940).

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