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Running Head: THE IMPACT OF DEPLOYMENT

The Impact of Deployment Length and Deployment Experience
on the Wellbeing of Male and Female Military Personnel

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Abstract

The present study examines the effects of deployment history on the psychological health of male and female military personnel. Previous research has shown that deployment history may be a significant factor in understanding soldiers' psychological wellbeing while currently deployed. Male and female personnel (N= 12,336) re-deploying from the NATO mission in the former Yugoslavia (e.g. Hungary and Bosnia-Herzegovina) were assessed for symptoms of posttraumatic stress, depression, and alcohol problems. Personnel scoring above criteria on the psychological screen scales received an interview by mental health staff to determine referral need. There were no gender differences in exceeding criteria on the overall psychological screening scores. However, gender differences were evident in the nature of the relationship between deployment history and psychological wellbeing. For male soldiers, first time deployments and longer deployments were associated with an increase in exceeding criteria on one of the psychological screen scales. In contrast, women's overall screen rates remained relatively stable throughout the deployment regardless of how long they were deployed or whether they had been previously deployed. The findings suggest distinct gender differences in the impact of deployment history on soldier health under chronic moderate stress conditions.

The Impact of Deployment Length and Deployment Experience
on the Wellbeing of Male and Female Military Personnel

Increasingly, military personnel deploy on peacekeeping and humanitarian missions that entail multiple deployments to the same operational theater and deployments that last longer than 6 months (Castro & Adler, 1999). Understanding the effect of this high pace of deployment is critical for predicting soldier wellbeing and readiness given that deployments have been linked to significant psychological stressors (e.g., Bartone, Adler, & Vaitkus, 1998). Based on the literature reviewed below, two aspects of the pace of operations, previous deployment experience and the length of a deployment, emerge as potentially key deployment history variables. These two variables need to be studied in order to determine their relevance for predicting soldier wellbeing in a context of high deployment tempo.

There have been several peacekeeping studies that have examined the role of deployment history but few have specifically examined the experiences of female soldiers. The extent to which results based on studies of male soldiers apply to female soldiers is not certain. Similarly, the extent to which research on deployment history and combat missions applies to peacekeeping operations is also not clear (see Litz, 1996, for a discussion of this contrast). Thus, the literature offers suggestions for predicting the impact of deployment history but is restricted to combat missions and male soldiers.

Research has demonstrated that one aspect of deployment history, deployment length, significantly predicts soldier adjustment. Specifically, the Portuguese Army Centre of Applied Psychology examined the effects of deployment length during a peacekeeping mission (da Silva, Paiva, Elsa, Rodrigues & Ricardo, 1998). A Portuguese

military unit deployed to the peacekeeping operation in Bosnia-Herzegovina was administered the Symptom Check List (SCL-90) to measure psychological wellbeing. An analysis of the data indicated that at four months into the deployment soldiers were less distressed than at six months into the deployment. This study provides evidence for the negative impact of longer deployments on male soldiers deployed on peacekeeping missions.

In a study of U.S. soldiers, Ritzer, Campbell and Valentine (1999) examined the psychological and physical status of army personnel deployed to the Balkan region in support of Operation Joint Guard (OJG). Soldiers completed the Brief Symptoms Inventory (BSI) and a physical health symptoms checklist. Units that were deployed for the longest period of time reported more psychological distress and physical health symptoms than units deployed for shorter periods of time. Gender differences were not reported.

Taken together, these two peacekeeping studies support findings from combat studies that deployment length predicts greater psychological distress. Research with soldiers deployed on combat missions also finds that the longer the deployment, the more negatively soldiers are affected. In one study conducted with Vietnam veterans from New Zealand, Vincent, Chamberlain and Long (1994) investigated the effects of deployment length on male veterans. It was found that soldiers who were deployed to Vietnam for at least 19 months were more likely to be classified as having PTSD as measured by the Mississippi Scale than soldiers who were deployed for less than 19 months.

None of the three studies of deployment length cited above addressed outcomes with female soldiers. In the only study we found on female soldiers and deployment length, Pierce (1997) reported that two years after the Gulf War, female veterans' depression rates as measured by the Hopkins Symptoms Check List were not related to the length of their deployment.

Besides deployment length, another aspect of deployment history that should be assessed in order to analyze the impact of the high pace of deployments on soldier wellbeing is the number of times a soldier has been deployed. In a study of U.S. peacekeepers deployed to Bosnia, Ritzer et al. (1999) investigated the effects of multiple deployments. Ritzer and colleagues found that the number of deployments a soldier had experienced in the last three years was not predictive of psychological health as measured by the BSI. Again, gender differences were not reported.

In another study of the impact of multiple deployments, U.S. Army soldiers returning from the Balkans in support of NATO's Operation Allied Force, a mission in support of the air war against Serbia, were assessed for psychological symptoms (Martinez, Huffman, Adler & Castro, 2000). The study found that male and female soldiers with a history of prior peacekeeping deployment to the Balkans reported lower rates of psychological distress on measures of post-traumatic stress disorder, alcohol problems, and depression. This finding suggests a "stress inoculation effect" associated with deployment experience.

Two studies have examined the role of deployment experience on U.S. soldier adjustment following the Gulf War. McCarroll, Fagan, Hermsen, and Ursano (1997) compared the wellbeing of male U.S. service members who had served in both the

Persian Gulf War and in Vietnam with those personnel who served in the Persian Gulf War but not in Vietnam. McCarroll et al. reported that Gulf War veterans with Vietnam War experience were more likely to be diagnosed by a clinician as having posttraumatic stress disorder than soldiers who had no Vietnam war experience. Wolfe, Erickson, Sharkansky, King and King (1999) also surveyed Gulf War veterans and found that combat experience prior to the Gulf War predicted higher rates of post-traumatic stress disorder in the week after the soldiers returned to the U.S. The relationship between prior combat experience and post-traumatic stress disorder was significant for both male and female veterans, but there were only 10 female veterans in the sample with prior combat experience, making any definitive conclusions difficult.

Thus, in the case of combat veterans, deployment experience was associated with poorer adjustment to a deployment compared to those soldiers without prior combat experience. However, the other two studies cited above (Ritzer et al., 1999; Martinez, 2000) suggest the negative effect is not the case for prior peacekeeping deployments.

Overall, the data on deployment history indicate deployment length and experience are important variables to consider. However, while there is strong evidence for a deployment length effect for males, it is uncertain whether this effect applies to female soldiers. In addition, the evidence for a multiple deployment effect is equivocal; there is only preliminary support for the positive impact of deployment experience on soldier wellbeing, and the degree to which this applies to females as well as males is uncertain. The present study examines the effect of two aspects of peacekeeping deployment history (i.e. deployment length and previous deployments) on the psychological health of male and female military personnel. There are three hypotheses:

Hypothesis 1: For male soldiers, as deployment length increases psychological wellbeing decreases.

Hypothesis 2: For female soldiers, deployment length will not have an effect on psychological wellbeing.

Hypothesis 3: For both genders, deployment experience will be associated with increased psychological wellbeing.

Method

Participants

The overall sample included 12,336 U.S. soldiers deployed on a NATO peacekeeping mission to the Bosnia area of operations that included Hungary, Bosnia-Herzegovina and Croatia (September 1997 to October 1999). The sample included 85.1% male and 11.4% female soldiers. The largest ethnic group was white (60.3%), followed by African American (22.8%), Hispanic (9.3%) and other (7.7%). In terms of rank, 48.2% of the sample were junior-enlisted (E1 to E4) soldiers, 36.8% were non-commissioned officers (NCO; E5 to E9), and 15.0% were officers (O1 to O7). A total of 50.9% of the sample were married, 38.9% were single, 10.1% were separated or divorced, and 0.1% were widowed. In terms of the highest education level obtained, 35.6% were high school graduates, 49.3% had some college, and 19.4% had a college degree. In this sample of deployed soldiers, 19.1% had previous deployment experience; while this was the first deployment for 80.9% of the sample. There were significant gender differences for each of the demographic variables (Table 1). Male soldiers were significantly more likely than female soldiers to have previously deployed, to have higher rank, to be white, to be married, and to have only a high school education.

Procedures

Soldiers deployed to the Balkan region were administered a primary psychological screening survey within 30 days prior to redeploying back to their home station. The majority of these screenings occurred in groups of up to 100 soldiers. The surveys were hand scored on-site by medical personnel and mental health staff members briefly interviewed those soldiers scoring above specified criteria on the screening as part of a secondary screen. Based on the secondary screen interview, some military personnel were referred for follow-up mental health services. The data presented here are taken from the results of the primary screen.

Measures

The 2-page primary screening survey consisted of both demographic questions and three psychological symptom scales. Demographic questions included gender, rank and marital status. This page also included two questions concerning deployment history: 1) number of months on the deployment the soldier was just completing and 2) how many previous times the participant had been deployed to the Balkans.

The three psychological scales measured posttraumatic stress symptoms, depression and alcohol problems. The Post-Traumatic Stress Scale (Bartone, Vaitkus, & Adler, 1994; Castro, Adler & Huffman, 1999) measures post- traumatic stress symptoms that correspond to the symptom criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV; American Psychiatric Association, 1994). This instrument consists of a 17-item checklist with items that are rated on a 5-point scale (1="not at all," 2="rarely," 3="sometimes," 4="often," and 5="very often"). Some sample items include, "Had upsetting memories of the stressful event(s)", "Wasn't

interested in things that used to be important to me,” and “Had difficulty falling or staying asleep.” Those respondents who rated at least six symptoms as occurring often or very often were considered to have exceeded criteria and received a secondary screening interview. This cut-off is based on the DSM IV criteria for diagnosis that requires at least six symptoms. Unlike the DSM IV criteria, the six symptoms can occur in any particular subscales (i.e. arousal, intrusion and avoidance). In this sample, the internal consistency was high for both females and males (Cronbach’s $\alpha=.92$ and $.92$).

The Zung Self-rating Depression Scale (SDS; Zung, 1965), a 20-item scale, measures depressive symptoms. The items are rated on a 4-point scale (1=“a little of the time,” 2=“some of the time,” 3=“good part of the time,” and 4=“most of the time”) with a possible raw score of 20 to 80 points. The scale contains items requiring reverse scoring to reduce the influence of the acquiescence response set. Soldiers scoring above a raw score of 43 points were considered to have exceeded criteria and were interviewed as part of a secondary screen. This cut-off score is mid-way in the mild depression range as reported by Zung (1993). Additionally, personnel indicating agreement with the item “I feel that others would be better off if I were dead” also met cut-off criteria. The internal consistency for both females and males was high, Cronbach’s $\alpha=.85$ and $.84$, respectively.

A brief screen of potential alcohol problems, the CAGE Questionnaire (Ewing, 1984), is a 4-item scale that has “yes” or “no” response items. Examples of questions include, “Have you ever attempted to cut back on alcohol?” and “Have you ever been annoyed by comments made about your drinking?” Respondents exceeded criteria if they answered “yes” to two or more questions. In a study to evaluate the usefulness of the

CAGE Questionnaire, Mayfield, McLeod, and Hall (1974) found that a cut-off of 2 or more positive responses detected problem drinking. The internal consistency for this instrument while difficult to assess given the binary response options, was modest for both for females and males, Cronbach's $\alpha=.52$ and $.50$, respectively.

Results

In order to assess the impact of deployment history on soldier wellbeing, we first calculated the basic rates of exceeding criteria on the primary screen scales. We then examined the relationship between exceeding criteria on the primary screen and the two deployment history variables, deployment length and deployment experience using Chi Square statistics. Finally, we ran two logistic regression equations, one for each gender, to predict the impact of deployment history variables on the likelihood of exceeding primary screen criteria. The significance level was set at alpha less than $.05$.

Overall, 15.6% of the entire sample exceeded criteria on at least one of the scales, with 17.5% of females and 15.7% of males exceeding primary screen criteria. The overall rates exceeding criteria on the primary screen were not significantly different by gender, $\chi^2(x, N=11,849) = 11.47$. Specifically, 3.8% of the entire sample exceeded criteria on PTSD, 8.5% exceeded criteria on depression, and 7.1% exceed criteria on the alcohol problems scale.

Length of Deployment

The length of the deployment was associated with increased reports of psychological distress. Individuals who had been deployed longer were more likely to exceed criteria on at least one of the symptoms scales than individuals with shorter deployments, $\chi^2(4, N=12,230) = 61.12$. This pattern was similar for each of the three

individual scales, PTSD, $\chi^2(4, N=12,237) = 31.46$, depression, $\chi^2(4, N=12,237) = 50.01$, and alcohol problems, $\chi^2(4, N=12,234) = 11.47$.

As can be seen in Figure 1, male distress rates increased over time whereas female rates remained relatively stable. For male soldiers, there was a significant relationship between the number of months they were deployed and the rate of exceeding criteria on the primary screen, $\chi^2(4, N=10,415) = 69.83$. This relationship was not significant for female soldiers, $\chi^2(4, N=1,342) = 2.66$. At the three to four month range, female distress rates were higher than male rates. This trend reversed itself at nine to ten months with male rates of distress symptoms higher than females' rates. Table 2 shows male and female soldiers' rates of exceeding criteria for each scale. For male soldiers, the pattern was similar for each scale, PTSD, $\chi^2(4, N=10,421) = 38.47$, depression, $\chi^2(4, N=10,421) = 63.78$, and alcohol problems, $\chi^2(4, N=10,418) = 11.47$. There were no patterns for female soldiers for the different scales, PTSD, $\chi^2(4, N=1,343) = 2.60$, depression, $\chi^2(4, N=1,343) = 3.04$, ns, and alcohol problems, $\chi^2(4, N=1,343) = 4.91$.

Deployment Experience

In terms of previous deployment experience, soldiers who had been deployed to the Balkans before this current deployment were less likely to exceed criteria on the primary screen than soldiers who were on their first deployment (12.5% vs. 16.4%, respectively), $\chi^2(1, N=12,238) = 21.32$. Specifically, scores on the PTSD and depression scales were affected by first-time deployment status. Rates of exceeding criteria on the PTSD scale were significantly higher for personnel who were on their first deployment (4.1%) than those who had been deployed before (2.6%), $\chi^2(1, N=12,237) = 11.31$. Similarly, more of those who were on their first deployment exceeded depression criteria

(8.9%) than who had been deployed before (6.6%), $\chi^2(1, N=12,247) = 13.92$.

Deployment history had no effects on reported alcohol problems, $\chi^2(1, N=12,224) = 1.5$.

Similar to deployment length, previous deployment experience only impacted male soldiers' psychological wellbeing, $\chi^2(1, N=8,357) = 22.87$, (Figure 2). For male soldiers, 12.3% who had deployed before exceeded primary screen criteria compared to 16.5% who had not deployed before. Deployment history had no effect on female soldiers' psychological wellbeing, $\chi^2(1, N=1,342) = .23$. For female soldiers, rates of exceeding primary screen criteria were 16.3% for those who had previous deployment experience and 17.8% for those who had not deployed before.

Logistic Regression

To examine the role of gender and deployment history in predicting psychological wellbeing, defined as exceeding primary screen criteria vs. not exceeding primary screen criteria, we used Binary Logistic Regression. We chose this analysis because of the mix of continuous and categorical predictor variables and a categorical (dichotomous) dependent measure (Hosmer & Lemeshow, 1989). Using SPSS 10.0 (SPSS, Inc., 1999), separate analyses were run for the male and female soldiers. The independent variables of rank, length of deployment (in months), deployment experience, and the interaction of length of deployment and deployment experience were entered into an equation predicting individuals who exceeded primary screen criteria. Indicator contrast coding was used to dummy code the two categorical variables, rank and deployment experience.

The logistic regression analyses for both genders are presented in Table 3. We used two different estimates of probability. In the first analysis, we used a .5 estimate of probability, and in the second estimate, we set the value at .2. We chose this lower value

because previous findings on the deployment screening have ranged from 15.7% to 23.9%, yielding an average rate of about 20% of soldiers exceeding criteria on the primary screen (Martinez, et al., 2000) although the current study found the rate of those soldiers exceeding criteria on one of the screens was 15.6%. For females, rank was the only significant predictor of exceeding primary scale criteria Model χ^2 (5, N= 1,551) 11.97. With the estimate of probability at .5, respondents were correctly classified in terms of whether or not they exceeded criteria on any one of the three scales. We overpredicted those not exceeding criteria (100%), however, and underpredicted those exceeding criteria (0%). The second estimate of probability resulted in 57.1% of the sample being correctly classified (57.8% of those not exceeding criteria and 53.9% of those exceeding criteria). Revising the cut-point provided a better classification for the group of interest, those who exceeded criteria on the primary screen increasing their likelihood of correct classification from 0% to more than 50%. The results indicated that the lower the rank the more female soldiers are more likely to exceed criteria on one of the scales.

For males, rank, length of deployment and previous deployment experience were all significant in predicting male soldiers who exceeded criteria on the primary screen, Model χ^2 (5, N= 10,503) = 271.57. In the first estimate of probability (.5), 84.2% of respondents were correctly classified in terms of whether or not they would exceed criteria on the primary screen (100% of those not exceeding criteria and 0% of those exceeding criteria). Again, when the estimate of probability was set at .2, more accurate predictions were obtained for soldiers exceeding criteria. Overall, 67.6% were correctly classified (72.4% of those not exceeding criteria and 42.0% of those exceeding criteria).

If a male soldier did not have deployment experience, the odds of that soldier exceeding criteria increased by a factor of 1.6. The interaction term of deployment experience and deployment length did not predict psychological wellbeing.

Discussion

The current study used rank, length of deployment (in months) and number of previous deployments to predict the rate at which male and female soldiers exceed criteria on a primary psychological screen. As expected, deployment length was related to decreased wellbeing in male soldiers returning from a peacekeeping deployment. However, this effect was not found for female soldiers. The second deployment history variable, number of previous deployments, was again significantly related to psychological wellbeing for male soldiers but not for female soldiers. Interestingly, the interaction between deployment length and experience was not significant for either male or female soldiers, suggesting that deployment experience does not have a greater or lesser effect on soldier wellbeing based on the length of the current deployment. Although not one of the specific hypotheses in this study, rank was a strong predictor of exceeding primary screen criteria for both genders that the more junior-ranking soldiers were more likely to exceed criteria than more senior-ranking soldiers.

There was a clear divergence for male and female soldiers in terms of the relationship between deployment length and experience and psychological wellbeing. Male soldiers were negatively affected by peacekeeping missions that exceeded five months but were positively affected by having had previous peacekeeping experience. The findings for male soldiers are consistent with other peacekeeping research findings in which longer deployments are associated with increased symptomatology (e.g., da Silva

et al., 1998; Ritzer, et al., 1999). For female soldiers, the data did not show a relationship between rates of psychological distress and deployment length or experience. The lack of a deployment history effect for female soldiers is consistent with results from Pierce (1997) who also found that depression rates for female soldiers who served in the Gulf war were not related to deployment length.

Gender Differences in Deployment Length Effects

The General Adaptation Syndrome theory (GAS; Selye, 1976) is one theory that predicts the deployment length effect, at least for males. The GAS describes a series of phases through which an individual progresses (i.e. alarm, resistance, and exhaustion) in responding to stress. This model can be applied to the findings regarding male soldiers by suggesting that over the course of a long deployment, the ability of male soldiers to resist stress diminishes. For female soldiers, the GAS does not appear to easily describe their deployment experience but it is unclear why it would not. It may be gender differences in coping with stress account for the differences we found in the effect of deployment length.

According to the “fight-or-flight” model of stress adaptation (cited in Taylor et al., 2000), individuals respond to stressors by assessing the threat and then either “attacking” the stressor or escaping it. This coping style may leave the individual exhausted after dealing with a stressor over a long period of time (i.e. the “exhaustion” phase of the GAS). While this may describe how men respond to stressors at the behavioral level, one promising new area of research, the “tend-and-befriend” model by Taylor and colleagues (2000), presents an alternative to the “fight-or-flight” model for women. In the “tend-and-befriend” model, which is rooted in biobehavioral research on

attachment theory and the neuroendocrine system, women are described as coping with stressors by actively seeking social support. This emphasis on social support as a key stress response for women is often missing from the traditional “fight-or-flight” research which has been largely based on men. This alternative model may lead to a clearer understanding of the stress response of female soldiers that will provide a framework from which to view our results. It may well be that the coping strategy of females, the seeking of social support, does not help them deal with stressors in a relatively short deployment, but does protect them from chronic stressors inherent in a long deployment. In contrast, the coping strategy of male soldiers appears to protect them from the stressors in a short deployment, but does not appear to help deal with stressors in a deployment that lasts more than six months.

We do not have enough information to state unequivocally why we found gender effects in the deployment length effect. There has been a dearth of research on women and military deployments, and even less research on the occupational stress of peacekeeping missions on women. In the development of the Women’s Wartime Stressor Scale, Wolfe, Brown, Furey, and Levin (1993) reported that female military personnel perceive stressors differently than do their male counterparts. Yet the degree to which there are gender differences in coping with these military stressors has not been directly addressed.

Nonmilitary occupational health literature supports the contention that women perceive stressors differently than men (e.g., Spielberger & Reheiser, 1994). Yet, there is also evidence the gender differences in stressor perception may be overestimated (e.g., Murphy, Beaton, Cain, & Pike, 1994). There is similar disagreement in the field about

gender differences in coping styles. For example, Lutzky and Knight (1994) and Soderstrom, Dolbier, Leiferman, and Steinhardt (2000) found gender differences in coping styles but other researchers did not (e.g., Hamilton & Fagot, 1988). In terms of reactions to stressors, there are also inconsistent findings regarding gender differences. Some research has found stress responses to be similar (e.g., Spielberger & Reheiser, 1994), whereas other research has found gender differences in responses to stressors (e.g., Jick & Mitz, 1985). Clearly, the field is divided on the issue of gender differences in stressor perception, coping, and stress response.

Perhaps the inconsistent results reported in other studies are a function of the duration of the stressor. Studies of the effects of acute vs. chronic stressors have also found that stressor duration accounts for differences in both coping style and adjustment (e.g. Harnish, Aseltine, & Gore, 2000). Results from our study indicate that psychological assessments at the end of three to four months of deployment resulted in female soldiers reporting greater distress than males, at the end of five to eight months of deployment resulted in no gender differences in wellbeing, and at the end of nine or more months of deployment male soldiers exceeding female soldiers in their reports of psychological distress. Our findings suggest that gender differences in coping depend on the duration of a particular stressor.

The current finding that deployment experience had a positive effect for male soldiers is consistent with Martinez et al. (2000) who found previous deployment to the same region was associated with better outcomes for soldiers in a non-peacekeeping role. The finding differs, however, from results with soldiers who had prior combat experience (e.g., McCarroll et al., 1997). Our findings on positive effects of deployment experience

for male soldiers are also inconsistent with those from the Ritzer et al. (1999) study, which found no effect of previous deployment experience on psychological outcomes. The difference between our findings and those from the Ritzer et al. study may be explained by how deployment experience is defined and calculated. We defined it as experience with deployments to the Balkan region (i.e. a similar peacekeeping deployment), whereas Ritzer et al. defined it as any type of previous deployment. In addition, we calculated deployment experience as a dichotomous variable (no experience vs. experience), whereas Ritzer et al. used a continuous measure of the number of previous deployments. It may well be that deployment experience has a positive effect on male soldiers when the experience is obtained in a non-combat mission and is similar to the deployment being studied, but that the deployment experience effect for male soldiers is not cumulative. That is, there may not be added gains from subsequent deployment experience beyond the first deployment.

Solomon (1993) suggests that deployment experience may immunize soldiers from the stress of future deployment through the development of coping strategies and appropriate expectations. It may be that having experienced one previous deployment is enough to make male soldiers more familiar and comfortable with a subsequent peacekeeping deployment than they would have been otherwise. This increased comfort may not, however, apply to all deployment situations. Extreme stressors, such as those experienced in combat, may not lead to better adaptation to subsequent combat or to very different types of deployment (e.g., Wolfe et al., 1999). Why these trends are not found with the sample of female soldiers is not clear.

Future Research

Deployment history can be analyzed at a very detailed level. In our study, the deployment history variables are relatively simple. A follow-up study could ask soldiers to specify the exact type of previous deployments, the length of each of these previous deployments, and the extent to which these previous deployments are similar to the current deployment. In addition, the degree to which the deployed environment is physically comfortable and has garrison amenities (e.g., showers, heat, shopping facilities) may also have an impact on the role of deployment history variables. As is suggested by the evidence from combat and peacekeeping studies, the type of deployment may also be crucial in understanding the beneficial effects of deployment history. Experience in a peacekeeping mission may aid soldiers, yet it may not help them cope in a future combat mission. The positive effect of previous deployment experience may only be apparent in comparable missions. Studying other missions may lead to a different pattern of psychological results based on exposure to more intense peacekeeping missions.

It would also be helpful to understand the limits to the positive effect of deployment history. The study's survey only allowed for soldiers to report their deployment length from one to ten months so we do not know what the pattern of effect is for deployments that last longer than 10 months. It would be interesting to see if psychological wellbeing continues to decrease as the deployment time increases and at what point the effect ceases or is altered. The same is true for multiple deployments. Although second deployments appear to be beneficial to wellbeing, it may well be that incessant repeated deployments on the same operation begin to take a toll on a soldier's wellbeing.

The findings from the present study suggest that shorter deployments and deployment experience benefit male soldiers on peacekeeping operations. These same deployment history variables are not predictive of female soldier adjustment to the same operations. Future research needs to examine factors that may account for this gender difference. Promising areas of investigation include gender differences in the experience of deployment stressors and gender differences in coping style. These two factors may provide an explanation for why it is that deployment length and experience are predictive of the psychological wellbeing of male soldiers and not female soldiers. Although the effect of deployment history may only be true for the peacekeeping mission in the Balkans, it is important to understand the nature and mechanisms behind such an effect in order to predict optimal soldier readiness in other deployed environments.

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Table 1

Demographics by Gender

	Gender	
	Female n=1355 (11.4%)	Male n=10503 (88.6%)
Deployment Length (mean in months)	5.6	5.7
Deployment History*		
Previously Deployed	227 (14.6)	2813 (21.3)
Never Deployed	1327 (88.7)	10415 (78.7)
Rank**		
Enlisted (E1-E4)	921 (60.2)	6662 (50.8)
NCOs (E5-E9)	431 (28.2)	4609 (35.2)
Officers	179 (11.7)	1832 (14.0)
Race/ethnicity**		
White	627 (46.4)	6446 (61.9)
African American	480 (35.6)	2224 (21.3)
Hispanic	111 (8.2)	965 (9.3)
Other	132 (9.8)	782 (7.5)
Marital Status ¹ **		
Single	789 (51.3)	5169 (39.3)
Married	471 (30.6)	6937 (52.7)
Separated/Divorced	277 (18.0)	1052 (8.0)
Education**		
High School/GED	328 (32.3)	3605 (38.7)
Some College	546 (53.8)	4404 (47.2)
College Graduate	140 (13.8)	1316 (14.1)

Note. Values enclosed in parentheses represent percentages.

¹Percentages do not equal 100% because widowed soldiers were not included (n=13).

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

Table 2
Length of Deployment and Percent Exceeding Criteria by Gender

	Deployment Length (in months)				
	1 – 2	3 – 4	5 – 6	7 – 8	9+
PTSD					
Female	7.0	5.4	5.7	5.3	8.7
Male*	3.1	2.0	2.8	4.5	5.2
Depression					
Female	10.5	14.5	11.1	13.5	10.1
Male*	6.4	5.0	7.2	8.8	11.8
Alcohol Problems					
Female	5.8	3.7	6.3	4.3	2.2
Male*	6.4	6.3	7.6	7.4	9.1

* $p < .05$

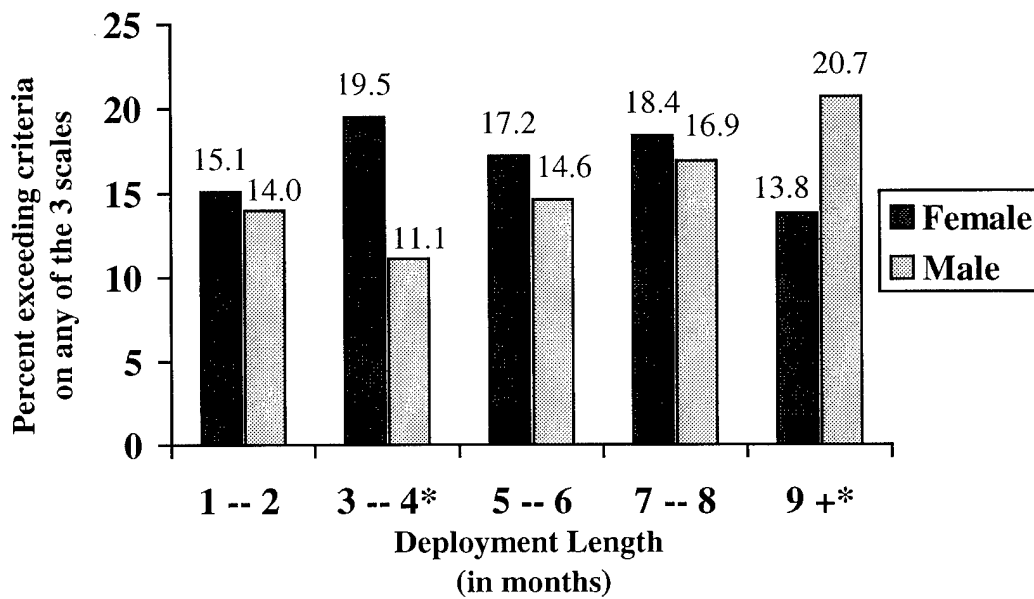
Table 3

Logistic Regression Analysis of Exceeding Criteria on one of the Three Scales

Variable	Regression Coefficient (β)		SE	
	Female	Male	Female	Male
Deployment Length	.02	.15**	.09	.04
No Deployment History	.48	.49*	.54	.21
Deployment Length x				
No Deployment History	-.06	-.06	.10	.03
Rank				
Enlisted (E1-E4)	.63*	1.3**	.26	.11
NCOs (E5-E9)	.25	.80**	.28	.11
Officers				
Constant	-2.17**	-3.64**	.52	.21

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

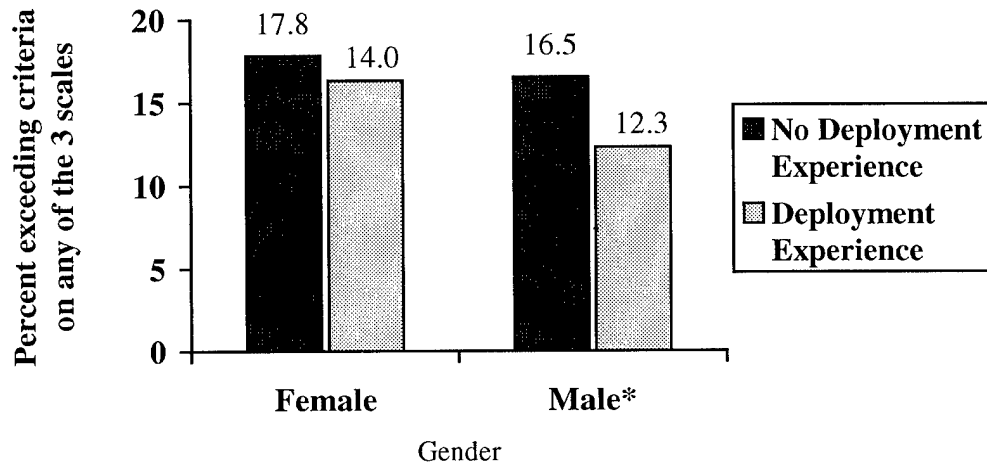
Figure 1. Descriptive Statistics of Deployment Length and Percent Exceeding Criteria on any of the Three Scales by Gender.



Note. In order to isolate each individual Deployment Length time period, Fischer's Exact Tests were run on each time period to compare wellbeing by gender.

* $p < .05$

Figure 2. Descriptive Statistics of Deployment Experience and Percent Exceeding Criteria on any of the Three Scales by Gender.



*p<.05

Running Head: THE IMPACT OF DEPLOYMENT

The Impact of Deployment Length and Deployment Experience
on the Wellbeing of Male and Female Military Personnel

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Abstract

The present study examines the effects of deployment history on the psychological health of male and female military personnel. Previous research has shown that deployment history may be a significant factor in understanding soldiers' psychological wellbeing while currently deployed. Male and female personnel (N= 12,336) re-deploying from the NATO mission in the former Yugoslavia (e.g. Hungary and Bosnia-Herzegovina) were assessed for symptoms of posttraumatic stress, depression, and alcohol problems. Personnel scoring above criteria on the psychological screen scales received an interview by mental health staff to determine referral need. There were no gender differences in exceeding criteria on the overall psychological screening scores. However, gender differences were evident in the nature of the relationship between deployment history and psychological wellbeing. For male soldiers, first time deployments and longer deployments were associated with an increase in exceeding criteria on one of the psychological screen scales. In contrast, women's overall screen rates remained relatively stable throughout the deployment regardless of how long they were deployed or whether they had been previously deployed. The findings suggest distinct gender differences in the impact of deployment history on soldier health under chronic moderate stress conditions.

The Impact of Deployment Length and Deployment Experience
on the Wellbeing of Male and Female Military Personnel

Increasingly, military personnel deploy on peacekeeping and humanitarian missions that entail multiple deployments to the same operational theater and deployments that last longer than 6 months (Castro & Adler, 1999). Understanding the effect of this high pace of deployment is critical for predicting soldier wellbeing and readiness given that deployments have been linked to significant psychological stressors (e.g., Bartone, Adler, & Vaitkus, 1998). Based on the literature reviewed below, two aspects of the pace of operations, previous deployment experience and the length of a deployment, emerge as potentially key deployment history variables. These two variables need to be studied in order to determine their relevance for predicting soldier wellbeing in a context of high deployment tempo.

There have been several peacekeeping studies that have examined the role of deployment history but few have specifically examined the experiences of female soldiers. The extent to which results based on studies of male soldiers apply to female soldiers is not certain. Similarly, the extent to which research on deployment history and combat missions applies to peacekeeping operations is also not clear (see Litz, 1996, for a discussion of this contrast). Thus, the literature offers suggestions for predicting the impact of deployment history but is restricted to combat missions and male soldiers.

Research has demonstrated that one aspect of deployment history, deployment length, significantly predicts soldier adjustment. Specifically, the Portuguese Army Centre of Applied Psychology examined the effects of deployment length during a peacekeeping mission (da Silva, Paiva, Elsa, Rodrigues & Ricardo, 1998). A Portuguese

military unit deployed to the peacekeeping operation in Bosnia-Herzegovina was administered the Symptom Check List (SCL-90) to measure psychological wellbeing. An analysis of the data indicated that at four months into the deployment soldiers were less distressed than at six months into the deployment. This study provides evidence for the negative impact of longer deployments on male soldiers deployed on peacekeeping missions.

In a study of U.S. soldiers, Ritzer, Campbell and Valentine (1999) examined the psychological and physical status of army personnel deployed to the Balkan region in support of Operation Joint Guard (OJG). Soldiers completed the Brief Symptoms Inventory (BSI) and a physical health symptoms checklist. Units that were deployed for the longest period of time reported more psychological distress and physical health symptoms than units deployed for shorter periods of time. Gender differences were not reported.

Taken together, these two peacekeeping studies support findings from combat studies that deployment length predicts greater psychological distress. Research with soldiers deployed on combat missions also finds that the longer the deployment, the more negatively soldiers are affected. In one study conducted with Vietnam veterans from New Zealand, Vincent, Chamberlain and Long (1994) investigated the effects of deployment length on male veterans. It was found that soldiers who were deployed to Vietnam for at least 19 months were more likely to be classified as having PTSD as measured by the Mississippi Scale than soldiers who were deployed for less than 19 months.

None of the three studies of deployment length cited above addressed outcomes with female soldiers. In the only study we found on female soldiers and deployment length, Pierce (1997) reported that two years after the Gulf War, female veterans' depression rates as measured by the Hopkins Symptoms Check List were not related to the length of their deployment.

Besides deployment length, another aspect of deployment history that should be assessed in order to analyze the impact of the high pace of deployments on soldier wellbeing is the number of times a soldier has been deployed. In a study of U.S. peacekeepers deployed to Bosnia, Ritzer et al. (1999) investigated the effects of multiple deployments. Ritzer and colleagues found that the number of deployments a soldier had experienced in the last three years was not predictive of psychological health as measured by the BSI. Again, gender differences were not reported.

In another study of the impact of multiple deployments, U.S. Army soldiers returning from the Balkans in support of NATO's Operation Allied Force, a mission in support of the air war against Serbia, were assessed for psychological symptoms (Martinez, Huffman, Adler & Castro, 2000). The study found that male and female soldiers with a history of prior peacekeeping deployment to the Balkans reported lower rates of psychological distress on measures of post-traumatic stress disorder, alcohol problems, and depression. This finding suggests a "stress inoculation effect" associated with deployment experience.

Two studies have examined the role of deployment experience on U.S. soldier adjustment following the Gulf War. McCarroll, Fagan, Hermsen, and Ursano (1997) compared the wellbeing of male U.S. service members who had served in both the

Persian Gulf War and in Vietnam with those personnel who served in the Persian Gulf War but not in Vietnam. McCarroll et al. reported that Gulf War veterans with Vietnam War experience were more likely to be diagnosed by a clinician as having posttraumatic stress disorder than soldiers who had no Vietnam war experience. Wolfe, Erickson, Sharkansky, King and King (1999) also surveyed Gulf War veterans and found that combat experience prior to the Gulf War predicted higher rates of post-traumatic stress disorder in the week after the soldiers returned to the U.S. The relationship between prior combat experience and post-traumatic stress disorder was significant for both male and female veterans, but there were only 10 female veterans in the sample with prior combat experience, making any definitive conclusions difficult.

Thus, in the case of combat veterans, deployment experience was associated with poorer adjustment to a deployment compared to those soldiers without prior combat experience. However, the other two studies cited above (Ritzer et al., 1999; Martinez, 2000) suggest the negative effect is not the case for prior peacekeeping deployments.

Overall, the data on deployment history indicate deployment length and experience are important variables to consider. However, while there is strong evidence for a deployment length effect for males, it is uncertain whether this effect applies to female soldiers. In addition, the evidence for a multiple deployment effect is equivocal; there is only preliminary support for the positive impact of deployment experience on soldier wellbeing, and the degree to which this applies to females as well as males is uncertain. The present study examines the effect of two aspects of peacekeeping deployment history (i.e. deployment length and previous deployments) on the psychological health of male and female military personnel. There are three hypotheses:

Hypothesis 1: For male soldiers, as deployment length increases psychological wellbeing decreases.

Hypothesis 2: For female soldiers, deployment length will not have an effect on psychological wellbeing.

Hypothesis 3: For both genders, deployment experience will be associated with increased psychological wellbeing.

Method

Participants

The overall sample included 12,336 U.S. soldiers deployed on a NATO peacekeeping mission to the Bosnia area of operations that included Hungary, Bosnia-Herzegovina and Croatia (September 1997 to October 1999). The sample included 85.1% male and 11.4% female soldiers. The largest ethnic group was white (60.3%), followed by African American (22.8%), Hispanic (9.3%) and other (7.7%). In terms of rank, 48.2% of the sample were junior-enlisted (E1 to E4) soldiers, 36.8% were non-commissioned officers (NCO; E5 to E9), and 15.0% were officers (O1 to O7). A total of 50.9% of the sample were married, 38.9% were single, 10.1% were separated or divorced, and 0.1% were widowed. In terms of the highest education level obtained, 35.6% were high school graduates, 49.3% had some college, and 19.4% had a college degree. In this sample of deployed soldiers, 19.1% had previous deployment experience; while this was the first deployment for 80.9% of the sample. There were significant gender differences for each of the demographic variables (Table 1). Male soldiers were significantly more likely than female soldiers to have previously deployed, to have higher rank, to be white, to be married, and to have only a high school education.

Procedures

Soldiers deployed to the Balkan region were administered a primary psychological screening survey within 30 days prior to redeploying back to their home station. The majority of these screenings occurred in groups of up to 100 soldiers. The surveys were hand scored on-site by medical personnel and mental health staff members briefly interviewed those soldiers scoring above specified criteria on the screening as part of a secondary screen. Based on the secondary screen interview, some military personnel were referred for follow-up mental health services. The data presented here are taken from the results of the primary screen.

Measures

The 2-page primary screening survey consisted of both demographic questions and three psychological symptom scales. Demographic questions included gender, rank and marital status. This page also included two questions concerning deployment history: 1) number of months on the deployment the soldier was just completing and 2) how many previous times the participant had been deployed to the Balkans.

The three psychological scales measured posttraumatic stress symptoms, depression and alcohol problems. The Post-Traumatic Stress Scale (Bartone, Vaitkus, & Adler, 1994; Castro, Adler & Huffman, 1999) measures post-traumatic stress symptoms that correspond to the symptom criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV; American Psychiatric Association, 1994). This instrument consists of a 17-item checklist with items that are rated on a 5-point scale (1="not at all," 2="rarely," 3="sometimes," 4="often," and 5="very often"). Some sample items include, "Had upsetting memories of the stressful event(s)", "Wasn't

interested in things that used to be important to me,” and “Had difficulty falling or staying asleep.” Those respondents who rated at least six symptoms as occurring often or very often were considered to have exceeded criteria and received a secondary screening interview. This cut-off is based on the DSM IV criteria for diagnosis that requires at least six symptoms. Unlike the DSM IV criteria, the six symptoms can occur in any particular subscales (i.e. arousal, intrusion and avoidance). In this sample, the internal consistency was high for both females and males (Cronbach’s $\alpha=.92$ and $.92$).

The Zung Self-rating Depression Scale (SDS; Zung, 1965), a 20-item scale, measures depressive symptoms. The items are rated on a 4-point scale (1=“a little of the time,” 2=“some of the time,” 3=“good part of the time,” and 4=“most of the time”) with a possible raw score of 20 to 80 points. The scale contains items requiring reverse scoring to reduce the influence of the acquiescence response set. Soldiers scoring above a raw score of 43 points were considered to have exceeded criteria and were interviewed as part of a secondary screen. This cut-off score is mid-way in the mild depression range as reported by Zung (1993). Additionally, personnel indicating agreement with the item “I feel that others would be better off if I were dead” also met cut-off criteria. The internal consistency for both females and males was high, Cronbach’s $\alpha=.85$ and $.84$, respectively.

A brief screen of potential alcohol problems, the CAGE Questionnaire (Ewing, 1984), is a 4-item scale that has “yes” or “no” response items. Examples of questions include, “Have you ever attempted to cut back on alcohol?” and “Have you ever been annoyed by comments made about your drinking?” Respondents exceeded criteria if they answered “yes” to two or more questions. In a study to evaluate the usefulness of the

CAGE Questionnaire, Mayfield, McLeod, and Hall (1974) found that a cut-off of 2 or more positive responses detected problem drinking. The internal consistency for this instrument while difficult to assess given the binary response options, was modest for both for females and males, Cronbach's $\alpha=.52$ and $.50$, respectively.

Results

In order to assess the impact of deployment history on soldier wellbeing, we first calculated the basic rates of exceeding criteria on the primary screen scales. We then examined the relationship between exceeding criteria on the primary screen and the two deployment history variables, deployment length and deployment experience using Chi Square statistics. Finally, we ran two logistic regression equations, one for each gender, to predict the impact of deployment history variables on the likelihood of exceeding primary screen criteria. The significance level was set at alpha less than $.05$.

Overall, 15.6% of the entire sample exceeded criteria on at least one of the scales, with 17.5% of females and 15.7% of males exceeding primary screen criteria. The overall rates exceeding criteria on the primary screen were not significantly different by gender, $\chi^2(x, N=11,849) = 11.47$. Specifically, 3.8% of the entire sample exceeded criteria on PTSD, 8.5% exceeded criteria on depression, and 7.1% exceed criteria on the alcohol problems scale.

Length of Deployment

The length of the deployment was associated with increased reports of psychological distress. Individuals who had been deployed longer were more likely to exceed criteria on at least one of the symptoms scales than individuals with shorter deployments, $\chi^2(4, N=12,230) = 61.12$. This pattern was similar for each of the three

individual scales, PTSD, $\chi^2(4, N=12,237) = 31.46$, depression, $\chi^2(4, N=12,237) = 50.01$, and alcohol problems, $\chi^2(4, N=12,234) = 11.47$.

As can be seen in Figure 1, male distress rates increased over time whereas female rates remained relatively stable. For male soldiers, there was a significant relationship between the number of months they were deployed and the rate of exceeding criteria on the primary screen, $\chi^2(4, N=10,415) = 69.83$. This relationship was not significant for female soldiers, $\chi^2(4, N=1,342) = 2.66$. At the three to four month range, female distress rates were higher than male rates. This trend reversed itself at nine to ten months with male rates of distress symptoms higher than females' rates. Table 2 shows male and female soldiers' rates of exceeding criteria for each scale. For male soldiers, the pattern was similar for each scale, PTSD, $\chi^2(4, N=10,421) = 38.47$, depression, $\chi^2(4, N=10,421) = 63.78$, and alcohol problems, $\chi^2(4, N=10,418) = 11.47$. There were no patterns for female soldiers for the different scales, PTSD, $\chi^2(4, N=1,343) = 2.60$, depression, $\chi^2(4, N=1,343) = 3.04$, *ns*, and alcohol problems, $\chi^2(4, N=1,343) = 4.91$.

Deployment Experience

In terms of previous deployment experience, soldiers who had been deployed to the Balkans before this current deployment were less likely to exceed criteria on the primary screen than soldiers who were on their first deployment (12.5% vs. 16.4%, respectively), $\chi^2(1, N=12,238) = 21.32$. Specifically, scores on the PTSD and depression scales were affected by first-time deployment status. Rates of exceeding criteria on the PTSD scale were significantly higher for personnel who were on their first deployment (4.1%) than those who had been deployed before (2.6%), $\chi^2(1, N=12,237) = 11.31$. Similarly, more of those who were on their first deployment exceeded depression criteria

(8.9%) than who had been deployed before (6.6%), $\chi^2(1, N=12,247) = 13.92$.

Deployment history had no effects on reported alcohol problems, $\chi^2(1, N=12,224) = 1.5$.

Similar to deployment length, previous deployment experience only impacted male soldiers' psychological wellbeing, $\chi^2(1, N=8,357) = 22.87$, (Figure 2). For male soldiers, 12.3% who had deployed before exceeded primary screen criteria compared to 16.5% who had not deployed before. Deployment history had no effect on female soldiers' psychological wellbeing, $\chi^2(1, N=1,342) = .23$. For female soldiers, rates of exceeding primary screen criteria were 16.3% for those who had previous deployment experience and 17.8% for those who had not deployed before.

Logistic Regression

To examine the role of gender and deployment history in predicting psychological wellbeing, defined as exceeding primary screen criteria vs. not exceeding primary screen criteria, we used Binary Logistic Regression. We chose this analysis because of the mix of continuous and categorical predictor variables and a categorical (dichotomous) dependent measure (Hosmer & Lemeshow, 1989). Using SPSS 10.0 (SPSS, Inc., 1999), separate analyses were run for the male and female soldiers. The independent variables of rank, length of deployment (in months), deployment experience, and the interaction of length of deployment and deployment experience were entered into an equation predicting individuals who exceeded primary screen criteria. Indicator contrast coding was used to dummy code the two categorical variables, rank and deployment experience.

The logistic regression analyses for both genders are presented in Table 3. We used two different estimates of probability. In the first analysis, we used a .5 estimate of probability, and in the second estimate, we set the value at .2. We chose this lower value

because previous findings on the deployment screening have ranged from 15.7% to 23.9%, yielding an average rate of about 20% of soldiers exceeding criteria on the primary screen (Martinez, et al., 2000) although the current study found the rate of those soldiers exceeding criteria on one of the screens was 15.6%. For females, rank was the only significant predictor of exceeding primary scale criteria Model χ^2 (5, N= 1,551) 11.97. With the estimate of probability at .5, respondents were correctly classified in terms of whether or not they exceeded criteria on any one of the three scales. We overpredicted those not exceeding criteria (100%), however, and underpredicted those exceeding criteria (0%). The second estimate of probability resulted in 57.1% of the sample being correctly classified (57.8% of those not exceeding criteria and 53.9% of those exceeding criteria). Revising the cut-point provided a better classification for the group of interest, those who exceeded criteria on the primary screen increasing their likelihood of correct classification from 0% to more than 50%. The results indicated that the lower the rank the more female soldiers are more likely to exceed criteria on one of the scales.

For males, rank, length of deployment and previous deployment experience were all significant in predicting male soldiers who exceeded criteria on the primary screen, Model χ^2 (5, N= 10,503) = 271.57. In the first estimate of probability (.5), 84.2% of respondents were correctly classified in terms of whether or not they would exceed criteria on the primary screen (100% of those not exceeding criteria and 0% of those exceeding criteria). Again, when the estimate of probability was set at .2, more accurate predictions were obtained for soldiers exceeding criteria. Overall, 67.6% were correctly classified (72.4% of those not exceeding criteria and 42.0% of those exceeding criteria).

If a male soldier did not have deployment experience, the odds of that soldier exceeding criteria increased by a factor of 1.6. The interaction term of deployment experience and deployment length did not predict psychological wellbeing.

Discussion

The current study used rank, length of deployment (in months) and number of previous deployments to predict the rate at which male and female soldiers exceed criteria on a primary psychological screen. As expected, deployment length was related to decreased wellbeing in male soldiers returning from a peacekeeping deployment. However, this effect was not found for female soldiers. The second deployment history variable, number of previous deployments, was again significantly related to psychological wellbeing for male soldiers but not for female soldiers. Interestingly, the interaction between deployment length and experience was not significant for either male or female soldiers, suggesting that deployment experience does not have a greater or lesser effect on soldier wellbeing based on the length of the current deployment. Although not one of the specific hypotheses in this study, rank was a strong predictor of exceeding primary screen criteria for both genders that the more junior-ranking soldiers were more likely to exceed criteria than more senior-ranking soldiers.

There was a clear divergence for male and female soldiers in terms of the relationship between deployment length and experience and psychological wellbeing. Male soldiers were negatively affected by peacekeeping missions that exceeded five months but were positively affected by having had previous peacekeeping experience. The findings for male soldiers are consistent with other peacekeeping research findings in which longer deployments are associated with increased symptomatology (e.g., da Silva

et al., 1998; Ritzer, et al., 1999). For female soldiers, the data did not show a relationship between rates of psychological distress and deployment length or experience. The lack of a deployment history effect for female soldiers is consistent with results from Pierce (1997) who also found that depression rates for female soldiers who served in the Gulf war were not related to deployment length.

Gender Differences in Deployment Length Effects

The General Adaptation Syndrome theory (GAS; Selye, 1976) is one theory that predicts the deployment length effect, at least for males. The GAS describes a series of phases through which an individual progresses (i.e. alarm, resistance, and exhaustion) in responding to stress. This model can be applied to the findings regarding male soldiers by suggesting that over the course of a long deployment, the ability of male soldiers to resist stress diminishes. For female soldiers, the GAS does not appear to easily describe their deployment experience but it is unclear why it would not. It may be gender differences in coping with stress account for the differences we found in the effect of deployment length.

According to the “fight-or-flight” model of stress adaptation (cited in Taylor et al., 2000), individuals respond to stressors by assessing the threat and then either “attacking” the stressor or escaping it. This coping style may leave the individual exhausted after dealing with a stressor over a long period of time (i.e. the “exhaustion” phase of the GAS). While this may describe how men respond to stressors at the behavioral level, one promising new area of research, the “tend-and-befriend” model by Taylor and colleagues (2000), presents an alternative to the “fight-or-flight” model for women. In the “tend-and-befriend” model, which is rooted in biobehavioral research on

attachment theory and the neuroendocrine system, women are described as coping with stressors by actively seeking social support. This emphasis on social support as a key stress response for women is often missing from the traditional “fight-or-flight” research which has been largely based on men. This alternative model may lead to a clearer understanding of the stress response of female soldiers that will provide a framework from which to view our results. It may well be that the coping strategy of females, the seeking of social support, does not help them deal with stressors in a relatively short deployment, but does protect them from chronic stressors inherent in a long deployment. In contrast, the coping strategy of male soldiers appears to protect them from the stressors in a short deployment, but does not appear to help deal with stressors in a deployment that lasts more than six months.

We do not have enough information to state unequivocally why we found gender effects in the deployment length effect. There has been a dearth of research on women and military deployments, and even less research on the occupational stress of peacekeeping missions on women. In the development of the Women’s Wartime Stressor Scale, Wolfe, Brown, Furey, and Levin (1993) reported that female military personnel perceive stressors differently than do their male counterparts. Yet the degree to which there are gender differences in coping with these military stressors has not been directly addressed.

Nonmilitary occupational health literature supports the contention that women perceive stressors differently than men (e.g., Spielberger & Reheiser, 1994). Yet, there is also evidence the gender differences in stressor perception may be overestimated (e.g., Murphy, Beaton, Cain, & Pike, 1994). There is similar disagreement in the field about

gender differences in coping styles. For example, Lutzky and Knight (1994) and Soderstrom, Dolbier, Leiferman, and Steinhardt (2000) found gender differences in coping styles but other researchers did not (e.g., Hamilton & Fagot, 1988). In terms of reactions to stressors, there are also inconsistent findings regarding gender differences. Some research has found stress responses to be similar (e.g., Spielberger & Reheiser, 1994), whereas other research has found gender differences in responses to stressors (e.g., Jick & Mitz, 1985). Clearly, the field is divided on the issue of gender differences in stressor perception, coping, and stress response.

Perhaps the inconsistent results reported in other studies are a function of the duration of the stressor. Studies of the effects of acute vs. chronic stressors have also found that stressor duration accounts for differences in both coping style and adjustment (e.g. Harnish, Aseltine, & Gore, 2000). Results from our study indicate that psychological assessments at the end of three to four months of deployment resulted in female soldiers reporting greater distress than males, at the end of five to eight months of deployment resulted in no gender differences in wellbeing, and at the end of nine or more months of deployment male soldiers exceeding female soldiers in their reports of psychological distress. Our findings suggest that gender differences in coping depend on the duration of a particular stressor.

The current finding that deployment experience had a positive effect for male soldiers is consistent with Martinez et al. (2000) who found previous deployment to the same region was associated with better outcomes for soldiers in a non-peacekeeping role. The finding differs, however, from results with soldiers who had prior combat experience (e.g., McCarroll et al., 1997). Our findings on positive effects of deployment experience

for male soldiers are also inconsistent with those from the Ritzer et al. (1999) study, which found no effect of previous deployment experience on psychological outcomes. The difference between our findings and those from the Ritzer et al. study may be explained by how deployment experience is defined and calculated. We defined it as experience with deployments to the Balkan region (i.e. a similar peacekeeping deployment), whereas Ritzer et al. defined it as any type of previous deployment. In addition, we calculated deployment experience as a dichotomous variable (no experience vs. experience), whereas Ritzer et al. used a continuous measure of the number of previous deployments. It may well be that deployment experience has a positive effect on male soldiers when the experience is obtained in a non-combat mission and is similar to the deployment being studied, but that the deployment experience effect for male soldiers is not cumulative. That is, there may not be added gains from subsequent deployment experience beyond the first deployment.

Solomon (1993) suggests that deployment experience may immunize soldiers from the stress of future deployment through the development of coping strategies and appropriate expectations. It may be that having experienced one previous deployment is enough to make male soldiers more familiar and comfortable with a subsequent peacekeeping deployment than they would have been otherwise. This increased comfort may not, however, apply to all deployment situations. Extreme stressors, such as those experienced in combat, may not lead to better adaptation to subsequent combat or to very different types of deployment (e.g., Wolfe et al., 1999). Why these trends are not found with the sample of female soldiers is not clear.

Future Research

Deployment history can be analyzed at a very detailed level. In our study, the deployment history variables are relatively simple. A follow-up study could ask soldiers to specify the exact type of previous deployments, the length of each of these previous deployments, and the extent to which these previous deployments are similar to the current deployment. In addition, the degree to which the deployed environment is physically comfortable and has garrison amenities (e.g., showers, heat, shopping facilities) may also have an impact on the role of deployment history variables. As is suggested by the evidence from combat and peacekeeping studies, the type of deployment may also be crucial in understanding the beneficial effects of deployment history. Experience in a peacekeeping mission may aid soldiers, yet it may not help them cope in a future combat mission. The positive effect of previous deployment experience may only be apparent in comparable missions. Studying other missions may lead to a different pattern of psychological results based on exposure to more intense peacekeeping missions.

It would also be helpful to understand the limits to the positive effect of deployment history. The study's survey only allowed for soldiers to report their deployment length from one to ten months so we do not know what the pattern of effect is for deployments that last longer than 10 months. It would be interesting to see if psychological wellbeing continues to decrease as the deployment time increases and at what point the effect ceases or is altered. The same is true for multiple deployments. Although second deployments appear to be beneficial to wellbeing, it may well be that incessant repeated deployments on the same operation begin to take a toll on a soldier's wellbeing.

The findings from the present study suggest that shorter deployments and deployment experience benefit male soldiers on peacekeeping operations. These same deployment history variables are not predictive of female soldier adjustment to the same operations. Future research needs to examine factors that may account for this gender difference. Promising areas of investigation include gender differences in the experience of deployment stressors and gender differences in coping style. These two factors may provide an explanation for why it is that deployment length and experience are predictive of the psychological wellbeing of male soldiers and not female soldiers. Although the effect of deployment history may only be true for the peacekeeping mission in the Balkans, it is important to understand the nature and mechanisms behind such an effect in order to predict optimal soldier readiness in other deployed environments.

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Table 1

Demographics by Gender

	Gender	
	Female n=1355 (11.4%)	Male n=10503 (88.6%)
Deployment Length (mean in months)	5.6	5.7
Deployment History*		
Previously Deployed	227 (14.6)	2813 (21.3)
Never Deployed	1327 (88.7)	10415 (78.7)
Rank**		
Enlisted (E1-E4)	921 (60.2)	6662 (50.8)
NCOs (E5-E9)	431 (28.2)	4609 (35.2)
Officers	179 (11.7)	1832 (14.0)
Race/ethnicity**		
White	627 (46.4)	6446 (61.9)
African American	480 (35.6)	2224 (21.3)
Hispanic	111 (8.2)	965 (9.3)
Other	132 (9.8)	782 (7.5)
Marital Status ¹ **		
Single	789 (51.3)	5169 (39.3)
Married	471 (30.6)	6937 (52.7)
Separated/Divorced	277 (18.0)	1052 (8.0)
Education**		
High School/GED	328 (32.3)	3605 (38.7)
Some College	546 (53.8)	4404 (47.2)
College Graduate	140 (13.8)	1316 (14.1)

Note. Values enclosed in parentheses represent percentages.

¹Percentages do not equal 100% because widowed soldiers were not included (n=13).

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

Table 2
Length of Deployment and Percent Exceeding Criteria by Gender

	Deployment Length (in months)				
	1 – 2	3 – 4	5 – 6	7 – 8	9+
PTSD					
Female	7.0	5.4	5.7	5.3	8.7
Male*	3.1	2.0	2.8	4.5	5.2
Depression					
Female	10.5	14.5	11.1	13.5	10.1
Male*	6.4	5.0	7.2	8.8	11.8
Alcohol Problems					
Female	5.8	3.7	6.3	4.3	2.2
Male*	6.4	6.3	7.6	7.4	9.1

* $p < .05$

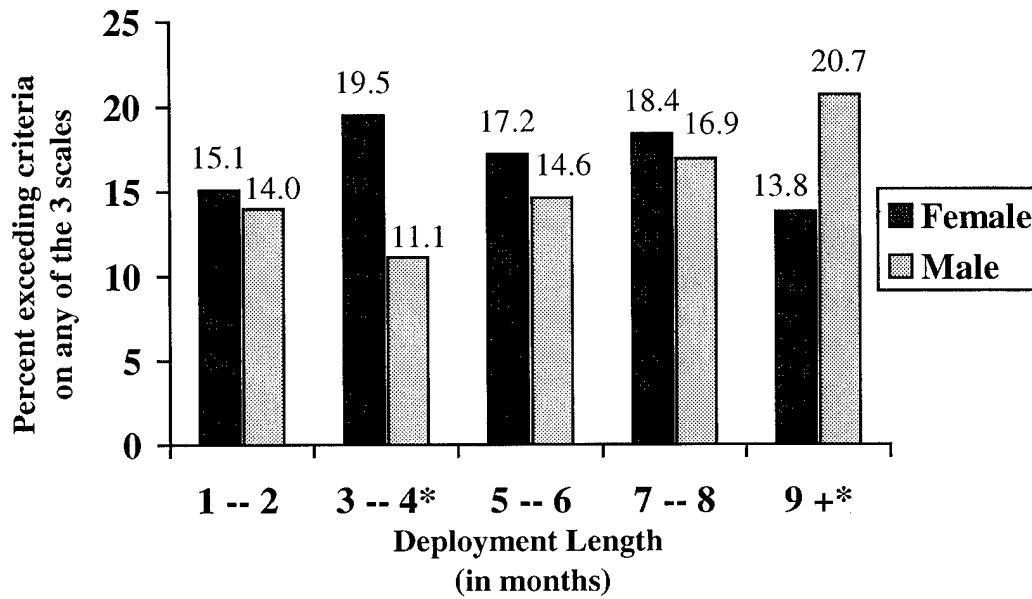
Table 3

Logistic Regression Analysis of Exceeding Criteria on one of the Three Scales

Variable	Regression Coefficient (β)		SE	
	Female	Male	Female	Male
Deployment Length	.02	.15**	.09	.04
No Deployment History	.48	.49*	.54	.21
Deployment Length x				
No Deployment History	-.06	-.06	.10	.03
Rank				
Enlisted (E1-E4)	.63*	1.3**	.26	.11
NCOs (E5-E9)	.25	.80**	.28	.11
Officers				
Constant	-2.17**	-3.64**	.52	.21

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

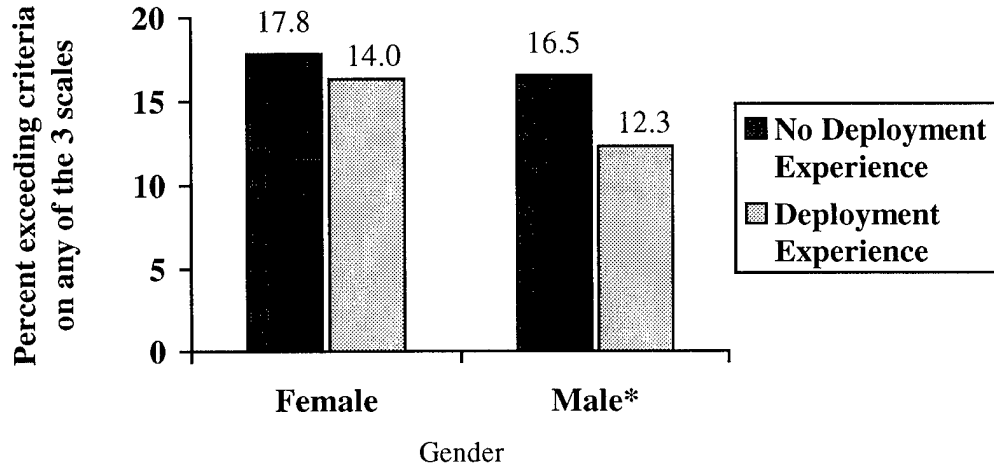
Figure 1. Descriptive Statistics of Deployment Length and Percent Exceeding Criteria on any of the Three Scales by Gender.



Note. In order to isolate each individual Deployment Length time period, Fischer's Exact Tests were run on each time period to compare wellbeing by gender.

* $p < .05$

Figure 2. Descriptive Statistics of Deployment Experience and Percent Exceeding Criteria on any of the Three Scales by Gender.



*p<.05