CAREGIVER BURDEN IN SPOUSES OF NATIONAL GUARD/RESERVE SERVICE MEMBERS DEPLOYED DURING OPERATIONS ENDURING AND IRAQI FREEDOM

by

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ABSTRACT

Spouses of combat veterans with posttraumatic stress disorder have elevated psychological distress, some of which has been explained by increased caregiver burden. However, there is very little knowledge regarding intraindividual characteristics of these spouses that may be related to their burden. The current study examined caregiver burden in a sample of 102 spouses of reserve component troops deployed during Operation Enduring Freedom/Operation Iraqi Freedom. Despite similar patterns of associations with spousal traits, factor analyses revealed that items related to burden and distress each loaded onto distinct factors, suggesting that they measure unique experiences. Burden did, however, fully mediate the relation between service members' distress and spouses' distress. Levels of burden were directly related to spouses' neuroticism and emotion-focused coping, and marginally related to lower levels of self-efficacy and perceived support from partners, although none of these factors were significant in a regression of burden that included service members' distress. Finally, problem-focused coping moderated the relation between service members' distress and spouses' burden, with the association weakening as spouses endorsed higher amounts of these coping processes. These results suggest that spouses' burden is primarily related to the degree of distress in service members, but the promotion of adaptive coping styles in spouses may help mitigate this link.

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INTRODUCTION

Combat-related posttraumatic stress disorder (PTSD) has been found to be strongly related to familial discord and spousal distress (e.g., Beckham, Lytle, & Feldman, 1996; Calhoun, Beckham, & Bosworth, 2002; Dekel, Solomon, & Bleich, 2005; Jordan et al., 1992; Manguno-Mire et al., 2007). Although several veteran characteristics have been found to be associated with spousal distress (Beckham et al., 1996; Calhoun et al., 2002; Evans, McHugh, Hopwood, & Watt, 2003; Galovski & Lyons, 2004; Riggs, Byrne, Weathers, & Litz, 1998), characteristics of the spouses/caregivers have received far less attention.

One exception is the construct of caregiver burden, which can be broadly defined as the impact that caregiving roles and tasks have upon aspects of caretakers' lives. Areas of one's life that are most typically influenced include physical and psychological health, finances, social life, and quality of interpersonal interactions (Zarit, Reever, & Bach-Peterson, 1980; Zarit, Todd, & Zarit, 1986). Recently, research has begun to focus on burden in partners of Vietnam veterans with PTSD (Beckham et al., 1996; Calhoun et al., 2002; Manguno-Mire et al., 2007), with an additional study of partners of Israeli veterans with PTSD (Dekel et al., 2005). These investigations have consistently indicated that these partners report higher levels of burden and psychological distress than control groups, and that levels of burden are positively associated with partners' overall distress. Furthermore, Dekel and colleagues (2005) found that burden partially or fully mediated

the relations of veterans' psychological distress and level of functioning with spouses' psychological distress and martial adjustment, a finding that has been replicated in caregivers of individuals with other mental or medical illnesses (Minnes, Woodford, & Passey, 2007; Noh & Turner, 1987). No research to date, however, has examined these issues in spouses of service members deployed to recent military operations, such as Operation Enduring Freedom (OEF; operations in Afghanistan) or Operation Iraqi Freedom (OIF; operations in Iraq).

Additionally, our current understanding of contributors to burden is limited to factors concerning the affected veterans or patients, such as their symptom severity and level of functioning. It is likely that characteristics unique to partners themselves account for much of the variation in reports of caregiver burden, but the only investigation to look at spousal characteristics associated with burden in a combat-related PTSD population remained largely focused on spouses' perceptions of veterans' experiences (Manguno-Mire et al., 2007). Furthermore, the sample consisted of spouses of veterans of the Vietnam War who were already receiving treatment for clinical levels of PTSD. It is unclear whether spouses of recently returned service members who may or may not be in treatment would be similar.

Finally, although the cumulative results of prior investigations provide strong evidence for the impact of caregiver burden and the variables related to it, the operationalization of this construct has not always been clear or consistent. Investigators have assessed caregiver burden by (a) calculating an overall score of how burdened the individual feels (e.g., Beckham et al., 1996; Calhoun et al., 2002; Dekel et al., 2005; Manguno-Mire et al., 2007; Majerovitz, 2007), (b) separating burden into objective and

subjective domains (e.g., Biegel, Ishler, Katz, & Johnson, 2007; Jeglic et al., 2005; Magliano et al., 1998), or (c) including items directly questioning how distressed (e.g., embarrassed, angry, strained, upset) caregivers feel because of the care recipients or their caregiving responsibilities (e.g., Montgomery, Gonyea, & Hooyman, 1985; Novak & Guest, 1989; Zarit et al., 1980, 1986). In particular, the inclusion of distress-related items creates the possibility that the associations detected between burden and distress are tautological. Initial investigations into the distinctiveness of burden and psychological distress have been mixed, with some research finding differences between their patterns of correlates (Brannan & Heflinger, 2001; Manguno-Mire et al., 2007) but other research revealing large overlaps in these two constructs (Jeglic et al., 2005; Stommel, Given, & Given, 1990). Therefore, additional research is needed to thoroughly tease apart these concepts.

With these limitations in mind, the current investigation had multiple aims. First, we examined the distinctiveness of burden and distress in spouses of combat veterans to determine whether a measure of overall burden was (a) unitary and (b) distinct from measures of psychological distress. Second, we aimed to extend prior findings regarding burden to a sample of spouses of National Guard/Reserve (NG/R) service members who had been deployed since September 11, 2001. This is a unique population, in that the OEF/OIF era is one of the first times in which NG/R service members were deployed to such combat-heavy locations (Renshaw, Rodrigues, & Jones, 2009), and these individuals may be more vulnerable to the development of PTSD and other postdeployment difficulties than their active duty counterparts (Milliken, Auchterlonie, & Hoge, 2007). In addition, these deployments were much more recent than those from the Vietnam era,

allowing us to determine whether similar patterns of relationships would be detected in this new population. Third, we included individuals with both clinical and nonclinical levels of symptoms and assessed a wide range of symptoms beyond PTSD, to provide a broader examination of spouses' experience of burden. Finally, we examined spousal characteristics in relation to levels of self-reported burden. Based on prior research with relatives of individuals with other mental or physical disorders (Biegel et al., 2007; Chang, Brecht, & Carter, 2001; Magliano et al., 1998; Majerovitz, 2007; McDonell, Short, Berry, & Dyck, 2003; Moller-Leimkuhler, 2005, 2006; Solomon & Draine, 1995; Vitaliano, Russo, Young, Teri, & Maiuro, 1991), we hypothesized that lower levels of perceived self-efficacy, social support, and problem-focused coping, and higher levels of emotion-focused coping and neuroticism in spouses would be related to greater perceived burden. We also examined these characteristics as potential moderators of the association between veterans' psychological distress and spouses' burden.

METHOD

Participants

A total of 102 White, male NG/R service members, who had been deployed overseas since the beginning of OEF in 2001, and their White, female spouses/partners completed measures relevant to this investigation. There were an additional 14 non-White spouses who completed relevant measures; however analyses indicated that these individuals reported higher levels of burden ($F[1, 127] = 10.27, p < .01$) and psychological distress ($F[1, 116] = 7.28, p < .01$). Due to this difference and the low numbers of non-Caucasian spouses in the sample, which rendered us unable to adequately control for this variable, only the 102 Caucasian couples were included in analyses.

Service members' ages ranged from 20 to 54 ($M = 33.69$, $SD = 7.61$). Less than one percent of service members did not earn a high school degree, 22.5% had a high school degree or GED, 44.1% had some college experience or an associate's degree, and 32.4% had a bachelor's degree or higher. A total of 80.4% of service members deployed to Iraq, 4.9% deployed to Afghanistan, 9.8% to other locations in the Middle East, and 4.9% deployed to non-Middle East locations.

Partners' ages ranged from 18 to 50 ($M = 31.24$, $SD = 7.17$). Nearly six percent of partners did not earn a high school degree, 19.6% had a high school degree or GED, 50.0% had some college experience or an associate's degree, and 24.5% had a bachelor's

degree or higher. Ninety-eight percent of the couples were married, and the mean length of marriage was 9.64 years (SD = 7.31).

Measures

The *Burden Interview* (BI; Zarit et al., 1980, 1986) is a 22-item, Likert-type, self-report measure that was completed by spouses of service members and was intended to assess levels of caregiving burden. The BI was originally developed for use with family caregivers of elderly or disabled individuals, but it has been adapted for use in a combat veteran population (Beckham et al., 1996; Calhoun et al., 2002; Manguno-Mire et al., 2007). Items are comprised of feelings and beliefs about the patient and the overall impact that caregiving has had on the caregiver. Respondents are asked how often they experience the feelings listed, on a scale from 0 (*never*) to 4 (*nearly always*). Item responses are summed, and total scores range from 0 to 88, with higher scores representing higher levels of burden. This measure has been shown to have strong test-retest reliability, internal consistency, and convergent and divergent validity (Gallagher et al., 1985; Hebert, Bravo, & Preville, 2000). Internal consistency in our sample was strong (Cronbach's α = .91).

The *PTSD Checklist* (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) is a widely used and well-validated measure of PTSD symptoms. The PCL is a 17-item, Likert-type, self-report scale intended to assess the 17 criteria for PTSD outlined in the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV; American Psychiatric Association, 1994). Participants are asked to respond to the questions in regard to the past month. There are two versions of the PCL, one for military personnel (PCL-M) and another for civilians (PCL-C). In this sample, service members

completed the PCL-M in regard to their military service, and spouses completed the PCL-C in regard to hearing about stressful military experiences from their spouses.

Response options range from 1 (*not at all*) to 5 (*extremely*) and are summed to calculate a total score. The original authors recommended a total scale score of 50 as a cutoff for probable PTSD in a military population, with a cutoff score of 44 for civilian populations. However, more recent investigations that have employed Receiver Operating Characteristics methodology have indicated that a cutoff of 35 is optimal for estimates of possible PTSD in military populations (Bliese et al., 2008), and a cutoff of 30 is optimal for civilian women (Walker, Newman, Dobie, Ciechanowski, & Katon, 2002). In addition to score cutoffs, Weathers and colleagues (1993) suggested that scores of 3 or more on any given item can be considered an endorsement of that particular PTSD symptom, allowing researchers to estimate a diagnosis of PTSD based on the total number of PTSD criteria met within each of the three DSM symptom clusters. Weathers and colleagues suggest using a combination of this method and the score cutoff to determine the probable presence or absence of PTSD. Both versions of the PCL demonstrate adequate internal consistency, test-retest reliability, and convergent validity with other widely used measures of PTSD (Norris & Hamblen, 2003; Ruggiero, Del Ben, Scotti, & Rabalais, 2003). Internal consistencies of this measure in our sample were adequate, with Cronbach's alphas of .95 for the PCL-M and .87 for the PCL-C.

The *Depression Anxiety Stress Scale* (DASS; Lovibond & Lovibond, 1995) is a 42-item, Likert-type, self-report measure of depression, anxiety, and stress that was completed by both service members and spouses. Participants are asked to indicate how much each statement applied over the past week, on a scale from 0 (*did not apply to me*

at all) to 3 (*applied to me very much* or *most of the time*). The three subscales have shown good test-retest reliability, convergent and divergent validity, and internal consistency (Antony, Bieling, Cox, Enns, & Swinson, 1998). Only the depression (DASS-D) and anxiety (DASS-A) subscales were used in this investigation. Cronbach's alphas for service members in our sample were .94 for both of these subscales, and .93 and .88, respectively, for spouses.

The *Aggression Questionnaire* (AQ; Buss & Perry, 1992) is a 29-item, Likert-type, self-report measure intended to assess overall aggression and was completed by both service members and spouses. Response choices range from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*), and items are summed together to create a total score. Buss and Perry found adequate internal consistency, test-retest reliability, convergent validity, and divergent validity for the total scale. Internal consistencies in our sample were also adequate, with Cronbach's alphas for service members and spouses equal to .90 and .86, respectively.

The *General Self-Efficacy Scale* (GSES; Schwarzer & Jerusalem, 1995) was completed by spouses and is a 10-item, Likert-type, self-report measure of beliefs about one's capability to deal with common life demands. Response choices range from 1 (*not at all true*) to 4 (*exactly true*), and total scores range from 10 to 40, with higher scores indicating a stronger level of self-efficacy. Research has indicated that this measure is unidimensional, with high internal consistency and adequate test-retest reliability (Scholz, Dona, Sud, & Schwarzer, 2002; Schroder, Schwarzer, & Konertz, 1998). Internal consistency for this measure in our sample was strong (Cronbach's $\alpha = .90$).

The *Multidimensional Scale of Perceived Social Support* (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) was developed to assess perceptions of social support adequacy from three domains: family, friends, and significant others. This measure was completed by spouses and is a 12-item, Likert-type, self-report scale with response options ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*) on items assessing levels and quality of social support. Zimet and colleagues found excellent internal consistency and test-retest reliabilities both for the overall scale and the family, friends, and significant other subscales. Internal consistency in our sample for the MSPSS total scale and subscales were also strong ($.91 \leq \alpha \leq .96$).

The *Big Five Inventory* (BFI; John, Donahue, & Kentle, 1991) was completed by spouses and is a 44-item, Likert-type, self-report measure developed to assess five factors of personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. This inventory lists a number of phrases describing personality characteristics and asks respondents to indicate how strongly the features apply to them, from 1 (*disagree strongly*) to 5 (*agree strongly*). Each item loads onto a particular personality factor, and specific items are summed to get a total score for each factor. Internal consistency of the overall BFI and its subscales are quite high (John & Srivastava, 1999). Furthermore, John and Srivastava found excellent test-retest reliability (Cronbach's $\alpha = .85$), corrected pairwise convergent validities with the NEO-FFI ($r = .92$; Costa & McCrae, 1992) and Trait Descriptive Adjectives ($r = .95$; Goldberg, 1992), and good divergent validity amongst the BFI factors ($r < .33$). Only the neuroticism subscale was analyzed in this investigation, and internal consistency for this subscale in our sample was adequate (Cronbach's $\alpha = .80$).

The *Ways of Coping Questionnaire - Revised* (WOC; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) was completed by spouses and is a 66-item, Likert-type, self-report measure developed to assess strategies for dealing with stressful situations. Spouses in this investigation were asked to rate how often they used specific coping techniques to handle difficulties encountered after service members' deployments. Response options range from 0 (*not used*) to 3 (*used a great deal*). Items on this measure address levels of problem-focused coping and emotion-focused coping. The subscales have been found to have adequate internal consistencies and split half reliabilities (Folkman et al., 1986; Weyers, Ising, Reuter, & Janke, 2005; Ising, Weyers, Reuter, Janke, 2006). Parker, Endler, and Bagby (1993) and Tennen and Herzberger (1985) recommended that researchers perform factor analyses within each sample to determine the relevant structure of the WOC for that sample. A principal components analysis with varimax rotation conducted within our sample of spouses revealed a two-factor solution, with 19 and 18 items mapping onto emotion-focused and problem-focused coping processes, respectively (all factor loadings $\geq$.40). Internal consistencies in our sample were adequate for both of these subscales (Cronbach's αs = .85).

Procedures

All procedures were approved by the University of Utah Institutional Review Board and the Utah NG Judge Advocate General. Service members and partners were recruited for participation during government-funded marriage education workshops offered to all Utah NG/R members. All participants completed written, informed consent prior to participating, and partners were requested to complete the questionnaires independently from one another to prevent biased or inaccurate responses. Participants

either returned their completed packets at the end of the weekend-long workshop or were provided postage to mail them back when finished, at which point they were reimbursed $10 per person.

Analytic Plan

To explore the factorial nature of the BI and the distinctions and overlaps between the BI and the measures of psychological distress, principal components analyses with varimax rotation were conducted first on items from the BI alone, and then on those items together with items from the depression and anxiety subscales of the DASS. In addition, the correlations of relevant variables (e.g., self-efficacy, social support, coping styles, neuroticism) with burden were statistically compared to correlations of the same variables with depression and anxiety, using the formulas provided by Steiger (1980).

Subsequently, bivariate correlations were utilized to evaluate the associations between service members' distress, spouses' distress, and spouses' burden. Presuming significant associations among these measures, Baron & Kenny's (1986) three-step regression analysis was conducted to evaluate burden as a mediating factor in the association between veterans' and spouses' psychological distress.

Finally, bivariate correlations were used to examine the associations of spouses' burden with their levels of self-efficacy, social support, coping styles, and neuroticism. Further, interaction terms of these potential correlates with service members' psychological symptoms were created and included in a series of regressions of caregiver burden to test for the moderations proposed. Each potential moderator was examined independently to conserve power, which is inherently low for the detection of significant interactions in regression (although this is the recommended approach for detecting

moderation; see Stone-Romero & Anderson, 1994). Follow-up analyses of significant interactions were conducted as recommended by Aiken and West (1991).

RESULTS

Means and standard deviations on all measures of psychological distress and burden are reported in Table 1. A total of 13.9% of service members in the sample endorsed the specified number of DSM-IV-TR criteria on the PCL-M at a moderate level or greater, and 9.9% met or exceeded the cutoff score of 50 for probable PTSD (all of whom met the combination of both the required cutoff and number of criteria for probable PTSD). Using the more recently recommended criterion, 23.5% of service members in this sample met or exceeded a total score of 35 on this measure. Similarly, 22.5% of service members endorsed at least mild symptoms of depression on the DASS-D, and 21.4% endorsed at least mild symptoms of anxiety on the DASS-A. Finally, 9.8% of service members exceeded one standard deviation above the norm for aggression on the total score of the AQ (Buss & Perry, 1992), but no service members exceeded this norm by two standard deviations.

Only two percent of spouses met the earlier designated PCL-C cutoff of 44 for probable PTSD, and only 1% endorsed the required number of DSM-IV-TR criteria at a moderate level or greater. No spouses met the combined criteria for probable PTSD. Using the less conservative recommended criterion for civilian women, however, 18.6% of spouses met or exceeded a total score of 30 on this measure. Further, 21.4% and 15.0% of spouses endorsed at least mild symptoms of depression and anxiety on the DASS-D and DASS-A, respectively. Finally, a total of 2.9% of spouses exceeded one standard

Table 1

Means, Standard Deviations, and Intercorrelations of Service Members' Distress, Spouses' Distress, and Burden

	M	*SD*	1	2	3	4	5	6	7	8
1. Spouse Burden	17.76	11.77								
2. SMSR PTSD	29.25	12.53	.27**							
3. SMSR Depression	5.22	7.15	.31**	.69***						
4. SMSR Anxiety	4.35	6.61	.30**	.70***	.77***					
5. SMSR Aggression	69.42	16.37	.16	.62***	.62***	.60***				
6. Spouse PTSD	23.96	7.36	.31**	.37***	.30**	.25*	.29**			
7. Spouse Depression	6.14	7.23	.42***	.07	.11	.10	.01	.42***		
8. Spouse Anxiety	3.64	5.36	.36***	.13	.13	.15	.08	.49***	.62***	
9. Spouse Aggression	59.78	14.02	.35***	.07	.10	-.004	.09	.27**	.34**	.25*

Note. SMSR = service members' self-report; PTSD = posttraumatic stress disorder.

*** $p < .001$; ** $p < .01$; * $p < .05$

deviation above Buss & Perry's (1992) reported norm for aggression in females, but no spouses exceeded this norm by two standard deviations.

Burden's Distinctiveness from Distress

The factor structure of the BI was evaluated using a principal components analysis with varimax rotation for all of the items. The Scree plot indicated a 1-factor solution for this measure that accounted for 39.0% of the variance, with 20 items possessing factor loadings greater than .51, and items 20 and 21 having factor loadings of .28 and .22, respectively. The additional principal components factor analysis with varimax rotation on all items from the BI, DASS-D, and DASS-A together revealed a two-factor solution, with most BI and DASS items each loading onto separate factors (factor loadings ranging from .38 to .79). Three BI items (i.e., 9, 20, and 21) and four DASS items (i.e., 15, 23, 37, and 38) did not load significantly onto either factor (corresponding factor loadings for BI items: .31, .17, and .16; and DASS items: .25, .25, .33, and .33). Only one DASS item (item number 10: "[over the past week] I felt that I had nothing to look forward to") loaded onto both factors, although its loading on the DASS factor (.62) was higher than its loading on the BI factor (.40). Because almost all BI items loaded significantly onto a single factor in both analyses, the total score of the BI was used in all subsequent analyses to represent the construct of burden (thus allowing findings to be compared with prior research).

In order to further evaluate potential distinctions between measures of burden and psychological distress, correlations of burden with the aforementioned spousal characteristics (i.e., neuroticism, self-efficacy, social support, and coping) were compared to those of depression and anxiety with the same spousal characteristics (see Table 2).

Table 2

Means, Standard Deviations, and Correlations of Burden and Psychological Distress with Spousal Characteristics

Spousal Characteristics	*M*	*SD*	Spouses' Burden	Spouses' Depression	Spouses' Anxiety
Neuroticism	25.77	5.59	.20*	.52***	.39***
Self-Efficacy	30.29	4.46	-.19†	-.33**	-.34**
Total Perceived SS	70.48	13.85	-.15	-.12	-.20*
Significant Other SS	25.24	4.83	-.19†	-.14	-.15
Family SS	23.84	4.97	-.09	-.16	-.25*
Friend SS	21.40	6.16	-.11	-.04	-.13
Problem-Focused Coping	31.23	9.22	.07	.03	.17†
Emotion-Focused Coping	19.02	9.66	.25*	.34**	.40***

Note. SS = social support.

*** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .10$

Analyses revealed that the correlation of neuroticism with burden was statistically weaker than that with depression (t = -3.36, p < .01), but no other significant differences in correlation magnitudes were detected.

Burden and Distress in Spouses of Service Members

Bivariate correlations revealed that all forms of self-reported psychological symptoms in both spouses and service members were significantly associated with higher burden in spouses, with the exception of service members' aggression (see Table 1). The strength of these associations were not significantly affected by whether or not service members' PTSD (interaction part r = .11, p = .28), depressive (interaction part r = .02, p = .82), or anxiety symptoms (interaction part r = .13, p = .17) met cutoffs indicating a clinical level of severity. Moreover, no specific types of symptoms in service members were significantly more or less correlated with each type of symptom in spouses (all ts < 1.61, all ps > .05), and there were also no differences in the magnitudes of correlations of spouses' burden with each individual measure of service members' (all ts < 1.71, all ps > .09) or spouses' (all ts < 1.07, all ps > .27) psychological distress.

Considering the high intercorrelations among measures of distress for both service members and spouses, and the lack of differences in the relations between each corresponding set of distress measures and burden, weighted distress variables for service members and spouses were created for subsequent analyses to preserve power while reducing the chance of Type I error. Two separate principal components analyses with varimax rotation of the total scores from the four psychological symptom scales for service members (i.e., PCL-M, DASS-D, DASS-A, and AQ) and those for spouses (i.e., PCL-C, DASS-D, DASS-A, and AQ) were conducted, and factor loadings from these

analyses (which both yielded 1-factor solutions) were used as weights. Factor loadings for service members' scale scores ranged from .72 to .87, and those for spouses' distress scale scores ranged from .65 to .85. Service members' and spouses' weighted distress variables were both significantly correlated with each other ($r = .22$, $p < .05$) and with spouses' burden ($r = .32$, $p < .01$; $r = .53$, $p < .001$, respectively).

Because these associations were all significant, a formal test of burden's meditational value was conducted. In a regression of spouses' distress onto service members' distress and spouses' burden ($F[2, 84] = 17.19$, $p < .001$), only burden was significant (part $r = .49$, $p < .001$), whereas service members' distress was no longer significant (part $r = .02$, $p = .81$). The reduction in the strength of the association between service members' and spouses' distress was significant ($t[84] = 2.76$, $p < .01$), indicating that burden fully mediated the association between these two variables.

Burden and Spousal Characteristics

Spouses' levels of perceived burden were positively correlated with their neuroticism and emotion-focused coping and marginally negatively correlated with their self-efficacy and perceived social support from their partners (see Table 2). Although spouses' problem-focused coping was not correlated with their level of burden, a regression analysis ($F[3, 90] = 5.37$, $p < .01$) indicated that it was a marginally significant moderator of the relation between service members' distress and spouses' burden (interaction part $r = -.18$, $p < .07$). Follow-up probes of this analysis (see Aiken & West, 1991) indicated that the association was weaker in the context of higher levels of problem-focused coping (part $r = .04$, $p = .70$) than in lower levels of problem-focused coping (part $r = .36$, $p < .001$). Spouses' emotion-focused coping, neuroticism, self-

efficacy, and social support (total, friend, family, or significant other subscale scores) were not significant moderators of this relation (all *p*s > .05).

Lastly, a regression of spouses' burden onto service members' distress together with all five of these spousal characteristics ($F[6, 77] = 3.40$, $p < .01$) revealed that only service members' distress (part $r = .34$, $p = .001$) significantly accounted for a portion of burden's variance. All spousal characteristics were nonsignificant (all *p*s > .12) in this equation.

DISCUSSION

Given the extensive literature supporting the negative impact of combat-related PTSD on spouses of service members and the potential role of caregiver burden in the distress experienced by these spouses, this study aimed to more deeply investigate the experience of such spousal burden. Although a number of investigations have addressed these issues in caregivers of individuals with medical illnesses, fewer investigations have focused on the experience of burden in spouses of military veterans (Beckham et al., 1996; Calhoun et al., 2002; Dekel et al., 2005; Manguno-Mire et al., 2007), and no investigations have yet addressed this in spouses of service members deployed during the Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) era or in spouses of National Guard/Reserve (NG/R) troops. In addition to examining these constructs in such a population, we expanded the assessment of psychological distress to include symptoms of PTSD, depression, anxiety, and aggression in both service members and spouses.

Consistent with prior research, findings from this investigation revealed positive associations between service members' psychological symptoms, spouses' perceived burden, and spouses' psychological symptoms. Results were consistent across all symptom types, regardless of whether symptoms were at a clinical level of severity. Our findings additionally indicated that burden fully mediated the relationship between service members' and spouses' distress, similar to findings of Dekel and colleagues (2005) and Minnes, Woodford, and Passey (2007).

These findings contribute to the growing literature on spouses of combat veterans in new and distinct ways. First, the cultural climate of romantic relationships, family dynamics, and the manner in which service members and their families are treated by society at large are quite different today than during the period following the Vietnam War. Our society has recently placed more emphasis on improving the quality of life of family members of OEF/OIF service members, and there is a strong societal and political push to support troops deployed to OEF/OIF, regardless of political views. In spite of these differences, our findings suggest that spouses are still experiencing significant levels of distress and burden associated with service members' postdeployment psychological symptoms, indicating that focused effort continues to be needed for these individuals. Second, the service members in our sample were more recently deployed than those in prior samples. The similarity of our findings to those from earlier samples suggests that perceived burden is not something that necessarily grows slowly over time. These findings suggest that stronger preventative measures might be needed earlier to preclude the development of these feelings upon the service members' return from deployment. Finally, these results indicate that spouses of NG/R service members experience similar patterns of psychological symptoms and caregiver burden as do spouses of active duty troops, who have been the primary focus of prior investigations. This pattern is consistent with recent research that indicates that reserve component service members are seeing equivalent levels of combat and endorsing equal or greater levels of postdeployment psychological difficulties as their active duty counterparts (Milliken, Auchterlonie, & Hoge, 2007; Renshaw, Rodrigues, & Jones, 2009). As these service members and their families do not live on military bases where many resources

and services are available, extra effort may be needed to increase the availability of resources outside of military bases.

In addition to investigating these constructs in a heretofore unstudied population, this study aimed to gain a better understanding of the construct of burden, so as to increase our ability to interpret the growing literature in this area. Little research to date has addressed the possibility that the associations between burden and feelings of distress may be an artifact of overlapping constructs. Some research has revealed such a large overlap between burden and distress that meaningful interpretations of the experience of burden, outside of the caregivers' psychological symptoms, become difficult (Jeglic et al., 2005; Stommel, Given, & Given, 1990). In contrast, other investigations have found differences in the associations of potential correlates with measures of burden and measures of distress (Brannan & Heflinger, 2001; Manguno-Mire et al., 2007). Although our findings indicated that there were few significant differences in the pattern of correlates of burden and distress, factor analyses suggested that the BI has a unitary factor solution, and that its items are distinct from those on a measure of depressive and anxiety symptoms. Thus, even though we were unable to reject the null hypothesis and conclude that there is incontrovertible evidence for a distinction between burden and distress, these factor analytic findings support the ability of the BI and the DASS to assess separate and unique feelings and experiences in spouses of NG/R service members. Further research should be conducted to replicate these results in other populations.

Finally, this investigation offers some of the first empirical findings on intraindividual characteristics specific to spouses of combat veterans that may or may not

be related to their experience of caregiver burden. Although Manguno-Mire and colleagues (2007) began to address these issues in spouses of Vietnam War veterans with combat-related PTSD, their variables of interest remained largely focused on spouses' perceptions of the veteran (e.g., treatment and symptoms), except for a negative relation detected between spouses' level of self-efficacy and perceived burden. This finding was replicated in the current study; moreover, we found that greater caregiver burden in spouses also was associated with higher levels of their own neuroticism and emotion-focused coping. Previous research has consistently indicated that both of these characteristics are broadly associated with greater psychological difficulties (e.g., Bolger & Schilling, 1991); however, our results also indicated that service members' symptoms remained a significant predictor of spousal burden above and beyond these characteristics. Thus, in our sample, the experience of burden was primarily related to service members' symptoms, rather than any intraindividual characteristics of spouses.

Our findings are also the first to suggest that spouses' utilization of problem-focused coping strategies may help mitigate the effect of service members' symptoms on spouses' burden, with higher amounts of this coping style associated with a weakening of this relationship. Although this finding was only of marginal significance, these results support the literature stating that problem-focused coping styles are more adaptive, while emotion-focused coping processes are associated with worse outcomes (Blake, Cook, & Keane, 1992; Nezu & Carnevale, 1987; Sharkansky et al., 2000). Future research is needed to explore this and other potential mechanisms that might serve to ease the impact of service members' distress, as this could help with the development and refining of

interventions to help spouses of veterans suffering from PTSD and other service related difficulties.

There are limitations to this investigation that should be considered when interpreting these results. The use of self-report measures always carries the risk of inaccurate reporting, whether it is due to difficulty with recall, social desirability, or other biases. Further, the cross-sectional nature of this study prevents causal inferences from being made regarding service members' distress, spouses' burden, and spouses' psychological distress. Longitudinal investigations focused on these issues would give us better insight into the development of burden and psychological distress in spouses of service members and allow us to make more informed decisions when developing and implementing interventions for this population. Additionally, the sample in this investigation consisted of all male service members and female spouses, preventing the exploration of possible sex differences in the experience of burden, distress, and spousal characteristics related to these constructs. This limitation spans across most investigations utilizing military populations, and research targeted specifically toward female service members and male spouses is sorely needed to obtain a greater understanding of these constructs and potential variations in prevention efforts and treatment implementation, if necessary. Similarly, participants in our sample were all White and operating in the Utah National Guard/Reserve; thus, it is unknown whether our findings would generalize to other populations. Finally, participants in this investigation were recruited through optional marriage enrichment workshops, and it is possible that this recruitment method served to bias the types of couples who were eligible to participate.

Despite these limitations, this investigation provides the first in-depth research on intraindividual features of spouses of combat veterans that may be related to their own levels of caregiver burden. As such, it opens the door for future investigations to replicate and extend these findings. Continuation of this line of research would allow for a more thorough understanding of the variability in the experience and report of caregiver burden and, thus, could help tailor prevention and treatment efforts to more clearly address these related tendencies in spouses of military service members.

APPENDIX

PROPOSED ANALYSES NOT INCLUDED IN THESIS WRITE-UP

- Spousal perceptions (SP) of service members' distress were strongly correlated with service members' self-report (SMSR) of symptoms of distress (see Table 3).

- SP of service members' distress were positively correlated with psychological distress and burden in spouses (see Table 4).

- SP of each type of symptom in service members were more strongly related to spouses' burden than SMSR of each type of symptom ($-2.46 \leq ts \leq -5.04$, all $ps < .001$), with the exception of general anxiety. For general anxiety, there was not a significant difference in the magnitudes of the correlations between spouses' burden and SMSR or SP of service members' distress ($t = -0.92$, $p = .35$).

- The association between SP of PTSD and burden was marginally moderated (interaction part $r = .17$, $p < .06$) by whether or not spouses' perceptions of PTSD in service members indicated likely presence of PTSD, as defined by a combination of spouses' perceived PCL-M scores equal to or greater than 50, and an endorsement of the appropriate number of DSM-IV criteria (overall regression: $F[3, 98] = 11.16$, $p < .001$).
    - Follow-up probes of this analysis indicated that the association was stronger in the context of SP of clinical levels of PTSD (part $r = .30$, $p = .001$) than in the context of SP of nonclinical levels of PTSD (part $r = .25$, $p = .005$); however, the association was significant in both conditions.

- The association between SP and burden was not impacted by whether or not depression reached clinical severity ($F[3, 96] = 13.05$, $p < .001$; interaction part $r = -.11$, $p > .18$).

- SP measures of distress were highly intercorrelated ($.40 \leq rs \leq .72$), and there were no significant differences in the magnitudes of correlations between these distress measures and burden (all $ts < -1.73$, all $ps > .05$). Therefore, a weighted distress variable for SP of service members' overall distress was created for subsequent analyses to preserve power while reducing the chance of Type I error. A principal components analysis, with varimax rotation, of the four psychological symptom measures for SP was used to create these variables, by using factor

loadings (which ranged from .70 to .89) as weights. This variable was then used in all remaining analyses.

- A regression analysis revealed that SP of service members' distress were significantly related (part $r = .52$, $p < .001$) to spouses' distress; however, this association was weakened (part $r = .26$, $p = .003$) in the context of a regression ($F[2, 88] = 23.21$, $p < .001$) that included spouses' burden (part $r = .27$, $p = .003$). This reduction in the strength of the association between SP and spouses' distress was significant ($t[88] = 2.78$, $p < .01$), indicating that burden partially mediated the relation between these two variables.

- Regression analyses indicated that spouses' neuroticism ($F[3, 93] = 18.48$, $p < .001$; interaction part $r = -.17$, $p < .05$) and self-efficacy ($F[3, 87] = 17.18$, $p < .001$; interaction part $r = .16$, $p < .06$) were significant and marginally significant moderators of the relation between burden and SP of service members' distress. Follow-up probes of these analysis indicated that:
    - The association was weaker in the context of lower (part $r = .43$, $p < .001$), as compared to higher (part $r = .49$, $p < .001$), levels of neuroticism.
    - The association was weaker in the context of lower (part $r = .31$, $p < .001$), as compared to higher (part $r = .42$, $p < .001$), levels of self-efficacy.

Table 3

Means, Standard Deviations, and Correlations of Service Members' Distress and Spouses' Perceptions of Service Members' Distress

SP of Service Members' Distress	*M*	*SD*	SMSR PTSD	SMSR Depression	SMSR Anxiety	SMSR Aggression	SMSR Weighted Distress
SP PTSD	27.72	12.85	.67***	.52***	.51***	.47***	.62***
SP Depression	4.25	6.66	.45***	.55***	.42***	.35**	.51***
SP Anxiety	2.21	4.88	.43***	.33**	.41***	.31**	.43***
SP Aggression	58.69	19.29	.34**	.34**	.36***	.53***	.46***
SP Weighted Distress	n/a	n/a	.58***	.54***	.52***	.51***	.62***

Note. SMSR = service members' self-report, SP = spouses' perceptions of service members' distress; PTSD = posttraumatic stress disorder.

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 4

Correlations of Spouses' Perceptions of Service Members' Distress with Spouses' Own Burden and Distress

SP of Service Members' Distress	Burden	Spouse PTSD	Spouse Depression	Spouse Anxiety	Spouse Aggression	Spouse Weighted Distress
SP PTSD	.48***	.53***	.24*	.29**	.13	.41***
SP Depression	.52***	.50***	.35**	.40***	.19†	.51***
SP Anxiety	.40***	.42***	.32**	.50***	.14	.49***
SP Aggression	.56***	.26**	.20†	.14	.30**	.31**
SP Weighted Distress	.57***	.52***	.34**	.40***	.23*	.52***

Note. SP = spouses' perception of service members' distress; PTSD = posttraumatic stress disorder.

*** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .07$

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