ORIGINAL ARTICLE



The Role of Natural Support Systems in the Post-deployment Adjustment of Active Duty Military Personnel

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Abstract This study examined the relations among three different types of naturally occurring social support (from romantic partners, friends and neighbors, and unit leaders) and three indices of service member well-being (self reports of depressive symptoms, satisfaction with military life, and perceptions of unit readiness) for service members who did and did not report negative experiences associated with military deployment. Data were drawn from the 2011 Community Assessment completed anonymously by more than 63,000 USAF personnel. Regression analyses revealed that higher levels of social support was associated with better outcomes regardless of negative deployment experiences. Evidence of moderation was also noted, with all forms of social support moderating the impact of negative deployment experiences on depressive symptoms and support from unit leaders moderating the impact of negative deployment experience on satisfaction with military life. No moderation was found for perceptions of unit readiness. Subgroup analyses revealed slightly different patterns for male and female service members, with support providing fewer moderation effects for women. These findings may have value for military leaders and mental health professionals working to harness the power of naturally occurring relationships to maximize the positive adjustment of service members and their families. Implications for practices related to re-integration of post-deployment military personnel are discussed.

Introduction

The Global War on Terror has resulted in deployment of thousands of U.S. service personnel to war zones where many have been exposed to traumatic combat-related experiences. The impact of these collective experiences on the well-being of service members and their families, as well as the readiness and morale of their military units, has been an ongoing concern of both military leadership and civilian society. Research on the mental health and psychosocial adjustment of combat-exposed service members has indicated that these individuals are at risk for a variety of problems, including elevated rates of depression and post-traumatic stress disorder (PTSD) (Institute of Medicine 2014; Seal et al. 2007), substance abuse (Shen et al. 2012; Wilk et al. 2010), family difficulties, including marital discord (Adler et al. 2011; Foran et al. 2013; Gibbs et al. 2012), and premature separation from the military (Hoge et al. 2006).

Recognizing these issues, the Department of Defense (DOD) and the various service branches have intensified efforts to provide returning service members and their families with a wide array of services designed to facilitate



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post deployment adjustment. Unfortunately, these services may be persistently underutilized due to pervasive stigma associated with help seeking, as well as perceptions of negative career impact associated with seeking care for personal issues (Hoge et al. 2004; Vogt 2011). There is some evidence indicating that many military personnel rely primarily on informal supports such as friends and family members to help them to cope with the aftermath of stressful wartime experiences, and that these supports are in fact quite helpful (Greenberg et al. 2003).

A large body of research, much of it focused on civilian samples and published in the 1980s, has explored the relations between naturally occurring social support and psychosocial adjustment, both generally and within the context of a specific stressor (e.g., job loss, illness, and work-related experiences). There is evidence for both the idea of social support as a direct effect and as a buffer in the presence of stress, depending on the way in which it is operationalized. Studies that viewed social support in terms of social network connectedness (i.e., the number of social ties a person has and perceptions of their availability to provide psychological and instrumental aid when needed), generally found a relation between network size and positive life events. Yet, little empirical evidence exists that social support defined in this way protects individuals against the negative effects of stressful life events (Broadhead et al. 1983; Barrera 1986; Leavy 1983; Mitchell et al. 1982).

These main effect models suggest that being socially well-connected and feeling that support is available is important for general well-being, as it provides people with a sense of self-esteem and social identity (Thoits 1982). However, research also suggests that when people are confronted with significant stressors, it is social support from specific individuals who provide emotional and tangible resources, rather than the extent of their social network, that helps to buffer against negative outcomes by actively promoting adaptive coping strategies (Cohen and Wills 1985; Wortman 1984). For example, Abbey et al. (1985) found a stress-buffering effect existed for some specific individuals within a social network, but not for the social network generally. Other work indicates marital partners appear to play a critical role in psychological adjustment, particularly in the face of stress (Eaton 1978; Kessler and Essex 1982; Linn and McGranahan 1980; McCubbin and McCubbin 1991). Still other studies of civilians in stressful occupational settings also demonstrate the buffering effect of work-related social support on physical and mental health. For example, negative effects of job stress are moderated by support from colleagues and supervisors for both Emergency Medical System workers (van der Ploeg and Klaber 2003) and secretaries (Snow et al. 2003). Cobb (1976) reviewed the literature on moderated effects of social support on well-being and concluded that social support buffers against a diverse range of stressors, including loss of employment, pregnancy, major illness, bereavement, and combat exposure.

Models of social support and their relation to adverse outcomes associated with combat experiences, particularly PTSD, have been examined in several cohorts of military personnel. Many of these studies find support for a buffering hypothesis. For example, in their study of primarily National Guard and reservist veterans from Connecticut, Pietrzak et al. (2009) found that individual resilience and post-deployment social support from friends and family members were associated with lower levels of post-deployment PTSD and depression. A second study using the same sample examined the role of support from unit leaders (Pietrzak et al. 2010). This study found that the impact of unit support on post-deployment adjustment was fully mediated by personal resilience, and that social support partially mediated the impact of PTSD symptoms on psychosocial functioning. Similarly, James et al. (2013) found support for a buffering effect of social support in a sample of national guard/reservist veterans who experienced combat deployments in OEF/OIF; social support appeared to provide protection both against depression and PTSD, but not substance abuse. In a large sample of U.S. service personnel, Hourani et al. (2003) defined social support in terms of social network size (the number of friends and family members a person indicated were available to him/her) and examined its relations with adverse outcomes (e.g., substance abuse, mental health issues, and physical health problems). Consistent with the conclusions of Barrera (1986), this study found that social network size was negatively associated with adverse outcomes, but it was not a moderator of stressful wartime experience.

The role of unit leadership emerges as an important factor for the post-deployment adjustment of military personnel and their families, and may also influence the other types of supports service members are willing to access. For example, several studies have found lower levels of perceived support from leadership is associated with increased stigma and reduced willingness to seek services for personal problems associated with deployment (Wright et al. 2009). Consistent with the buffering hypothesis, Mulligan et al. (2010), in their study of deployed U.K. military personnel, found perceptions of strong unit leadership were associated with lower levels of psychological distress and PTSD symptoms. Conversely, in a sample of soldiers deployed to Kosovo, Britt et al. (2007) found lack of confidence in unit leadership was predictive of postdeployment depression. Bowen et al. (2003) found a somewhat different, but equally important, effect of unit leadership; in their studies of active duty Air Force



personnel, leadership influenced service members' sense of community, which in turn impacted well-being and satisfaction of service members and their families.

Given the extensive deployment experiences of contemporary military personnel, the current study sought to extend the research on social support and adjustment by examining the role of specific types of social support in post deployment adjustment in a large, representative sample of active duty personnel, and to determine whether different sources of social support were directly associated with well-being or were more consistent with a buffering hypothesis. We identified three sources of naturally occurring social support that other research has indicated might be important for post-deployment adjustment: support from intimate partners (spouses or other stable romantic partners), support from unit leaders, and support from friends and neighbors. We identified three relevant outcomes: mental health (i.e., depressive symptoms), perceived mission readiness, and satisfaction with military life. Based on the prior research with combat-exposed service members, our first hypothesis was that all forms of social support would show buffering effects. We expected relations among social support and all three outcomes would be stronger in the presence of greater deployment adversity.

Second, given previous research indicating the significance of particular relationships for adjustment in the presence of stress (e.g., Abbey et al. 1985), we hypothesized different types of social support would have selective impacts on each of the outcome variables. Specifically, we expected support from leadership would be significantly related to perceptions of mission readiness, whereas support from spouses or significant others would be more strongly associated with depressive symptoms. We anticipated satisfaction with military life, which could represent an important indicator of willingness to remain in the military, would be more generally impacted by support from a variety of sources, including unit leaders, romantic partners, and neighbors.

Method

Participants

Data for this study were drawn from a subset of 22,150 active duty Air Force personnel who responded to the 2011 Air Force Community Assessment (CA) project. The larger CA sample included 63,290 active duty personnel and their spouses, reservists and Air National Guard members and their spouses, and civilians employed by the Air Force. Data were collected from 81 Air Force bases worldwide. The CA was administered anonymously, with no

identifying information collected regarding respondents. For 18 bases with census numbers below 2222, all personnel were included in the sampling frame. For the remaining 63 bases, a stratified sampling plan ensured adequate representation of men and women, those with and without deployment experience, and those at various levels of rank. The study subsample included only active duty personnel who indicated that they had experienced at least one deployment, were married or in a committed romantic relationship, and had responded to all of the survey items included in the independent and dependent measures (described below). Respondents were considered in a "committed romantic relationship" if they responded positively to the following question: "Are you now engaged or seriously involved in a relationship with someone? In other words, is there an important significant other in your life right now?"The study sample varied slightly from the overall sample on a few demographic variables; most notably there was a higher proportion of men and officers in the study sample, and study sample respondents had overall more years of military service. The two groups did not vary significantly on any of the measures of interest for the study. Means and standard deviations for both groups on demographic variables and variables included in the study analyses are summarized below in Table 1.

Measures

Dependent Variables

Depressive symptoms were assessed with a shortened seven-item version of the Center for Epidemiological Studies Depression Scale (CES-D) as described by Mirowsky and Ross (1992). The index included seven self-report items in which respondents rated how often they experienced specific depressive symptoms. Each question

Table 1 Demographic and descriptive data

Demographic variables				
Gender	86.4 % male			
Median age	26-35 years			
Average years military service		13.5 years		
Independent and dependent variables	Mean	SD	Range	
Depressive symptoms	1.385	.510	1–4	
Air Force satisfaction	4.326	1.235	1–6	
Perceived mission readiness	3.403	.960	1-5	
Negative deployment experiences	2.862	.667	1-5	
Spouse/significant other support	5.035	.966	1–6	
Leadership support	4.127	1.103	1–6	
Neighbor support	3.894	1.333	1–6	



included four possible response categories ranging from 1 for "none" to 4 for "5–7 days." An example item is, "How many days during the past seven days have you felt that you just couldn't get going?" Cronbach's alpha for the current sample was 0.855.

Air Force satisfaction was assessed with a two-item index that was developed for this survey. Respondents rated their satisfaction with the Air Force as way of life and as an environment to bring up children. Response categories ranged from 1 for "very dissatisfied" to 6 for "very satisfied." Cronbach's alpha for the current sample was 0.819.

Perceived mission readiness was assessed with a sixitem index that was developed for this survey. On two of the items, respondents were asked to rate their relationships with co-workers and supervisors. Response categories ranged from 1 for "extremely poor" to 5 for "excellent." In addition, respondents were asked to respond to four questions related to perceptions of teamwork among members of their unit. For these items, response categories ranged from 1 for "strongly disagree" to 6 for "strongly agree." An example item is, "What is your level of agreement with: Members of this squadron would perform well in a deployment or crisis situation." Responses on the four questions with six-point response categories were scaled to fit with those on a five-point scale. Cronbach's alpha for this index was 0.930.

Independent Variable

Negative deployment experiences were measured with a six-item index that was created for this study. Two items asked respondents to report the degree to which recent deployments were difficult for them and their spouses/ significant others. Response categories ranged from 1 for "not difficult at all" to 5 for "extremely difficult." In addition, four questions asked respondents to rate the impact of recent deployments on family life, professional life, personal life, and health behaviors. Response categories ranged from 1 for "strong positive impact" to 5 for "strong negative impact." Cronbach's alpha for this sample was 0.732.

Support Variables

Spouse/significant other support was assessed with a threeitem index. Respondents rated the degree to which their spouse or significant other has been supportive of their Air Force career. Response categories ranged from 1 for "almost never" or "extremely unsupportive" to 6 for "almost always" or "extremely supportive." An example question is "my spouse or significant other is understanding of the demands of my Air Force job." Cronbach's alpha was 0.821. Unlike the depression measure, the social support variables were global and not linked to a specific time period. So, while the depression items asked people about their mood in the past weeks and days, the social support items were more global, and did not refer to a specific time frame.

Support from leadership was assessed with a six-item index. Two items were designed to assess perceived effectiveness of Air Force leaders on addressing the needs of respondents and their families. Response categories for these items ranged from 1 for "extremely ineffective" to 6 for "extremely effective." In addition, four items were designed to assess respondents' perceptions of the degree to which unit-level leaders take action to support personnel and their families. An example item is, "How much do you agree or disagree with these statements about unit-level leaders: Help new members and families get settled in the community and connected with other members and families." Response categories ranged from 1 for "strongly disagree" to 6 for "strongly agree." Cronbach's alpha was 0.923.

Support from neighbors was assessed with a four-item index in which respondents rated the degree to which they agreed that neighbors were supportive of one another. An example item is, "What is your level of agreement with: People in the neighborhood in which you live look out for one another." Response categories ranged from 1 for "strongly disagree" to 6 for "strongly agree." Cronbach's alpha was 0.946.

Frequency counts for all measures indicated that values for each variable included the full range of response options, although extreme scores were rare for some variables.

Analytic Plan

Data were analyzed using ordinary least squares (OLS) regression analyses. To examine main effects of deployment and social support, each outcome variable was regressed on negative deployment experiences and the three social support variables. Specifically, depressive symptoms, Air Force satisfaction, and perceived mission readiness were separately regressed on negative deployment experiences, spouse/significant other support, leadership support, and neighbor support.

Moderating effects of each form of social support were assessed by multiplying each social support variable by the negative deployment experiences variable, and entering the resulting interaction terms on a separate block of each regression equation. In accordance with the procedures outlined by Aiken et al. (1991), we centered all continuous independent variables before running these analyses as a way of minimizing the effects of multicollinearity that can



result from entering multiple interaction terms into a single regression equation. Finally, all significant interactions were plotted to visually examine potential protective effects of the social support variables (Cohen and Cohen 1983). Given the large sample size, we used a conservative p < .01 level for statistical significance in all analyses.

Results

Bivariate Correlations

Results from bivariate correlations suggest that all variables were related in expected directions. Negative deployment experience was positively correlated with depressive symptoms, and negatively correlated with Air Force satisfaction and perceived mission readiness. In addition, each of the social support variables was negatively correlated with depressive symptoms and positively correlated with Air Force satisfaction and perceived mission readiness. Finally, there were significant correlations among all of the hypothesized independent variables and moderating variables (p < .001 for all correlation coefficients, see Table 2).

Hypothesis Testing

Table 3 includes the results from the regression equations. The first model for each equation shows which main effects were statistically significant for each dependent variable. Results indicate that negative deployment experiences were associated with increased levels of depressive symptoms and decreased levels of both Air Force satisfaction and perceived mission readiness. In addition, all three social support variables, including spouse/significant other support, leadership support, and neighbor support were associated with lower levels of depressive symptoms and higher levels of both Air Force satisfaction and perceived mission readiness (p < .001 for all analyses).

The second set of models show significant interaction terms. Results for depressive symptoms show significant interaction terms between each form of social support and

Table 2 Correlations among hypothesized independent and dependent variables

negative deployment experiences (p < .001). For the Air Force satisfaction variable, the interaction between leadership support and negative deployment experiences was significant (p < .001). Finally, for perceived mission readiness, none of the interaction terms were statistically significant.

To interpret the significant interaction effects, we plotted the data following the procedures outlined by Aiken et al. (1991). Figures 1, 2 and 3 include separate regression lines for depressive symptoms regressed on low, medium, and high levels of each form of social support. Low levels are one standard deviation below the mean for each form of support, medium levels are at the mean, and high levels are one standard deviation above the mean. This approach to plotting interactions has been outlined by Cohen and Cohen (1983). Visual inspection of each plot suggests that at the lowest end of the distribution of negative deployment experiences levels of depressive symptoms are generally low. As the level of negative deployment experiences increases, the level of symptoms also increases across all levels of each type of social support. However, the increase is less pronounced under each condition of higher social support, suggesting that spouse/significant other support, leadership support, and neighbor support each partially buffer against negative deployment experiences (see Figs. 1, 2, 3).

Figure 4 includes data plotted for Air Force satisfaction as an outcome. Specifically, it includes the interaction between leadership support and negative deployment experiences. These regression lines suggest a relatively subtle moderating effect in which the relation between negative deployment experiences and Air Force satisfaction is somewhat lower under conditions of higher leadership support as compared to lower leadership support. However, this moderating effect appears much weaker than those described above for the depressive symptoms outcome.

Subgroup Analyses

Models 3–10 in Table 3 show the results for male officers, female officers, male enlisted personnel, and female personnel. Regarding direct effects of negative deployment

	1.	2.	3.	4.	5.	6.
1. Depressive symptoms						
2. Air Force satisfaction	300					
3. Mission readiness	291	.427				
4. Negative deployment experiences	.331	456	274			
5. Support from significant other	247	.414	.231	341		
6. Leadership support	271	.516	.588	348	.273	
7. Neighbor support	159	.228	.292	133	.165	.293

p < .001 for all coefficients



Table 3 Summary of regression models for outcomes regressed on social support variables

	Depressive symptoms		Air Force satisfaction		Mission readiness	
	\overline{B}	SE	\overline{B}	SE	\overline{B}	SE
Model 1						
Intercept	1.382*	.003	4.361*		3.428*	
Negative deployment experiences	.177*	.005	460*	.011	086*	.009
Spouse/significant other support	063*	.004	.284*	.007	.047*	.006
Leadership support	064*	.003	.392*	.006	.451*	.005
Neighbor support	026*	.002	.057	.005	.098*	.004
Model 2 (interactions)						
Intercept	1.371*		4.379*		3.427	
Deployment by significant other support	024*	.005	.013	.036	004	.008
Deployment by leadership support	015*	.004	.068*	.153	003	.007
Deployment by neighbor support	018*	.004	008	017	.003	.006

^{*} p < .001

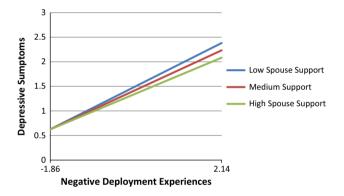


Fig. 1 Spousal/significant other support moderates the relation between negative deployment experience and depressive symptoms

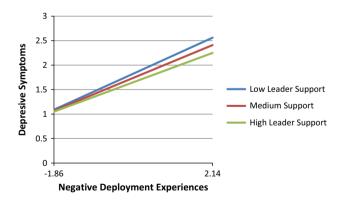


Fig. 2 Leadership support moderates the relation between negative deployment experience and depressive symptoms

experiences, spousal/significant other support was not significantly related to perceptions of mission readiness for either male or female officers or for female enlisted

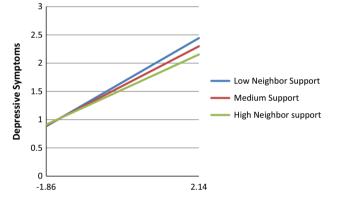


Fig. 3 Neighbor support moderates the relation between negative deployment experience and depressive symptoms

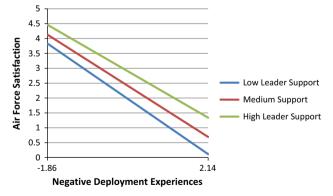


Fig. 4 Leadership support moderates the relation between negative deployment experience and depressive symptoms

personnel, but it was modestly related for male enlisted personnel. All other direct relations between support variables and depressive symptoms, satisfaction with Air Force



life, and mission readiness were similar in direction and magnitude to the overall sample. For all subgroups, leadership support was most strongly related to satisfaction with Air Force life. Although support from neighbors was significantly related to satisfaction with Air Force life for all groups, the magnitude of this relation was relatively greater for women (both enlisted and officers) than for men.

Regarding the buffering effect of social support in the presence of negative deployment experiences, the subgroup analyses revealed some subgroup differences. As with the full sample, there were no buffering effects of support on perceptions of mission readiness for any subgroup, with the exception of female enlisted personnel, for whom spouse/ significant other support did moderate. For depressive symptoms, there were relatively more buffering effects for men (4 out of 6 possible relations significant), whereas for women only 1 out of 6 possible interaction terms was significant. For Air Force satisfaction, the pattern for men, both enlisted and officers, was the same for the overall sample, with leadership support as the only moderator, whereas for women there was no buffering effect of any support variable on Air Force satisfaction (see Table 3).

Discussion

This study examined the role of different types of social support on the post-deployment adjustment of active duty Air Force personnel, with the goals of understanding the differential roles of various types of support on specific outcomes. We were also interested to see whether different types of social support contribute directly to positive adjustment to military life, or whether they operate more specifically as buffers against the effects of negative deployment experiences.

Consistent with prior research on combat-exposed personnel, we found the more negative deployment experiences a service member reported, the more likely he or she was to also report higher levels of depression and lower levels of both mission readiness and satisfaction with military life. These factors in turn may be related to the family and work-related issues experienced by many military personnel during or after wartime deployment, and may contribute to premature separation from the military and to problems with successful transition to civilian life (Hoge et al. 2006).

Our analyses of the differential impacts of social support from neighbors, commanders, and spouses/significant others indicated each of these made significant, independent contributions to depressive symptoms, mission readiness, and satisfaction with military life, although the magnitude of the impact varied depending upon the specific variable. Not surprisingly, support from spouses or significant others was less strongly related to mission readiness than leadership support, while support from neighbors seemed less important than either support from romantic partners or leaders for depressive symptoms and Air Force satisfaction.

Our hypotheses were not entirely confirmed, as evidence for buffering in the presence of negative deployment experience was mixed. Main effects on depressive symptoms, satisfaction with military life, and mission readiness were found for all three support variables, indicating that social support makes important contributions to positive adaptation whether or not service members are exposed to stressful deployment experiences. Moreover, none of the social support factors moderated or buffered the impact of negative experiences on perceptions of mission readiness, suggesting social support may have a greater effect on individual functioning as compared to unit functioning. On the other hand, all three support variables acted as a buffer against depressive symptoms. Thus, military members who perceived high levels of deployment-related stressors were less likely to experience depression if they perceived high levels of support from spouses or significant others, unit leadership, and neighbors, indicating that a variety of naturally occurring supports may be a helpful protective factor for the mental health of service members exposed to negative war-related experiences.

In terms of satisfaction with military life, support from leadership was found to be the only significant moderator. Military members with negative deployment experiences were more likely to remain positive about military life if they perceived high levels of support from their leaders, but this effect was not noted for support from neighbors or romantic partners. Moreover, these results confirm the findings of other researchers (i.e., Bowen et al. 2003; Britt et al. 2007; Mulligan et al. 2010; Wright et al. 2009) in highlighting the particularly pivotal role unit leaders may play in maintaining morale, mission readiness, and mental health of service members following deployment.

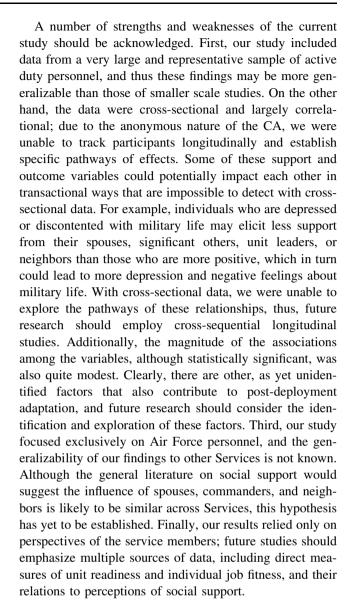
The subgroup analyses revealed few differences between officers and enlisted personnel. Patterns of relations among deployment experiences, social support, and the outcome variables were similar for male officers and enlisted personnel; both subgroups reiterated patterns found in the overall sample. There were some slight differences for female service members. Most notably, moderation of negative deployment on adjustment outcomes was less common for women than men, regardless of whether they were officers or enlisted personnel. This finding contradicts the limited research on gender differences in the buffering effects of social support, which generally finds stronger buffering relations for women than men (e.g., Belle 1991; Kendler et al. 2005). However, none of this prior research was conducted with military service members. As women



increasingly choose military careers and experience wartime deployments, more research that explores gender differences in the impact of these experiences is needed.

Our results are consistent with several findings from the general social support literature. First, they suggest naturally occurring support networks are available in the lives of most active duty military personnel, and the presence of these supports is associated with fewer depressive symptoms, heightened perceptions of mission readiness, and greater satisfaction with military life. As military leadership continues to grapple with the challenge of overcoming stigma associated with help-seeking from mental health and other professionals, efforts to maximize the benefits of these naturally occurring support systems may be particularly valuable. Related to this, Huebner et al. (2009) concluded that the main function of "formal" support networks (including mental health and social service agencies) is to facilitate and strengthen the informal supports upon which military personnel and their families typically rely. Thus it may be especially important for unit leaders and installation support personnel to provide resources and education to spouses, significant others, and neighbors to strengthen the support offered to military members returning from deployment. Therefore, additional research should be conducted to identify gaps in post-deployment resources and education to spouses, significant others, and neighbors to strengthen the support offered to military members returning from deployment. Moreover, further research efforts could also examine the usefulness of self-help support groups that offer unit-specific discussion platforms post-deployment to serve as an internet-based linkage for the unit members to communicate with each other.

When service members lack one or more of these important support systems, there may need to be proactive attempts to support these individuals. For example, although our analyses focused on military members who indicated they were in a committed romantic relationship, many personnel (22.6 %) responding to the CA indicated they were not in a relationship of this type. Consistent with the general literature on the role of romantic partners in promoting positive mental health (Horwitz et al. 1996), we found this group did on average have significantly higher rates of depressive symptoms and lower levels of satisfaction with Air Force life than those with romantic partners. Thus, when identifying individuals who lack one or more critical support systems, unit leaders may be able to mobilize alternative support systems for them and may help to prevent psychological problems for these individuals. While our study did not examine the role of best friends or extended family (e.g., parents, siblings) in promoting well-being of active duty personnel, it is possible these relationships also serve a particularly important function for service members without romantic partners.



In sum, this study explored the relations between negative deployment experiences, naturally occurring social support, and post-deployment adjustment in active duty military personnel and found social support from spouses/ significant others, unit leaders, and neighbors was significantly related to a number of important outcomes. These findings may have value for military leaders and mental health professionals working to harness the power of naturally occurring relationships to maximize the positive adjustment of service members and their families.

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