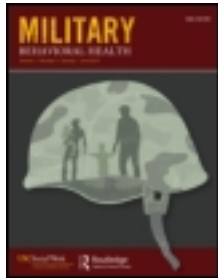


This article was downloaded by: [King's College London]

On: 10 January 2013, At: 05:53

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Military Behavioral Health

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/umbh20>

### Exploring the Impact of Deployment to Iraq on Relationships

Melissa Rowe <sup>a</sup>, Dominic Murphy <sup>a</sup>, Simon Wessely <sup>a</sup> & Nicola T. Fear <sup>a</sup>

<sup>a</sup> King's Centre for Military Health Research, King's College London

Version of record first published: 11 Dec 2012.

To cite this article: Melissa Rowe, Dominic Murphy, Simon Wessely & Nicola T. Fear (2012): Exploring the Impact of Deployment to Iraq on Relationships, Military Behavioral Health, DOI:10.1080/21635781.2012.721060

To link to this article: <http://dx.doi.org/10.1080/21635781.2012.721060>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

# Exploring the Impact of Deployment to Iraq on Relationships

Melissa Rowe, Dominic Murphy, Simon Wessely, and Nicola T. Fear  
*King's Centre for Military Health Research, King's College London*

Little is known about the impact of deployment on romantic relationships among United Kingdom (U.K.) military personnel. This study analyzed a self-report questionnaire via logistic regression to explore associations between negative relationship change and predeployment, deployment, postdeployment, and health factors in 5,133 personnel who had deployed to Iraq between 2003 and 2006. There was no significant association between deployment to Iraq and negative or positive relationship change, after adjusting for sociodemographic factors. Risk factors for negative relationship change are identified. These include younger age, childlessness, increased length of deployment, problems adjusting on return from deployment, family violence, and problems resuming sexual relationships. Other risk factors included post-traumatic stress disorder (PTSD), other common mental health problems, and alcohol misuse. It seems that deployment of UK military personnel to Iraq is not associated with relationship breakdown. However, a group of personnel at risk of suffering relationship breakdown who may benefit from intervention is identified.

**Keywords:** Iraq, relationship change, military deployment, trauma, PTSD

## Background

In 2003, 46,000 U.K. military personnel took part in the invasion of Iraq (U.K. Ministry of Defence, n.d.). Many of those deployed left partners, wives, and children behind for six months or longer. It has long been accepted this prolonged absence, combined with potential traumatic experiences during deployment, can add emotional and psychological strains to relationships (Peebles-Kleiger & Kleiger, 1994; Ruger, Wilson, & Waddoups, 2002). Previous research has shown

that deployments to a hostile war zone are associated with increased relationship problems (Meis, Erbes, Polusny, & Compton, 2010; Milliken, Auchterlonie, & Hodge, 2007) and a decline in marital satisfaction (Renshaw, Rodrigues, & Jones, 2008; Schumm, Bell, & Grade, 2000; Schumm & Hemesath, 1996).

However, these studies are U.S. based, most are based on small samples or on samples of those with diagnosed mental health problems, usually post-traumatic stress disorder (PTSD). Studies have shown that PTSD symptoms among war veterans are associated with poorer relationship satisfaction, and these veterans are particularly vulnerable to relationship problems (Goff, Crow, Reisbig, & Hamilton, 2007; Sayers, Farrow, Ross, & Oslin, 2009). A few studies have examined changes in relationship status, such as divorce, separation, and dissolution of long-term relationships (Angrist & Johnson, 2000; Karney & Crown, 2007; McCone & O'Donnell, 2006; Ruger et al., 2002). However, most research comes from the Vietnam War, the 1990–1991 Persian Gulf War, or from peacekeeping missions (Angrist & Johnson, 2000; Card, 1983; Kulka, Schlenger, & Fairbank, 1988; Laufer & Gallops, 1985; Peebles-Kleiger & Kleiger, 1994; Schumm et al., 2000; Schumm & Hemesath, 1996).

In this current study, we firstly report on whether deployment to the Iraq War from 2003 onwards is associated with relationship breakdown. Secondly, we report on factors

---

This research was funded by a grant from the Ministry of Defence (MoD). Authors are based at King's College London, which for the purpose of this study and other military-related studies receives funding from the U.K. MoD. NTF and SW have grant support for a study of the children of military fathers from the U.S. Department of Defense. NTF holds PhD studentship funding from the Economic and Social Research Council (ESRC), Medical Research Council (MRC), and the Royal British Legion. SW is an honorary civilian consultant advisor in psychiatry to the British Army and a trustee of combat stress. SW is partly funded in relation to the NIHR Specialist Mental Health Biomedical Research Centre at the Institute of Psychiatry, King's College London, and the South London and Maudsley NHS Foundation Trust.

Correspondence should be addressed to Nicola T. Fear, King's Centre for Military Health Research, King's College London, Weston Education Centre, 10 Cutcombe Road, London, UK SE5 9RJ. E-mail: nicola.t.fear@kcl.ac.uk

associated with negative relationship changes in UK military personnel who have deployed to Iraq. We did not include those who reported a positive relationship change because this was deemed less likely to negatively influence the health, mental health, and functioning of military personnel. We use a representative sample of all those who deployed and not just those with mental health problems.

## METHOD

### Study Design and Participants

Data were drawn from the first stage of a cohort study comparing the physical and mental health outcomes between those who took part in the 2003 invasion of Iraq (January 18 to June 28, 2003) and those who were in the military at that time but not deployed. Data collection took place over two years, during which time many others were deployed to Iraq. The final sample frame included all those who had served in Iraq between 2003 and 2006 (the “deployed” group) and those who were in the armed forces but did not deploy to Iraq (the “not deployed” group).

Data were collected either via a postal questionnaire sent to participants identified by the U.K. Ministry of Defence’s Defence Analytical Services Agency (DASA). Military postal codes containing numbers of personnel above a certain threshold received a visit. More than 50 bases were visited. Those who had been assigned a visit but had not been visited by March 2005 or who had not responded after a visit were subsequently sent a questionnaire by mail.

In all, 17,812 military personnel were sampled, with 10,272 questionnaires received (response rate = 58.4%) (Hotopf et al., 2006). An intensive follow-up study of non-responders found no evidence of bias (Hotopf et al., 2006; Tate et al., 2007). Participants filled the questionnaire from 1 to 30 months after returning from Iraq.

Inclusion criteria for the current study were that participants had answered both questions regarding relationship

status on the questionnaire (currently and 12 months prior) and reported no change, a negative relationship change, or a positive relationship change. This left 10,221 personnel for inclusion in our analysis. Of the respondents, reserve personnel were oversampled, thus the percentages given in our results are weighted, with the input of reservists halved to avoid overrepresentation. We then focused on associations between predeployment, during, and postdeployment factors; health factors; and negative relationship change. These analyses were restricted to those individuals with deployment experience and either a negative relationship change or no relationship change, thus all personnel with a positive relationship change and those who had not deployed to Iraq were excluded from these analyses.

### Measures and Variables Used

#### *Relationship Change*

The first question asked about relationship status 12 months previously; the second asked about current relationship status. Personnel were asked to choose the relationship status that best described their relationship. These questions were then used to generate a measure of relationship change. There were seven possible options for both questions: (1) *Married*; (2) *Living with partner*; (3) *In a long-term relationship*; (4) *Single and not in a long-term relationship*; (5) *Separated*; (6) *Divorced*; and (7) *Widowed*. Table 1 outlines the definitions of negative, positive, and no relationship change used here. Personnel who were widowed were excluded from this study.

#### *Deployment to Iraq*

All respondents who had been deployed to Iraq between 2003 and 2006 were included in the “deployed” group. Those who had not been deployed to Iraq were in the “not deployed” group.

TABLE 1  
Definitions of Relationship Change

Negative Relationship Change	No Relationship Change	Positive Relationship Change
married - living with partner	married - married	single - married
married - long-term relationship	living with partner - living with partner	single - living with partner
married - single	living with partner - long-term relationship	single - long-term relationship
married - separated	long term relationship - long-term relationship	separated - married
married - divorced	single - single	separated - living with partner
living with partner - single	separated - separated	separated - long-term relationship
living with partner - separated	divorced - divorced	divorced - married
living with partner - divorced	divorced - single	divorced - living with partner
long-term relationship - single	separated - single	divorced - long-term relationship
long-term relationship - separated		living with partner - married
long-term relationship - divorced		long-term relationship - married
single - separated		long-term relationship - living with partner
single - divorced		
separated - divorced		

### *Predeployment Factors*

Predeployment factors included sex, service, status, rank, age, and number of children under 18 years of age. A true/false question asking whether personnel argued more with their partners prior to their deployment was also included.

### *Deployment Factors*

Deployment factors were defined as those specifically related to the deployment itself or those that had occurred during deployment. Personnel were asked to record the total number of months they had been deployed during the past three years, and their responses were recoded as a binary variable of either *Less than 13 months* or *13 or more months*. Deployment trauma was investigated by asking participants yes/no questions about traumatic experiences. The questions asked are provided here:

1. Did you see personnel wounded or killed?
2. Did you handle bodies?
3. Did you give aid to the wounded?
4. Did you come under small-arms fire?
5. Did you come under mortar/Scud/artillery fire?
6. Did you experience a land mine strike?
7. Did you experience hostility from civilians?

A yes/no question asking if personnel had ever thought that they might be killed was included. We also asked subjects about family issues, such as the amount of support personnel felt they received from their families during their deployment, as well as the amount of support they felt their families had received from the military during that same time.

### *Postdeployment Factors*

Postdeployment factors were defined as those that occurred once personnel had returned from Iraq. Participants were asked to agree or disagree with statements on a 4-point Likert scale. Statements concerned family arguments, physical violence, problems adjusting on returning home, and problems resuming sexual relations with their partners.

### *Health Factors*

Participants were asked to complete a range of health outcomes, including current health problems postdeployment. These included a measure of problems with alcohol and binge drinking, as well as whether personnel were experiencing symptoms of PTSD or any other mental health problems. Cases of PTSD were identified as personnel who scored higher than 50 on the PCL-C (the PTSD Checklist for civilians), a 17-item checklist used by the National Center for PTSD (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Symptoms of common mental disorders were measured with the General Health Questionnaire 12 (GHQ-12),

a 12-item screening tool with established validity (Goldberg et al., 1997; Goldberg & Williams, 1988). Cases were identified as those who scored more than 4 out of 12. Alcohol consumption and harmful use were measured using the World Health Organization (WHO)'s Alcohol Use Disorders Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Personnel who scored higher than 16 were considered to be engaging in alcohol misuse (defined as alcohol use that is also harmful to health; Fear et al., 2010).

### *Statistical Analysis*

All analyses were conducted using Stata 9 (StataCorp, College Station, Texas, USA), and survey commands were used to take account of the sampling strategy. We compared relationship change between the "deployed" and "not deployed" groups to investigate the impact of deploying to Iraq since 2003 on relationship change. Results were adjusted for statistically significant sociodemographic factors. These were service, age, sex, rank, status, and having children under the age of 18 years. Associations were determined using multinomial logistic regression analysis; relative risk ratios with 95% confidence intervals are presented.

We then analysed factors associated with negative relationship change in the deployed group, thus all those with positive relationship change or who had not deployed to Iraq were dropped from the sample frame. Results were adjusted for statistically significant sociodemographic factors for this group, namely sex, age, rank, and having children under the age of 18. Logistic regression models were fitted to generate odds ratios with 95% confidence intervals to explore associations between negative relationship change and (1) predeployment factors, (2) deployment factors, (3) post-deployment factors, and (4) health factors.

## RESULTS

Of 5,854 personnel deployed to Iraq, 8% reported a negative relationship change, 12% reported a positive relationship change, and 80% reported no relationship change. Of the 4,367 personnel who did not deploy to Iraq, 9% reported a positive change, 7% a negative change, and 84% reported no change. There was initially a significant association between deployment to Iraq and negative relationship change (relative risk ratio [RRR] = 1.22 [95% confidence interval 1.04–1.43]) and positive relationship change (RRR = 1.34 [95% confidence interval 1.17–1.52]). However, after adjusting for significant sociodemographic factors (sex, rank, status, service, age, and having children under age 18), there was no longer a significant association between deployment to Iraq and negative relationship change (RRR = 1.04 [95% confidence interval 0.89–1.23]) or positive relationship change (RRR = 1.06 [95% confidence interval 0.93–1.22]).

After this analysis, all those who had not deployed to Iraq or reported a positive relationship change were dropped from

TABLE 2  
Predeployment Factors

Predeployment Factors	Number of Personnel with Negative Relationship Change (weighted%) <i>N</i> = 445	Number of Personnel with No Relationship Change (weighted%) <i>N</i> = 4,688	Logistic Regression Analysis	
			Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio <sup>a</sup> (95% CI)
Sex				
Male	390 (88.1)	4,295 (92.4)	1.00	1.00
Female	55 (11.9)	393 (7.6)	1.64 (1.20–2.23)	1.33 (0.96–1.83)
Service				
Navy	54 (12.6)	648 (14.3)	0.82 (0.61–1.12)	0.82 (0.60–1.12)
Army	318 (70.2)	3,132 (66.1)	1.00	1.00
RAF	73 (17.4)	908 (19.6)	0.83 (0.64–1.09)	0.95 (0.72–1.25)
Status				
Regular	379 (92.0)	3,884 (90.6)	1.00	1.00
Reserve	66 (8.0)	804 (9.4)	0.84 (0.64–1.10)	1.04 (0.77–1.40)
Rank				
Noncommissioned officer or below	393 (89.0)	3,861 (82.9)	1.00	1.00
Officer or above	52 (11.0)	827 (17.1)	0.60 (0.44–0.82)	0.72 (0.52–1.00)
Age group (years)				
Under 25	136 (32.0)	728 (16.7)	1.00	1.00
25 to 35	197 (45.0)	1,978 (43.7)	0.53 (0.42–0.67)	0.65 (0.51–0.84)
Over 35	112 (23.0)	1,982 (39.6)	0.30 (0.23–0.40)	0.45 (0.32–0.62)
Children status (under 18 years)				
No children	303 (68.8)	2,289 (48.8)	1.00	1.00
Children	142 (31.2)	2,399 (51.2)	0.43 (0.35–0.53)	0.56 (0.44–0.71)
Argued more with partner				
No	161 (49.0)	2,446 (74.5)	1.00	1.00
Yes	165 (51.0)	820 (25.5)	3.04 (2.40–3.85)	2.79 (2.19–3.55)

Note: Numbers may not equal totals due to missing data.

<sup>a</sup>Adjusted for sociodemographic factors (described in methods).

the sample, leaving a total of 5,133 Iraq-deployed military personnel with either no relationship change or a negative relationship change.

### Predeployment Factors

Being an officer (rather than a noncommissioned officer [NCO] or other rank), of older age, and having children younger than 18 years of age were protective against negative relationship change (see Table 2). Personnel who reported arguing more with their partners prior to deployment were more likely to report a negative relationship change. Following adjustment for significant sociodemographic factors, there was no significant association between relationship change and sex, service, or enlistment status (regular or reserve).

### Deployment Factors

Handling bodies on deployment and experiencing hostility from civilians were significantly associated with negative relationship change (see Table 3). Those who had deployed for 13 months or more in the past 3 years were also more likely to report a negative relationship change.

Events at home were also associated with negative relationship change, the strongest association being seen with experiencing financial problems while on deployment. Those

who felt that the military had not provided enough support for their families were more likely to report a negative relationship change, as were those who felt that their family had not provided them with enough personal support.

### Postdeployment Factors

Those who reported problems adjusting on return from deployment were more likely to report a negative relationship change (see Table 4). Personnel who reported arguing more with their partners, being concerned that their partners would leave them and having problems resuming sexual relations with their partners were more than three times as likely to report a negative relationship change. This risk was also increased among personnel who reported being physically violent toward a family member on return from deployment.

### Health Factors

Personnel with probable PTSD were more likely to report a negative relationship change, as were personnel who reported experiencing common mental health problems (see Table 5). Alcohol misuse and being a binge drinker were both significantly associated with negative relationship change.

TABLE 3  
Deployment Factors

Deployment Factors	Number of Personnel with Negative Relationship Change (weighted%) <i>N</i> = 445	Number of Personnel with No Relationship Change (weighted%) <i>N</i> = 4,688	Logistic Regression Analysis	
			Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio <sup>a</sup> (95% CI)
Saw personnel wounded or killed				
No	222 (50.5)	2,654 (56.7)	1.00	1.00
Yes	222 (49.5)	2,032 (43.3)	1.29 (1.05–1.57)	1.16 (0.95–1.42)
Handled bodies				
No	361 (81.6)	4,027 (86.3)	1.00	1.00
Yes	83 (18.4)	659 (13.7)	1.42 (1.09–1.83)	1.30 (1.00–1.69)
Gave aid to the wounded				
No	351 (80.1)	3,838 (82.7)	1.00	1.00
Yes	93 (19.9)	848 (17.3)	1.19 (0.93–1.52)	1.12 (0.87–1.44)
Came under small-arms fire				
No	276 (61.7)	3,174 (67.3)	1.00	1.00
Yes	168 (38.3)	1,512 (32.7)	1.28 (1.04–1.57)	1.13 (0.92–1.39)
Came under mortar/scud/artillery fire				
No	216 (48.8)	2,315 (49.7)	1.00	1.00
Yes	228 (51.2)	2,317 (50.3)	1.04 (0.85–1.27)	1.02 (0.83–1.24)
Experienced a landmine strike				
No	428 (96.1)	4,506 (96.1)	1.00	1.00
Yes	16 (3.9)	180 (3.9)	1.00 (0.59–1.68)	0.86 (0.51–1.47)
Experienced hostility from civilians				
No	215 (48.6)	2,653 (56.3)	1.00	1.00
Yes	229 (51.3)	2,033 (43.7)	1.36 (1.11–1.66)	1.22 (1.00–1.49)
Thought that they might be killed				
No	263 (61.1)	2,599 (57.2)	1.00	1.00
Yes	164 (38.9)	1,918 (42.8)	0.85 (0.70–1.04)	0.88 (0.71–1.08)
Total months deployed in 3 years				
Less than 13	324 (72.8)	3,780 (80.7)	1.00	1.00
13 or more	110 (27.2)	827 (19.3)	1.56 (1.24–1.97)	1.47 (1.16–1.85)
Military provided enough support for family				
Yes	225 (52.2)	2,869 (62.8)	1.00	1.00
No	196 (47.8)	1,620 (37.2)	1.55 (1.26–1.90)	1.31 (1.06–1.62)
Received enough personal support from family				
Yes	421 (95.5)	4,539 (97.1)	1.00	1.00
No	23 (4.5)	147 (2.9)	1.57 (0.98–2.51)	1.85 (1.14–3.00)
Had serious financial problems when on deployment				
No	420 (95.6)	4,561 (97.8)	1.00	1.00
Yes	24 (4.4)	125 (2.2)	2.03 (1.27–3.25)	2.08 (1.27–3.39)

Note: Numbers may not equal totals due to missing data.

<sup>a</sup>Adjusted for sociodemographic factors (described in methods).

## DISCUSSION

We have shown that deployment to Iraq is not significantly associated with negative relationship change, after adjusting for sociodemographic factors. There is also no significant association between deployment to Iraq and positive relationship change after adjusting for sociodemographic factors. We then focused on negative relationship changes, in keeping with the purpose of the study. Looking solely then at those who have deployment experience, negative relationship change was associated with the predeployment risk factors of younger age, lower rank, childlessness, and argumentative relationships. Although one cannot exclude a link between, for example, interpartner arguments and impending deployment,

the most plausible explanation is that unstable relationships prior to deployment were more at risk of negative change postdeployment, regardless of deployment experiences. Perhaps surprisingly, exposure to warfare on deployment has little or no impact on negative relationship change, with only handling bodies and experiencing hostility from civilians associated with negative relationship change.

So the important associations within the deployed group were related to time spent away and events occurring at home. Increased length of deployment was associated with negative relationship change, and those that felt their families lacked military support, did not receive enough support from their families, and had serious financial problems were more at risk of negative relationship change. However, one must accept

TABLE 4  
Postdeployment Factors

Postdeployment Factors	Number of Personnel with Negative Relationship Change (weighted%) <i>N</i> = 445	Number of Personnel with No Relationship Change (weighted%) <i>N</i> = 4,688	Logistic Regression Analysis	
			Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio <sup>a</sup> (95% CI)
Found it difficult to adjust to being back home				
Disagree	218 (53.6)	2,952 (67.7)	1.00	1.00
Agree	201 (46.4)	1,486 (32.3)	1.82 (1.48–2.23)	1.68 (1.36–2.07)
Argued more with partner on return from deployment				
Disagree	185 (48.1)	3,243 (77.6)	1.00	1.00
Agree	210 (51.9)	953 (22.4)	3.74 (3.02–4.64)	3.90 (3.13–4.85)
Had difficulty resuming sexual relations with partner				
Disagree	273 (70.5)	3,641 (87.4)	1.00	1.00
Agree	120 (29.5)	542 (12.6)	2.90 (2.29–3.69)	3.00 (2.32–3.88)
Was physically violent toward a family member				
Disagree	354 (91.6)	4,045 (96.2)	1.00	1.00
Agree	32 (8.4)	156 (3.8)	2.35 (1.58–3.52)	1.83 (1.21–2.77)
Worried spouse would leave				
Agree	207 (55.0)	3,486 (86.8)	1.00	1.00
Disagree	171 (45.0)	529 (13.2)	5.36 (4.27–6.72)	4.84 (3.84–6.11)

Note: Numbers may not equal totals due to missing data.

<sup>a</sup>Adjusted for sociodemographic factors (described in methods).

the risk of recall bias, particularly relating to perceived family support, since personnel may be more inclined to blame the military for a negative relationship change suffered post-deployment.

Postdeployment, problems resuming sexual relations with partners, arguing more with partners, and initiating intrafamily violence were strongly associated with negative relationship change. However, many of these variables may be markers for relationships that were in trouble prior to deployment, making it difficult to determine the direction of causality.

Finally, negative relationship change was associated with PTSD, common mental health problems, alcohol misuse, and

binge drinking, in keeping with an older literature (e.g., Kulka et al., 1988; Ruger et al., 2002). However, reserve causality (poor marital relationships contribute to poor mental health) cannot be excluded (Romito, Turan, & De Marchi, 2005).

### The Overall Impact of Deployment to Iraq on Relationships

The fact that deployment to Iraq is not significantly associated with negative relationship change is an important finding, especially when compared to research from previous conflicts such as World Wars I and II, Korea, and Vietnam,

TABLE 5  
Health Factors

Health Factors	Number of Personnel with Negative Relationship Change (weighted%) <i>N</i> = 445	Number of Personnel with No Relationship Change (weighted%) <i>N</i> = 4,688	Logistic Regression Analysis	
			Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio <sup>a</sup> (95% CI)
Probable PTSD				
No	387 (90.2)	4,432 (96.4)	1.00	1.00
Yes	44 (9.8)	171 (3.6)	2.90 (2.03–4.14)	2.70 (1.87–3.90)
Alcohol misuse				
No	294 (65.8)	3,924 (84.4)	1.00	1.00
Yes	142 (34.2)	699 (15.6)	2.81 (2.26–3.50)	2.21 (1.75–2.78)
Binge drinking problems				
No	157 (34.0)	2,508 (52.9)	1.00	1.00
Yes	280 (66.0)	2,136 (47.1)	2.18 (1.77–2.69)	1.76 (1.42–2.19)
Common mental health problems				
No	300 (70.1)	3,760 (81.6)	1.00	1.00
Yes	133 (29.9)	869 (18.4)	1.89 (1.52–2.36)	1.89 (1.51–2.37)

Note: Numbers may not equal totals due to missing data.

<sup>a</sup>Adjusted for sociodemographic factors (described in methods).

which has shown increased divorce rates amongst postwar veterans (Glass, 1934; Laufer & Gallops, 1985; Ruger et al., 2002). Our time frame (12 months) is shorter than in those studies. However, Card (1983), in a study of Vietnam veterans and their relationships, reported that most divorces happened in what she labeled the “first vulnerable year,” after which there was no long-term difference in marital stability between veterans and nonveterans. More important, to our knowledge, this is the first article on this subject from the United Kingdom. Our results directly contradict a growing body of popular opinion in the media and the general public that deployments to Iraq and Afghanistan are destroying marriages (Winston, 2011).

There have been a few studies from the United States that support our findings of no impact of military deployment on relationships. A RAND study found little evidence of increased risk of marriage dissolution in the military following deployment to Iraq and Afghanistan (Karney & Crown, 2007). Similarly, research by Angrist and Johnson (2000) found that deployment of male soldiers during the 1990–1991 Persian Gulf War had no effect on marriage dissolution, although there was an increased risk among female soldiers. Our study did not find this, although numbers of women were small ( $n = 448$ ).

More recent research into divorce trends of U.S. Air Force Academy graduates found divorce rates were actually lower than the general population, although this research does not look specifically at the effects of deployment (McCone & O’Donnell, 2006). However, these studies focus specifically on divorce rates and do not include separation and breakdown of other long-term relationships, as we do. What we did not study, however, was relationship satisfaction, especially of partners left behind, which has been shown to significantly decrease during deployment yet not result in separation or divorce (Burrell, Adams, Durand, & Castro, 2006; de Burgh, White, Fear, & Iversen, 2011; Schumm et al., 2000).

We did not overlook the finding that many military personnel feel experiencing trauma strengthens their relationships with their partners and families (Newby et al., 2005). So our overall lack of association between deployment to Iraq and negative relationship change may reflect the equal amount of positive and negative relationship changes in the sample following deployment.

### Risk Factors for Negative Relationship Change

Our findings suggest that having children who are younger than age 18 is protective of negative relationship change. While it is tempting to view this as a positive outcome, recent research has suggested that children whose parents stay together only for the sake of their children but have high interpersonal conflict levels do worse than those whose parents are amicably separated (Musick & Meier, 2010).

We were surprised that our research shows little association between negative relationship change and combat experiences. This differs from previous research suggesting that the most important predictor of marriage dissolution is experience of combat and conflict (Call & Teachman, 1991; Ruger et al., 2002; Goff et al., 2007).

One way of reconciling these differences is that trauma may only influence negative relationship change via the agency of mental disorder (Sayers et al., 2009). This theory is supported by our findings that probable PTSD is associated with negative relationship change, and by recent research suggesting that PTSD is associated with decreased marital satisfaction (de Burgh et al., 2011; Goff et al., 2007; Meis et al., 2010; Sayers et al., 2009). Other research from the Vietnam War suggests that ex-prisoners of war with PTSD had high divorce and separation rates (Mills & Turnbull, 2004). However, given that PTSD is also more common in those who are single, divorced, or separated, it is again possible that we are seeing reverse causality, with poor or absent relationships increasing the risk of PTSD (Iversen et al., 2009).

Perhaps not surprisingly, personnel who binge drink or misuse alcohol are more likely to report negative relationship change. This may be confounded in some cases by the fact that personnel with PTSD use alcohol as a coping mechanism (Henderson, Langston, & Greenberg, 2009).

Interestingly, lower rank and younger age are associated with negative relationship change. Personnel of lower rank are likely to be younger and therefore more likely to be in newer relationships, with both parties less experienced at coping with deployment, increasing the risk of relationship problems (Harrell, 1992; Ruger et al., 2002). In addition, personnel in the lower ranks of the military have traditionally been recruited from inner-city areas with high levels of socioeconomic deprivation, which often includes exposure to dysfunctional or violent relationships as young children (Iversen, Fear, et al., 2007; Maguen et al., 2010). It has been suggested that this childhood trauma may lead to adult personality traits such as sensation seeking, poor self-regulation, and impulsivity (Brodsky et al., 2001), which may predispose such individuals to function poorly within a relationship, especially after a military deployment. These personality traits may also predispose these personnel to seek out combative situations and put them at risk of developing PTSD (Iversen, Waterdrinker, et al., 2007; Iversen, Fear, et al., 2007; Iversen et al., 2008).

### Study Limitations

Our study has limitations, the first being our definition of relationship change, which is somewhat subjective. For example, personnel may differ in their definition of a long-term relationship. In addition, it is a crude measure of relationship change, as it is not possible to determine whether personnel are referring to the same relationship for both responses, as



the questionnaire merely asks about relationship status pre- and postdeployment. As there was only 12 months between previous and current relationship status, it is hoped that this does not allow too much scope for error. Moreover, since the study is cross-sectional, we cannot confidently determine a pattern of causality, as many of the measures used are outcome measures or “disease modifiers” themselves. Importantly, not all negative relationship changes represent a negative life event for the people involved—many could actually find ending a relationship a positive step. It is interesting to note that Newby and colleagues (2005) have found that married soldiers are more likely to report negative effects of deployment than are single soldiers, suggesting that while there may not be any change in relationship status, relationship satisfaction is likely to decrease for both partners during deployment. Finally, we did not investigate predictors of positive relationship change, as they are less likely to negatively influence the health, mental health, and functioning of military personnel.

## CONCLUSIONS

Our study suggests that deployment of UK military personnel to Iraq is not associated with an overall increase in negative relationship change, after adjustment for significant sociodemographic characteristics. Further, our research suggests that trauma experience itself mostly does not influence negative relationship change, and that the stability of the relationship and levels of interpersonal conflict both pre- and postdeployment are important.

Personnel at risk of relationship breakdown are those who display symptoms of PTSD, are binge drinkers or misuse alcohol, have difficulty adjusting postdeployment, have argumentative relationships, and are more likely to be younger personnel with no children in the lower ranks of the military. We hope that identifying this at-risk group will allow for greater support and targeted interventions for these personnel and their families.

## REFERENCES

- Angrist, J., & Johnson, J. (2000). Effects of work-related absences on families: Evidence from the Gulf war. *Industrial and Labor Relations Review*, 54(1), 41–58. Retrieved from [www.ilr.cornell.edu/ilrreview/](http://www.ilr.cornell.edu/ilrreview/)
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *AUDIT: The Alcohol Use Disorders Identification Test* (2nd ed.). Geneva, Switzerland: World Health Organization.
- Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD checklist (PCL). *Behavioural Research Theories*, 34(8), 669–673. doi:10.1016/0005-7967(96)00033-2
- Brodsky, B. S., Oquendo, M., Ellis, S. P., Grunebaum, M. F., Malone, K. M., Brodsky, B. S., ... Mann, J. J. (2001). The relationship of childhood abuse to impulsivity and suicidal behavior in adults with major depression. *American Journal of Psychiatry*, 158(11), 1871–1877. doi:10.1176/appi.ajp.158.11.1871
- Burrell, L. M., Adams, G. A., Durand, D. B., & Castro, C. A. (2006). The impact of military lifestyle on well-being, Army, and family outcomes. *Armed Forces and Society*, 33(1), 43–58. doi:10.1177/0002764206288804
- Call, V. R. A., & Teachman, J. D. (1991). Military service and stability in the family life course. *Military Psychology*, 3(4), 233–251. doi:10.1207/s15327876mp0304.4
- Card, J. J. (1983). *Lives after Vietnam: The personal impact of military service*. Lexington, MA: Lexington Books.
- de Burgh, H. T., White, C. J., Fear, N. T., & Iversen, A. C. (2011). The impact of deployment to Iraq or Afghanistan on partners and wives of military personnel. *International Review of Psychiatry*, 23(2), 192–200.
- Fear, N. T., Jones, M., Murphy, D., Hull, L., Iversen, A. C., Coker, B., ... Wessely, S. (2010). What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK armed forces? A cohort study. *Lancet*, 22, 1783–1797. doi:10.1016/S0140-6736(10)60672-1
- Glass, D. (1934). Divorce in England and Wales. *Sociological Review*, 26(3), 288–308.
- Goff, B. S., Crow, J. R., Reissbig, A. M., & Hamilton, S. (2007). The impact of individual trauma symptoms of deployed soldiers on relationship satisfaction. *Journal of Family Psychology*, 21(3), 344–353. doi:10.1037/0893-3200.21.3.344
- Goldberg, D. P., Gater, R., Sartorius, N., Ustun, T. B., Piccinelli, M., Gureje, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine*, 27(1), 191–197.
- Goldberg, D. P., & Williams, P. (1988). *A users' guide to the General Health Questionnaire*. London, UK: NFER-Nelson.
- Harrell, M. C. (1992). *Invisible women: Junior enlisted Army wives*. Santa Monica, CA: RAND Corporation.
- Henderson, A., Langston, V., & Greenberg, N. (2009). Alcohol misuse in the Royal Navy. *Occupational Medicine*, 59(1), 25–31. doi:10.1093/occmed/kqn152
- Hotopf, M., Hull, L., Fear, N. T., Browne, T., Horn, O., Iversen, A., ... Wessely, S. (2006). The health of UK military personnel who deployed to the 2003 Iraq war: A cohort study. *Lancet*, 367, 1731–1741. doi:10.1016/S0140-6736(06)68662-5
- Iversen, A. C., Fear, N. T., Ehlers, A., Hacker-Hughes, J., Hull, L., Earnshaw, M., ... Hotopf, M. (2008). Risk factors for post-traumatic stress disorder among UK armed forces personnel. *Psychological Medicine*, 38(4), 511–522. doi:10.1017/S0033291708002778
- Iversen, A. C., Fear, N. T., Simonoff, E., Hull, L., Horn, O., Greenberg, N., ... Wessely, S. (2007). Influence of childhood adversity on health among UK military personnel. *British Journal of Psychiatry*, 191, 506–511. doi:10.1192/bjp.bp.107.039818
- Iversen, A. C., van Staden, L., Hacker Hughes, J., Browne, T., Hull, L., Hall, J., ... Fear, N. T. (2009). The prevalence of common mental disorders and PTSD in the UK military: Using data from a clinical-interview based study. *BMC Psychiatry*, 9, 68. doi:10.1186/1471-244X-9-68
- Iversen, A., Waterdrinker, A., Fear, N., Greenberg, N., Barker, C., Hotopf, M., ... Wessely, S. (2007). Factors associated with heavy alcohol consumption in the U.K. armed forces: Data from a health survey of Gulf, Bosnia, and era veterans. *Military Medicine*, 172(9), 956–961. Retrieved from [www.ingentaconnect.com/content/amsus/zmm/2007/00000172/00000009/art00019](http://www.ingentaconnect.com/content/amsus/zmm/2007/00000172/00000009/art00019)
- Karney, B. R., & Crown, J. S. (2007). *Families under stress: An assessment of data, theory, and research on marriage and divorce in the military*. Santa Monica, CA: National Defense Research Institute, RAND Corporation.
- Kulka, R. A., Schlenger, W. E., & Fairbank, J. A. (1988). *Contractual report of findings from the national Vietnam veterans' readjustment study*. Research Triangle Park, NC: Research Triangle Institute.
- Laufer, R. S., & Gallops, M. S. (1985). Life course effects of Vietnam combat and abusive violence: Marital patterns. *Journal of Marriage and Family*, 47(4), 839–853. Retrieved from <http://www.jstor.org/stable/352328>

- Maguen, S., Lucenko, B. A., Reger, M. A., Gahm, G. A., Litz, B. T., Seal, K. H., . . . Marmar, C. R. (2010). The impact of reported direct and indirect killing on mental health symptoms in Iraq war veterans. *Journal of Traumatic Stress, 23*(1), 86–90. doi:10.1002/jts.20434
- McCone, D., & O'Donnell, K. (2006). Marriage and divorce trends for graduates of the U.S. Air Force Academy. *Military Psychology, 18*(1), 61–75. doi:10.1207/s15327876mp1801\_4
- Meis, L. A., Erbes, C. R., Polusny, M. A., & Compton, J. S. (2010). Intimate relationships among returning soldiers: The mediating and moderating roles of negative emotionality, PTSD symptoms, and alcohol problems. *Journal of Trauma and Stress, 23*(5), 564–572. doi: 10.1002/jts.20560
- Milliken, C. S., Auchterlonie, J. L., & Hodge, C. W. (2007). Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war. *Journal of the American Medical Association, 298*(18), 2141–2148. doi:10.1001/jama.298.18.2141
- Mills, B., & Turnbull, G. (2004). Broken hearts and mending bodies: The impact of trauma on intimacy. *Sexual and Relationship Therapy, 19*(3), 265–289. doi:10.1080/14681990410001715418
- Musick, K., & Meier, A. (2010). Are both parents always better than one? Parental conflict and young adult well-being. *Social Science Research, 39*(5), 814–830. doi:10.1016/j.ssresearch.2010.03.002
- Newby, J. H., McCarroll, J. E., Ursano, R. J., Zizhong, F., Shigemura, J., & Tucker-Harris, Y. (2005). Positive and negative consequences of a military deployment. *Military Medicine, 170*(10), 815–819. Retrieved from www.ingentaconnect.com/content/amsus/zmm/2005/00000170/00000010/art00004
- Peebles-Kleiger, M. J., & Kleiger, J. H. (1994). Re-integration stress for Desert Storm families: Wartime deployment and family trauma. *Journal of Traumatic Stress, 7*(2), 173–194. doi:10.1002/jts.2490070203
- Renshaw, K. D., Rodrigues, C. S., & Jones, D. H. (2008). Psychological symptoms and marital satisfaction in spouses of Operation Iraqi Freedom veterans: Relationships with spouses' perceptions of veterans' experiences and symptoms. *Journal of Family Psychology, 22*(4), 586–594. doi:10.1037/0893-3200.22.3.586
- Romito, P., Turan, J. M., & De Marchi, M. (2005). The impact of current and past interpersonal violence on women's mental health. *Social Science and Medicine, 60*(8), 1717–1727. doi:10.1016/j.socscimed.2004.08.026
- Ruger, W., Wilson, S. E., & Waddoups, S. L. (2002). Warfare and welfare: Military service, combat, and marital dissolution. *Armed Forces and Society, 29*(1), 85–107. doi:10.1177/0095327x0202900105
- Sayers, S. L., Farrow, V. A., Ross, J., & Oslin, D. W. (2009). Family problems among recently returned military veterans referred for mental health evaluation. *Journal of Clinical Psychiatry, 70*(2), 163–170. doi:10.4088/JCP.07m03863
- Schumm, W., Bell, B., & Grade, P. (2000). Effects of a military overseas peacekeeping deployment on marital quality, satisfaction, and stability. *Psychological Reports, 87*(3 Part 1), 815–821. doi:10.2466/pr0.2000.87.3.815
- Schumm, W., & Hemesath, K. (1996). Did Desert Storm reduce marital satisfaction among Army enlisted personnel? *Psychological Reports, 78*(3 Part 2), 1241–1242. doi:10.2466/pr0.1996.78.3c.1241
- Tate, A. R., Jones, M., Hull, L., Fear, N. T., Rona, R., Wessely, S., & Hotopf, M. (2007). How many mailouts: Could attempts to increase the response rate in the Iraq war cohort study be counterproductive? *BMC Medical Research Methodology, 7*, 51. doi:10.1186/1471-2288-7-51
- U.K. Ministry of Defence. (n.d.). Operations in Iraq: Facts and figures. Retrieved from <http://www.mod.uk/DefenceInternet/FactSheets/OperationsFactSheets/OperationsInIraqFactsandFigures.htm>
- Winston, S. (2011, January 21). No medals for those who stay at home. *The Guardian*, Retrieved from <http://www.guardian.co.uk/lifeandstyle/2011/jan/22/afghanistan-iraq-army-families>