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Women at War: Understanding the Impacts of Combat on Women's Educational Attainment

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ABSTRACT

This paper offers a first view on the potential economic outcomes for American women serving along-side men in combat roles. Specifically, this paper examines the impact of deployment and exposure to intense combat for women who served in the most high-risk occupations open to them in Iraq and Afghanistan on their subsequent use of GI bill benefits for higher education. It also compares these women to men who served in the same capacities and women who served in lower risk occupations. Women in general, and in these occupations in particular, were more likely than their male counterparts to use the GI bill. Following deployment, this paper presents robust evidence that women in all capacities, and men, were more likely to use their GI bill benefits. Moreover, exposure to intense combat, which was far more likely to impact these women than other women, detracted from their propensity to use the GI bill. This negative impact on pursuit of higher education was similar for both men and women. Taken together, this paper provides evidence that deployment may benefit the young men and women alike who serve in the U.S. military, and that both suffer together when faced with exposure to intense fighting.

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Introduction

Most of the debate surrounding the 2015 decision to open all combat roles in the U.S. military to women has focused on combat readiness. The decision, however, also raises questions regarding the likely impact of combat service on women and their families. One way to shed light on that question is to consider America's recent experience in Afghanistan and Iraq. Nearly 300,000 American women were deployed to serve in Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF). While women who participated in OEF and OIF were not allowed to serve in combat roles per se, many served alongside men in support functions that brought them into harm's way. It seems pertinent to ask how deployment and exposure to intense combat affected these women.

In this paper, I consider the impact of deployment to OEF/OIF, and exposure to combat once deployed, on women, particularly women who served in the most dangerous support roles in those operations. What was their experience, in terms of deployment and danger, compared with men who were deployed in similar roles? How did these women fare when compared with woman who served in less demanding or dangerous roles? How did women who deployed fare when compared with those who served in the military but did not participate in OEF/OIF?

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While participating in combat can impact those who fight in a variety of ways, this paper focuses on a specific preliminary indicator of social and economic well-being – the pursuit of higher education post-service. Specifically, this paper asks whether service members used their Montgomery GI bill, which provides educational assistance to veterans. Evidence from past conflicts suggests a strong relationship between GI bill use and long run earnings. Looking at Vietnam Veterans, Angrist (1990) estimates that Veterans' educational benefits raised schooling 1.4 years and increased lifetime earnings by approximately 6%. Hence, I interpret greater interest in the pursuit of higher education, as captured by the use of the GI Bill, as a positive sign that a veteran is successfully assimilating back into civilian life and showing an active interest in her long-term welfare.

In order to understand the consequences of combat exposure, this paper focuses on the cohort of women who served in jobs which accounted for the preponderance of hostile deaths and injuries for women. It looks at whether deployment, and exposure to intense combat if deployed, influenced subsequent GI bill use among this cohort. I compare these women to men in the same jobs and to women in other professions in the U.S. military.

All three cohorts of people were more likely to use their GI bill benefits if they were deployed. However, those who were exposed to the most intense fighting were less likely than other deployed personnel to use these benefits. Women were more likely than their male counterparts, in general, to use the GI bill, and exposure to more intense combat did not detract from GI bill use for women any more than it did for men. Women who were in the most high-risk professions were more likely to use their GI bill benefits than other women and appear to have had the same responses to deployment and combat intensity as other women.

This paper has six sections. Section 2 reviews the literature on the impacts of combat, use of the GI bill, and the impact of military service on women. Section 3 describes the data. Section 4 explains the econometric strategy. Section 5 provides results for a basic model of GI bill use and explores robustness to various model specifications and selection issues. Section 6 concludes the paper.

Literature

A body of literature has been developed that attempts to understand the impact of serving in a war on future socio-economic outcomes. To try to understand the impact of serving in war on soldiers drafted in World War II and Vietnam, Angrist (1990) used birthdates from the draft lottery as instruments for being a combat veteran. The body of literature using this approach has found mixed results on the outcomes of veterans. On the one hand, Angrist and Krueger (1994) found that serving in World War II reduced future earnings and Autor, Duggan, and Lyle (2011) found declining employment among Vietnam era veterans and increasing use of government assistance for these individuals. However, Dobkin and Shabani (2009) found little impact on health and Angrist and Chen (2011) found little negative economic impact of having served in Vietnam.

An additional line of research studies the specific impact of deployment and combat on the all-volunteer force. Unlike the previous research, this line of research typically compares those who were deployed to those who were not. This research, generally, assumes that deployment is exogenous among those who serve since individuals neither choose nor are chosen to deploy. Researchers report primarily negative consequences of participation in combat on veterans' earnings, education, divorce rates, mental health, and the school performance of their children. (Lyle 2006; Engel, Gallagher, and Lyle 2010; Shen et al. 2010; Cesur, Sabia, and Tekin 2013; Negrusa, Negrusa, and Hosek 2014; Edwards 2015, Armey and Lipow 2015).

The GI bill has proved to be a particularly important channel for mitigating some of these economic harms of war. Angrist (1990, 1993) found that veterans' benefits raise earnings by approximately six percent, while Angrist and Chen (2011) reported seven percent returns. Bound and Turner (2002) reported substantial returns to World War II veterans in educational attainment. Lemieux and Card (2001) found similar results looking at the returns to the Canadian World War II era GI bill.

There is some evidence that military service has provided an economic benefit to women and minorities, particularly through education, and that this long-term advantage continues to motivate

many women to serve. This may be important, as the reasons women join may make their experiences fundamentally different than men's experience. Routon (2014) found that veteran women, like minorities, were more likely to go to college than their non-veteran counterparts. Similarly, data from the 2000 U.S. census suggests higher educational attainment among veteran women than non-veteran women, and higher attainment among veteran women than veteran males (Census 2011). Holder (2010) finds that post 9–11 female veterans face similar labor market challenges to their male counterparts, and she also finds that women are taking advantage of GI bill benefits in unprecedented numbers despite joining the service with higher levels of education than past female service members. Taken together, it seems that education as well as other economic advantages are a motivator for women to choose military service, and an important indicator of post service well-being.

Turning to the impact of combat on women, recent analyses have focused primarily on the health outcomes of women who have been deployed and who serve in combat support functions. These studies have found very mixed results. Some studies suggest that female veterans face more or different health challenges than their male counterparts (see for ex. Carney et al. 2003 and Street, Vogt, and Dutra 2009), and in some cases have higher rates of PTSD (Hoge, Clark, and Castro 2007). However, Fontana, Litz, and Rosenheck (2000) observed similar incidence of PTSD in both men and women peacekeepers. Haskell et al. (2009) found that women veterans were less likely to use the VA to address pain and less likely to report severe pain. And in comparing women in combat support roles to those in non-combat support roles, Lindstrom et al. (2006) found that the former were less likely to be hospitalized for mental health issues.

Thus, a gap persists in the literature for work addressing the impact of combat on women's economic outcomes. The service and combat exposure of U.S. women in OEF/OIF present a new opportunity to study the impacts of deployment and combat exposure on women. Arguably, other countries have allowed women into combat roles, and some of these women have served in these conflicts, however, the numbers of women deployed to combat zones in combat roles remains very small even for those countries that allow it.[1]

To the extent that the military is an important economic equalizer for women, the impact of serving in a war on these economic outcomes seems particularly important. Evidence that service in combat either positively or negatively impacts use of the GI bill would point toward the kinds of economic outcomes women are likely to experience in the future as they take on more active role on the front lines.

Data

The data used in this paper comes from administrative data covering all enlisted members of the U.S. Armed Forces stored primarily at the Defense Manpower Data Center (DMDC 2013). I focus my analysis on those who volunteered for service prior to September 2004 but had yet to complete their first term of service by that date. The choice of the cut-off date was made so as to balance an adequate sample size, with adequate numbers of women who were exposed to combat, with an interest in allowing enough time to have passed for many of this cohort to have used their Montgomery GI Bill (MGIB). Table 1 details all of the variables used in the study.

DMDC provided information on each individual's OEF/OIF deployments – including their location and dates, as well individual deaths and injuries from hostile forces. Using this data, I sought patterns in hostile deaths and injuries for women by profession. Table 2 lists these professions and the female fatalities and casualties associated with them. Women in these professions experienced more than 50% of the combat related injuries and fatalities women sustained in OEF and OIF. I use this group as my main cohort for analysis, it is comprised of about 34,000 individuals. I also compare these service members and their experiences with about 96,000 men in the same jobs and 88,000 women in other military jobs.

From the deployment and injury data, I construct two treatment variables. The first is a dummy variable for whether someone was deployed during their first term of enlistment. Second, I construct a dummy variable for whether or not an individual's unit suffered fatalities while the individual was deployed. I use this second dummy as a proxy for whether or not the individual faced intense combat.

Table 1. Variables.

Variable	Value	Definition
MGIB Use	1,0	Value of 1 if service member has begun to use MGIB benefits
Deployed	1,0	Value of 1 if service member was deployed during first term
Unit Mortality	1,0	Value of 1 if unit experienced a fatality while service member was deployed
Unit 30% Deployed	1,0	Value of 1 if a service member's unit deployed 30% of its personnel sometime in service member's first term of enlistment
Quit First Term	1,0	Value of 1 if service member did not reenlist for a second term
AFQT Percentile	1–98	Percentile score on AFQT
Age	20–56	Age at first term end
Married	1,0	Value of 1 if married at first term end
Children	1,0	Value of 1 if service member had children at first term end.
African American	1,0	Value of 1 if self-identified as Black
Hispanic	1,0	Value of 1 if self-identified as Hispanic
Asian	1,0	Value of 1 if self-identified as Asian
Risky Job	1,0	Value of 1 if service member had one of the MOSs listed in table 2
Female	1,0	Value of 1 if female
Unemployment	0.042–0.098	U.S. unemployment rate the year First Term Ended

Table 2. Female Fatality and Hostile Injury Rates in Riskiest MOSs.

Professions	Deaths	Professions	Hostile Injuries
Law enforcement	10	Law Enforcement	122
Supply	6	Vehicle Operator	93
Vehicle operator	5	Medical	80
Medical	3	Supply	41
Automotive	3	Food Service	26
Missile Fuel	3	Missle Fuel	20
Food Service	2	Automotive	8
Percent total	0.542372881		0.579494799

The MGIB, which commenced in 1984, provides up to 36 months of benefits, worth as much as $70,000, toward education expenses for veterans who commence studies within ten years of discharge from military service. Use of the MGIB requires completing a minimum term and a $100 per month contribution during the first year of service, and the service member must be in at least their third year of active service or have received an honorable discharge to use the benefit. The Veterans Administration (VA) provided the MGIB usage data and I created a dummy variable for whether a service member used the MGIB.

Additional DMDC data provides control variables such as each individual's race and gender. The data also includes annual updates of marital status, number of children, rank, and job, or Military Occupation Specialty (MOS), for as long as the individual is in uniform. It also includes percentile scores on the Armed Forces Qualification Test (AFQT). The AFQT is a subtest of the larger Armed Services Vocational Aptitude Battery (ASVAB), and is formed from a composite score of four general areas: arithmetic reasoning, word knowledge, paragraph comprehension, and mathematics knowledge. Volunteers with AFQT scores below the 31st percentile are rarely allowed to enlist. I include these variables as they could influence veterans' interest in tertiary education.

Finally, one might expect that economic conditions could impact an individual's choice to pursue employment, stay in the military, or go to school. To account for this I include the U.S. unemployment rate during the year that a service member's first term ended.

Table 3 provides summary statistics. The first column summarizes the characteristics of the cohort of primary interest: the women who served in risky professions in their first-term of enlistment. For comparison, I provide the same descriptive statistics for men who served in these same professions, and women in other professions. I also compare descriptive statistics of those women in risky professions who deployed with those who did not.

Table 3. Descriptive statistics.

	Women with Risky Jobs		Men with Same Jobs		Women First-term Other Jobs		Women Depl with Risky Jobs		Women not Depl with Risky Jobs	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
GI Bill Use	0.4100363	0.4918472	0.2861014	0.4519397	0.3684234	0.4823797	0.4272517	0.4947042	0.4028741	0.4904861
AFQT	53.48491	18.09155	55.2993	19.44394	61.70007	21.14508	52.37484	18.50673	53.94674	17.89611
Black	0.3599434	0.4799906	0.2473522	0.4314754	0.2595852	0.4384094	0.3563611	0.4789477	0.3614337	0.4804259
Asian	0.027465	0.1634364	0.0319122	0.1757674	0.0285248	0.1664675	0.0282571	0.165715	0.0271333	0.1624751
Hispanic	0.130563	0.3369268	0.1282832	0.3344067	0.1076239	0.3099065	0.1454234	0.352545	0.1243396	0.3299756
Children	0.6358451	1.010203	0.8648195	1.236271	0.6469108	0.9286672	0.6233494	1.027365	0.6414853	1.002335
Age	23.89294	4.368325	24.96766	5.147341	23.83868	3.86727	24.27282	4.185085	23.7349	4.43284
Married	0.3776145	0.4847976	0.3763239	0.4844653	0.4260494	0.4945038	0.3800582	0.4854252	0.3765979	0.4845428
Unemployment	0.0533264	0.0080742	0.0537259	0.0094963	0.0529516	0.0076625	0.0546375	0.0070678	0.0527809	0.0083978
Quit first term	0.8861846	0.3175916	0.900443	0.2994099	0.7524982	0.4315631	0.938548	0.2401695	0.8643997	0.3423708
Depl	0.2938018	0.455509	0.4298578	0.4950582	0.2138237	0.410006				
30% Unit Deployed	0.3135086	0.463926	0.4092623	0.4917003	0.2042576	0.4031603	0.8138367	0.3892579	0.1053555	0.3070174
Unit Hostile Deaths						0.0072296	0.1140288			
Sample Size	33,570		96,170		88,800		9909		23,661	

Notable here, women in general, and women in high-risk jobs in particular, are more likely than men to use the GI bill, consistent with the literature on women's post-service economic performance. Women in these risky jobs who did deploy, were more likely to use their MGIB benefits than those who did not. There are some other notable differences across groups as well. Women in high risk jobs were less likely to have children than men or women in other jobs. Men and women in these jobs were very unlikely to reenlist at the end of their first term.

Women in risky jobs were also somewhat more likely to be deployed than women in other positions but less likely than men in the same jobs. Similarly, they were less likely to serve in deployed units than men in the same set of positions. Women in high risk jobs who did deploy were less likely to have children than those who did not, and were also more likely to leave service at the end of their first term. Taken together these facts suggest that women in high-risk position who deployed were different from their counterparts who did not.

Thus, there is evidence that deployment may actually positively influence the likelihood that women in high risk jobs use the MGIB. However, given the differences in characteristics of these groups, the next sections present the strategies for controlling for these differences and their further implications.

Econometric Strategy

This paper estimates the probability of using the Montgomery GI bill based on one's first term deployment experiences and other control variables. I first employ a basic logit model for whether or not someone uses their MGIB. In addition to treatment variables – deployment and combat intensity - I add controls for age, family status, AFQT score, race, MOS, and the economic conditions at the end of the first term of enlistment.

To measure the differential treatment effect on females relative to males, and women in risky positions relative to those in other jobs, I included dummy variables and interaction terms in the cohorts of all personnel in risky jobs and all women. In the analysis of all personnel with high-risk jobs I include a dummy variable for female and a dummy variable for females who were deployed. In the all-female cohort, I include a dummy variable for high-risk jobs and one for deployment and high-risk employment. In measuring the impact of exposure to fatalities, I once again include the dummy variable for females in the analysis of all personnel with high-risk jobs, and a dummy variable for high-risk employment in the all-female analysis. I also interact female with unit fatalities, and high risk employment with unit fatalities, respectively.

As a test for the robustness of the logit results, I look at various modeling issues that might impact the accuracy of the result. One concern is that the decision to use the MGIB is related to the decision to reenlist, a decision which could also be influenced by exposure to combat. To deal with this Simon, Negrusa, and Warner (2010) use a Heckman style selection model to control for common factors driving the decision to leave the military and the decision to use the MGIB subsequent to leaving. While most service members do leave the military prior to going to school, some use their GI bill while they are still in the military, and some may decide to leave in order to use their GI bill. I thus model these as overlapping decisions using binomial probit instead.

As a final check for robustness, I correct for selection to deployment and high-risk units. Most recent studies have treated deployment as random. The rationale goes that if one joins the military, one has little impact on the unit to which one gets assigned and no ability to impact whether the unit gets sent to a combat zone. As most personnel deploy with their units, assignment to combat is as good as random. However, recent work casts doubt on the validity of this approach. Armey, Berck, and Lipow (2016) found that being African-American, having children, and being married greatly reduced the likelihood of deployment among those in combat jobs. Moreover, our descriptive statistics clearly indicate that there are differences between deployed and non-deployed personnel in the same jobs.

There are several choices for correcting for this selection to treatment, i.e. selection for deployment that one can use to more accurately measure the treatment effect. Most of these essentially involve weighting the un-deployed sample with the probability they would have been deployed. Wooldridge (2010) suggests inverse probability weighted regression adjustment. This model, implemented with STATA 13's teffects command, allows one to estimate both the outcome and the treatment probability. It also allows for both the outcome and treatment to be modeled as logits, which eases the comparison with earlier models and is appropriate for the binomial outcome variable, MGIB use. This model is considered robust to misspecification in either the outcome or treatment probability, or is 'doubly robust' unlike other potential corrections for assignment to treatment.

Results

I find that across all groups and models, deployment increases use of the MGIB, while combat intensity lowers the use of the MGIB. In Table 4, Deployment increases the odds of MGIB use across all groups from 6.5 to 10 percent.[2] These results are significant at the 99 percent level. Controlling for the decision to leave service using the bivariate probit in Table 5, being deployed has a positive and significant (99% level) impact on the decision to leave, and it also has a positive and significant (99% level) impact on the choice to use the GI bill across all cohorts. The propensity is greater, both to use the GI bill and to leave service, for women in high-risk professions than either of the other cohorts.

Women in high risk positions are particularly inclined to use their GI bill benefits. Relatively speaking, Table 4 suggests that they are 75% more likely than their male counterparts to use the GI bill. However, deployment appears to have the same impact on women as men in these positions. Similarly, women

Table 4. Impact of deployment Montgomery G.I. bill use logit.

Variables	Women Risky Job	All Risky Job	Women All Jobs
Deployed	0.0768***	0.0630***	0.0947***
	(0.0253)	(0.0152)	(0.0170)
Marriage	0.249***	0.0402**	0.219***
	(0.0292)	(0.0176)	(0.0156)
Children	−0.153***	−0.106***	−0.132***
	(0.0157)	(0.00828)	(0.00881)
Age	−0.0260***	−0.0210***	−0.0265***
	(0.00315)	(0.00159)	(0.00175)
African-American	0.0530**	0.0439***	0.0778***
	(0.0265)	(0.0153)	(0.0144)
Asian	0.0195	0.262***	−0.0152
	(0.0717)	(0.0358)	(0.0370)
Hispanic	0.0622*	0.209***	0.0659***
	(0.0364)	(0.0194)	(0.0199)
AFQT	0.00135**	0.00692***	0.00383***
	(0.000679)	(0.000351)	(0.000320)
Unemployment	3.883***	−0.114	2.186***
	(1.499)	(0.750)	(0.803)
Female		0.562***	
		(0.0177)	
Female deployed		0.0204	
		(0.0295)	
Female w/risky job			0.193***
			(0.0166)
Risky job deployed			−0.0115
			(0.0304)
Constant	−0.0580	−0.795***	−0.293***
	(0.105)	(0.0531)	(0.0579)
Observations	30,393	117,199	114,899

Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 5. Impact of deployment quitting and Montgomery G.I. bill benefit use bivariate probit.

	Women Risky Job		All Risky Job		Women All Jobs	
Variables	Discharged First Term	MGIB	Discharged First Term	MGIB	Discharged First Term	MGIB
Deployed	0.459***	0.0471***	0.383***	0.0364***	0.221***	0.0567***
	(0.0231)	(0.0158)	(0.0124)	(0.00913)	(0.0117)	(0.0105)
Marriage	−0.224***	0.152***	−0.335***	0.0180*	−0.130***	0.131***
	(0.0234)	(0.0181)	(0.0135)	(0.0106)	(0.0108)	(0.00961)
Children	0.0203	−0.0917***	0.0276***	−0.0591***	−0.0411***	−0.0786***
	(0.0124)	(0.00954)	(0.00616)	(0.00484)	(0.00587)	(0.00532)
Age	0.00273	−0.0159***	0.00462***	−0.0124***	0.00646***	−0.0156***
	(0.00254)	(0.00193)	(0.00121)	(0.000941)	(0.00120)	(0.00105)
African-American	−0.0707***	0.0339**	−0.0624***	0.0274***	−0.0285***	0.0520***
	(0.0215)	(0.0165)	(0.0121)	(0.00925)	(0.00989)	(0.00888)
Asian	−0.345***	0.00983	−0.417***	0.153***	−0.200***	−0.00958
	(0.0519)	(0.0447)	(0.0255)	(0.0220)	(0.0242)	(0.0228)
Hispanic	−0.0113	0.0381*	−0.123***	0.126***	0.0431***	0.0412***
	(0.0302)	(0.0227)	(0.0152)	(0.0118)	(0.0140)	(0.0123)
AFQT	−0.00721***	0.000814*	−0.00358***	0.00419***	−0.00151***	0.00240***
	(0.000539)	(0.000423)	(0.000273)	(0.000212)	(0.000214)	(0.000199)
Unemployment	10.23***	2.351**	10.54***	−0.0239	8.210***	1.374***
	(1.237)	(0.931)	(0.598)	(0.450)	(0.555)	(0.496)
Female			−0.0522***	0.343***		
			(0.0132)	(0.0108)		
Female deployed			0.0791***	0.0147		
			(0.0262)	(0.0181)		
Female w/ risky job					0.415***	0.123***
					(0.0120)	(0.0102)
Risky job deployed					0.240***	−0.00735
					(0.0256)	(0.0188)
Athrho		0.409***		0.368***		0.522***
		(0.0133)		(0.00744)		(0.00609)
Constant	0.974***	−0.0398	0.824***	−0.502***	0.227***	−0.206***
	(0.0872)	(0.0651)	(0.0422)	(0.0317)	(0.0402)	(0.0355)
Observations	30,393	30,393	117,199	117,199	114,899	114,899

Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

with high-risk jobs are about 20% more likely than other women to use the GI bill, but not any more or less likely to react to deployment.

The Bivariate probit in Table 5 sheds some light on whether the propensity to use the GI bill is a result of different propensities to leave service for women or those in high risk positions. Deployment leads to a greater propensity for women in high risk positions to leave service than men in comparable positions. This result is significant at the 99% level. Once this propensity is accounted for, women who were deployed are no more likely to use their GI bill post-deployment than men.

Deployment similarly discourages women in high risk professions from reenlisting to a greater degree than women in lower risk positions, and women in high-risk positions are less likely to reenlist than those in low-risk positions in the first place. Once these propensities for leaving are taken into account, the result is consistent with the first model, deployment increases the propensity for service members to use the GI bill.

In Table 6, I report the results of the IPWRA analysis which predicts a positive effect of deployment across groups, but at a much lower rate than the previous analysis. The models predict 1.5–2.5% increase in odds of use of the GI bill following deployment. This models deployment as a function of the same observables as GI bill use to correct the treatment effect.

Notably, it appears from this analysis that these observables are important predictors of deployment. Moreover, once this selection is controlled for, the positive impact of deployment, while still significant across groups at the 99 percent level, is much smaller. This suggests that selection for deployment is

Table 6. Impact of deployment Montgomery G.I. bill benefit use logit with estimation of treatment on observables.

	Women in Risky Jobs					Men in Risky Jobs					Women in Other Jobs				
Variables	Treatment	Potential Outcome Mean	Untreated	Treated	First Stage	Treatment	Potential Outcome Mean	Untreated	Treated	First Stage	Treatment	Potential Outcome Mean	Untreated	Treated	First Stage
Married			0.318***	0.0958*	−0.0416			0.0480	−0.213***	−0.113***			0.256***	0.0267	0.0509**
			(0.0354)	(0.0524)	(0.0311)			(0.0317)	(0.0321)	(0.0197)			(0.0213)	(0.0387)	(0.0215)
Children			−0.165***	−0.134***	−0.0617***			−0.0752***	−0.0940***	0.116***			−0.131***	−0.0864***	−0.115***
			(0.0192)	(0.0284)	(0.0164)			(0.0147)	(0.0142)	(0.00837)			(0.0121)	(0.0230)	(0.0123)
Age			−0.0207***	−0.0378***	0.0299***			−0.0246***	−0.00726***	−0.00550***			−0.0194***	−0.0555***	0.0386***
			(0.00351)	(0.00600)	(0.00298)			(0.00220)	(0.00281)	(0.00145)			(0.00223)	(0.00496)	(0.00207)
African-American			0.0690**	0.00262	−0.0798***			0.0401	0.0271	−0.170***			0.128***	−0.0769**	−0.0641***
			(0.0319)	(0.0478)	(0.0282)			(0.0255)	(0.0283)	(0.0168)			(0.0193)	(0.0367)	(0.0199)
Asian			0.00931	0.0466	−0.000512			0.364***	0.305***	−0.139***			0.0219	−0.213**	−0.0425
			(0.0865)	(0.128)	(0.0759)			(0.0545)	(0.0620)	(0.0391)			(0.0488)	(0.0938)	(0.0499)
Hispanic			0.0414	0.0930	0.146***			0.327***	0.205***	−0.0254			0.0597**	0.0622	0.182***
			(0.0449)	(0.0622)	(0.0379)			(0.0311)	(0.0337)	(0.0211)			(0.0276)	(0.0468)	(0.0265)
AFQT			0.00177**	0.000946	−0.00486***			0.00921***	0.00870***	0.00567***			0.00566***	0.000859	−0.00271***
			(0.000816)	(0.00120)	(0.000734)			(0.000572)	(0.000603)	(0.000368)			(0.000395)	(0.000795)	(0.000402)
Unemployment			−3.134*	24.33***				−8.874***	10.25***				−3.245***	16.61***	
			(1.689)	(3.099)				(1.123)	(1.278)				(1.055)	(1.957)	
Treatment Deployed	0.0151** (0.00611)					0.0115*** (0.00306)					0.0227*** (0.00403)				
Av. Not Depl		0.408*** (0.00340)					0.277*** (0.00207)					0.370*** (0.00189)			
Constant			0.143	−0.732***	−1.185***			−0.410***	−1.654***	−0.343***			−0.319***	0.0127	−1.947***
			(0.117)	(0.213)	(0.0804)			(0.0745)	(0.0939)	(0.0415)			(0.0746)	(0.151)	(0.0546)
Observations	30,393	30,393	30,393	30,393	30,393	86,806	86,806	86,806	86,806	86,806	84,506	84,506	84,506	84,506	84,506

Robust standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 7. Impact of unit fatalities on those deployed Montgomery G.I. bill use logit.

	Women	All	Women
Variables	Risky Job	Risky Job	All Jobs
Unit Mortality	−0.757**	−0.559***	−0.139
	(0.318)	(0.0758)	(0.118)
Marriage	0.0983*	−0.125***	0.0536*
	(0.0523)	(0.0273)	(0.0309)
Children	−0.134***	−0.110***	−0.102***
	(0.0281)	(0.0124)	(0.0176)
Age	−0.0373***	−0.0124***	−0.0482***
	(0.00595)	(0.00261)	(0.00370)
African-American	0.000382	0.0170	−0.0486*
	(0.0478)	(0.0243)	(0.0291)
Asian	0.0495	0.263***	−0.123
	(0.128)	(0.0559)	(0.0754)
Hispanic	0.0923	0.183***	0.0716*
	(0.0625)	(0.0298)	(0.0375)
AFQT	0.000944	0.00722***	0.000799
	(0.00120)	(0.000535)	(0.000664)
Unemployment	24.82***	13.41***	18.92***
	(3.016)	(1.213)	(1.629)
Female		0.583***	
		(0.0242)	
Female with Unit Mortality		−0.178	
		(0.323)	
Female w/ risky job			0.144***
			(0.0266)
Risky job with Unit Mortality			−0.549
			(0.337)
Constant	−0.767***	−1.613***	−0.294**
	(0.212)	(0.0890)	(0.121)
Observations	9501	49,423	28,501

Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

indeed an important issue. It also suggests, however, that the impact of the deployment experience can be positive, or at least neutral, in people's lives.

Turning to combat intensity and its impact on GI bill use, the effect of unit mortality among the deployed is generally negative. In the logit models in Table 7, among those women deployed in high risk professions, unit mortality reduced the likelihood that they would use their MGIB by 45%. However, this result is only statistically significant at the 95% level. For all personnel deployed in risky jobs the reduction was about 57% and is significant at the 99% level. Women in general saw fewer unit fatalities which perhaps accounts for the lower significance level, and the lack of significance for the third category of women in general. Neither of the interaction terms are significant meaning that women did not react in the long run significantly differently than men in response to being in units with fatalities, nor were women in risky professions more or less able to cope upon returning home with high intensity combat.

The results of the initial model are generally robust to the bivariate probit model in Table 8. The bivariate probit suggests that all personnel were less likely to leave the service if exposed to unit mortalities. This seemingly strange result is in-line with findings of a 2006 Rand report in which many service members reported a greater intention to stay in the military if they had been involved in combat operations (Hosek, Kavanagh, and Miller 2006). This may be a result of unobservable heterogeneity – those in higher risk units may be there because they are more suited to military life in some way. Alternatively, those who have experienced in-unit casualties may feel a greater sense of obligation to 'get the job done' and reenlist accordingly.

Table 8. Impact of fatalities quitting and Montgomery G.I. bill benefit use bivariate probit.

	Women Risky Job		All Risky Job		Women All Jobs	
Variables	Discharged First Term	MGIB	Discharged First Term	MGIB	Discharged First Term	MGIB
Unit Mortality	−0.604***	−0.455**	−1.280***	−0.338***	−0.271***	−0.0931
	(0.217)	(0.187)	(0.0399)	(0.0434)	(0.0763)	(0.0729)
Marriage	−0.239***	0.0572*	−0.345***	−0.0794***	−0.0773***	0.0277
	(0.0503)	(0.0324)	(0.0240)	(0.0164)	(0.0236)	(0.0190)
Children	−0.0462*	−0.0789***	0.0228**	−0.0623***	−0.0881***	−0.0580***
	(0.0263)	(0.0170)	(0.0106)	(0.00728)	(0.0131)	(0.0105)
Age	0.0246***	−0.0226***	0.00774***	−0.00705***	0.0279***	−0.0283***
	(0.00635)	(0.00363)	(0.00239)	(0.00156)	(0.00297)	(0.00221)
African-American	−0.0849*	0.00181	−0.0641***	0.0112	0.000819	−0.0258
	(0.0469)	(0.0297)	(0.0224)	(0.0146)	(0.0222)	(0.0180)
Asian	−0.105	0.0310	−0.398***	0.157***	−0.117**	−0.0752
	(0.117)	(0.0795)	(0.0447)	(0.0343)	(0.0539)	(0.0464)
Hispanic	0.106	0.0585	−0.0841***	0.111***	0.166***	0.0470**
	(0.0662)	(0.0389)	(0.0270)	(0.0181)	(0.0304)	(0.0233)
AFQT	−0.0124***	0.000552	−0.00490***	0.00432***	−0.00642***	0.000469
	(0.00114)	(0.000745)	(0.000481)	(0.000322)	(0.000496)	(0.000412)
Unemployment	12.44***	15.37***	9.214***	8.251***	9.022***	11.84***
	(3.161)	(1.848)	(1.089)	(0.735)	(1.235)	(1.005)
Female			−0.0485**	0.357***		
			(0.0234)	(0.0149)		
Female with Unit Mortality			0.734***	−0.113		
			(0.218)	(0.190)		
Female w/ risky job					0.611***	0.0921***
					(0.0231)	(0.0165)
Risky job with Unit Mortality					−0.312	−0.319
Athrho		0.465***		0.395***		0.607***
		(0.0307)		(0.0141)		(0.0143)
Constant	1.110***	−0.487***	1.353***	−1.003***	0.176*	−0.228***
	(0.228)	(0.130)	(0.0819)	(0.0538)	(0.0954)	(0.0742)
Observations	9501	9501	49,423	49,423	28,501	28,501

Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Less surprising, among those who leave service, personnel who were in units with fatalities were less likely to use the MGIB. This negative impact on MGIB use is significant among women in high-risk jobs and high-risk jobs in general (99% level). However, notably, women actually were significantly less adversely affected by in unit fatalities than their male counterparts (see Table 9).

Finally, controlling for selection to more dangerous units, the impact of hostile deaths on men and women's propensities to use the MGIB by a more moderate 11–15 percent. The impact on women in low risk occupations was insignificant. Here, controlling for selection may be less important as the first stage predictors are largely insignificant, particularly for women. The small difference between the impact on men and women of combat exposure provides evidence that men and women fare similarly when faced with killing and dying. The results suggest that both men and women, when exposed to intense combat, potentially have a more difficult time moving on with their lives than others who have served in war.

Table 9. Impact of fatalities Montgomery G.I. bill benefit use.

	Women in Risky Jobs					Men in Risky Jobs					Women in Other Jobs				
Variables	Treatment	Potential Outcome Mean	Untreated	Treated	First Stage	Treatment	Potential Outcome Mean	Untreated	Treated	First Stage	Treatment	Potential Outcome Mean	Untreated	Treated	First Stage
Married			0.0974*	0.689	−0.00869			−0.204***	−0.109	0.664***			0.0355	−0.725*	0.117
			(0.0525)	(0.836)	(0.340)			(0.0326)	(0.203)	(0.0812)			(0.0390)	(0.371)	(0.126)
Children			−0.133***	−0.581	0.0941			−0.102***	0.0445	−0.162***			−0.0884***	0.282	0.107*
			(0.0285)	(0.474)	(0.112)			(0.0145)	(0.0778)	(0.0334)			(0.0231)	(0.247)	(0.0592)
Age			−0.0373***	0.0421	0.0987***			−0.00607**	−0.00115	0.0676***			−0.0556***	−0.00449	−0.0317
			(0.00602)	(0.103)	(0.0176)			(0.00285)	(0.0166)	(0.00511)			(0.00501)	(0.0344)	(0.0245)
African-American			0.00206	−0.629	−0.563			0.0294	−0.410*	−0.383***			−0.0789**	−0.208	−0.998***
			(0.0479)	(0.788)	(0.343)			(0.0286)	(0.229)	(0.0858)			(0.0370)	(0.386)	(0.182)
Asian			0.0632	−5.548***	0.413			0.320***	0.134	0.294*			−0.213**	0.0814	−0.104
			(0.129)	(1.457)	(0.634)			(0.0630)	(0.373)	(0.153)			(0.0944)	(0.706)	(0.343)
Hispanic			0.0862	1.844**	−0.184			0.208***	0.280	0.276***			0.0546	0.423	0.313**
			(0.0624)	(0.930)	(0.443)			(0.0343)	(0.192)	(0.0838)			(0.0475)	(0.303)	(0.148)
AFQT			0.00102	−0.0268	−0.00208			0.00889***	0.00228	0.000555			0.000758	0.00685	−0.01000***
			(0.00120)	(0.0189)	(0.00691)			(0.000610)	(0.00415)	(0.00142)			(0.000803)	(0.00608)	(0.00309)
Unemployment			25.57***	7.448				10.67***	9.326*				17.72***	−18.48	
			(3.189)	(21.60)				(1.355)	(5.087)				(2.018)	(11.93)	
Treatment	−0.166***					−0.112***					−0.0456				
Unit Fatality	(0.0599)					(0.0128)					(0.0293)				
Av. No Deaths		0.427***					0.292***					0.392***			
		(0.00509)					(0.00231)					(0.00357)			
Constant			−0.811***	−1.063	−7.481***			−1.703***	−2.077***	−5.421***			−0.0368	0.173	−2.696***
			(0.218)	(2.590)	(0.653)			(0.0980)	(0.507)	(0.153)			(0.155)	(0.808)	(0.586)
Observations	9501	9501	9501	9501	9501	39,922	39,922	39,922	39,922	39,922	19,000	19,000	19,000	19,000	19,000

Note:
Robust standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Conclusion

Across specifications and models, participating in the war in OEF/OIF does not appear to negatively impact the educational pursuits of those who serve. In fact, serving in a war may be an experience that galvanizes young people to come home and be more productive with their lives. In other words, the interest in higher education by returning service members suggests a lower time discount rate as a result of going to war, a mark of adulthood.

The results herein, however, suggest that exposure to violence may be moderately detrimental and can undermine veterans' efforts to move on with their lives. When faced with in unit fatalities, both men and women are less likely to pursue higher education.

Perhaps most important for the purpose of this paper, serving in a war influences women's educational attainment in much the same way it influences men's. If anything, the positive impact of deployment on educational attainment was greater for women than for their male counterparts. Moreover, serving in dangerous capacities also does not appear to unduly harm female service members' educational attainment. Nor did exposure to intense combat undermine female service members' pursuit of higher education any more than for males.

Notes

1. http://news.nationalgeographic.com/news/2013/13/130125-women-combat-world-australia-israel-canada-norway/
2. To measure these impacts I exponentiate the logit coefficients to generate odds ratios. Odds ratios give the difference in the odds an outcome occurs for a categorical variable relative to the base, or they give the percentage change in odds for a one-unit increase in a continuous variable. For example, an odds ratio of 1.02 represents a 2% increase in odds of deployment while an odds ratio of 0.98 represents a 2% decrease in the odds of deployment.

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