

Military service and marital dissolution: a trajectory analysis

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Abstract Military service adds additional challenges for married couples. Previous literature on service and marital stability is comprised of mixed results and has often ignored the timing of these effects. This timing is important as it helps disclose the nature of causality and has implications for both military and social security policies. Using a trajectory specification, I estimate the effect of military service on the likelihood of divorce during the volunteer's period of service and the years following. Two veteran cohorts are examined, those who served during the early twenty-first century wars and those who served during the early 1980s. Among my results, the former cohort is shown to have had their divorce probability increased in the first 2 years post-service, while the opposite effect is found for the latter cohort. Unlike many previous studies of military service and marital stability, I find that effects are not overly dissimilar across racial groups.

Keywords Military service · Divorce · Marital stability · Marital dissolution · Trajectory analysis

JEL Classification J12 · J15

1 Introduction

The quality of life of military veterans is a growing national concern in the United States. The U.S. Department of Veterans Affairs (or VA) is the government's second largest department and will have an annual budget of 168.8 billion dollars in

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2016 (U.S. Department of Veterans Affairs 2015). The military is the largest vocational training institution in the country (Magnum and Ball 1987) and the largest single employer of young adults (Angrist 1998). Approximately 7 % of the American population were military veterans in 2010 (Routon 2014). For those military volunteers who are married, the quality of their marriage constitutes a significant portion of their overall quality of life. Military service adds additional challenges for married couples. Servicemen and women are often required to spend significant periods of time away from their families (especially during wartime), are subject to increased risks of injury and death, and military families often have to relocate themselves geographically. Thus, insofar as we are concerned with veterans' quality of life, the overall impact of military service on marital stability is an important area of research.

Until recently, the literature on the impacts military service has on marital stability made use of cross-sectional or repeated cross-sectional data and empirical techniques. While informative, these types of studies cannot fully characterize the impact in question. Cross-sectional data does not typically disclose the timing of either the respondent's military service or divorce. The key explanatory variable is often simply an indicator for those respondents who have or are currently serving in the armed forces. More importantly, the divorce variable is most often simply an indicator for those respondents who report being divorced *at the time of the survey*. This illicit several concerns. First, those individuals who became divorced prior to military service as well as those who became divorced long after service (respondents whose divorce likely had little or nothing to do with their military service) are coded the same as those whose divorce occurred during or immediately following service. Second, any veterans whose service caused them to divorce but who later remarried are coded as being married at the time of the survey. Also, cross-sectional data do not allow for the use of panel techniques which can address issues pertaining to unobservables.

More recent literature has taken advantage of longitudinal data when analyzing the military service-marital stability relationship. Using a longitudinal sample of military personnel from 1999 through 2008, Negrusa et al. (2014) find that the divorce hazard is increasing in the length of deployment. These authors also conclude that females are more affected in this regard than males, and that the same can be said of those who married pre-9/11 but were deployed after. This last effect plausibly stems from the idea that these couples expected a lower risk of deployment, compared to those married post-9/11. Negrusa and Negrusa (2014) study the relationships between deployment, mental health, and divorce. Here, posttraumatic stress disorder (PTSD) is shown to compound the marital instability caused by deployment length.

This study attempts to add to the literature on military service and marital stability in multiple ways. First, my empirical strategy incorporates a trajectory specification to help disclose the timing of the effects of military service on the probability of marital dissolution. Second, to this author's knowledge, this is the first study to compare the marital stability of veterans of the early twenty-first century wars to civilian couples of the same age cohort. This is an important way in which this analysis differs from that of Negrusa et al. (2014) and Negrusa and Negrusa

(2014), which both compare military personnel to other military personnel. Lastly, for further comparison, I re-estimate these effects for those from a previous cohort, veterans who served during the early 1980s.

I find that military volunteers in both of these eras were both less likely to either be or become divorced during their period of service. For those that served during the early twenty-first century wars, I find they became more likely to become divorced in the first 2 years post-service. While highly statistically significant, these effects are shown to be somewhat small, with an upper bound of approximately five percentage points. Results are fairly consistent across race. For veterans of the 1980s, I find that service during this period decreased the probability of divorce in the first 2 years post-service, perhaps suggesting differing effects for war and peacetime. Robustness checks using varied trajectory specifications support these findings.

2 Military service and marital stability

Figure 1 presents two annual time series from 1940 through 2007: the percent of the American population that is serving in the military and the national divorce rate.¹ The initial spike in military personnel (in the 1940s) is due, of course, to the second world war. Not since has such a high percentage served in the armed forces. Immediately following this spike in military personnel is a spike in American divorces, and this relationship has been shown to be causal (Pavalko and Elder 1990). The divorce rate grew rapidly in the 1960s and 1970s. The cause of this increase has been the topic of much debate among divorce researchers (Michael 1978, 1988; Oppenheimer 1997; Preston 1997; Ruggles 1997; Friedberg 1998; Goldstein 1999; Wolfers 2006; Nunley and Zietz 2012). Proposed causes include changes in divorce laws (Friedberg 1998; Wolfers 2006), the economic empowerment of women (Ruggles 1997; Bremmer and Kesselring 2004; Nunley 2010), and changes in age demographics (Michael 1978, 1988; Carlson 1979; South 1985; Nunley and Zietz 2012).

Why might we expect military personnel to have different rates of divorce? There are two main hypotheses regarding the vulnerability of military volunteers to divorce. Enlistment imposes significant demands on military families, increases risks of death or injury, decreases geographic mobility, and can require long working hours. The first hypothesis is that these characteristics of service increase divorce probabilities and has been called “the stress hypothesis.” Several studies (Kaylor et al. 1987; Elder et al. 1991; Call and Teachman 1991, 1996; MacLean and Elder 2007) have discussed the psychological effects of military service which, in turn, may alter marital stability. Since 2003, about 14 % of U.S. Army soldiers have reported symptoms of PTSD (Negrusa and Negrusa 2014). The second hypothesis is known as “the selection hypothesis” and postulates that the military

¹ Military personnel (divorce rate) data come from the Correlates of War Project (U.S. Centers for Disease Control and Prevention).

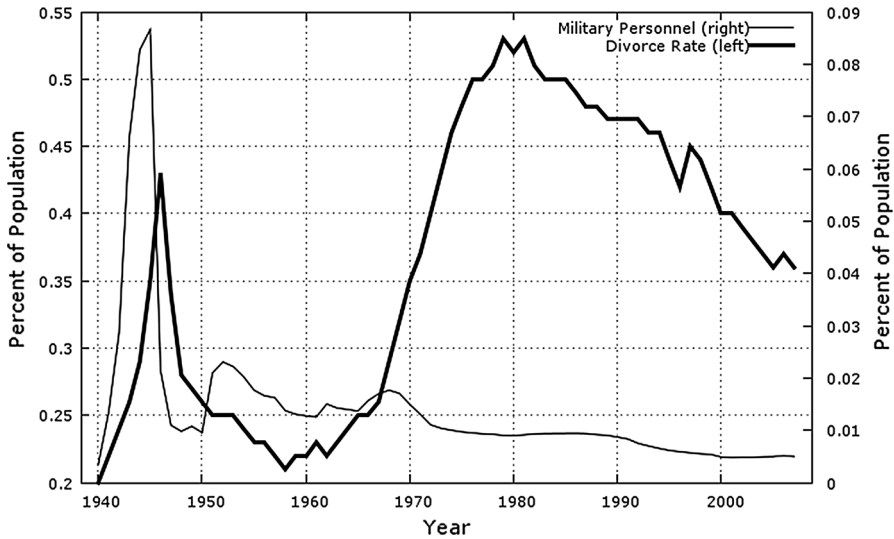


Fig. 1 U.S. military personnel and the divorce rate. *Notes* Military personnel (divorce rate) data come from the Correlates of War Project (U.S. Centers for Disease Control and Prevention)

tends to recruit individuals from the high risk of divorce population and, through potential additional compensation,² encourages them to marry.

As discussed by Negrusa et al. (2014), we may also consider a conceptual framework based on the theories developed by Becker (1973, 1974) and Becker et al. (1977), where unexpected “shocks” may increase or decrease individuals’ expected gains from marriage. Specifically, unanticipated and negative events are thought to decrease the expected gains from marriage, while unanticipated and positive events have the opposite effect. Deployment itself often constitutes an unexpected shock, while the heterogeneous deployment experience (experiences during wartime service are by no means predictable) can also qualify (Negrusa et al. 2014). Hosek et al. (2006) describe the length, conditions, and risks of deployments as sources of shocks to marriages. Military service may also induce positive shocks such as the acquisition of unexpected skills, a fulfilled sense of duty (Hattiangadi et al. 2004; Hosek et al. 2006), and unexpected income from deployment (Negrusa et al. 2014).

For soldiers who have returned from Iraq, Castro (2008) documents a significant decline in self-reported marital satisfaction. Military spouses and children are, of course, also affected by service and deployment. Spouses generally take on increased household responsibilities (Savych 2008), and children may become more anxious or develop behavioral issues (Chandra et al. 2011), for example.

The empirical literature on military service and marital formation is comprised of mixed results. Two fairly consistent findings are that marriage rates are higher

² The military provides several benefits that are more valuable to volunteers with dependents. For example, military personnel who have dependents receive housing allowances that are approximately 25 % greater than personnel with no dependents (Hogan and Seifert 2010).

among military and veteran personnel when compared to the general population and that any effects are likely to vary across race. Cadigan (2000) finds that military personnel are more likely to become married and have children. Lundquist (2004) finds that, though whites have higher marriage rates in the general population than do African-Americans, this gap disappears when looking at the military and veteran populations. Lundquist and Smith (2005) find that women who choose to volunteer for military service marry earlier than others and suggest that this is due to military family-friendly incentives. Teachman (2007) finds that service increases the probability of first marriage in all races, but that the effect is particularly strong for African-American men.

There is yet no consensus as to the impact military service has on the probability of divorce. Zax and Flueck (2003) use data from 1980 to find that military men are more likely to get married and divorced and do both at earlier ages. Pollard et al. (2008) use data from 1995–2002 and find that military men are less likely to get divorced than their civilian counterparts. Cohen and Segal (2009) find that service during the Vietnam era did not affect the probability of divorce after a relatively high level of control was implemented. Teachman and Tedrow (2008) find that military service made African-Americans less prone to divorce in the early days of the All-Volunteer Force (AVF; 1973–present). The authors explain this finding by noting that the military is a “relatively race-blind institution,” that is, that the military provides an environment within which civilian differences in resources and status across race are minimized.

The military is aware that their personnel face additional marital challenges and is attempting to address the issue. There are several marital aid programs currently offered by the military to active duty, Reserve, and Guard personnel.³ These programs vary somewhat by military branch and are often the responsibility of a chaplain. The programs offer workshops, “marriage enrichment” classes, and couples retreats. Military personnel and family have access to free legal services and advice provided by the military legal office (JAG), which can be useful when considering or going through a divorce. The U.S. Army, through their program entitled Military OneSource, provides free counseling on issues such as couples communication, stress management, and others. The other major military branches have similar but lesser known programs. Therefore, estimates (both their magnitude and timing) of the impact of military service on marital stability also have implications for these programs.

3 Cross-sectional analysis

As a baseline analysis, I examine the Current Population Survey (CPS): July 2010 Veterans Supplement. This survey was a joint project of three agencies: the U.S. Department of Commerce’s Bureau of the Census, the U.S. Department of Labor’s Bureau of Labor Statistics, and the U.S. Department of Veterans Affairs. As the title

³ Strong Bonds, the Prevention and Relationship Enhancement Program (PREP), the Chaplain’s Religious Enrichment Development Operations (CREDO), and MarriageCare are the names of the U.S. Army’s, Marines’, Navy’s, and Air Force’s marital aid programs, respectively.

suggests, these data differ from the typical CPS survey instrument in that those individuals who identified as military personnel or veterans are overrepresented and responded to a few additional questions regarding their service. These include in which war era⁴ they served and whether they participated in combat. The remaining additional veteran survey questions pertained to their experience with and aid from the Department of Veterans Affairs, this being the supplement's primary purpose. As with other CPS instruments, data were also collected on the individual's general demographics and labor market status.

In addition to providing baseline estimates, these data do have some advantages over the longitudinal data used later in the trajectory analysis. First, the number of respondents (both military and civilian) is significantly larger. Second, while the longitudinal data contain high quality survey weights designed for national representation, this CPS instrument includes weights that additionally ensure the veteran subsample is representative of the national U.S. population of military veterans. Third, the data set contains an indicator for those who saw combat during their period of military service.

Summary statistics from these data are presented in Table 1. Means for each of the variables I use are shown for the full sample as well as within each veteran-war era subsample. The top panel in Table 1 presents the marital status breakdown (with five categories) of each grouping at the time of the survey. Both Vietnam and AVF veterans are shown to be divorced at higher rates than the full sample average. Additionally, AVF veterans report being separated from their spouses at a higher rate than the full sample average. The second panel of Table 1 shows several demographic characteristics of each subsample. Females, African-Americans, and other minorities make up larger portions of the AVF sample than any other veteran group. Several other demographics are shown. The third panel of Table 1 presents the labor market variables captured by the survey. AVF veterans are more likely to be either unemployed or employed in the public sector than any other veteran cohort or the full sample, as well as belong to a high income household. The last panel in this table presents means from a binary variable relating whether the respondent was ever in a combat scenario while serving.⁵ At approximately 26 %, more AVF veterans saw combat than the Korean War veterans surveyed (22 %), but less than the World War II (49 %) or Vietnam veterans (35 %) surveyed.

Not being panel in nature, these data only allow for cross-sectional estimation. Also, because of its cross-sectional nature, only the individual's *current* marital status (as of July 2010) is captured. Thus, individuals who were previously divorced and later remarried are coded as being married. Additionally, for those that report being divorced, it is unknown whether the divorce occurred before, during, or after active duty military service. Lastly, these data do not allow for one to address unobservables.

⁴ The eras are generally named for the major war that took place in that time period while the All-Volunteer Force era refers to the post-draft period. Specifically, the World War II (WWII) service era refers to pre-July 1950; Korean War era July 1950–July 1964; Vietnam War era August 1964–April 1975; and the All-Volunteer Force era post-April 1975.

⁵ Gimbel and Booth (1994) find that Vietnam veterans who saw combat were more likely to have antisocial behaviors which, in turn, decreased their marital stability. Ruger et al. (2002) find that self-reported participation in combat increases the hazard rate for marital dissolution by over 60 percent.

Table 1 Selected sample means (CPS July 2010 Vet. Supp.)

Variable	Full sample	WWII war era veterans	Korean war era veterans	Vietnam war era veterans	All-vol force veterans
<i>Marital status</i>					
Divorced	0.102	0.041	0.099	0.161	0.167
Separated	0.019	0.006	0.010	0.013	0.024
Married	0.526	0.625	0.747	0.721	0.642
Widowed	0.060	0.303	0.114	0.037	0.016
Never married	0.293	0.025	0.030	0.068	0.152
<i>Demographics</i>					
Male	0.479	0.965	0.981	0.971	0.869
Age	45.362	82.492	74.008	63.009	45.762
African-American	0.101	0.050	0.054	0.071	0.122
Other non-white	0.075	0.022	0.030	0.041	0.062
Born in U.S.	0.858	0.976	0.976	0.969	0.952
Homeowner	0.734	0.867	0.906	0.872	0.754
Edu.: High school or above	0.837	0.791	0.878	0.955	0.977
Edu.: Associate's or above	0.354	0.297	0.348	0.400	0.415
Edu.: Bachelor's or above	0.266	0.257	0.272	0.285	0.273
Edu.: Master's or above	0.092	0.107	0.113	0.117	0.100
Edu.: Ph.D./prof. degree	0.026	0.044	0.040	0.034	0.026
Children at home	0.364	0.004	0.012	0.052	0.403
Metro. resident	0.783	0.758	0.705	0.738	0.776
Region: northeast	0.209	0.238	0.221	0.192	0.168
Region: south	0.310	0.294	0.310	0.318	0.357
Region: west	0.245	0.225	0.227	0.246	0.243
<i>Labor market</i>					
Unemployed	0.059	0.001	0.012	0.041	0.062
Public sector job	0.095	0.007	0.029	0.107	0.200
Retired	0.113	0.674	0.549	0.237	0.051
Low income	0.289	0.422	0.350	0.240	0.208
High income	0.186	0.080	0.093	0.195	0.220
<i>Combat status</i>					
Saw combat	0.026	0.492	0.224	0.353	0.256
Observations	108,534	1069	2604	3400	3696

The CPS sample was restricted to exclude those individuals with missing values for the marital status variable. Low (high) income refers to annual earnings less than (greater than) \$30,000 (\$100,000)

Table 2 Cross-sectional results (CPS July 2010 Veterans Supplement)

	(1)	(2)	(3)	(4)	(5)	(6)
All-Vol. Force	0.0409*** (0.0073)	0.0512*** (0.0074)	0.0505*** (0.0074)	0.0493*** (0.0076)		
Pre-9/11 AVF service					-0.0315*** (0.0070)	
Post-9/11 service						0.0780*** (0.0055)
<i>Controls</i>						
Demographic		X	X	X	X	X
Labor market			X	X	X	X
Combat status				X	X	X
Pseudo R ²	0.01	0.09	0.10	0.10	0.10	0.10
Observations	70,216	70,216	70,216	70,216	67,660	69,467

Dependent variable is a divorced indicator. The sample was restricted to exclude those who are widowed and those who have never been married. Values are marginal effects with standard errors in parentheses. See Eq. 1 for the specification and Sect. 3 or Table 1 for the sets of controls. Asterisks refer to *p*-values * *p* < 0.10; ** *p* < 0.05; *** *p* < 0.01

Therefore, estimates of the effect of military status on marital dissolution with these data, like other studies which use similar data and techniques, must be considered suggestive only. I use these data in logit divorce models which take the form

$$y_i = \alpha + \sum_{j=1}^4 \beta_j \text{Service era}_{ij} + x'_i \theta + \varepsilon_i \tag{1}$$

where *y_i* represents a divorced indicator; α an intercept; *x_i* a vector of controls, with θ its corresponding vector of parameters; and ε_i the error term. Also included in these models are indicator variables relating to the four war eras discussed previously. These variables are represented by Service era_{*ij*} in Eq. (1). Of key interest here is the effect of service during the AVF era on divorce.

The results of these models are presented in Table 2. Values in this table are marginal effects, and should be interpreted as percentage points. Marginal effects of military service during the AVF period on current divorce status for four models are shown (in columns 1–4), each with an increasing level of control. From left to right, the first model only includes the service era indicators, the second adds demographic controls, the third labor market controls, and the fourth combat status. Across all four levels of control, the effect of service during the AVF era on divorce varies little, from approximately 4.1 to 5.1 percentage points. Some previous literature on AVF veterans has shown a negative (not positive, as shown here) effect of service on divorce. However, these studies focused on the early days of the AVF and did not include veterans of the wars in Iraq and/or Afghanistan.⁶

⁶ It is worth restating that these CPS models do not address unobservables. It may be the case that (especially during the AVF period) unobservables related to enlistment are correlated with unobservables

To test whether this is indeed the difference, I re-estimate the model in column (4) first excluding then only including veterans who indicated they served post the September 9, 2001 attacks on the U.S. These results are presented in columns (5) and (6). Consistent with prior literature, pre-9/11 AVF service is shown to *decrease* the divorce probability by approximately three percentage points. The estimated effect on post-9/11 service remains positive and increased to almost eight percentage points. Panel methods may better disclose the true nature of these effects.

4 Primary methodology and data

4.1 Trajectory analysis

Any service-induced increases or decreases in divorce probabilities may evolve: effects may appear, disappear, grow, diminish, or change sign in the years after service. Also of interest is if, how, and how much the probability of divorce changes during a volunteer's period of service. A trajectory specification will help answer these questions. In my primary analysis, I specify divorce models that take the form

$$y_{it} = \alpha_i + \sum_{k=1}^2 \beta_k \text{Service}_{it-k} + \gamma \text{Service}_{it} + \sum_{j=1}^2 \delta_j \text{Service}_{it+j} + x'_{it} \theta + \lambda_t + \varepsilon_{it} \quad (2)$$

where y_{it} is a marital dissolution indicator for individual i at time t (data are annual); Service_{it} an indicator for military service; x'_{it} a vector of individual-level controls, with θ its corresponding vector of parameters; λ_t time fixed effects; and ε_{it} the error term. Thus, the models contain five parameters relating to military service - one for the period of service (Service_{it}), two lags, and two leads.⁷ More lags and/or leads could have been used, but the greater the distance between service and the divorce, the more difficult it is to be sure that service was indeed the cause. Still, models with three, four, and five lags/leads were also estimated. In all of these models, the additional parameters (the 3rd, 4th, and 5th lags and leads) were found to be statistically insignificant and the remaining military service parameters were highly similar to those in the models presented here.

The control variables included in x'_{it} are fully discussed in the following subsection. Individual fixed effects control for individual-specific, time-invariant heterogeneity.⁸ Such control allows me to address two important empirical issues.

Footnote 6 continued

related to the probability of divorce, a point made later on in this article. Estimates here may not be truly interpreted as causal, but serve as a starting point.

⁷ Trajectory specifications have been widely used in empirical studies. For example, they have recently been used to estimate the effects of motherhood on earnings by Fernández-Kranz et al. (2013).

⁸ Models without individual fixed effects were also estimated. For brevity, these results are not presented here but are available from the author. However, I note that these results are highly similar to those presented here in terms of sign and significance, but much larger in magnitude - implying that controlling for unobservables is important in this case.

First, there are likely unobservables contributing to one's choice to enlist in the military. Second, unobservables may also play a role in the likelihood of divorce. With these fixed effects, time-invariant controls are not needed and are thusly excluded. Time fixed effects allow for control of year-specific unobservables that might affect the probability of divorce, such as any national trends.

I make use of two dependent variables. The first is an indicator for a marital dissolution event (a legal divorce) occurring for individual i in time t . The second is an indicator that takes on the value one in all periods individual i 's marital status is "divorced," and zero otherwise. The dissolution event indicator has the advantage of better disclosing the timing of any effects. However, it has a disadvantage in the fact that those who, for example, are volunteers and experience a divorce in $t = 1$ are much less likely to experience a divorce in the following period(s),⁹ but remain in the sample and therefore introduce downward bias on estimates in periods $t = 2$ and beyond. Thus, I make use of both dependent variables. Since both are binary, all models are estimated using logistic regression.

For robustness, I run multiple trajectory specifications. I start by estimating models that only include an indicator for the service period, that is, models that exclude the terms $\sum_{j=1}^2 \beta_j \text{Service}_{it-j}$ and $\sum_{k=1}^2 \delta_k \text{Service}_{it+k}$. Next, I estimate models that include the service period indicator and leads but not lags. Then, I estimate models that include the service period indicator and lags but not leads. Lastly, I estimate my full and preferred models that include both lags and leads as well as the service period indicator (Eq. (2) in its entirety). The coefficients δ_k act as a type of falsification test where statistical significance could imply the presence of spurious correlation (Granger 1969).

Two data sets are used. All models are first estimated for the full sample within each data set and then a within-racial group analysis is performed. Two racial groups are considered, whites and minorities.¹⁰ This was done as some previous studies find differing effects across race (see Sect. 2). Thus, I present the results of 48 models, one for each of the four trajectory specifications within each of the two racial splits and the full sample, for both dependent variables, within each of the two data sets.

4.2 National longitudinal surveys of youth

I draw data from both the 1979 and 1997 cohorts of the National Longitudinal Survey of Youth, the NLSY79 and NLSY97, respectively. The NLSY79 is an ongoing survey of Americans who were aged 14 to 21 in the initial 1979 interview (BLS 2011a). The initial survey consisted of 12,868 individuals who responded to questions on a variety of topics including demographics, education, and labor market performance. Overall, there have been nearly 2000 military personnel

⁹ That is to say, it is uncommon for an individual to experience two legal divorces in back to back years, for example.

¹⁰ More specific minority veteran sample sizes (e.g., Hispanic veterans or African-American veterans) were deemed too small to analyze individually, especially with regard to the NLSY97 sample, which constitutes my primary data sample.

surveyed as part of the NLSY79. These individuals generally served during the early and mid 1980s. The NLSY97, a similar survey, consists of respondents who were born in 1980–1984 (BLS 2011b). Follow-up interviews have been conducted annually. Of the almost 9000 respondents, 520 have served in the armed forces as of 2010. These respondents were 16–22 years old during 2001, the year of the September 11 attacks on the U.S. and the start of the war in Afghanistan, and 18–24 in 2003, the beginning of the Iraq War. This age range makes the NLSY97 cohort a useful sample for studying the impacts of military service during these early twenty-first century wars. Both the NLSY79 and NLSY97 were designed to be nationally-representative samples when using the survey weights provided.

There are multiple reasons why one would expect different results from these two panels. Perhaps the most important difference between the two veteran samples is that the NLSY79 veterans served during a period of relative peace while the NLSY97 veterans all served during the wars in Afghanistan and/or Iraq. Wartime service is likely to impact marital stability differently than peacetime service. There have also been more general changes between these two time periods including an increased moral acceptance of divorce. Also, as previously mentioned, the military now offers more marital aid and counseling programs to their married personnel. Beyond these theoretical justifications, this study's baseline analysis provided evidence that pre- and post-9/11 AVF effects are different in both direction and magnitude.

From the NLSY samples, I drop the subsamples of individuals who have never been married. For use as dependent variables, I construct the two previously-mentioned indicators, one for the period the respondent became legally divorced, a divorce *event* indicator, and another that equals one in all periods the respondent reports being divorced. My control set includes only time-variant controls. Perhaps the most important of these is the length (in years) of the respondent's current marriage (and its square). Several studies (Becker et al. 1977; Ono 1998; Brines and Joyner 1999) have shown that income is a strong predictor of divorce. Rodgers (2004) finds that the ratio of spouses' incomes is another such predictor. More directly related to this study, Weiss and Willis (1997) show that income shocks have significant effects on the divorce hazard. This is of particular importance here since military personnel will most likely experience a different rate of pay upon leaving service. I therefore include several labor market variables in all models: an employment indicator (I separate civilian and military employment for the obvious reason), spousal employment, weeks worked (0–52), the respondent's annual income, and the ratio of the spouse's income to that of the respondent's. Other controls include total years of schooling and the number of children.

There exist other relevant variables which would ideally be included in this analysis, but which are unfortunately not captured by the NLSY survey instruments. I advise the reader to consider these data limitations when interpreting my findings. Specifically, information on military occupation, rank, branch of service (Army, Navy, Air Force, and Marines), and whether or not the individual has received marital counseling through a military program would be of high value here.

Table 3 presents selected summary statistics from the NLSY97 and NLSY79. At the time of writing, 2010 was the most recent publicly-available survey wave for

Table 3 Selected sample means, NLSY97 and NLSY79

Variable	NLSY97			NLSY79		
	Veteran (i)	Non-veteran (ii)	Difference (i) - (ii)	Veteran (iii)	Non-veteran (iv)	Difference (iii) - (iv)
Ever divorced	0.18	0.06	0.12***	0.44	0.35	0.09***
Ever married	0.60	0.44	0.16***	0.75	0.77	-0.02
Male	0.78	0.49	0.29***	0.73	0.46	0.27***
African-American	0.24	0.26	-0.02	0.26	0.25	0.01
Hispanic	0.21	0.21	0.00	0.09	0.17	-0.08***
Mother's education	12.63	12.50	0.13	11.41	10.92	0.49***
Father's education	12.69	12.79	-0.10	11.48	11.09	0.39***
AFQT percent score	50.45	44.90	5.55***	49.43	41.19	8.24***
Raised by both parents	0.45	0.49	-0.04	0.52	0.60	-0.08***
Raised in a rural area	0.24	0.22	0.02	0.08	0.20	-0.12***
Raised Catholic	0.32	0.31	0.01	0.30	0.34	-0.04***
Raised Protestant	0.53	0.52	0.01	0.57	0.49	0.08***
Raised in other religion	0.01	0.03	-0.02***	0.09	0.12	-0.03***
Age	27.60	27.30	0.30***	48.65	48.63	0.02
Number of children	0.56	0.69	-0.13***	1.66	2.09	-0.43***
Years of schooling	12.71	12.43	0.28***	13.63	13.28	0.25***
Income (\$0,000)	33.72	30.95	2.77*	45.03	39.08	5.95***
Region: northeast	0.16	0.20	-0.04*	0.23	0.22	0.01*
Region: north central	0.21	0.21	0.00	0.13	0.25	-0.12***
Region: west	0.22	0.24	-0.02	0.24	0.18	0.06***
Observations	348	8,455		1,914	10,772	

Asterisks refer to p -values from t -tests of sample mean equality across military status

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

both samples. Combining answers from all survey waves, and for descriptive analysis, I create two indicator variables for each sample. One discloses those respondents who have at any time been married and the other those respondents who have ever completed a legal divorce. The top panels in each table relate means from these two created variables. Veterans and nonveterans in the NLSY79 are not statistically different in their propensity to have been married, but veterans are shown to have divorced more often (at 44 vs. 35 %). Veterans in the NLSY97, a much younger sample, are shown to be both more likely to have gotten married (at 60 vs. 44 %) and had a divorce (at 18 vs. 6 %). For further descriptive analysis, also shown in these tables are means, differences, and results from equality tests for some relevant individual characteristics. Generally speaking, NLSY79 veterans appear to differ more from their nonveteran counterparts than do NLSY97 veterans. Notably, both veteran groups are shown to be of higher average ability (as proxied by their AFQT scores), have had fewer children, more years of schooling, and higher wages than their nonveteran counterparts.

5 Trajectory model results

The left pane of Table 4 contains the divorce event model results from the NLSY97, veterans who served during the early twenty-first century. Values here are marginal effects and should be interpreted as percentage points. The top panel presents results from the full sample, the middle panel the white subsample, and the bottom panel the minority subsample. Columns $k = \{1, 2\}$ represent survey waves (years) prior to service while $j = \{1, 2\}$ represent survey waves after military service. The column $s = 1$ refers to those years of active duty military service for each respondent. For all three samples and all specifications, I find no statistically significant effects in the years prior service (the falsification test was passed), but significant effects are found elsewhere in most cases. Effects across trajectory specification are generally robust. Small negative effects are found for active service years, with a decreased probability of a divorce event of approximately 2.8 percentage points for whites and 4.5 percentage points for minorities when referring to the preferred specification (those with both lags and leads). As both spouses are generally present for a divorce event (signatures are required, negotiations pertaining to wealth and property division are often needed, etc.) and active duty service often displaces volunteers, negative effects within service years are perhaps not surprising. White veterans are shown to be 3.2 and 2.7 percentage points *more* likely, however, when compared to the general American population, to experience a divorce in the first and second years following service, respectively. For minorities, these effects are fairly similar at approximately 3.1 and 3.6 percentage points. These findings are consistent with those of Angrist and Johnson (2000), who find that Gulf War veterans much more often experienced a divorce after, and not during, service.

The right pane of Table 4 presents the “is divorced” model results for the same sample, the NLSY97. As before, results are robust across trajectory specification and not too dissimilar across race. Again, there are no statistically significant marginal effects in time periods prior to service. Analogous to the divorce event models, military volunteers are shown to be less likely to *be* divorced during service, but more likely in both of the two years immediately following service. The probability increases in post-service year two, which is unsurprising given those who dissolve their marriage in year one are likely still divorced. Referring to the full-trajectory within-race specifications, white veterans are approximately 2.7 and 5.1 percentage points more likely to be divorced in these two years than nonveterans. For minorities, these numbers are somewhat smaller at about 2.0 and 3.2 percentage points. Overall, it appears that military service during the early twenty-first century increased the divorce probability of returning veterans.

I now turn to the veteran cohort of the early 1980s. The left pane of Table 5 contains the divorce event model results from the NLSY79, this older cohort. Results here are also robust across specification, though less similar across racial identity, and are statistically significant only in periods during and post service. All marginal effects reported in this table are negative in sign. Military service appears to have not made veterans from this earlier era more likely to have a divorce. On the contrary, for the first year following service, white veterans are shown to be

Table 4 Trajectory results, NLSY97

Divorce event	Is divorced																
	k = 2	k = 1	s = 1	j = 2	k = 2	k = 1	s = 1	j = 1	k = 2	k = 1	s = 1	j = 1	k = 2	k = 1	s = 1	j = 2	
Full sample (N = 43,988)																	
	-0.0518 (0.0417)	-0.0447 (0.0308)	-0.0237*** (0.0073)		-0.0044 (0.0067)	-0.0053 (0.0061)	-0.0104*** (0.0038)		-0.0094** (0.0037)	-0.0096** (0.0037)	-0.0096** (0.0037)	0.0229*** (0.0061)	0.0412*** (0.0068)	0.0238*** (0.0061)	0.0229*** (0.0061)	0.0412*** (0.0068)	0.0416*** (0.0068)
	-0.0528 (0.0418)	-0.0463 (0.0309)	-0.0217*** (0.0076)		0.0307*** (0.0108)	0.0248** (0.0118)	0.0307*** (0.0108)		0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)	0.0248** (0.0118)
Whites sample (N = 26,614)																	
	-0.0522 (0.0457)	-0.0489 (0.0350)	-0.0172* (0.0101)		-0.0047 (0.0098)	-0.0060 (0.0090)	-0.0098* (0.0055)		-0.0098* (0.0055)	-0.0098* (0.0055)	-0.0098* (0.0055)	0.0249*** (0.0090)	0.0496*** (0.0103)	0.0249*** (0.0090)	0.0249*** (0.0090)	0.0496*** (0.0103)	0.0505*** (0.0103)
	-0.0519 (0.0459)	-0.0487 (0.0350)	-0.0282*** (0.0110)		0.0320** (0.0150)	0.0270* (0.0164)	0.0320** (0.0150)		0.0320** (0.0150)	0.0320** (0.0150)	0.0320** (0.0150)	0.0269*** (0.0091)	0.0505*** (0.0103)	0.0269*** (0.0091)	0.0269*** (0.0091)	0.0505*** (0.0103)	0.0505*** (0.0103)
Minorities sample (N = 17,374)																	
	-0.0514 (0.0473)	-0.0404 (0.0357)	-0.0309*** (0.0105)		-0.0039 (0.0090)	-0.0042 (0.0081)	-0.0086* (0.0051)		-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)	-0.0086* (0.0051)

Table 4 continued

Divorce event	Is divorced							
	<i>k</i> = 1	<i>s</i> = 1	<i>j</i> = 1	<i>j</i> = 2	<i>k</i> = 1	<i>s</i> = 1	<i>j</i> = 1	<i>j</i> = 2
		-0.0306*** (0.0110)	0.0305*** (0.0063)	0.0124* (0.0070)		-0.0084* (0.0050)	0.0200*** (0.0081)	0.0320*** (0.0089)
-0.0540 (0.0475)	-0.0436 (0.0357)	-0.0453*** (0.0116)	0.0305*** (0.0063)	0.0364*** (0.0173)	-0.0020 (0.0090)	-0.0084* (0.0050)	0.0199*** (0.0082)	0.0319*** (0.0089)

Values are marginal effects with standard errors in parentheses. Subscript *k* (*j*) represents periods prior to (since) military service while *s* represents time during service. See Eq. (2). Asterisks refer to *p*-values

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 5 Trajectory results, NLSY79

Divorce event	Is divorced								
	k = 2	k = 1	s = 1	j = 2	k = 2	k = 1	s = 1	j = 1	j = 2
Full sample (N = 188,418)									
			-0.0400*** (0.0042)				-0.0594*** (0.0038)		
-0.0591 (0.0400)	-0.0492 (0.0387)		-0.0467*** (0.0043)		-0.0037 (0.0128)	-0.0039 (0.0111)	-0.0598*** (0.0037)		
			-0.0467*** (0.0044)	-0.0178** (0.0072)			-0.0597*** (0.0038)	-0.0301*** (0.0090)	-0.0250*** (0.0092)
-0.0628 (0.0400)	-0.0522 (0.0487)		-0.0549*** (0.0045)	-0.0223*** (0.0073)	-0.0038 (0.0128)	-0.0037 (0.0111)	-0.0601*** (0.0038)	-0.0274*** (0.0090)	-0.0233** (0.0092)
Whites sample (N = 111,444)									
			-0.0292*** (0.0054)				-0.0541*** (0.0048)		
-0.0524 (0.0433)	-0.0518 (0.0416)		-0.0358*** (0.0056)		-0.0111 (0.0170)	-0.0173 (0.0148)	-0.0545*** (0.0048)		
			-0.0336*** (0.0058)	-0.0058 (0.0090)			-0.0544*** (0.0048)	-0.0201* (0.0109)	-0.0216* (0.0112)
-0.0549 (0.0433)	-0.0533 (0.0416)		-0.0415*** (0.0060)	-0.0100 (0.0091)	-0.0115 (0.0170)	-0.0184 (0.0148)	-0.0548*** (0.0048)	-0.0168* (0.0090)	-0.0200* (0.0112)
Minorities sample (N = 76,974)									
			-0.0537*** (0.0065)				-0.0670*** (0.0062)		
-0.0668 (0.0451)	-0.0462 (0.0331)		-0.0606*** (0.0066)		-0.0062 (0.0194)	-0.0080 (0.0152)	-0.0675*** (0.0062)		

Table 5 continued

Divorce event	Is divorced								
	<i>k</i> = 1	<i>s</i> = 1	<i>j</i> = 1	<i>j</i> = 2	<i>k</i> = 2	<i>k</i> = 1	<i>s</i> = 1	<i>j</i> = 1	<i>j</i> = 2
<i>k</i> = 2		-0.0615*** (0.0067)	-0.0506*** (0.0119)	-0.0331*** (0.0121)			-0.0675*** (0.0062)	-0.0453** (0.0156)	-0.0288* (0.0158)
-0.0715 (0.0651)	-0.0513 (0.0432)	-0.0700*** (0.0069)	-0.0552*** (0.0119)	-0.0379*** (0.0121)	-0.0068 (0.0194)	-0.0301 (0.0167)	-0.0679*** (0.0062)	-0.0432*** (0.0156)	-0.0268* (0.0158)

Values are marginal effects with standard errors in parentheses. Subscript *k* (*j*) represents periods prior to (since) military service while *s* represents time during service. See Eq. (2). Asterisks refer to *p*-values

* *p* < 0.10; ** *p* < 0.05; *** *p* < 0.01

approximately 2.6 percentage points less likely to experience a divorce. For minority veterans, this effect is over twice that size at 5.5 percentage points. Additionally for minorities, there appears to be a negative effect in the second year post-service at approximately 3.8 percentage points. For both racial groups, and like the twenty-first century veteran cohort, volunteers are less likely to dissolve their marriage during their period of service. Specifically, white and minority veterans during this era were approximately 4.2 and 7.0 percentage points less likely to experience a legal divorce during their period of service, compared to the civilian population, respectively.

The right pane of Table 5 displays the “is divorced” model results for the same cohort. Once again, a lack of significance in the pre-service years implies an absence of spurious correlation and results are similar across trajectory specification. Just as they were found to be made less likely to *obtain* a divorce during and after service, veterans of the 1980s are found to be less likely to *be* divorced as well. Like in the divorce event models, estimated effects here are larger in magnitude for minority veterans. White and minority veterans were about 5.5 and 6.8 percentage points less likely to be divorced during their period of service, respectively. In the two years following service, this difference is about 2 percentage points for whites and 3–4 for minorities. Overall, it appears that military service during the 1980s made marriages more stable.

It is of note that estimates across veteran cohort in the trajectory analysis mirror those from the cross-sectional analysis in Sect. 3 in terms of direction and statistical significance. Recall that veterans who served post-9/11 were shown to have an increased probability of divorce, while pre-9/11 AVF veterans the opposite. The former sample is analogous to the NLSY97 veteran sample, and the latter the NLSY79 sample.

6 Conclusions

I set out to estimate the overall effects of military service on the probability of marital dissolution, with particular interests in the timing of any effects and the most recent generation of veterans, those that served during the early twenty-first century wars in Afghanistan and Iraq. I find that these veterans were made more likely to obtain a divorce and that this divorce very often took place in the first two years following active duty service. Specifically, in the first two years home, veterans are estimated to be about three percentage points more likely to dissolve their marriage when compared to the general population. These volunteers were, however, shown to be 2.8 and 4.5 percentage points less likely to obtain a divorce in the period they were serving, for white and minority veterans, respectively.

Using a second data set containing veterans of the 1980s, I find that these volunteers’ marriages were made more stable by their military service. Perhaps the primary difference between these two veteran cohorts is that the former’s service period was a time of war while the latter’s a time of peace, suggesting differing effects for war and peacetime. In a baseline analysis, which used a separate data set which contains a larger veteran sample and includes veteran-specific survey weights

alongside a combat indicator, I find evidence that pre-9/11 AVF veterans were about three percentage points less likely to be divorced as of July 2010, while post-9/11 veterans were upwards of eight percentage points more likely to be divorced in the same month.

Overall, results here provide evidence that there is indeed a relationship between voluntary military service and marital dissolution. Again, divorces appear to often take place in the two years immediately following the last year of active duty service. Additionally considering that legal divorce proceedings can be lengthy, the “first year home” effect may seem “fast;” perhaps implying that, in many cases, at least one spouse has decided to dissolve the marriage during the active duty service period. This timing also indicates that any marital instability caused by PTSD or the “shock” of readjusting to civilian life can often be immediate. For more on this topic, I direct the reader to a study by Negrusa and Negrusa (2014) which provides longitudinal estimates for the relationships between deployment length, PTSD, and the divorce hazard among the population of twenty-first century military personnel. Jordan et al. (1992) also discusses PTSD and family issues in the context of the Vietnam War.

More research is needed before a complete picture of the relationship between military service and marital stability can be achieved. Both veteran cohorts used in the trajectory analysis here come from the All-Volunteer Force era. Using data from prior periods, trajectory analysis on veterans of earlier theaters (e.g., Vietnam, Korea) would shed light on historical effects. More importantly, I remind the reader of the primary data limitations encountered here. Information on military occupation, rank, branch of service, and whether or not the individual received marital counseling through a military program was unavailable. If program participation information was available, a direct test of the efficacy of the military’s marital aid programs may influence policy and military resource allocation. Lastly, I find evidence that volunteers are less likely, when compared to the general population, to be divorced in the years of service. Thus, a study on marriage, marital stability, and the choice to volunteer may advance the literature on the determinants of enlistment.

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