



# The causal effects of Vietnam-era military service on post-war family dynamics

Jennifer A. Heerwig<sup>a,\*</sup>, Dalton Conley<sup>b</sup>

<sup>a</sup> Doctoral Candidate, Department of Sociology, New York University, United States

<sup>b</sup> University Professor, Department of Sociology, New York University, United States

## ARTICLE INFO

### Article history:

Received 21 March 2012

Revised 6 November 2012

Accepted 7 November 2012

Available online 21 November 2012

### Keywords:

Instrumental variables

Family stability

Vietnam draft

Marital dissolution

Filial coresidence

Military service

Veterans

## ABSTRACT

Past work has suggested a lasting impact of military service on the lives of veterans. By intervening at a critical stage in the lives of young men, service may open up opportunities for disadvantaged youth. In contrast, the negative consequences of exposure to combat may offset these presumed advantages. Induction into the military is also a nonrandom process that makes identifying the effects of service exceedingly difficult. In this study we use an instrumental variable (IV) approach to model the causal impact of Vietnam-era military service on two outcomes, marital stability and co-residence with adult offspring. We find limited evidence to suggest that military service may have a lasting effect on family life. In particular, we find that service reduces the probability of marital dissolution for white men. Service also significantly increases the probability of filial co-residence for men of other races.

© 2012 Elsevier Inc. All rights reserved.

## 1. Introduction

Veterans of the Vietnam-era currently constitute the single largest veteran population in the United States. With well over seven million Vietnam-era veterans now in the civilian population (NCVAS, 2011), they receive the largest overall and per veteran share of service-related disability benefits (Department of Veterans Affairs, 2001, 2006, 2011b). Wartime exposure to the herbicide, Agent Orange, is now recognized as potentially linked to a variety of health problems including certain cancers, type II diabetes, and heart disease (Department of Veterans Affairs, 2011a), while the lifetime incidence of post-traumatic stress disorder for these veterans exceeds thirty percent (Price, 2011). In contrast to veterans of World War II, Vietnam veterans returned to a more hostile sociopolitical environment (Modell and Haggerty, 1991) and also received less generous post-service educational benefits relative to foregone wages (Mattila, 1978). As the Vietnam-era veterans now enter into their sixties, attention has turned to identifying the lingering effects of service in one of America's least supported military conflicts (Jones, 2008). In this study, we turn our focus to evaluating the impact of Vietnam-era military service on the stability of family life for veterans in late mid-life.

The present study builds on past work by investigating the consequences of Vietnam-era service for the stability of family life 25 and 30 years post-service. We turn our attention to two family stability outcomes. The first outcome, marital dissolution, has been studied extensively in light of the overall association between wartime mobilization and divorce rates. At the same time, service in the All-Volunteer Force (AVF) has had a salutary effect on marital relations for non-white men by potentially decreasing the strain of uncertain labor market prospects and racial discrimination (Lundquist, 2006a, 2006b, 2008; Teachman, 2009; Teachman and Tedrow, 2008; Usdansky et al., 2009). We also present a preliminary analysis of a

\* Corresponding author. Address: 295 Lafayette St., 4th Floor, New York, NY 10012, United States. Fax: +1 212 995 4140.

E-mail address: [jah321@nyu.edu](mailto:jah321@nyu.edu) (J.A. Heerwig).

second outcome, co-residence with adult children. Filial co-residence has been studied in relation to its significance for understanding the transition of offspring to adult roles (White, 1994). However, since the interpretation of this outcome as it relates to the well-being of children *and* parents is not straightforward and is further complicated by the limitations of our data for studying household composition (discussed below), we urge considerable caution in interpreting the estimates presented here.

While military service is often a critical turning point in the lives of recruits, estimating the effect of this experience on later-life outcomes is complicated by selection bias. Since entry into the military is typically far from random, the men represented in the ranks of the armed forces may not be representative of the male population as a whole, making identification of a treatment effect of military service difficult at best. In particular, unobserved differences between veterans and non-veterans may influence substantive outcomes directly, therefore biasing estimates of the effect of military service. As such, the present study deploys an instrumental variable (IV) that exploits Vietnam-era order of induction numbers to identify a local average treatment effect (LATE) of military service.<sup>1</sup>

Using the 2000 Decennial Census and the 2005 American Community Survey, we produce causal estimates of the impact of Vietnam-era military service on important family outcomes. Both surveys have the virtue of including exact date of birth and veteran status—two variables crucial to our estimation strategy.<sup>2</sup> We note, however, that the 2000 and 2005 datasets offer glimpses of the veteran population only 5 years apart, but in dramatically different macroeconomic climates. The 2000 Census was fielded before the terrorist attacks of September 11, 2001 and the recession that followed. By 2005, although the US economy was not technically in a recession, unemployment rates had nearly doubled from 3.7% in 2000 to 6.9% in 2005.<sup>3</sup> The increase in the unemployment rate was even more dramatic for younger Americans—the age group we focus on in our analysis of filial co-residence. For young adults between the ages of 20 and 24 the unemployment rate stood at 7.7% in 2000, but had increased to 12.2% by 2005 (Census Bureau, 2000, 2005). Since marital dissolution and filial co-residence are both sensitive to changes in the labor market (Becker et al., 2010; Card and Lemieux, 1997; Rosenzweig and Wolpin, 1993; South and Spitze, 1986), where applicable we describe how our results may have been affected by the changed macroeconomic circumstances.

After reviewing the literature on the importance of military service and its relation to family outcomes, we present an in-depth explanation of our causal estimation strategy including a discussion of the assumptions and limitations of the IV model. In the results section, we review both naïve, ordinary least squares (OLS) and instrumental variables (IV) estimates of veteran status on marital dissolution and filial co-residence. We find that Vietnam-era military service has only modest effects on the long-term family stability of veterans. In particular, we show that in the 2005 ACS military service slightly, but significantly, reduced the probability of divorce for white men—a finding consistent with prior work on this cohort (Call and Teachman, 1991). The results also suggest that service increases the probability of filial co-residence for races other than white or black.

## 2. Background

Military service is often a turning point in the lives of young recruits. As a break with the community and a separation from the family, the military provides a space for self-reflection and, more importantly, for self-reinvention. Basic training requires that recruits shed or marginalize past identities in favor of a new role as a member of a military unit, dependent on group cooperation for success (Sampson and Laub, 1996). For many, the military also offers additional occupational training during and after service as well as a constellation of social support services unique to veterans. Especially for men of disadvantaged backgrounds, the military can serve as the springboard for an acceleration of personal development and the needed human capital for upward social mobility (Elder, 1986; Elder et al., 1991; London and Wilmoth, 2006). The military also diminishes racial inequalities, suggesting that it affords men (and women) of color a uniquely egalitarian context in which to pursue personal and occupational goals (Lundquist, 2006a, 2006b).

Service also produces disparities in the timing—if not the sequence—of major life events including marriage, fertility, education, and career development. For recruits that enter the military just out of high school, a term in the service often means that life's major milestones are delayed by one or more years. On the other hand, induction into the military at later stages of life, particularly after marriage and first childbirth, also means a major disruption of well-established patterns and relationships (Pavalko and Elder, 1990). Of course, even net of differences in major life events, age at entry may have an independent influence on the effect of service on subsequent development. Younger recruits may be more malleable in their worldviews and behavioral patterns, allowing the military to effectively “knife off” experiences of past disadvantage or criminality (Elder, 1986; Elder et al., 1991; Sampson and Laub, 1996).

As a total institution that demands much of its recruits and often bestows numerous benefits in return, the military is pivotal in structuring the paths of veterans (Gade, 1991). However, the men that enter the armed forces are far from a ran-

<sup>1</sup> We detail the assumptions (and potential violations) of the IV model in a later section.

<sup>2</sup> The research in this paper was conducted while the authors were Special Sworn Status researchers of the U.S. Census Bureau at the New York Census Research Data Center. Research results and conclusions expressed are those of the authors and do not necessarily reflect the views of the Census Bureau. This paper has been screened to insure that no confidential data are revealed.

<sup>3</sup> The unemployment estimates are for the general population age 16 and over and for young adults aged 20–24 in the 2000 Census and 2005 ACS.

dom sample of the eligible population.<sup>4</sup> Military service is often a more attractive option for men of lower socioeconomic status (MacLean and Elder, 2007; Modell and Haggerty, 1991), suggesting that pre-service characteristics could drive differences in substantive outcomes between the veteran and nonveteran populations. At the same time, induction into the military involves a multi-stage process that screens potential recruits for health, intelligence, and psychological stability (MacLean and Elder, 2007; Sampson and Laub, 1996). Thus, the net direction of the effect of military service on substantive outcomes is difficult to predict. For instance, lower socioeconomic status is often associated with increased marital instability (Kitson et al., 1985), but the pre-induction health screening as well as post-service benefits and educational opportunities may work in the opposite direction to offset pre-service disadvantages. Similarly, it may be only particularly ambitious and motivated—or conversely, particularly directionless and troubled—young men from lower socioeconomic backgrounds join the service to improve life chances (Bouffard, 2003, 2005). For these reasons, estimation of the effect of military service is exceedingly difficult even when conditioning on a host of observables.

### 2.1. Military service and marital dissolution

Divorce rates have been shown to temporarily but significantly increase in the years immediately following wartime mobilization (Gimbel and Booth, 1994; Pavalko and Elder, 1990; South, 1985). In the wake of World War II, divorce rates doubled between 1940 and 1945, only to decrease sharply by the end of the decade. These fluctuations have been the impetus for research into the relationship between military service—and wartime service in particular—and marital dissolution. Although temporary increases in the divorce rate following a wartime mobilization appear with consistency, the effect of military service on marital dissolution likely varies with period of service. For example, Korean War veterans had greater than two times the dissolution rates of World War II veterans with World War II veterans showing no significant difference when compared with nonveterans (Ruger et al., 2002). One potential explanation for the divergence in dissolution rates is the sociopolitical climate following wartime mobilization. Since ease of reintegration for veterans predicts the quality of post-service life (MacLean and Elder, 2007), the climate to which Vietnam Veterans returned is one potential contributor to lifelong relationship difficulties. Veterans of Vietnam—especially those who served in the last years of the conflict—returned to a “homefront population [that] had attached an aura of distaste, even disgrace, to the war and its unfortunate soldiers” (Modell and Haggerty, 1991: 213).

A number of additional potential mechanisms link military service with marital stability including the sequencing of marriage relative to service, age of entry into the service, and exposure to combat. Marriage before entry into the service often means a lengthy separation from spouses and, potentially, children. For World War II veterans, Pavalko and Elder (1990) found that marriage prior to service significantly increased the probability of divorce, but marriage after service did not. Among men married upon entry into the service, older age at entry also significantly increased the risk of divorce, suggesting that the disruption of separation during service was particularly acute for men whose familial lives were well-established. Later age at entry disrupts not only family life, but potentially also established careers. The developmental differences in age at entry also make the costs of service higher for older entrants who have already passed the stage in the life course at which military service presents the most opportunity for positive personal change (Sampson and Laub, 1996).

Since the Vietnam cohort was more likely to enter the service at younger ages, marital formation was at once more likely to occur after service and to be delayed as compared to nonveteran peers. In itself, later age at marriage is a strong and consistent predictor of marital stability. Thus, insofar as service in Vietnam caused young men to delay marriage, it may have indirectly aided marital stability. At the same time, the life course perspective suggests that younger age at service may allow recruits to overcome socioeconomic disadvantages as well as reform antisocial behaviors (Sampson and Laub, 1996), both of which are potentially conducive to more stable marriages. In a study of the Vietnam cohort, Call and Teachman (1996) found that marriage before service did not affect marital stability. Marriage following service, however, had a significant *salutary* effect on marital stability for white men (Call and Teachman, 1991, 1996).

The remaining mechanism—exposure to combat—has been consistently linked to marital quality and marital dissolution.<sup>5</sup> The pathways by which combat exposure may degrade intimate relationships are many (Gimbel and Booth, 1994). Combat exposure could proxy for pre-service characteristics (like increased aggression or antisocial behavior) that, regardless of military service, diminish the quality of intimate relationships. But combat exposure is also linked to relationship disruption directly by its long-term emotional and psychological consequences. Post-traumatic stress disorder (PTSD) is a mental disorder that “is caused by a traumatic event, which leads to the re-experiencing of the event, or flashbacks, combined with avoidance of memories of the event, and hyper-arousal, including insomnia and exaggerated startle response” (MacLean and Elder, 2007: 181–2). Veterans with PTSD have exhibited higher rates of violent behavior and emotional numbing leading to relationship distress and problems with intimacy (Riggs et al., 1998). PTSD also frequently co-occurs with drug and alcohol abuse as well as anxiety and

<sup>4</sup> Women are, of course, ever more important in the military. However, only men were eligible for the Vietnam era draft lottery, which we use in this analysis to identify the effects of service. Additionally, during the Vietnam-era, an overwhelming majority of military personnel were men (Kulka et al., 1990).

<sup>5</sup> The data we utilize here do not include variables for combat exposure. Thus, it could be the case that combat exposure increases marital disruption, but the effect is not discernible in the aggregate. Similarly, it could be that the negative effects of combat exposure are offset by the positive effects of non-combat military service, generating a null overall effect in the population. While we acknowledge that heterogeneity in combat exposure could dilute or mask long-term consequences for some veterans, we note that past studies have found similar patterns when controlling for combat status (Call and Teachman, 1991, 1996).

personality disorders (Zatzick et al., 1997). Beyond the reach of the emotional consequences of PTSD, then, comorbidities have direct, negative effects on the stability of relationships between veterans and their families (Gimbel and Booth, 1994).

In contrast to the effects of wartime service or combat on marital relations, military service, and especially service in the contemporary All-Volunteer Force, has generally been associated with an increase in marital formation rates as well as a decrease in marital dissolution among servicemen. These benefits, moreover, accrue disproportionately to African American enlistees who are more likely to enter into wedlock as well as more likely to remain married than their civilian peers (Lundquist, 2006a, 2006b; Teachman, 2009; Teachman and Tedrow, 2008). In the military, racial disparities in rates of marital formation following non-marital fertility likewise disappear, leaving African American and white men equally likely to enter into unions (Usdansky et al., 2009). This effect dissipates following service suggesting that the relationship between military service and marriage is causal, and not merely a result of selection into the service. Race-blind family benefits, pay equality, and the relative lack of racial discrimination in comparison to the civilian labor market together suggest that the military is a uniquely egalitarian institution.<sup>6</sup> The current study will further our understanding of whether military service has differential—and perhaps inequality reducing—effects on blacks' and whites' family structure net of selection.<sup>7</sup>

## 2.2. Filial co-residence

We offer a preliminary analysis of an additional outcome—filial co-residence—that points to a further dimension of post-service family life, and suggests avenues for future research. Since LaGrone (1978), researchers have investigated the effect of the so-called “military family” characterized by “authoritarian fathers, depressed mothers, and out-of-control children” (Palmer, 2008: 205). Factors such as frequent relocation, father's absence during deployment, and the strain of PTSD following mobilization have linked military service to behavioral problems in the children of veterans (Jensen et al., 1986, 1991; LaGrone, 1978; Palmer, 2008). On the other hand, military service has been associated with an opportunity for self-improvement for men of disadvantaged backgrounds (Elder, 1986; Elder et al., 1991), the mitigation of racial inequalities (Lundquist, 2006a, 2006b), and increased marital stability (Call and Teachman, 1991, 1996). Consequently, the net effect of military service on the relationship between veterans and their children is, once again, unclear.

Given past research on the effect of military service for veterans and their families, we offer two stylized explanations for the filial co-residence outcome. In one potential interpretation, filial co-residence may represent increased financial security for veterans, but decreased labor market competitiveness and independence for offspring. Alternately, co-residence may suggest financial uncertainty for parents with offspring stepping into supplement household income, or health problems among veterans with children living in the parental home to assume a caretaker role. With these contradictory accounts in mind, we model the effect of military service on filial co-residence, but urge considerable caution in interpreting the results.<sup>8</sup> We review the existing literature on this extended family outcome as it relates to the two potential interpretations outlined above, and speculate as to the plausibility of each.

In the first potential interpretation, filial co-residence may simultaneously represent a key mechanism for parents to buffer children from labor market uncertainty and a marker of delayed entry into establishing an independent household (White, 1994). Since the 1960s, rates of intergenerational co-residence have increased, with younger adults particularly likely to share their living quarters with a parent (Danziger and Ratner, 2010; Matsudaira, 2006). The rate of filial co-residence is, however, sensitive to labor market conditions, with the number of young adults living at home rising with unemployment and decreasing with higher wages for these age groups (Becker et al., 2010; Card and Lemieux, 1997; Glick and Lin, 1986; Rosenzweig and Wolpin, 1993).

The prevalence of offspring co-residence also varies by both income and race. While young adults from more privileged backgrounds are often the recipients of direct financial transfers, low-skilled youth from lower income families more often receive assistance in the form of co-residence (Kaplan, 2010; White, 1994). Similarly, young adult African American men are twice as likely as white men to live with a parent, but significantly less likely to receive a direct financial transfer (Rosenzweig and Wolpin, 1993). Adult male children who live with parents are more likely to be inactive—that is, without steady employment or enrollment in school—than those who live on their own (Card and Lemieux, 1997).

In this interpretation, co-residence with a parent represents one, albeit partial, measure of the transition to adulthood for the children of Vietnam veterans. It is an indicator of labor market disadvantage, and it also reflects the inability of adult children to successfully transition into independent living. Since leaving home often follows marital formation for adult children, increased filial co-residence may also suggest delayed entry into (or a reduction in the likelihood of) marriage (Glick and Lin, 1986; Goldscheider and DaVanzo, 1985; White, 1994).

<sup>6</sup> There is, however, also evidence to suggest that black veterans represent a more selective group vis-à-vis their non-veteran counterparts than white veterans (Lundquist, 2006a, 2006b) raising the possibility that selection may be driving these. To address this concern of racially different selection into the military, Brown (2006) examines the racial test score gap among the offspring of military personnel and finds that among those who are educated on base in military schools, racial disparities are significantly smaller than in military offspring sent to local civilian schools, lending support to the notion that the mitigation of racial inequalities in the military is not merely a consequence of differential selection into the armed forces.

<sup>7</sup> Death rates during the war itself were similar for blacks and whites, mitigating any concerns that racial differences in wartime survival rates may be driving post-war outcomes directly (Rohlf, 2007).

<sup>8</sup> Filial co-residence is not the ideal measure of family instability. Given that we only observe the children of veterans if they are still living at home, we included this measure as an incomplete, but illustrative, proxy for well-being. Further, we would have liked to extend this analysis to the characteristics of the children living at home, but Census confidentiality procedures prevented us from exploring this relationship. Consequently, we present the filial co-residence results in hopes of inspiring further research on this important but under-researched topic.

At the same time, filial co-residence suggests that veterans themselves may be better able to provide for their children in times of economic hardship. Past work on this cohort has found that there was, in fact, no long-term earnings penalty of military service suggesting that veterans are likely not less financially capable of offering assistance to adult children (Angrist et al., 2011). Moreover, filial co-residence may imply that veterans are able to provide for children, and that these families are more stable. In general, filial co-residence is lower for children of single-parent households and stepfamilies (Aquilino, 1990, 1991; Goldscheider and Goldscheider, 1989; Kiernan, 1992; Mitchell et al., 1989) suggesting that “prolonged co-residence is likely only when parents and children have a harmonious relationship and are part of an intact family” (White, 1994: 94). Thus, while co-residence may suggest some delay in the transition to adult roles for offspring, it may also imply significant family stability.

In another potential interpretation, the consequences of military service may have had long-lasting negative consequences for veterans, and filial co-residence may imply some form of dependence on the part of these parents. Veterans with PTSD frequently manifest symptoms that are detrimental to the health of intimate relationships and to the development of children in particular. Aggression, emotional numbing and detachment, difficulties with self-disclosure, and perhaps more importantly, violent behavior, are just some of the symptoms of PTSD that have been linked with relationship problems (Jordan et al., 1992; Stretch and Figley, 1984). Veterans with PTSD have more parenting problems (Samper et al., 2004) and are more likely to commit domestic violence (Jordan et al., 1992). As a consequence, the effects of PTSD are felt acutely by children. In past studies, the children of Vietnam veterans with PTSD exhibited higher rates of violent behavior than their peers even in early adulthood (Glenn et al., 2002), and a heightened risk for psychiatric disorders than children of WWII veterans (Davidson et al., 1989).<sup>9</sup>

Given that there are no differences in the disability rates or the earnings of Vietnam Veterans over 30 years after service (Angrist et al., 2011), however, we find this interpretation to be less plausible.<sup>10</sup> Research on filial co-residence specifically also suggests that, in most instances, children remain at home for the benefit of the child and less frequently for the benefit of the parent (Aquilino, 1990; Ward et al., 1992; White, 1994). Although we cannot rule this possibility out given data limitations, we speculate that the available evidence is more consistent with an explanation that links filial co-residence to a delay of transition to adulthood for offspring, and increased financial and marital stability for parents. But again, we urge caution in interpretation, and leave it to future research to fully disentangle the effect of military service on household composition.

### 3. Data and methods

Between December 1969 and February 1972, the United States Selective Service held four Vietnam draft lotteries. Each of these draft lotteries randomly assigned men in eligible birth cohorts order of induction numbers through a hand drawing of birthdates. The random assignment mechanism of the draft lottery serves as a rare ‘natural experiment’ that approximates a randomized-encouragement design. Here, random assignment to a low (i.e., draft eligible) lottery number mirrors being “encouraged” to participate in military service. The estimand, in this case, implicitly compares men who *did serve when drafted* to those men *who would have served if drafted*.<sup>11</sup> By exploiting information about the association between draft number and veteran status, we estimate the local average treatment effect (LATE) of military service on marital dissolution and filial co-residence using an instrumental variable (IV) technique. While past research has pursued this same approach to estimate military service effects on earnings (Angrist, 1990; Angrist and Chen, 2008), disability status (Angrist and Chen, 2008), and mortality (Angrist and Chen, 2008; Conley and Heerwig, 2012; Hearst et al., 1986), it has neglected family outcomes such as those we model here.

We utilize data from two sources. The first source, the 2000 Decennial Census Long Form, is a 1 in 6 household sample of the American population that supplements the information collected on the Census’ standard short-form questionnaire. Our second data source, the 2005 American Community Survey, included 3 million households—approximately a 2.5% sample—and was designed to replace the Census long form starting in 2010.<sup>12</sup> Both samples contain questions on the social and economic characteristics of each surveyed household. Additionally, both sources include two variables necessary to estimate the IV models—birth date and veteran status.<sup>13</sup> Although the ACS offers a similar set of questions to the long form questionnaire, we note one significant difference in the sampling of the two surveys that could affect the results presented here. While the Census long form is designed to reflect a snapshot of the population on April 1 of the corresponding calendar year, the ACS is collected

<sup>9</sup> Both of these studies were limited by small sample sizes and less-than-ideal comparison groups. However, they provide preliminary evidence to suggest a relationship between PTSD in parents and children’s outcomes.

<sup>10</sup> Conley and Heerwig (2012) and Angrist et al. (2010) demonstrate that there is little evidence for long-term excess mortality among this cohort. Thus, the null finding for disability rates is not an artifact of selective mortality.

<sup>11</sup> Since the IV estimates compare the subpopulations of men who served given draft eligibility to those who would have served if draft eligible, this eliminates from consideration the substantial group of men who were deemed unfit to serve after medical examinations. It also limits the population to which we can infer the effect of military service. In particular, the effect of military service presented here does not generalize to the population of men who were true volunteers. For more discussion of how to conceptualize the instrumental variable estimates in a counterfactual framework, see Gelman and Hill (2007), Angrist and Pischke (2009), and Angrist et al. (1996).

<sup>12</sup> Prior to the full implementation of the ACS in 2010, the Census Bureau fielded the ACS to smaller, but nonetheless representative, samples of the US population.

<sup>13</sup> Both birth date and veteran status for these cohorts are necessary to estimate our models. As such, longitudinal datasets common to research on marital stability are not adequate for our purposes.

**Table 1**  
Proportion of draft eligible birth dates by birth year based on randomly assigned Vietnam lottery order of induction numbers, 1950–1952.

Cohort	Eligibility ceiling	Days in year	Proportion eligible
1950	195	365	0.53
1951	125	365	0.34
1952	95	366	0.26

continuously over the full 12 months of a calendar year. As a consequence, estimates from the Census long form could reflect significant seasonal variation, while the ACS represents annual averages (Census Bureau, 2008).

Using order of induction numbers by birthdate from the Selective Service System website,<sup>14</sup> we code each man born between 1950 and 1952 with the lottery number corresponding to his month, day, and year of birth. Based on the highest lottery number called to report for service in a given birth cohort, we then also code each man with a draft eligibility dummy where “1” indicates that the man’s draft lottery number was called in the corresponding draft year, and “0” otherwise. Table 1 reports the highest number called to report for each birth cohort as well as the corresponding portion of draft eligible men. Veteran status is taken directly from the Census and ACS and is coded “1” for all men who served during the Vietnam era and “0” otherwise.

Our samples from these files are restricted to United States native men born between 1950 and 1952. In both cases, we exclude the institutionalized and group quarters populations. For each analysis, we divide our sample into white alone, black alone, and all other race categories including more than one race category. The white category includes only those men who selected “white” alone for the Census’ race question, while “black” includes men who answered only “black or African American”. The other category includes those men who identified as any other race and those men who identified with multiple races.<sup>15</sup>

Descriptive statistics for the 1950–1952 birth cohorts by race and veteran status appear in Tables 2 and 3. Table 2 shows background variables of interest for the 2000 Census sample while Table 3 reports this information for the 2005 ACS. Veterans, on the whole and white veterans in particular, are far less likely to have graduated college or to have received any post-graduate training than nonveterans. Similarly, a large income difference of over \$10,000 for the sample as a whole—concentrated again among white veterans—appears in both samples. Differences between veterans and nonveterans are far less stark for black men and men of other races.

### 3.1. Dependent variables

We model the effect of military service on marital dissolution and filial co-residence as follows. For marital dissolution, we compare those who are divorced or separated to those who are currently married. Men who have never been married or are widowed are excluded from this analysis. The coefficient for these models represents the change in the probability of marital dissolution or separation conditional on being married, with a caveat. The absence of a complete marital history in the Census data precludes estimation of changes in the cumulative probability of divorce or remarriage due to military service. A positive coefficient for military service on the divorce outcome could imply that service increases the probability of divorce for veterans, or it could suggest that service decreases the rate of remarriage. Conversely, a negative coefficient for service might mean a decrease in the divorce rate for veterans as a consequence of service, or it might suggest an increase in the rate of remarriage. While these are certainly possibilities, it seems unlikely that the effects we report here (concentrated among white men) could be due exclusively to differences in rates of remarriage, especially given similar findings with complete marital histories (Call and Teachman, 1991, 1996).

The filial co-residence outcome is similarly limited by the structure of the Census question. As opposed to documenting the relationship between each member of a given household, the Census Bureau only asks survey respondents to list the relationship of each household member to the head-of-household. As such, we model filial co-residence with a restricted sample of men who are also listed as heads-of-household. We compare all male heads-of-household with children over 22 years of age living in residence to male heads-of-household without children over 22 years of age present.

Unfortunately, this limited measure of filial co-residence does not allow us to untangle the potentially confounding effects of differences in the rate and timing of fertility among veterans. For instance, if Vietnam veterans are more likely to remain childless, our estimates of filial co-residence may be attenuated. Conversely, if veterans have higher total fertility than nonveterans, a positive coefficient for this outcome could reflect this difference in fertility, rather than any difference in rates of co-residence. Similarly, if veterans form families earlier, then our estimates may overstate the impact of military

<sup>14</sup> The results of the Vietnam draft lottery are available for download at: <http://www.sss.gov/lotter1.htm>.

<sup>15</sup> Other races include American Indian, Alaska Native, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Native Hawaiian, Guamanian, Chamorro, Samoan, Other Pacific Islander, Other Asian, and other self-identified race categories. Although the Census Bureau does ask respondents if they are Spanish, Hispanic, or Latino in a separate question, we do not treat these respondents separately in our analysis. These respondents may be classified in any of the three race categories that we utilize here, but are most often grouped into the race categories “white” (47.9%) or “some other race” (42.2%) based on tabulations from the 2000 Census (Census Bureau 2001: 10). We opted for this scheme to ensure our analyses were broadly similar and comparable to past research on these cohorts using IV methods (see Angrist, 1990; Angrist and Chen, 2008).

**Table 2**  
Descriptive statistics for 2000 Census sample, 1950–1952 birth cohorts by race category.

	All		White		Black		Other	
	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran	Veteran
Draft eligible	0.33	0.53	0.32	0.54	0.35	0.48	0.33	0.49
0–8 Years	0.03	0.01	0.02	0.01	0.06	0.01	0.07	0.03
9–12 Years	0.09	0.07	0.07	0.06	0.21	0.10	0.14	0.08
H.S. Graduate	0.27	0.33	0.26	0.34	0.33	0.31	0.27	0.29
Some college	0.22	0.30	0.23	0.30	0.20	0.35	0.23	0.33
Associate's	0.07	0.11	0.07	0.11	0.05	0.10	0.07	0.12
Bachelor's	0.20	0.12	0.21	0.12	0.10	0.09	0.13	0.10
College+	0.13	0.06	0.14	0.06	0.05	0.04	0.09	0.05
Earnings	44154.97	37058.08	46416.62	38257.96	26925.01	28681.93	32164.52	30236.76
Divorced or Separated	0.19	0.22	0.18	0.21	0.32	0.33	0.25	0.28
N	525,935	173,050	466,330	151,470	41,845	14,365	17,760	7215
Parental Co-residence	0.10	0.11	0.09	0.11	0.14	0.14	0.14	0.14
N	537,695	171,365	478,095	150,425	41,795	13,880	17,810	7065

Note: All sample sizes are rounded in accordance with Census confidentiality guidelines. Proportions are calculated with rounded sample sizes.

**Table 3**  
Descriptive statistics for 2005 ACS sample, 1950–1952 birth cohorts by race category.

	All		White		Black		Other	
	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran	Veteran	Non-veteran	Veteran
Draft eligible	0.33	0.54	0.33	0.55	0.34	0.50	0.32	0.51
0–8 Years	0.02	0.01	0.02	0.01	0.04	0.01	0.05	0.02
9–12 Years	0.07	0.05	0.06	0.05	0.17	0.06	0.11	0.06
H.S. Graduate	0.26	0.33	0.26	0.34	0.35	0.32	0.28	0.31
Some College	0.21	0.29	0.21	0.28	0.20	0.32	0.22	0.29
Associate's	0.07	0.12	0.07	0.12	0.06	0.12	0.08	0.15
Bachelor's	0.21	0.13	0.22	0.13	0.11	0.11	0.16	0.11
College+	0.15	0.07	0.16	0.08	0.07	0.05	0.10	0.07
Earnings	49562.2	39260.7	51661.91	40637.28	28573.03	26335.77	35358.26	31628.05
Divorced or Separated	0.18	0.20	0.17	0.19	0.31	0.32	0.25	0.28
N	54,410	17,315	49,460	15,500	3350	1175	1600	645
Parental Co-residence	0.12	0.12	0.12	0.12	0.13	0.12	0.13	0.14
N	56,590	17,555	51,455	15,725	3515	1190	1615	640

Note: All sample sizes are rounded in accordance with Census confidentiality guidelines. Proportions are calculated with rounded sample sizes.

service on filial co-residence. It could also be the case that wartime service delays entrance into stable, long-term unions and, subsequently, delays childbearing. Past work in this area, however, suggests that Vietnam veterans delayed childbearing (as they delayed marriage) and had fewer children than nonveterans (Call and Teachman, 1991). If these patterns held through 2000 and 2005, our estimates should, if anything, be downwardly biased. Nonetheless, we again urge caution in interpreting these results and return to the implications of these limitations in the discussion section.

### 3.2. Analytic approach

We first estimate the effect of military service on the marital stability and filial co-residence outcomes using a standard OLS regression. The OLS coefficients are naïve estimates of the effect of military service on our outcomes that do not exploit the random variation of the draft lottery. The OLS coefficients represent the regression-adjusted mean differences for veterans compared to nonveterans. If there are unobservable differences between these groups (or observable differences that have not been measured), then OLS estimates will be biased. For instance, if, on average, men selecting into the military are more prone to aggressive behavior and aggression is associated with marital instability, then our estimates of the effect of military service on marital dissolution will be upwardly biased if we omit measures of aggression or propensity for aggression in the regression equation.

In contrast to the naïve OLS estimates, we employ an instrumental variable technique to generate causal estimates of military service on marital dissolution and filial co-residence. This approach utilizes a third, exogenous variable, the instrument, to estimate the causal effect of an endogenous regressor or ‘treatment’ on some outcome. The model requires that the instrument be correlated with the endogenous regressor of interest—military service in this case—but unrelated to the outcome except through its effect on the endogenous regressor. The first assumption is easily tested and we present standard strength of instrument statistics below.

The second assumption, better known as the exclusion restriction, holds that draft eligibility does not have a direct causal impact on either of our outcomes of interest other than through its association with military service. Although it is plausible

that the behavioral responses to draft eligibility affected our substantive outcomes directly, past research has provided convincing counterfactuals to suggest that the exclusion restriction holds. For instance, the 1953 birth cohort was assigned draft lottery numbers, but not called to report for service. If the draft itself affected outcomes directly, we would expect differences in outcomes by eligibility status for this cohort. Angrist (1990), however, shows that the direct effect of draft eligibility on earnings for the 1953 cohort is not significant. Similarly, educational attainment—a key variable that could influence both marital dissolution and filial co-residence—does not co-vary with draft number for the cohorts under study (Angrist and Krueger, 1992; Card and Lemieux, 2001).

In practice, the IV model is estimated through a two-stage least squares regression where the first stage regresses the endogenous regressor on the instrument (and the other exogenous independent variables) and the second stage regresses the outcome on the fitted values from the first stage regression. In our case, we estimate the effect of military service on marital dissolution and filial co-residence by using the instrument, draft eligibility status. The first-stage regression of this 2SLS approach is:

$$veteranstat^* = \beta_0 + \beta_1 draft\ status + \beta_2 \mathbf{X} + \varepsilon_1 \quad (1)$$

where *veteranstat\** is coded “1” for having served in the military and “0” otherwise and where “*draft status*” is coded “1” for draft eligible males and “0” for draft ineligible men. Next, we estimate the following second stage regression (2):

$$y = \gamma_0 + \gamma_1 veteranstat^* + \gamma_2 \mathbf{X} + u_1 \quad (2)$$

where “*veteranstat\**” contains the predicted values generated by the first-stage regression,  $\mathbf{X}$  is our vector of month and year of birth dummies, and  $y$  is some outcome of interest. In this regression, the coefficient on “*veteranstat\**” will yield the true or pure effect of veteran status on our outcome, if the assumptions we detailed above hold. Both stages deploy a linear probability model (as does our “naïve” OLS approach for comparison). Even though both outcomes of interest are limited dependent variables, the simple linear probability model is the ideal specification when faced with a set of simultaneous equations where the instrument, the endogenous regressor, and the dependent measure are dichotomous (Angrist and Pischke, 2009; Heckman and Macurdy, 1985).

Because draft lottery numbers were assigned by a random drawing, draft number—and draft eligibility—is orthogonal to standard socio-demographic variables. Consequently, we do not include a standard vector of control variables.<sup>16</sup> All of our models do, however, include a vector ( $\mathbf{X}$ ) of indicator variables for month and year of birth to allay concerns raised by Fienberg (1971) about possible problems with the random assignment of lottery number during the 1969 lottery.<sup>17</sup>

#### 4. Results

As anticipated, we find the draft lottery status to be a strong predictor of veteran status in our first stage regression. In the 2000 Census, draft eligibility raises the likelihood of military service by 16.0 percentage points for the overall sample, and less so for racial minorities (an effect found by Angrist [1991] and others) (Table 4). In the 2005 ACS, the results are similar, though the increased probability is slightly higher at 16.7 percentage points for the overall sample (Table 5). The differences for members of minority racial groups are particularly notable. In the 2005 ACS, draft eligibility raises the propensity to be a veteran by 12.5% for blacks as compared to only a 10.3% rise in the 2000 Census sample. Likewise, among the “other” racial category the percentage point effect of draft eligibility is 13.0 in the 2000 Census for this group, and it is 16.3 points in the 2005 ACS. For all models in all (sub)samples, the  $F$ -tests for the significance of the instrument indicate that draft eligibility is a robust predictor of service (Apel et al., 2008; Bound et al., 1995).<sup>18</sup>

We begin with results for the effect of veteran status on marital dissolution (Table 6). In our OLS models, veteran status has a strong and significant effect on the probability of divorcing or separating across all race categories. The naïve estimates indicate that military service *increases* the probability of divorce. The effect is most pronounced in the 2000 Census where veteran status is associated with a 3% increase in the probability of divorce or separation for the full sample. The effect is smaller, although still significant, in the 2005 ACS for white men. For both samples, the pattern is consistent across racial groups, although the results for blacks and others in the ACS sample are not statistically significant. The effect is, overall, strongest for white men where the coefficients are indistinguishable from the full sample.

Turning to the 2SLS models, we present estimates of the causal impact of veteran status on marital dissolution. In the 2000 Census, the strong and positive association between veteran status and marital dissolution disappears. None of the

<sup>16</sup> Other than month of birth, we do not need to include another vector of control variables, because our assumption is that draft status will be truly random, and therefore orthogonal to standard socio-demographic variables (at the time of lottery), which we exclude due to concerns of endogeneity. That is, any variation in, say, education or earnings related to our instrument would likely be resulting from the treatment. Thus, we present a reduced form equation that will not shed light on the extent to which these behavioral responses are moderating or mediating our estimate of veteran status.

<sup>17</sup> Fienberg (1971) raises concerns with the randomness of the 1970 lottery drawing, which selected eligible birth dates for the 1950 cohort. Analyses of the results of that lottery indicate that later months of birth had, on average, lower induction numbers than months of birth earlier in the year. As such, we conducted all of the analyses contained in this paper separately for each birth cohort and, in the aggregate models, with controls for year of birth. The results for the birth cohort specific analyses were not demonstrably different for the 1950 cohort nor were the cohort indicators significant in the overall models.

<sup>18</sup> We test the strength of the draft eligibility instrument using the  $F$ -test for the joint significance of the instrument(s). The  $F$ -statistic is given by  $\frac{R_u^2 - R_r^2}{(1 - R_u^2)/df_2}$  where  $R_u^2$  gives the  $R^2$  value from the first stage regression including the instrument,  $R_r^2$  gives the  $R^2$  value from the first stage regression with the instrument excluded, and  $df_2$  gives the degrees of freedom for the unrestricted first stage.

**Table 4**

First stage estimates by race for the 2000 Census, 1950–1952 birth cohorts.

	All	White	Black	Other
Draft eligibility	0.1605** 0.0010	0.1676** 0.0011	0.1033** 0.0033	0.1310** 0.0054
Observations	781,070	681,725	701,90	29,155
R <sup>2</sup>	0.0356	0.0388	0.0187	0.0298
Δ R <sup>2</sup> including instruments	0.0327	0.0357	0.0137	0.0198
Partial R <sup>2</sup> for instruments	0.0328	0.0358	0.0138	0.0200
F-test for instruments	26481.71	25317.70	979.06	593.73

Note: Standard errors in parentheses. All models include controls for state of birth and birth cohort.

\* p < 0.05.

\*\* p < 0.01.

**Table 5**

First stage estimates by race for the 2005 ACS, 1950–1952 birth cohorts.

	All	White	Black	Other
Draft eligibility	0.1671** 0.0031	0.1706** 0.0032	0.1249** 0.0118	0.1634** 0.0184
Observations	79,775	71,615	5600	2565
R <sup>2</sup>	0.0397	0.0417	0.0342	0.0574
Δ R <sup>2</sup> including instruments	0.0361	0.0379	0.0194	0.0298
Partial R <sup>2</sup> for instruments	0.0362	0.0380	0.0197	0.0306
F-test for instruments	2996.60	2829.86	111.32	79.13

Note: Standard errors in parentheses. All models include controls for state of birth and birth cohort.

\* p < 0.05.

\*\* p < 0.01.

**Table 6**

Military service effect estimates on marital dissolution using 2000 Census and 2005 ACS data for 1950–1952 birth cohorts only by race.

Sample	All		White		Black		Other	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
2000 Census	0.030** (0.001)	0.004 (0.007)	0.030** (0.001)	0.003 (0.007)	0.017** (0.005)	−0.034 (0.041)	0.029** (0.006)	0.067 (0.048)
2005 ACS	0.018** (0.003)	−0.044* (0.019)	0.018** (0.003)	−0.052** (0.020)	0.009 (0.015)	0.096 (0.117)	0.012 (0.020)	−0.010 (0.122)

Note: Standard errors in parentheses. All models include controls for state of birth and birth cohort.

\* p < 0.05.

\*\* p < 0.01.

instrumental variables estimates reach statistical significance despite large sample sizes for all of the race categories. In the 2005 ACS, the marginal effect of military service on marital dissolution changes signs from the OLS model and indicates that military service *reduces* the probability of divorce. The effect is concentrated among white veterans with military service reducing the probability of divorce or separation by over 5%. Again, since these estimates use random assignment through the draft lottery, the effect is closer to a true causal effect of service on marital dissolution.

In Table 7, we present results for filial co-residence keeping in mind the ambiguity of interpretation discussed above. In the 2000 Census, the naïve estimates suggest that military service has mixed effects on filial co-residence by race. For white men, the effect appears positive and significant with veterans more likely to have an adult child at home than non-veterans. Black men, on the other hand, exhibit the opposite pattern with veterans less likely to live with an adult child, although the coefficient is not significant at conventional levels. In the 2005 ACS the coefficient for the full sample—as well as for white and black men—also fail to reach statistical significance.

While the OLS estimates for the 2000 Census suggest that military service increases the likelihood of having an adult child in the household, the IV results show the opposite sign, suggesting a decrease in this probability (Table 7). For the Census models, this effect is once again concentrated among white men, but the coefficients are not significant despite large sample sizes. In the 2005 ACS, however, we find further evidence that the effect of military service differs by race—for races other than white or black, military service significantly increases the probability of having an adult child in the household. The effect is also substantively significant, but the wide confidence interval recommends caution in interpreting more than the direction of the relationship. The statistically significant effect for this group drives the results for the full sample while the coefficients for white and black men in the 2005 ACS do not reach statistical significance.

**Table 7**

Military service effect estimates on adult child co-residence using 2000 Census and 2005 ACS data for 1950–1952 birth cohorts only by race.

Sample	All		White		Black		Other	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
2000 Census	0.010** (0.001)	−0.010 (0.005)	0.012** (0.001)	−0.009 (0.005)	−0.007 (0.003)	−0.044 (0.031)	0.002 (0.005)	0.043 (0.036)
2005 ACS	−0.003 (0.003)	0.028 (0.016)	−0.002 (0.003)	0.015 (0.017)	−0.017 (0.011)	0.060 (0.083)	0.015 (0.016)	0.357** (0.116)

Note: Standard errors in parentheses. All models include controls for state of birth and birth cohort.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

## 5. Discussion

In the present study we use the IV approach to model the causal impact of Vietnam era military service on two important family outcomes, marital dissolution and filial co-residence. The results suggest some—if limited—long-term effects of Vietnam era military service more than 25 years after the end of combat.

One of the most intriguing findings reported here is the decreased likelihood for white veterans to be divorced or separated in the 2005 ACS sample. This suggests a potentially positive effect of military conscription on family stability for this group that may be mediated by education or military service directly. Since the Census and ACS measures do not include a complete marital history, we cannot rule out the possibility that the cumulative probability of divorce is different between the veteran and non-veteran populations, although our results square well with past work in this area (Call and Teachman, 1991, 1996). Future research should revisit this outcome with a survey including a more complete measure of marital history to detect if the effect we report here holds.

The 2005 ACS results indicate that, for veterans other than white or black, military service significantly increases the probability of having an adult child in the household. In this case, the direction of the effect is opposite what we would expect given likely differences in fertility. Both reduced fertility and delayed childbearing would make it *less likely* to observe adult children living in the same household as parents, partially alleviating concerns that the effect we observe here is mere artifact.

Although the interpretation of this outcome is far from unambiguous, we speculate that the changed macroeconomic climate could have impacted the labor market prospects of young adult children. As noted earlier, the unemployment rate for young adults had increased 5 percentage points between 2000 and 2005. Since filial co-residence is a key mechanism of financial insurance for offspring, the positive coefficient for other races in the 2005 ACS may reflect changes in the labor market. For instance, in the relatively depressed labor market of 2005, the children of veterans of other races may have lacked the resources necessary to compete with the children of nonveterans as a consequence of reduced educational attainment. This interpretation may also imply that the families of veterans were more stable, and filial co-residence was a more viable option for the offspring of these men. We cannot, however, rule out the possibility that the increase in filial co-residence represents dependence on the part of parents. If it is the case that the changed macroeconomic climate affected employment prospects, filial co-residence among these veterans could represent offspring staying in the parental home to help defray costs. Again, we believe that this interpretation is less plausible given existing research, but we cannot rule it out definitively. We leave it to future research to reexamine this and other, related household composition outcomes with more robust data on the offspring of these cohorts and their overall fertility.

We also note the curious finding that the effect of service on marital dissolution for white men and filial co-residence for men of other races is significant only in the 2005 ACS but not the larger 2000 long form Census. In both cases, we speculate that the effect of changed macroeconomic circumstances may have played a role, as well as the 5-year increase in age for draft eligible men and their offspring. However, differences between the data collection methods of the two surveys may also be at play. While the Census estimates represent a snapshot of the population on April 1 of the calendar year, the ACS is collected continuously over a 12-month period. If either outcome varies by season, then the ACS estimates could better reflect the cumulative annual trend rather than a single snapshot taken during the spring months.

In many of our models, the unbiased, IV estimates diverged from the naïve, OLS estimates, not just in magnitude but also in direction. Most notably, the sign of the effect of military service on marital dissolution in the 2005 ACS changed from positive in the OLS models to negative (and significant) in the IV models. This suggests that comparisons between the veteran and non-veteran populations for this outcome are upwardly biased by factors that affect marital dissolution directly. Given the mean differences between veterans and nonveterans illustrated in Table 3, the positive OLS coefficient may reflect income or educational disparities between the service and non-service populations. Similarly, past work suggests that veterans are also likely to be unemployed and to have a disability (Angrist and Chen, 2008). These differences undoubtedly affect the likelihood of marital dissolution, and are also likely correlated with unobservables that OLS models cannot control for.

Although past research has provided a convincing defense of the assumptions of the draft eligibility instrument, we acknowledge that post-war educational attainment could mediate the effects we report here. In particular, if Vietnam vet-

erans took advantage of post-service educational benefits, the effects we observe in our IV models could reflect increased education among these cohorts instead of the direct of military service per se. The salutary effect of veteran service on marital stability observed for white veterans could, then, be not directly attributable to service, but to post-war increases in education as education directly increases marital stability (Heaton, 2002).

Finally, the IV estimates presented in this paper speak to the effect of military service on a subpopulation of men for whom the draft lottery “encouraged” participation in the service. Our estimates would not extend, then, to those men who were true volunteers during this era. The relationship of our findings to the era of the post-1973 All-Volunteer Force is consequently less straightforward. If it is the case that selection into the service is typically a non-random process, then our IV estimates represent the effect of military service on a group of men who may be dissimilar from those who now voluntarily select into the military. However, estimating the “true” effect of military service net of selection has important policy consequences. If many of the positive benefits that accrue to veterans in other eras are not in evidence here, it might suggest that, despite the best efforts of policymakers, the salutary effects of military service are an artifact of self-selection and the induction process.

## References

- Angrist, J., 1990. Lifetime earnings and the Vietnam era draft lottery: evidence from social security administrative records. *American Economic Review* 80, 313–336.
- Angrist, J., 1991. The draft lottery and voluntary enlistment in the Vietnam era. *Journal of the American Statistical Association* 86, 584–595.
- Angrist, J., Chen, S., 2008. Long-Term Consequences of Vietnam-Era Conscript: Schooling, Experience, and Earnings. NBER Working Paper #13411.
- Angrist, J., Chen, S., Frandsen, B., 2010. Did Vietnam veterans get sicker in the 1990s? The complicated effects of military service on self-reported health. *Journal of Public Economics* 94, 824–837.
- Angrist, J., Chen, S., Song, J., 2011. Long-term consequences of Vietnam-era conscription: new estimates using social security data. *American Economic Review* 101, 334–338.
- Angrist, Joshua, Krueger, Alan B., 1992. Estimating the Payoff to Schooling Using the Vietnam-Era Draft Lottery. NBER Working Paper #4067.
- Angrist, Joshua D., Pischke, Jorn-Steffen, 2009. *Mostly Harmless Econometrics: An Empiricist’s Companion*. Princeton University Press.
- Angrist, Joshua D., Imbens, Guido W., Rubin, Donald B., 1996. Identification of causal effects using instrumental variables. *Journal of the American Statistical Association* 91, 444–455.
- Apel, Robert et al, 2008. Using state child labor laws to identify the causal effect of youth employment on deviant behavior and academic achievement. *Journal of Quantitative Criminology* 24, 337–362.
- Aquilino, William S., 1990. The likelihood of parent-adult child co-residence: effects of family structure and parental characteristics. *Journal of Marriage and Family* 52, 405–419.
- Aquilino, William S., 1991. Family structure and home-leaving: a further specification of the relationship. *Journal of Marriage and Family* 53, 999–1010.
- Becker, Sascha O., Bentolila, Samuel, Fernandes, Ana, Ichino, Andrea, 2010. Youth emancipation and perceived job insecurity of parents and children. *Journal of Population Economics* 23, 1175–1199.
- Bouffard, Leana Allen, 2003. Examining the relationship between military service and criminal behavior during the Vietnam era: a research note. *Criminology* 41, 491–510.
- Bouffard, Leana Allen, 2005. The military as a bridging environment in criminal careers: differential outcomes of the military experience. *Armed Forces and Society* 31, 273–295.
- Bound, John, Jaeger, David A., Baker, Regina M., 1995. Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American Statistical Association* 90, 443–450.
- Brown, Charles, 2006. *Relatively Equal Opportunity in the Armed Forces: Impacts on Children of Military Families*. Unpublished manuscript. University of Michigan, Department of Economics.
- Call, Vaughn R.A., Teachman, Jay D., 1991. Military service and stability in the family life course. *Military Psychology* 3, 233–250.
- Call, Vaughn R.A., Teachman, Jay D., 1996. Life-course timing and sequencing of marriage and military service and their effects on marital stability. *Journal of Marriage and Family* 58, 219–226.
- Card, David, Lemieux, Thomas, 1997. Adapting to Circumstances: The Evolution of Work, School, and Living Arrangements Among North American Youth. NBER Working Paper #6142.
- Card, David, Lemieux, Thomas, 2001. Going to college to avoid the draft: the unintended legacy of the Vietnam war. *American Economic Review* 91 (2), 97–102.
- Conley, D., Heerwig, J., 2012. The long-term effects of military conscription on mortality: estimates from the Vietnam-era draft lottery. *Demography* 49, 841–855.
- Danziger, Sheldon., Ratner, David., 2010. Labor market outcomes and the transition to adulthood. *Future of Children* 20 (1), 133–158.
- Davidson, Jonathan, Smith, Rebecca, Kudler, Harold., 1989. Familial psychiatric illness in chronic posttraumatic stress disorder. *Comprehensive Psychiatry* 30, 339–345.
- Department of Veterans Affairs, 2001. Annual Benefits Report: Fiscal Year 2000. <[http://www.vba.va.gov/REPORTS/abr/fy2000\\_abr\\_v3.pdf](http://www.vba.va.gov/REPORTS/abr/fy2000_abr_v3.pdf)>.
- Department of Veterans Affairs, 2006. Annual Benefits Report: Fiscal Year 2005. <[http://www.vba.va.gov/REPORTS/abr/historical/2005\\_abr.pdf](http://www.vba.va.gov/REPORTS/abr/historical/2005_abr.pdf)>.
- Department of Veterans Affairs, 2011a. Agent Orange: Diseases Related to Agent Orange Exposure. <<http://www.publichealth.va.gov/exposures/agentorange/diseases.asp#veterans>>.
- Department of Veterans Affairs, 2011b. Annual Benefits Report: Fiscal Year 2010. <[http://www.vba.va.gov/REPORTS/abr/2010\\_abr.pdf](http://www.vba.va.gov/REPORTS/abr/2010_abr.pdf)>.
- Elder Jr., Glen H., 1986. Military times and turning points in men’s lives. *Developmental Psychology* 22, 233–245.
- Elder Jr., Glen H., Cynthia Gimbel, Rachelvie, 1991. Turning points in life: the case of military service and war. *Military Psychology* 3, 215–231.
- Fienberg, S.E., 1971. Randomization and social affairs: the 1970 draft lottery. *Science* 171, 255–261.
- Gade, Paul A., 1991. Military service and the life-course perspective: a turning point for military personnel research. *Military Psychology* 3, 187–199.
- Gelman, Andrew, Hill, Jennifer, 2007. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge University Press.
- Gimbel, Cynthia, Booth, Alan, 1994. Why does military combat experience adversely affect marital relations. *Journal of Marriage and Family* 56, 691–703.
- Glenn, D. Michael et al, 2002. Violence and hostility among families of vietnam veterans with combat-related posttraumatic stress disorder. *Violence and Victims* 17, 473–489.
- Glick, Paul C., Lin, Sung-Ling, 1986. More young adults are living with their parents: who are they? *Journal of Marriage and Family* 48, 107–112.
- Goldscheider, Frances K., DaVanzo, Julie, 1985. Living arrangements and the transition to adulthood. *Demography* 22, 545–563.
- Goldscheider, Frances K., Goldscheider, Calvin, 1989. Family structure and conflict: nest-leaving expectations of young adults and their parents. *Journal of Marriage and Family* 51, 87–97.
- Hearst, N., Newman, T., et al, 1986. A randomized natural experiment. *New England Journal of Medicine* 314, 620–624.
- Heaton, Tim B., 2002. Factors contributing to increased marital stability in the United States. *Journal of Family Issues* 23, 392–409.
- Heckman, J.J., Macurdy, T.E., 1985. A simultaneous equations linear probability model. *The Canadian Journal of Economics* 85, 28–37.

- Jensen, Peter S., Lewis, Ronel L., Xenakis, Stephen N., 1986. The military family in review: context, risk, and prevention. *Journal of the American Academy of Child Psychiatry* 25, 225–234.
- Jensen, Peter S., Xenakis, Stephen N., Wolf, Perry, Bain, Michael W., 1991. The 'military family syndrome' revisited: 'by the numbers'. *Journal of Nervous and Mental Disease* 179, 102–105.
- Jones, Jeffrey M., 2008. Opposition to Iraq War Reaches New High. Gallup. <<http://www.gallup.com/poll/106783/Opposition-Iraq-War-Reaches-New-High.aspx>>.
- Jordan, B. Kathleen et al, 1992. Problems in families of male Vietnam veterans with posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology* 60 (6), 916–926.
- Kaplan, Greg, 2010. Moving Back Home: Insurance Against Labor Market Risk. Federal Reserve Bank of Minneapolis Working Paper #677.
- Kiernan, Kathleen E., 1992. The impact of family disruption in childhood on transitions made in young adult life. *Population Studies* 46, 213–234.
- Kitson, Gay C., Babri, Karen Benson, Roach, Mary Joan, 1985. Who divorces and why: a review. *Journal of Family Issues* 6, 255–293.
- Kulka, Richard A., Schlenger, William E., et al, 1990. Trauma and the Vietnam War Generation. Brunner/Mazel, Inc., New York, NY.
- LaGrone, Don M., 1978. The military family syndrome. *American Journal of Psychiatry* 135, 1040–1043.
- London, A., Wilmoth, J., 2006. Military service and (dis)continuity in the life course. *Research on Aging* 28, 135–159.
- Lundquist, Jennifer Hickee, 2006a. The black-white gap in marital dissolution among young adults: what can a counterfactual scenario tell us? *Social Problems* 53, 421–441.
- Lundquist, Jennifer Hickee, 2006b. When race makes no difference: marriage and the military. *Social Forces* 83, 731–757.
- Lundquist, Jennifer Hickee, 2008. Ethnic and gender satisfaction in the military: the effect of a meritocratic institution. *American Sociological Review* 73, 477–496.
- MacLean, Alair, Elder Jr., Glen H., 2007. Military Service in the Life Course. *Annual Review of Sociology* 33, 175–196.
- Matsudaira, Jordan B., 2006. Economic Conditions and the Living Arrangements of Young Adults. Transitions to Adulthood Research Network Working Paper.
- Mattila, J. Peter, 1978. G.I. bill benefits and enrollments: how did vietnam veterans fare? *Social Science Quarterly* 59, 535–545.
- Mitchell, Barbara A., Wister, Andrew W., Burch, Thomas K., 1989. The family environment and leaving the parental home. *Journal of Marriage and Family* 51, 605–613.
- Modell, John, Haggerty, Timothy, 1991. The social impact of war. *Annual Review of Sociology* 17, 205–224.
- National Center for Veterans Analysis and Statistics, 2011. Department of Veterans Affairs Statistics at a Glance. <<http://www.va.gov/vetdata/docs/quickfacts/Homepage-slideshow.pdf>>.
- Palmer, Cale, 2008. A theory of risk and resilience in military families. *Military Psychology* 20, 205–217.
- Pavalko, Eliza K., Elder Jr., Glen H., 1990. World War II and divorce: a life-course perspective. *American Journal of Sociology* 95, 1213–1234.
- Price, Jennifer L., 2011. Findings from the National Vietnam Veterans' Readjustment Survey. <<http://www.ptsd.va.gov/professional/pages/vietnam-vets-study.asp>>.
- Riggs, David S., Byrne, Christina A., Weathers, Frank W., Litz, Brett T., 1998. The quality of the intimate relationships of male Vietnam veterans: problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress* 11 (1), 87–101.
- Rohlf, C., 2007. Does Combat Exposure Make You a More Violent or Criminal Person? Evidence from the Pre-Lottery Vietnam Draft. Working Paper. Maxwell School. Syracuse University.
- Rosenzweig, Mark R., Wolpin, Kenneth I., 1993. Intergenerational support and the life-cycle incomes of young men and their parents: human capital investments, co-residence, and intergenerational financial transfers. *Journal of Labor Economics* 11 (1), 84–112.
- Ruger, W., Wilson, S., et al, 2002. Warfare and welfare: military service, combat, and marital dissolution. *Armed Forces & Society* 29 (1), 85–107.
- Samper, Rita E., Taft, Casey T., King, Daniel W., King, Lynda A., 2004. Posttraumatic stress disorder symptoms and parenting satisfaction among a national sample of male Vietnam veterans. *Journal of Traumatic Stress* 17, 311–315.
- Sampson, Robert J., Laub, John H., 1996. Socioeconomic achievement in the life course of disadvantaged men: military service as a turning point, Circa 1940–1965. *American Sociological Review* 61, 347–367.
- South, Scott J., 1985. Economic conditions and the divorce rate: a time-series analysis of the postwar United States. *Journal of Marriage and Family* 47 (1), 31–41.
- South, Scott J., Spitze, Glenna, 1986. Determinants of divorce over the marital life course. *American Sociological Review* 51, 583–590.
- Stretch, Robert H., Figley, Charles R., 1984. Combat and the Vietnam veteran: assessment of psychosocial adjustment. *Armed Forces and Society* 10, 311–319.
- Teachman, J., 2009. Military service, race, and the transition to marriage and cohabitation. *Journal of Family Issues* 30 (10), 1433–1454.
- Teachman, Jay D., Tedrow, Lucky, 2008. Divorce, race, and military service. more than equal pay and equal opportunity. *Journal of Marriage and Family* 70, 1030–1044.
- U.S. Census Bureau, 2000. Employment Status by Sex: 2000. <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>.
- U.S. Census Bureau, 2001. Overview of Race and Hispanic Origin: Census 2000 Brief. U.S. Department of Commerce Economics and Statistics Administration. <<http://www.census.gov/prod/2001pubs/c2kbr01-1.pdf>>.
- U.S. Census Bureau, 2005. Employment Status: 2005 American Community Survey. <<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>>.
- U.S. Census Bureau, 2008. A Compass for Understanding and Using American Community Survey Data: What General Data Users Need to Know. U.S. Department of Commerce Economics and Statistics Administration. <<http://www.census.gov/acs/www/Downloads/handbooks/ACSGeneralHandbook.pdf>>.
- Urdansky, Margaret L., London, Andrew S., Wilmoth, Janet M., 2009. Veteran status, race-ethnicity, and marriage among fragile families. *Journal of Marriage and Family* 71, 768–786.
- Ward, Russell, Logan, John, Spitze, Glenna, 1992. The influence of parent and child needs on coresidence in middle and later life. *Journal of Marriage and Family* 54, 209–221.
- White, Lynn, 1994. Co-residence and leaving home: young adults and their parents. *Annual Review of Sociology* 20, 81–102.
- Zatzick, Douglas F. et al, 1997. Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *American Journal of Psychiatry* 154, 1690–1695.