Military Service and Later Labor Force Outcomes: 
A Life Course Approach

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Introduction

A large and interdisciplinary literature is devoted to measuring the effect of military service on a variety of outcomes at different points in the life course (MacLean and Elder 2007; Mettler 2005; Modell and Haggerty 1991; Settersten 2006). Much of this research is focused on comparing veterans and nonveterans from the World War II and Vietnam eras, although increasing attention is being paid to studying the effects of participation in the All-Volunteer Force (Lundquist 2004, 2006; Lundquist and Smith 2005; Teachman 2007; Teachman and Tedrow 2007). In this paper, we extend the extant research by studying the labor market outcomes of veterans and nonveterans from birth cohorts that span a broad and continuous range of historical periods. We combine data from the 1978 to 1996 National Health Interview Surveys to construct synthetic panels of veterans and nonveterans for the cohorts born in each year from 1931 to 1971. To account for the non-random assignment of people to military service, we exploit cohort-level variation in the incentives and constraints that influenced the decision to serve in the military. We argue that the risk of draft induction, the cost of college tuition, the college wage premium, the average wage in the labor market, the level of entry level military pay, and the unemployment rate for young men that prevailed when an individual was 18 years old do not determine labor market activities much later in life but do affect the likelihood that a person serves in the military. We employ an instrumental variables (IV) approach to estimate the

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effects of military service on a range of labor market outcomes using these factors as instruments for military service.

We present the remainder of the paper in six parts. The first section reviews the literature on the effect of military service on outcomes over the life course. In the second section we discuss what is known about the selection process determining military service at the individual and aggregate level. We also present evidence related to the degree of selection imposed by pre-induction physical exams. We explain our methods and the basic model we use to account for selection into the military and to describe labor market outcomes later in life in section three. In the fourth section we describe the key features of our data and explain the construction of the measures of labor market activity and veteran status that are central to our analysis. We present the results in section five and provide a discussion of the results in the final section of the paper.

1. The Literature On The Effect of Military Service

Similar to the education and prison systems, the military is a critical social institution that shapes subsequent life course outcomes (Laub and Sampson 2003; London and Myers 2006; MacLean, 2004; Sampson and Laub 1996). The question of how military service shapes men’s life course trajectories has received sustained attention in the literature for more than 25 years (Angrist 1990, 1998; Angrist and Krueger 1994; Dechter and Elder 2004; Elder 1974, 1986, 1987; Elder and Clipp 1988a; Elder, Shanahan, and Clipp 1994; Hogan 1978a, 1978b, 1981; Laub and Sampson 2003; London and Wilmoth 2006; MacLean 2005; Pavalko and Elder 1990; Sampson and Laub 1996; Teachman 2004, 2005, 2007, Teachman and Call 1996; Teachman, Call, and Segal 1993; Teachman and Tedrow 2004, 2007; Xie 1990). Through comparisons of veterans to non-veterans, as well as analyses of age at mobilization effects on educational, occupational, marital, and health outcomes, previous research has sought to examine continuities
and discontinuities in men’s life course trajectories as a function of military service.

Extant research provides evidence of mixed effects of military service on labor force outcomes depending upon the time period of service. On the one hand, previous studies suggest that military service could potentially improve labor force participation among veterans, particularly those who served in higher ranking positions, by providing skills-based training during enlistment periods and access to post-service educational benefits through the G.I. Bill (Mettler 2005). Dechter and Elder (2004) focus on the labor and military mobilizations associated with World War II and find that officers were able to convert their service into post-war occupational advancement, while other service men actually fared worse than non-veterans. Consistent with this finding, Angrist and Krueger (1994: 74) conclude that “World War II veterans earn no more than comparable non-veterans and way well earn less,” even though they had access to generous G.I. Bill educational benefits. On the other hand, some studies indicate military service has a negative impact on veteran’s labor force participation because enlistment in some periods involves risks that could lead to psychological trauma, physical injury, and disablement. Studies focusing mostly on Vietnam era veterans suggest that military service in a war zone and combat exposure lead to worse labor market experiences and lower earnings. Angrist (1990) finds that white male Vietnam War veterans earned 15% less than comparable non-veterans in the early 1980s. The lower earnings of Vietnam era veterans may in part be attributable to post-traumatic stress and other psychiatric disorders that can interfere with consistent labor force participation.

Angrist and Chen (2008) argue that even in the absence of physical and psychological disabilities, military service may adversely affect earnings and other labor market outcomes because it may reduce or alter the timing of a person’s human capital investments. Military
service may lead to lower labor market experience, for example, if veterans would have worked if they did not serve in the military. Service may lead to lower or different educational investments if it changes the timing and type of education that veterans would have pursued if they had not served in the military. For example, using data from the Wisconsin Longitudinal Study, MacLean (2005) finds that those who were drafted were less likely to attend college than those who were not drafted and non-veterans, which she interprets as evidence of life course disruption. Additionally, she finds that military service redirected academically-ambitious men away from college attendance, which she interprets as evidence of a negative turning point in their educational life course trajectories.

2. The Military Service Selection Process

People are not randomly assigned to military service, which complicates efforts to estimate the effect of military service on subsequent life outcomes. Military service is the product of i) individual agency in relation to voluntary enlistment and the incentives and constraints that guide the enlistment decision, ii) the federal government’s legal authority to compel military service through the draft, and iii) the military’s institutional authority to reject those deemed incapable of serving effectively (Fligstein 1980; Kilburn and Klerman 2000; Lutz forthcoming; Teachman, Call, and Segal 1993). This selection process, which is usually unobserved, is a problem for researchers to the extent that the people self- or otherwise-selected for military service differ systematically from the people who are not selected for military service in ways that influence later-life outcomes. Causal inference in the context of this type of non-experimental data relies upon on prior information about the selection process to guide assessments of the extent of the selection problem and to evaluate the plausibility of different modeling assumptions. In this section we review two key features of the military service
selection process that are relevant to our analysis.

**Age at Entry.** Although there is variation across historical periods, such as when there is an ongoing war, draft, or mobilization of the Reserve Components, those who serve in the military generally enter service at relatively young ages and exit after only a few years on active duty. From 1941 to 1973, American men of specific ages and varying characteristics were subject to a draft (Flynn 1993). However, most men and women who have served in the U.S. military in the 20th and 21st centuries have done so voluntarily. Since 1973, the U.S. military has been in what is commonly known as the era of the All-Volunteer Force (AVF). These basic facts suggest that the selection process determining military service begins and ends when people are relatively young, and that the economic, social, and public policy conditions that prevail when people enter the ages when entry into military service is most likely to occur may affect the likelihood that a person actually serves.

**Health Screening.** Regardless of whether enlistment is voluntary or mandatory, persons who enter and serve successfully must meet specified eligibility criteria. They must pass physical and mental health screenings, undergo standardized training regimens, and be willing and able to adhere to the military code of conduct. The imposition of minimum physiological and health requirements may induce nonrandom selection by removing people who are most disadvantaged with respect to health and, therefore, later morbidity and disability. Given that health problems and impairments often compromise labor force participation, the extent to which veterans are selected on good health is a critical issue. An indication of significance of this selection process is shown in Figure 1, which plots the percentage of recruits undergoing the pre-induction physical examination who were rejected for military service for health reasons over the time period relevant to our study, 1950-1971. The percentages are surprisingly high, suggesting a
good deal of positive selection on physical, mental, and health attributes. If anything, those entering the military are likely to be better off than the general population, at least along the health dimensions screened in this process. This strong, positive health selection favoring veterans suggests that any labor market advantage experienced by veterans may be attributable to selection. Studies comparing the labor market outcomes of veterans and non-veterans must address the health selection in order to be able to make compelling causal claims about the effects of military service on such outcomes.

3. Methods

In light of the voluntary nature of most decisions to enter the military, it seems reasonable to postulate a simple underlying decision process in which individuals arriving at the age of eligibility for service—for most people, at a time that coincides with the completion of secondary education—weigh the relative attractiveness of three main options: (1) go on to college (or some other form of additional education); (2) enter civilian employment; or (3) enter the military. We recognize that more complicated sequential choice options exist, especially attending a college or university with the explicit intention to subsequently enter the military as an officer. We also recognize that incarceration is an increasingly important factor in the life course trajectories of an increasing number of American men and women, particularly African American men with less than high school educational attainments (Pettit and Western 2004). However, men, and increasingly women, with aptitudes and resources that lead them to anticipate high levels of academic attainment, or high-paying jobs, or both, may view military service negatively, as it may delay the attainment of these anticipated outcomes. Thus, there may be some negative selection into military service, along unmeasured or difficult-to-measure dimensions that relate to lifetime economic status.
One methodological approach to taking into account selection effects is instrumental variable (IV) regression. Several papers have used an IV approach to examine differences in labor market outcomes between veterans and nonveterans (Angrist 1989, 1990; Lemieux and Card 2001; Angrist and Chen 2008). Yet few have included multiple cohorts who were subject to military service during different historical time periods. Our data span 18 calendar years and allow comparisons over a broad range of the life cycle. Thus, they permit an expansive view of the labor market consequences of military service among men at risk of such service in the late-20th century. We employ instrumental-variables techniques, choosing as instruments several variables that reflect the three-way decision process facing eligible young men: get a job, stay in school, or join the military.

4. Data

**HIS Survey Data.** We use data from the 1978 to 1996 National Health Interview Surveys (NHIS). The NHIS sample is a representative cross-section of the civilian non-institutionalized population at the time of the survey. The data contain information on the veteran status, age, gender, and recent labor market activity of each respondent.

The NHIS identifies veterans and nonveterans. For respondents who served in the armed forces, the NHIS also identifies the most recent armed conflict that falls within the respondent’s period of service. Unfortunately, this measure of period of service does not account for the possibility that some veterans may have served during multiple conflicts, or that some veterans who served during a specific conflict may have been stationed elsewhere in the world. Accordingly, we define veteran status as a dichotomy measuring ever versus never served and do not attempt to classify veterans by their exposure to combat or to specific wars.

The NHIS sampling frame is the civilian non-institutionalized population, which
excludes people who are serving in the military at the time of the survey. We assume that most veterans exit the military (and re-enter the civilian population) by age 25 years. To mitigate the effect of changes to the composition of the sample, we limit our analysis to male respondents who were over the age of 25 years at the time of the survey. The resulting sample consists of 64,845 observations.

We analyze four measures of labor market activity: whether unemployed, whether in the labor force, whether the respondent lost work, and the presence of bed disability. Unemployed is an indicator variable set to 1 if the respondent did not have a job but was seeking work in the two weeks preceding his interview date. In labor force is an indicator variable set to 1 if the respondent had a job or was actively seeking work in the two weeks preceding his interview date. Lost work is an indicator variable set to 1 if the respondent missed one or more days of work because of illness or injury in the two weeks preceding his interview date. Finally, bed disability is an indicator variable set to 1 if the respondent was confined to a bed for more than half the day at least one day in the 12 month preceding his interview date. We also control for age when observed in the NHIS, and for birth cohort (derived by subtracting age from the year of interview).

**Instrumental Variables.** The present analysis employs six instruments, each of which exhibit calendar-year variation only. In all cases, the value of the IV for the calendar year in which an observation has his eighteenth birthday is used. The six variables, their definitions, and sources, are as follows:

- **Induction risk** approximates the chances than an 18-year old will be drafted for military service. The number of people of all ages inducted into service each calendar year is taken from the U.S. Selective Service Commission’s website
In principle we would like to norm these figures to the number at risk of induction each year; those already serving in the military, for example, should be removed from the risk pool. The data with which to create such a relative-risks variable seem not, however, to be available. Instead, we approximate induction risks by dividing the total number inducted by the estimated population of 18-year old men in the population each year, taken from Census Bureau population estimates. Induction risk is zero after 1973.

- The wage gap represents the ratio of weekly wages of full-time, full-year workers among college graduates relative to high school graduates, based on analyses of Current Population Survey data reported in Autor, Katz, and Kearney (2005).


- Average weekly earnings represents earnings in private nonagricultural industries, in constant dollars, taken from the 2005 Economic Report of the President (table B-47).

- College cost is an index of the cost of tuition, room and board, and fees at public four-year universities, taken from the National Center for Educational Statistics’ Digest of Educational Statistics 2001 (Table 316, col. 4).

- Unemployment, which represents the relative chances of obtaining a civilian job, is the civilian unemployment rate among men age 16-19, taken from the 2005 Economic Report of the President (table B-42).

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2 We are grateful to David Autor for providing us with the data series used in this analysis.
The wage gap, military pay, earnings, college cost and unemployment variables are all set to zero in those years during which men were subject to the draft (i.e., up to and including 1973). The justification for this restriction is that the decision to join the military is dominated by induction risks during the period of forced conscription. This restriction also has a practical consequence of extending the time period of our analysis, because several of the data series used to create the instruments begin well after many of the men in our sample reached age 18.

**Statistical Methods.** Both the first- and second-stage regressions, each of which has a binary dependent variable, are estimated as linear probability models. We use robust standard errors in view of the well-known heteroscedasticity produced by this approach.

5. **Results**

The validity of our results hinge on the argument that the incentives and constraints associated with the decision to join the military are actually good predictors of having served in the military, that these factors vary across cohorts, and that these factors do not themselves determine labor market outcomes later in life. Figures 2, 3, and 4 plot the values of each instrumental variable that prevailed when each birth cohort was 18 years old. Figure 2 also includes the prevalence of veterans in each cohort.

As seen in Figure 2, there is considerable variation in induction risk across cohorts, and induction risk is related to the prevalence of veterans in each birth cohort. However, it also apparent that there is no variation in induction risk after 1973, which marks the beginning of the All-Volunteer Force era. After 1973, the variation in our instrument set comes from changes in college costs, average earnings, entry level military pay, unemployment rates, and the college wage gap. Figures 3 and 4 demonstrate that there is considerable variation across cohorts in
college costs, military pay, unemployment rates, and the college wage gap. In comparison, average wage earnings have been more stagnant.

A more formal test of the relationship between the instruments and veteran status comes from the analysis of the first stage regression of veteran status on exogenous variables (age, birth cohort, and the six instruments described above). Table 1 shows that of the six instruments, only the induction risk variable is individually statistically significant; however, as a group the six instruments appear to be quite strong ($F = 96.03; p < 0.0001$).

The second-stage regression results are shown in Table 2. For two of the four outcomes —unemployment and bed-days—we find statistically significant adverse effects of military service, averaging over the ages represented in our sample. The results also suggest that military service reduces labor force participation by an amount nearly identical to the increase in unemployment, but the participation effect is imprecisely estimated ($p < 0.10$). We find no effects of military service on having lost work for reasons of health or injury.

The magnitude of these effects is substantial. For example, on average veterans are 4.5 percentage points more likely to be unemployed than nonveterans. But the relative magnitude of this 4.5 percentage point varies with age. Figure 5 depicts the age-specific percentage change in unemployment probabilities associated with military service that is implied by our model. The specific shape of this age profile is a product of the quadratic age profile assumed by the model. Nevertheless, it is interesting to note that the largest relative effect of military service on unemployment occurs at age 51, which is long after a person’s service is complete.

6. Discussion

We find higher levels of unemployment, and a higher prevalence of bed-days in the prior year—a measure of serious health problems—among veterans than among non-veterans.
Although we are unable to include direct controls for endowments and other background characteristics that may be related to both the decision to enter the military and post-military labor-market outcomes, we are able to employ an instrumental variables approach in our analysis. To the extent that the six instrumental variables used in this analysis succeed in controlling for these various unobserved dimensions, there is a strong suggestion that the estimated effect of veteran status is causal. Together with other evidence that indicates that military service in some cohorts is associated with an increased likelihood of disability and death in later life (Bedard and Deschênes 2006; London and Wilmoth 2006), these results suggest that military service may impede labor market participation by engendering health impairments.

One important qualification that must be borne in mind when evaluating our results is the fact that the NHIS sample is drawn from the populations of those surviving to each of the interview years included in this study. If veterans and nonveterans have different death rates over the range of ages included in our sample, and if the risks of dying are correlated with labor market outcomes, then our estimated veteran effect is, in fact, a combined effect on labor market status and survivorship. A related problem results from the fact that the NHIS is a sample drawn exclusively from the civilian population. Long-serving and career military personnel re-enter the civilian population at ages well above 25. It is likely that such individuals have better health, and better post-military labor market experiences, than other vets from the same birth cohorts that left military service at younger ages. We have tried to isolate a study sample in which most of those who ever serve in the military have completed that service, by limiting our analysis to those 25 and older. Nevertheless, our inability to identify those whose service ended at a later age may introduce some bias into the findings.
REFERENCES


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*Dependent variable is veteran status.*
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* p < 0.10; ** p < 0.05; *** p < 0.01.
Figure 1: Preinduction Physical Exam Rejection Rates (%), by Year

Source: 1970/71 Semiannual report of the Director of Selective Service
Figure 2: Induction Risk and Veteran Prevalence By Cohort
Figure 3: College Costs, Average Earnings, and Military Pay By Cohort
Figure 4: Unemployment Rates and College Wage Gap By Cohort

Unemployment Rate for Young Men
College Wage Gap

Birth Year +18

Figure 5: Percent Difference In Unemployment Rates By Age