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UNEQUAL RISK: COMBAT OCCUPATIONS IN THE VOLUNTEER MILITARY

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Abstract

This study evaluates the characteristics of the men who served in the volunteer military in combat occupations. It examines whether these characteristics stem from supply-side or demand-side decisions, or reflect class bias. The findings suggest that, on the supply side, men who had greater academic abilities were more likely to go to college, thereby avoiding military service and the possibility of serving in a combat occupation. On the demand side, the armed forces were more likely to exclude men with lower academic abilities but were more likely to assign such men in the military to combat occupations. Net of the impacts of these supply-side and demand-side decisions, men who served in combat occupations still differed from those who did not in terms of their family background. The impact of family background was stronger on entering the military than on being assigned to combat occupations once in the military.

Keywords

military; inequality; occupations

Much research has examined how the people who served in the U.S. military differed from those who did not (e.g., Bachman, Segal, Freedman-Doan, and O'Malley 2000) and how the men who fought and died in U.S. wars differed from those who did not (e.g., Allen, Herrmann, and Giles 1994; Wilson 1995). However, little is known about the process by which people come to be at the greatest risk of fighting and dying, the process by which they come to serve in combat occupations. Only one previous article has examined this process. It focused on the Vietnam war era and showed that servicemen with low entry test scores were more likely to serve in combat occupations than those with high test scores (Gimbel and Booth 1996).

This article evaluates the characteristics of the men who were assigned to combat occupations in the late 1970s and the early 1980s, the early years of the All-Volunteer Force (AVF). Even during peacetime, service-members who perform combat occupations suffer the greatest risks relative to other service-members and receive the fewest rewards. If a war occurs, they are the ones most likely to see combat (Gimbel and Booth 1996). In addition, previous research suggests that they learn skills that are less transferable than those learned by service-members in non-combat occupations and have lower earnings in the civilian labor market (Mangum and Ball 1987).

This article contributes to research regarding the broader subject of social stratification in two areas. Scholars in the first area have explored educational transitions. They have theoretically and methodologically distinguished equality of opportunity from equality of result within the educational system (Buis 2008; Mare 1981). The article applies this distinction to the study of the military. It extends the model of nested transitions that has been developed to study educational outcomes to the study of the nested transitions that lead people to experience different military outcomes. Scholars in the second area have examined occupational segregation, or how certain types of people come to work in particular occupations in the civilian labor market (Petersen and Morgan 1995; Reskin and Roos 1990). Despite much research regarding civilian occupations, scholars have not applied the insights of this research to the study of military occupations. The article concludes by explaining how the findings of the current research increase our understanding not just of military outcomes but also, more broadly, of the relationship between equality of opportunity and result, and of occupational segregation.

MILITARY TRANSITIONS

People experience various military outcomes, including combat, as a chain of nested outcomes. Figure 1 shows the steps that lead to these outcomes, including combat occupations, combat exposure, and wartime mortality. After they turn 18, people can choose to enlist in the armed forces, enroll in post-secondary education, get a job, or do none of these things. If they choose to enlist in the armed forces and are accepted, they are then assigned to one of more than 100 jobs, or military occupational specialties (MOSs). Some MOSs are classified as involving combat, such as combat engineering, infantry, and artillery. The armed forces technically exclude women from these occupations (Department of Defense 2004). Non-combat occupational specialties range from law enforcement and administration to electronics repair and medical assistance. Service-members may be deployed to combat zones whether they are assigned to combat or to non-combat occupations if they serve during wartime. Only the soldiers exposed to combat are at risk of wartime mortality.

This chain of nested military outcomes is similar to the outcomes in the educational system, which have been referred to as educational transitions. Scholars of education have distinguished educational destinations, or equality of result, from the paths to those destinations, or equality of opportunity (Buis 2008; Mare 1981). For example, equality of result refers to whether or not family background determines the odds of getting a college degree. By contrast, equality of opportunity refers to whether or not family background affects the odds of making each of the preceding transitions, such as graduating from high school and attending college, that lead to a college degree. While the distinction regarding equality of opportunity and result has been applied extensively to the educational system (Lucas 2001; Muller and Karle 1993), it has not yet been applied to the military.

PREVIOUS RESEARCH REGARDING MILITARY TRANSITIONS

These insights regarding educational transitions can be applied to military transitions, such as enlisting in the armed forces, being assigned to combat occupations, deploying to war zones, and experiencing combat. A large body of research has examined the first military transition, enlisting in the armed forces, and has shown that the people who enlist in the military differ from those who do not in terms of their family background. Men were more likely to enlist in the military if they grew up in families with lower socioeconomic status (Segal, Burns, Falk, Silver, and Sharda 1998). They were also more likely to do so if their parents had lower educational attainment (Bachman et al. 2000; Kleykamp 2006; Teachman, Call, and Segal 1993). More recent research has suggested that men from both the bottom

and the top of the income distribution are under-represented in the armed forces (Congressional Budget Office 2007). At the very least, these findings suggest that service-members differ from civilians in terms of their class background.

Previous research also suggests that people are more likely to enlist in the armed forces if they come from the middle of the academic achievement distribution. On the one hand, people are less likely to serve in the armed forces if they have lower cognitive test scores (Warner and Asch 2001). On the other hand, they are more likely to enter the military if they had poorer high school grades (Bachman et al. 2000; Segal et al. 1998; Teachman et al. 1993). And they are less likely to enter the military if they have college aspirations and greater abilities than they are to go to college (Kleykamp 2006; Mare and Winship 1984).

Only two articles have examined the second military transition, concluding that service-members are assigned to combat positions not on the basis of race but on the basis of aptitude. During both the Vietnam and Iraq wars, black service-members were not disproportionately likely to serve in combat positions (Congressional Budget Office 2007; Gimbel and Booth 1996). However, one article finds that the service-members were assigned to these positions on the basis of test scores. Service-men were more likely to serve in combat positions if they had lower entry test scores than if they had higher scores (Gimbel and Booth 1996). These findings suggest that service-men are more likely to serve in combat roles if they have lower academic aptitude.

Relatively more research has examined the last two military transitions and indicates that service-members may have been more likely to be exposed to or killed in combat if they came from disadvantaged backgrounds. During the Vietnam War, men from families with lower socioeconomic status were more likely than those from families with higher socioeconomic status both to serve and fight (Wilson 1995). Similarly, men who came from families in which the fathers had less education and lower status and from neighborhoods with lower median income were more likely than more privileged men to die in combat (Allen et al. 1994; Barnett, Stanley, and Shore 1992). In 2003–2006, blacks were over-represented in the armed forces but were not over-represented among the casualties (Buzzell and Preston 2007; Gifford 2005). These findings suggest that the men who see combat differ from those who do not in terms of class, though not of race.

COMBAT AND CLASS BIAS

Previous researchers examining these military transitions have been guided, in part, by efforts to test the class bias hypothesis. This hypothesis states that people are exposed to combat on the basis of their family background (Appy 1993). According to the hypothesis, men who see combat are more likely than those who do not to come from poor and working-class families. Men from wealthier and higher status families are less likely to serve and fight during wartime (e.g., Hagan 2002). Such differences in combat exposure could stem from one or a combination of two processes. First, men from families with more resources may be less likely to enter the military, which could account for the fact that they are then less likely to see combat. If this process governs selection into combat occupations, service-members should differ systematically from civilians. However, the service-members who see combat should have similar socioeconomic status to the service-members who do not. Second, men may be equally likely to enter the military at all levels of socioeconomic status. Once in the armed forces, however, service-members may be more likely to be assigned to combat occupations if they have fewer than if they have more family resources. If this process governs selection into combat occupations, service-members in such positions should differ both from civilians and from other service-members.

Most scholars describing the class bias account leave the mechanisms underlying the association between class and combat unspecified. However, class bias in combat may stem from one or both of two possible mechanisms. First, men from families with more resources have, net of skills and abilities, greater access to education and therefore human capital (Lucas 2001). They may use this human capital to get civilian rather than military jobs and thus avoid the chance of combat. Alternatively, once in the military, they may use it to enter non-combat occupations (Levy and Sasson-Levy 2008). Second, men from families with more resources have, net of skills, abilities, and human capital, greater cultural capital (Bourdieu 1984). They learn skills and values that enable them to successfully navigate bureaucracies (Kohn 1977; Lareau 2003). They may use this cultural capital to obtain civilian jobs or higher education, rather than to enter the military, and thus avoid the risk of combat. Alternatively, once in the military, they may use it to obtain non-combat positions. The preceding reasoning leads to the following predictions:

Hypothesis 1: Among all men, those from disadvantaged backgrounds should be more likely than those from advantaged backgrounds to serve in combat occupations.

Hypothesis 2: Among service-men, those from disadvantaged backgrounds should be more likely than those from advantaged backgrounds to serve in combat occupations.

SUPPLY, DEMAND, AND MILITARY OCCUPATIONS

While many researchers have evaluated class bias in military outcomes, few researchers have assessed how such outcomes may be affected by supply and demand (but see DeBoer and Brorsen 1989).¹ Sociologists and economists, however, have previously assessed the relative importance of supply and demand factors for determining how people come to work in civilian occupations (Reskin and Roos 1990; Shauman 2006). Supply factors refer to the characteristics and choices of workers. Demand factors refer to forces that are outside of workers' control, such as institutional choices, employer preferences, economic trends, and discrimination.

Apparently only one previous study has applied the concept of supply and demand to the types of people who serve in the military. It was conducted by economists and evaluated how supply and demand affected recruits in terms of their average quality, as measured by test scores (DeBoer and Brorsen 1989). The researchers assessed how supply-side factors affected troops by looking at external trends and events that affect the choices of people. They calculated, for example, the ratio of the average pay that people receive when they are in the military to the average pay that people receive in the civilian labor market. According to this view, people should choose to enlist when they would earn less as civilians than they would earn in the military. The researchers also measured demand-side factors by looking at external trends and events, but at those that affect the choices of the institution, in this case

¹In the following discussion, I loosely adapt the terminology used by economists regarding supply and demand and juxtapose the impact of measures of these concepts with the impact of measures more commonly used by sociologists to capture family background and class. Economists use the terms *supply* and *demand* to describe how prices and volume are determined in markets, including the labor market. With reference to the market for products, they refer to supply factors as those that affect producers and demand factors as those that affect consumers. With reference to the market for labor, they refer to supply factors as those that describe the suppliers of labor, the potential workers. Typical supply factors include the preferences and abilities of workers, including the wages that workers would like to earn. Similarly, economists describe demand factors in the labor market as those that apply to the consumers of labor, potential employers. They describe demand factors as referring to the number of workers that employers would like to hire and the wage that employers would like to pay. The intersection of these supply and demand preferences, or curves, determines the number of people who will work and the wages that the workers will be paid (Reynolds, Masters, and Moser 1986). In this article, I adapt this framework loosely to describe how the military labor market works, labeling as supply factors those that refer to the preferences of the suppliers of military labor, the potential recruits, and demand factors those that refer to preferences of the consumers of military labor, the armed forces. Instead of examining how these factors determine wages, however, I evaluate how these factors may determine the observed characteristics of the people who serve in the military. I also juxtapose how supply and demand factors shape these observed characteristics with how these characteristics relate to family background, particularly focusing on race and class.

the military. They measured whether the nation was at war or conducting a draft. When the nation is at war, the military will need more soldiers, and therefore the demand will be greater. When it is conducting a draft, the military will need fewer volunteer soldiers, and therefore the demand will be less. In this economic framework, all potential service-members are affected by supply and demand factors in the same way (DeBoer and Brorsen 1989).

The following analyses, however, adopt an alternative concept of supply and demand factors that has been used to examine how these factors lead the members of one group to have labor market outcomes that differ from those of the members of another group. Using this framework, scholars evaluate, for example, why women and men tend to work in different occupations (Reskin and Roos 1990). In this case, they conceive of supply factors as reflecting whether women and men have different characteristics that make them suited for different types of jobs. Women may prefer to work in office jobs, while men may prefer to work in mechanical jobs, either innately or because they are socialized to do so. These researchers describe demand-side factors as reflecting whether employers prefer to put different types of workers in different jobs. Employers may expect women workers to be better at working with people and men to be better at working with things. These researchers acknowledge that supply factors could produce the same outcomes as demand factors (Shauman 2006). On the supply-side, for example, women could prefer to enroll in the humanities disciplines in college, while men could prefer to enroll in math and sciences. Women would then earn less than men on the basis of their different educational credentials. On the demand-side, however, employers could value more technical work because it is performed by men (Reskin and Roos 1990). Men would then earn more than women on the basis of employer choices. As a consequence, research in this vein often cannot disentangle the effects of supply and demand as definitively as described above for the economic research on supply and demand in the military.

Supply Factors and Combat Occupations

Some previous scholars assess how supply factors influence military outcomes. They focus on how the characteristics of service-members are affected by people's motives. Military sociologists, for example, evaluate motives for joining the armed forces according to the Institution/Occupation model (Moskos and Wood 1988). They juxtapose an "institutional" framework, which sees military service as a calling, with an "occupational" framework, which focuses on the material benefits of service, such as transferable skills and high pay (Moskos and Wood 1988). Recent theory argues that institutional factors, or symbolic rewards, and occupational factors, or material rewards, represent overlapping continuums (Levy 2007). Similarly, recent empirical research suggests that people join the military for multiple reasons, some of which fall into institutional or symbolic categories, while others fall into occupational or material categories (Woodruff, Kelty, and Segal 2006). Some previous research also assesses people's motives for choosing particular military occupations. For example, previous research suggests that Israeli soldiers are socialized to prefer combat occupations (Levy and Sasson-Levy 2008).

Economists also implicitly emphasize how supply-side factors affect military service, drawing on human capital theory (Becker 1964). They focus on the material rewards of service, such as pay and transferable skills. Accordingly, they test the impact of the relative wages paid by the military on the odds that people will enlist. During the draft period and the early years of the AVF, the wages paid by the armed forces were not as high as the wages paid in the civilian labor market (DeBoer and Brorsen 1989). Therefore, people who had greater skills and academic achievements were deemed more likely to want to continue their education or to enter the labor market than to enlist in the military. This reasoning leads to the following hypothesis:

Hypothesis 3: Men should be less likely to enter the military and thereby to serve in combat occupations if they are in the top of the academic aptitude and educational attainment distributions.

Demand Factors and Combat Occupations

Similar to civilian labor market outcomes, military outcomes may also be determined by demand-side factors. The military screens potential incumbents for entry to the institution and to positions. The armed forces exclude applicants on the basis of both ascribed and achieved status. They have partially or wholly excluded people on the basis of race, sex, sexuality, attainment, and ability. Homosexuals are still not officially allowed to serve openly in the military (Burrelli and Dale 2005). Up until 1948, blacks played a limited role in the armed forces. During World War II, they served in segregated units and were excluded from combat (Moskos and Butler 1996). Today, women still are not technically allowed to serve in combat positions (Department of Defense 2004). Because little previous theory has examined the impact of demand-side factors on the military, the following two sections describe the expected effects of military screening at the levels of the institution and of the occupation.

Institutional Screening

For most of the twentieth century, the military theoretically rejected people at the bottom of the aptitude distribution and restricted the numbers they would accept from the bottom of the educational distribution. Since World War I, the armed forces have administered tests to determine which recruits to accept. After World War II, the tests were combined, standardized across the services, and normalized on the men serving at the end of that war. The resulting entry test is referred to as the Armed Forces Qualifying Test (AFQT) (Laurence and Ramsberger 1991). In 1980, the armed forces re-normed the AFQT on the National Longitudinal Study of Youth 1979 (NLSY), a nationally representative sample of the military age population (Kilburn, Hanser, and Klerman 1998). Thus, the AFQT percentile scores represent percentiles in the population, not just among those taking the test. The test has been included in the National Longitudinal Surveys as a measure of ability for all respondents (Belley and Lochner 2007). The armed forces use the scores from this test, along with educational attainment, to determine which applicants to accept. Since 1951, they have theoretically excluded people who score in the bottom 9 percent on the test and have restricted the number of recruits with relatively low test scores, those between the 10th and 34th percentiles, who can enter the services (Angrist 1998; Warner and Asch 2001). (As Table 1 shows, however, some men enlisted in the military despite having scores in the lowest category.) The armed forces use the scores on this test along with educational attainment to determine which recruits to accept. They accepted, for example, men with high scores even if the men had dropped out of high school (Laurence and Ramsberger 1991). These military policies suggest the following prediction:

Hypothesis 4: Men should be less likely to be admitted to the military and thereby to serve in combat occupations if they are in the bottom of the academic aptitude and educational attainment distributions.

Occupational Screening

While institutional screening should lead the people who serve in combat occupations to be less likely than civilians in their cohort to have cognitive aptitude at the bottom of the distribution, occupational screening may produce the opposite result. Due to occupational screening, the service-members serving in combat occupations should be more likely to have cognitive aptitude near the bottom of the distribution than other service-members and, possibly, than civilians.

The armed forces assign positions on the basis of military needs and on the basis of the recruits' characteristics, experiences, skills, abilities, and aspirations. At any given time, the armed forces have jobs that they have a greater or lesser need to fill. In filling these positions, they consider the types of jobs that the recruits say they want to perform in the short and long-term. They exclude women from positions that involve combat or that are in units that primarily engage in combat (Harrell, Castaneda, Schirmer, Hallmark, Kavanagh, Gershwin, and Steinberg 2007). New service-members are excluded from jobs that are only available to those with military experience (U.S. Army 2009). They are allocated to positions that are open to them because they obtained skills or qualifications before they entered the military, through education or training. They are also assigned to positions based on the scores they receive on the Armed Services Vocational Assessment Battery (ASVAB), which consists of ten specialized tests that are designed to measure skills and achievements. One of these tests, for example, assesses recruits' familiarity and experience with mechanics (United States General Accountability Office 1999).

The armed forces also classify occupations according to the cognitive skills needed, including medium-skill jobs, such as those involving mechanics, support, and administration; and high-skill jobs, such as those involving communications and intelligence. The bulk of combat occupations, those in the infantry, fall into a category labeled as requiring lower cognitive skill, which also includes occupations that involve service and supply handling (Department of Defense 2004). Thus, service-members with higher ASVAB test scores should have greater access to technical, non-combat occupations. By extension, those with lower scores should be more likely to be assigned to combat occupations, which leads to the following prediction:

Hypothesis 5: Among those in the military, men should be less likely to serve in combat occupations the higher they are in the academic aptitude and educational attainment distributions.

DATA AND METHODS

Data

To evaluate the roles of class bias and supply and demand factors in determining who serves in combat occupations, we use data from the NLSY, a nationally representative survey of 12,686 men and women who were between the ages of 14 and 22 in 1979. These data are ideal for the current purpose because they include an over-sample of people serving in the armed forces as of September 30, 1978 (Center for Human Resource Research 2004b). The NLSY dropped many of the respondents from the military over-sample after the 1984 wave of the survey. Therefore, we focus on information reported by the respondents in the 1979–1984 waves. As mentioned above, we analyze data provided by the male respondents only. Of the 6,403 men in the NLSY sample, data on all the variables used in our analyses exist for 5,569 (87 percent). We use weights for survey waves 1979–1984 and correct for clustering within families.

Part of the following analysis presents findings regarding how socioeconomic, racial, cognitive, and educational characteristics relate to the odds that men would enlist in the volunteer military. The NLSY has been used for this purpose before (Seeborg 1994). The remainder of the analysis extends these findings to look at the associations between these characteristics and the odds that service-members would serve in combat positions. The data have not previously been used for this purpose. Indeed, only one article has examined selection into combat positions (Gimbel and Booth 1996), and none have examined such selection during the volunteer military. One article does look at the racial makeup of combat

positions during the Iraq war, but it does not consider the association between serving in such positions and any characteristics other than race (Congressional Budget Office 2007).

Outcomes

The following analyses simultaneously evaluate two related outcomes. The first outcome is whether or not the respondent had served in the military by 1984. The men are categorized as having served in the military if they were part of the military over-sample or if they answered “yes” to a series of questions about military service asked every year. A total of 1,647 male respondents had served in the military by 1984, of which 1,244 provided answers to all of the analysis questions. The second outcome is whether or not the respondent served in a combat occupation. The men are classified as having served in a combat occupation if they reported serving in an MOS that fell within the “Infantry, Gun Crews, and Seamanship Specialists” category established by the 1977 Department of Defense 3-Digit Enlisted Occupational Classification System (Center for Human Resource Research 2004a). This category includes people who work in infantry, combat engineering, artillery, and other occupational specialties. A total of 365 men had served in a combat MOS by 1984, of whom 316 had complete data. Unfortunately, the NLSY does not include a measure of whether or not these men who served in a combat occupation also experienced combat.

Ideally, research examining the effects of supply and demand should assess all of the decision points leading to a particular outcome. The following analyses, for example, would include all of the people who applied to serve in the military but were rejected. In practice, researchers often look at outcomes among a population and infer the preceding choices that led to those outcomes (DeBoer and Brorsen 1989; Shauman 2006). The current analyses follow this procedure.

Predictors

Birth Year—The NLSY respondents were born between 1957 and 1964. They first became eligible to serve in the armed forces between 1975 and 1982, the early years of the AVF. Between 1975 and 1980, the number of men entering the military declined. In 1981 and 1982, that number increased again, but only slightly (U.S. Census Bureau 2008). Accordingly, the analyses include a linear measure of birth year.

Race/Ethnicity—As mentioned above, research regarding class bias has focused not just on class but also on race (Mayer and Hoult 1955; Mazur 1995). Therefore, we evaluate the possibility that people had different probabilities of serving in the armed forces and in combat occupations if they came from different racial and ethnic backgrounds. We construct two dummy variables to measure race/ethnicity: one if the respondent reported being black and the other if the respondent reported being non-black and Hispanic.

Family Background—We use two family background measures. The first measure reflects whether or not the respondent grew up in an intact family. We consider those respondents who indicated that they lived with their biological father and mother when they were 14 years old to have been raised in an intact family. Respondents who provided a different answer are coded with a 0. Intact families tend to have greater financial resources than do other types of families (McLanahan and Sandefur 1994).

The second family background measure is the average years of schooling completed by the respondents’ parents. People with higher educational attainment are more likely than those with lower attainment to earn more and work in jobs with higher status (Sewell and Hauser 1975). Scholars examining selection into military service and wartime mortality have

commonly used parental education to assess class background (Bachman et al. 2000; Kleykamp 2006; Teachman et al. 1993). If the respondent only provided information on the educational level of one parent, we use this as the measure of parental education. In some households, the NLSY surveyed more than one respondent. If information for one respondent was missing, we substitute the parental education information from a sibling who reported information on parental education and also reported the same family structure.

Neither of these two measures of family background captures class position directly. In order to test whether the results are robust if education and family structure are used rather than a more direct measure of class, models were estimated on two different sub-samples: one for which a measure of father's occupation was present and the other for which, if father's occupation was not present, mother's occupation was present. In each of these sub-samples, models were estimated with two different sets of variables, all the measures of family background and the measure of parents' education, or the measure of father's or parents' occupation (table of results available by request). In all cases, the pattern of results was the same, which suggests that the measure of parents' education is a relatively robust indicator of family background.

AFQT Score—In 1980, 94 percent of the NLSY sample took the ASVAB test. Results from this test were used to construct an unofficial AFQT score. Researchers have previously used the scores in the NLSY to norm the AFQT scores (Kilburn et al. 1998) and as a measure of intelligence for all the survey respondents (Fischer 1996; Herrnstein and Murray 1996). In the current analyses, the scores are used to measure academic aptitude. They are calculated as percentiles ranging from 0 to 100. For the current analyses, the percentiles are converted to the categories used by the military: 1 = 91–100; 2 = 65–90; 3 = 31–64; 4 = 10–30; 5 = 0–9 (Laurence and Ramsberger 1991). Because there are so few respondents in Categories 1 and 5, we combine the respondents in each of these categories with those in Categories 2 and 4, respectively. An alternative would be to treat the scores on the test as linear and to test for non-linearities in the effects of AFQT score by including a quadratic measure. The analyses tested the robustness of the effects in this way, and the results of this robustness check (available by request) are mentioned when the results are described.

Educational Attainment—The measure of education is based on the respondents' reports of the highest grade of schooling that they completed. Among service-members, the measure is based on the respondents' answers to a question asking them to report the highest grade they had completed before they entered the military. If the answer to this question is missing, the measure is based on the answers to three questions: the highest grade completed as reported each year, the date on which that education was completed, and the date the respondents entered the military. If the answer is still missing, it is based on the highest grade the respondent reported. The linear measure of educational attainment is then transformed into a categorical measure with the following categories: 0–11 = less than high school; 12 = high school; 13–15 = some college; > 15 = college graduate. Among the national population of students enrolled in post-secondary education, the proportion of students who enroll in post-secondary education at neither 2-year nor 4-year institutions is less than 2 percent (Knapp, Kelly-Reid, and Ginder 2009). This article, therefore, refers to the broader category of post-secondary education as college. Higher education is potentially endogenous to military service. Therefore, we report models with and without educational attainment. We are accordingly cautious in our causal claims about the relationship between educational attainment and military service.

Models

The model used is a sequential logistic model, based on one that is popular among scholars who study educational attainment (Lucas 2001; Mare 1980). It has also been called a continuation ratio or “Mare” model (Agresti 1990; Buis 2008). It expands on the traditional logistic regression model to take account of the sub-samples that are “at risk” of making particular transitions. For example, with regard to education, only the people who have finished high school are at risk of entering college, and only those who have entered college are at risk of attaining a college degree (Buis 2008). While the model estimates conditional logistic regressions simultaneously, these regressions could also be fitted individually (Agresti 1990). Thus, the effects of the background variables can differ across the outcomes.

This model has not previously been used to study military outcomes. However, the same logic of nested transitions applies to the process by which people are assigned to combat occupations. Only people who have entered the military are at risk of being assigned to combat occupations. In the language of the model, people who did not serve in the military were at risk of entering the military, but not of being assigned to combat occupations. People who served in the military in non-combat occupations were at risk both of entering the military and of serving in combat occupations. They accomplished the first transition but not the second. Similarly, people who served in the military in combat occupations were at risk both of entering the military and of serving in combat occupations. They completed both transitions. Figure 2 shows a schematic of the model, which is based on the processes outlined in Figure 1.

The virtue of the model in the current case is that people can only serve in combat positions if they have enlisted in the military. However, net of this assumption, the factors that affect the decisions regarding entering the military and serving in combat positions are assumed to be independent. The general model is shown in equation 1:

$$p_{ki} = \frac{\exp(\alpha_k + \lambda'_k X_i)}{1 + \exp(\alpha_k + \lambda'_k X_i)} \Big|_{pass_{ki-1}=1} \quad (1)$$

where X represents a matrix of explanatory variables, λ' represents a vector of estimated parameters linking the explanatory variables to the outcome, and α represents the constant for the outcome. $pass_{ki-1}$ indicates whether or not a person has passed the previous transition. The following analyses include two transitions ($k = 1, 2$), where 1 represents the transition into military and 2 represents the transition into a combat position. This model is estimated in Stata using the sequential logit option developed by (Buis 2007).

FINDINGS

Table 1 presents the characteristics of different groups within the sample. The left panel compares the characteristics of service-men to civilians. The right panel compares the characteristics of service-men who served in non-combat occupations to those of service-men who served in combat occupations. As shown in the left panel, the men who enlisted in the military were slightly older than men who did not; they were born, on average, a third of a year earlier. They were also more likely to be black and less likely to have grown up with both biological parents. They came from families in which the parents had, on average, a third year less of schooling. On average, they themselves had one year less of schooling than did civilians. Despite the fact that the military theoretically excluded men with the lowest entry scores, 5 percent of service-men had scores in the bottom category of the AFQT. Similarly, despite the fact that the military theoretically restricted the number of high school

dropouts they would accept, service-men were as likely as civilians to have dropped out of high school. These findings suggest that service may be related both to family background and to supply-side factors.

As shown in the right panel, service-men were more likely to serve in combat occupations than in non-combat occupations if they grew up in intact than in non-intact families. Because previous researchers have shown that intact families provide children with more privileges than do non-intact families (McLanahan and Percheski 2008), this finding provides evidence that is consistent with the view that disadvantaged men were more likely than advantaged men to serve in combat occupations. Combat service-men also were more likely to have low and less likely to have high cognitive test scores than non-combat service-men. They had fewer years of education and were more likely to have dropped out of high school. These findings suggest that men served in combat occupations due to both supply and demand factors.

Table 2 reports coefficients from sequential logistic regression models predicting military service and combat occupation. Family characteristics are more strongly associated with the earlier transition, that into military service, than they are with the later transition, that into a combat occupation. The differences between these coefficients are statistically significant according to joint and separate chi-square tests. The first model shows that the odds of entering the military were associated with the following measures of family background: race, family structure, and parental education. Black men were more likely to enter the military than were white men. Men were less likely to enter the military if they grew up in intact families than in non-intact families. They were also less likely to enlist if their parents had college degrees than if their parents had less education. By contrast, the odds of completing the later transition were associated only with family structure. Among those in the military, service-men were more likely to serve in combat occupations if they grew up in non-intact families than if they grew up in intact families. These findings suggest that serving in a combat occupation was associated with family disadvantage.

Net of family background, the odds of entering the military and of serving in a combat position are associated with AFQT scores. However, the test scores are associated with the two outcomes in different ways. As above, these differences are statistically significant. According to the model, men were less likely to enlist in the military if they had high AFQT scores than if they had median test scores. Among service-men, they were also less likely to serve in combat occupations if they had high test scores. In addition, men were less likely to enlist in the military if they had low scores than if they had median scores. However, once in the military, they were equally likely to be assigned to combat occupations. (When the analyses are calculated using the linear and quadratic terms for AFQT, rather than the categorical variable, the results are the same in all respects, except that the association of race with the odds of serving in the military becomes slightly more positive [.629 versus .488 and 1.088 versus .812], and there appears to be no association between AFQT and entering a combat occupation once in the military.) These findings suggest that, net of family background, combat service may have stemmed from the intersection of supply and demand factors.

Figure 3 presents predicted probabilities derived from the preceding model, Model 1. The predicted probabilities are derived by multiplying the probability of making the transition by the percent of the population at risk of making the transition. All men are at risk of entering the military, for example, while only those in the military are at risk of being assigned to combat occupations. For the purposes of the figure, disadvantaged men are defined as those who did not grow up with both biological parents and whose parents had, on average, just a high school diploma. Advantaged men are defined as those who did grow up with both

biological parents and whose parents had, on average, a college degree. The dashed line at the top of the figure represents the predicted probabilities that disadvantaged men who were black would enter the military. The solid line below represents the predicted probabilities that advantaged men who were white would enter the military. The remaining two lines represent the probabilities, respectively, that disadvantaged black and that advantaged white men would serve in combat occupations when compared not just to those in the military but to the population.

The figure demonstrates the importance of family background. Black men who came from disadvantaged families were nearly four times as likely as white men from advantaged families to enter the military and therefore to serve in combat occupations. Among the men with test scores in the middle of the distribution, the predicted probability that a black man from a disadvantaged family would serve in a combat occupation was equal to the probability that a white man from an advantaged family would serve in the military in any capacity. Among those with the lowest test scores, white men from advantaged families were slightly less likely to serve in the military than black men from disadvantaged families were to serve in combat occupations. These findings are consistent with the family disadvantage account.

Model 2 in Table 2 presents evidence regarding the importance of human capital for selection into military service and combat occupations. This model incorporates the categorical measure of educational attainment, which reverses the apparent association between cognitive test scores and military service at the top of the distribution. Holding education constant, men with higher scores were no less likely to enter the military than those with median scores. This finding suggests that the association between high test scores and military service was mediated by human capital. Men with high test scores were probably less likely to enter the military than men with lower scores because they were more likely to get a college degree. According to Model 1, men were less likely to enter the military if they had higher than if they had lower AFQT scores. According to Model 2, however, they were more likely to do so at each level of schooling. These findings provide further evidence consistent with demand-side screening. All else equal, the armed forces would rather enlist recruits with higher than those with lower cognitive test scores.

The marginal association between educational attainment and military service in this model is quite large, suggesting that college may have kept men from enlisting in the military and therefore from obtaining combat positions. Indeed, the model shows that, net of AFQT and family background, college graduates were much less likely to enter the military and serve in combat occupations than were high school graduates. In contrast, a college degree had little relationship with occupational assignment among men in the military. This result suggests that service-men were assigned to occupations primarily on the basis of AFQT scores rather than on the basis of educational credentials.

The model including educational attainment provides some insight into the mechanisms underlying the association between military service and both race and family structure. The effect of coming from an intact family becomes smaller, though still negative, when education is included in the model. This finding suggests that the association between military service and family structure may be partially mediated by educational attainment. Men from intact families were more likely than those from non-intact families to attain higher education and correspondingly less likely to enter the military. The race association, by contrast, becomes larger. This finding suggests that, net of AFQT, at all levels of education, blacks were more likely than whites to enter the military, which is consistent with previous research suggesting that whites negatively select but that blacks positively select into the military (Teachman et al. 1993). It suggests that higher ability working-class black

men may have different outcomes from both higher ability whites and from other working-class blacks.

The analyses next evaluate whether and how the associations between the military outcomes and the independent variables differ by race in three steps. In the first step, four sets of models were separately estimated by race. (A table presenting coefficients from these models is available by request.) In the second step, models were estimated using data from the full sample and including interactions between race and the independent variables, except for birth year, which was not significantly different when models were estimated separately by race, in order to test for racial differences formally. These models suggest that most of the independent variables, except for family structure, interact with race based on comparing the models' Wald statistics. (A table with the Wald statistics for the different models is available by request.) In the third step, the coefficients from the models with significant differences in the Wald statistics were examined more closely. In the models with the interactions between race and parents' education or AFQT scores, the estimates of the main effects are similar to the model without interactions. The estimates of the interaction terms are, for the most part, insignificant. (A table containing estimates from these models is also available by request.) Based on these results, the interaction that is most informative suggests that blacks and whites experience different associations between military outcomes and educational attainment. The findings suggest that the military was more likely to exclude high school dropouts if they were black than if they were white. They also suggest that having more education provided black service-men, though not white service-men, with the option to avoid serving in combat positions.

Figure 4 is derived from the model with the interaction between race and education. The figure presents predicted probabilities that are derived for the same groups and represented as described above for Figure 3. In this figure, panel A contains predicted probabilities by AFQT score and family background for high school graduates, while panel B contains those predicted probabilities for men who attained more education than a high school degree. The contrast between panel A and panel B demonstrates the importance of human capital. More educated men had extremely low predicted probabilities both of serving in the armed forces and of being assigned to combat occupations, suggesting that attending more than high school gives men options that make military service and therefore combat service unlikely.

Among high school graduates, family background continues to be strongly associated with military service and combat occupations. White men from advantaged families were much less likely to enter the military than were black men from disadvantaged families. The association between family background and combat MOS is somewhat smaller. Disadvantaged black men were more likely than advantaged white men to be assigned to combat occupations regardless of their AFQT scores. This association predominately stems from family structure, as neither race nor parental education significantly affects combat assignment among service-men. Net of measured cognitive achievement and human capital, more privileged men may have unmeasured cultural capital that enables them to navigate the military bureaucracy.

CONCLUSION

The preceding analyses show that men come to serve in combat positions as a result of supply and demand factors but also at least partly as a result of family background. They confirm the importance of demand factors that have led the volunteer era armed forces to select people with higher ability. They also confirm the importance of supply factors, which suggest that, among service-members, people with less education and cognitive ability are more likely to be assigned to combat positions. Net of these supply and demand factors,

however, men were still less likely to enlist and were less likely to serve in combat occupations as a consequence of both race and class.

Only one previous article has looked at how both personal characteristics and race affect selection into combat positions. The current analysis differs from that previous article in two respects. First, the previous article used data provided only by veterans (Gimbel and Booth 1996), whereas the current article uses data from a sample of the entire population. Thus, the current article provides insight into the cumulative nature of the processes by which the members of particular groups end up first serving in the armed forces and then serving in combat occupations. To draw on the analogy of educational attainment, the strategy of the first article is akin to examining the factors that determine who graduates from college among the people who enter college. The strategy of the current article is akin to evaluating the preceding question but also evaluating the factors that determine who enters college among the broader population.

Second, the previous research focused on the Vietnam war era (Gimbel and Booth 1996), while the current analysis has focused on the years shortly after that war, the early years of the all-volunteer period. In the previous research, the veterans were more likely than the veterans examined in the current analyses to experience combat because they served during wartime. They also served during the draft era, which means, in theory, that they were less likely to differ systematically from the general population. Indeed, during the peacetime draft era, men who served in the armed forces grew up in families that had similar characteristics to those of the men who did not (MacLean 2008).

Despite the different samples and eras, the current analysis reaches similar conclusions to the previous article regarding the effects on combat assignment of race and cognitive test scores. In wartime and peacetime, and volunteer and draft militaries, service-men were assigned to combat occupations on the basis of their AFQT scores (Gimbel and Booth 1996). Most likely service-men with higher cognitive test scores were offered higher skill, non-combat occupations, leaving those with lower scores to serve in lower skill, combat occupations. To be sure, some combat occupations require skill. However, in general, the armed forces consider higher skill occupations to be ones that do not involve combat (Department of Defense 2004). The previous article and the current research both also show that, once in the military, race did not affect combat assignment (Gimbel and Booth 1996). Among service-men, blacks were as likely to be assigned to combat occupations as were whites.

The findings from the current article, however, differ from the findings of the previous article in two respects. First, they suggest that serving in a combat occupation was associated with family background. During the peacetime volunteer period, the men who entered the military and thus were at risk of serving in combat occupations differed from those who did not in terms of their family background, as measured by race, family structure, and parental education. The previous article did not evaluate the relationship between combat service and family characteristics other than race (Gimbel and Booth 1996). Second, the analyses show that part of the impact of test scores on serving in a combat occupation was mediated by educational attainment. Men with higher test scores were more likely to go on to college, less likely to enter the military, and therefore less likely to serve in combat occupations. Educational selection into the military may also have been important during the draft era, when men could avoid the draft by attending college (Flynn 1993). Indeed, one article shows that Vietnam veterans were less likely to have a college degree than the general population (Mazur 1995). The previous article could not explore this relationship because the data did not include respondents who did not enlist in the armed forces (Gimbel and Booth 1996).

The current research reaches similar conclusions regarding the importance of family background in combat occupations as does other research examining combat exposure. Previous research has suggested that the men who fought and died during the Korean and Vietnam wars came from families and neighborhoods with fewer advantages (Allen et al. 1994; Barnett et al. 1992). In contrast to this previous research, the current analyses also include measures of personal characteristics that could mediate the association between military outcomes and family background. These characteristics, particularly cognitive test scores, strongly affected who enlisted in the military and who served in combat occupations. They did not, however, explain the impact of family background characteristics completely.

More generally, the findings contribute to the literature regarding social stratification, particularly with respect to transitions made early in the adult life course. They show that military transitions partially resemble educational transitions. Similar to the educational transitions research (Mare 1980), the current analyses shed light on the relationship between equality of opportunity and of result. They simultaneously assess the impact of social background on the odds of accomplishing multiple outcomes. The educational transitions research focuses on the distribution of social rewards. It is concerned with the characteristics of the people who attain particular levels of education (Lucas 2001; Muller and Karle 1993). The current research on military transitions focuses on the distribution of social risks. It is concerned with the characteristics of the people who may fight in wartime. In both cases, the analyses show that socioeconomic background affects earlier transitions more strongly than it does later transitions. The unequal results, whether educational or military, stem from unequal opportunities to make or avoid earlier transitions.

Scholars have explained the pattern of a diminishing association between social background and educational attainment by developing two competing theoretical accounts. First, some scholars have argued that this pattern reflects maximally maintained inequality. This theory suggests, in part, that social background effects are strongest at the earliest transitions that are not universal (Lucas 2001; Raftery and Hout 1993). Based on the similar pattern with respect to military outcomes, the theory may apply not just to rewards but also to risks. The data used in the current article are derived from a period in which entering the military was far from universal. Thus, the relative strength of the association between family background and military service is consistent with the theory. Second, other scholars have suggested that the diminishing relationship between social background and educational transitions is consistent with an explanation derived from the life course perspective (Lucas 2001). This theoretical perspective, in part, emphasizes the importance of timing and of linked lives (Elder and Johnson 2002). Consistent with this view, people make earlier transitions, such as enrolling in college, when they are economically and socially closer to their families. They make later transitions, such as graduating from college, when they are farther from their families. The findings regarding military transitions are also consistent with this view. The current analyses cannot adjudicate between these two theories because they do not include enough historical variation. This theoretical contrast represents a promising avenue for future research.

In addition, the preceding analyses shed light on the relative importance of supply and demand for determining occupational segregation. Some previous research on the segregation of civilian occupations has suggested that such segregation stems primarily from actions taken at the organizational level (Petersen and Morgan 1995). The preceding analyses lead to a similar conclusion. They show that the segregation of military occupations stems primarily from the fact that particular types of people, defined by race, family structure, and parental education, are more likely than others to serve in the military. They also show that both supply and demand factors affect who goes into the military, but only demand factors affect who is assigned to particular occupations.

Future research should examine the extent to which service-men in combat positions are more likely than service-men and women in non-combat positions to see combat. This research could evaluate the risks that not just service-men but also service-women face, which would have increased relevance today because women are more likely to serve in the contemporary military and to be exposed to combat than they were in the past. In the late 1970s and early 1980s, when the NLSY was first fielded, women constituted 10 percent of the armed forces. Today, they constitute 15 percent (Segal and Segal 2004). In 1994, the Department of Defense opened some previously closed military occupations and units to women, while still technically excluding women from combat positions and from combat units (Harrell et al. 2007). As a consequence, service-women appear to face more of the dangers of war today than they have in the past (Alvarez 2009). Future research would ideally examine data that include measures of both military occupations and combat exposure among both men and women.

The preceding analyses also potentially shed light on the question of unequal risk in the wars in Iraq and Afghanistan because they include not just service-members on active duty but also those in the reserves. In the current wars, the troops are composed of a mixture of service-members who volunteered for active duty and service-members who volunteered to serve in the reserves and National Guard. Over the last 8 years, the armed forces have deployed to war zones more than 1.7 million service-members (Tanielian and Jaycox 2008). They have also placed on active duty more than 700,000 service-members who were in the reserves and National Guard (Department of Defense 2009). Approximately 24 percent of the service-members in the NLSY had not served on active duty by 1984. The current analyses therefore evaluate military service and combat occupations among a mixture of service-men who were and were not on active duty and may shed light on the selection processes in the current wars in which many service-members in the reserves have been deployed.

The analyses suggest that people differ systematically from each other in the odds that they will fight and die during wartime. They show that people serve in combat positions as a consequence of the ways that supply and demand preferences intersect. On the demand side, the armed forces want recruits with higher test scores and are more likely to put those people into non-combat positions. On the supply side, people with higher test scores have potentially more desirable options than enlisting in the military. Yet net of these competing supply and demand preferences, men with fewer pre-service advantages, as captured by race, parental education, and family structure, are still more likely than those with more advantages to serve in the military and, therefore, in combat occupations.

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FIGURE 1.
Paths Leading to Military Service, Combat Position, and Other Outcomes

FIGURE 2.
Stylized Model of Military Service and Combat Position

FIGURE 3.
Predicted Probability of Service and combat MOS

FIGURE 4.
Predicted Probability of Service and Combat MOS

TABLE 1

Means, Standard Deviations, and Proportions, by Military Status

Variable	Non-Military	Military	Non-Combat	Combat
Birth year	1960.53 (2.15)	1960.28* (2.93)	1960.26 (2.89)	1960.33 (3.04)
Black	0.12 (0.31)	0.19*** (0.50)	0.18 (0.49)	0.21 (0.53)
Hispanic	0.06 (0.22)	0.05 (0.29)	0.05 (0.27)	0.07 (0.33)
Average parents' years of education	11.78 (2.81)	11.48** (3.32)	11.59 (3.27)	11.16 (3.45)
Intact family growing up	0.78 (0.39)	0.67*** (0.60)	0.70 (0.58)	0.59* (0.64)
AFQT categories (percentiles) [†]				
1 (91–100)	0.09	0.07	0.08	0.03
2 (65–90)	0.28	0.24	0.27	0.14
3 (35–64)	0.30	0.41	0.40	0.44
4 (10–34)	0.21	0.23	0.20	0.30
5 (1–9)	0.12	0.05	0.04	0.08
Years of education	12.61 (2.06)	11.52*** (1.83)	11.61 (1.77)	11.24** (1.97)
High school dropout	0.21 (0.39)	0.21 (0.52)	0.18 (0.49)	0.31** (0.60)
Unweighted observations	4,324	1,244	928	316

Source: National Longitudinal Study of Youth, 1979–1984.

Note: Statistics are weighted. Standard deviations in parentheses.

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$;

[†] chi-squares for these tables are both statistically significant at $p < .001$.

TABLE 2

Sequential Logit Coefficients from Models Predicting Military Service and Combat MOS

	Model 1		Model 2	
	Military	Combat	Military	Combat
Birth year (started at 1957)	-0.054 [*] [0.021]	-0.040 [0.044]	-0.063 ^{***} [0.022]	-0.024 [0.044]
Black	0.488 ^{***} [0.116]	-0.285 [0.228]	0.682 ^{***} [0.125]	-0.162 [0.232]
Hispanic	-0.063 [0.142]	0.093 [0.274]	0.076 [0.145]	0.134 [0.273]
Intact family at 14	-0.505 ^{***} [0.107]	-0.447 [*] [0.213]	-0.458 ^{***} [0.112]	-0.401 [*] [0.213]
Parents' average education (ref: high school grad)				
< High school	0.051 [0.121]	-0.030 [0.239]	-0.001 [0.126]	-0.051 [0.241]
Some college	0.015 [0.141]	0.282 [0.300]	0.283 [*] [0.148]	0.277 [0.295]
College grad	-0.645 ^{**} [0.225]	-0.525 [0.540]	-0.137 [0.234]	-0.462 [0.526]
AFQT category (ref: category 3)				
Categories 1 & 2	-0.414 ^{***} [0.118]	-0.855 ^{**} [0.276]	0.098 [0.125]	-0.885 ^{***} [0.276]
Categories 4 & 5	-0.699 ^{***} [0.123]	0.395 [0.224]	-0.836 ^{***} [0.131]	0.271 [0.227]
Respondent's education (ref: high school grad)				
< High school			-0.161 [0.127]	0.426 [*] [0.227]
Some college			-1.482 ^{***} [0.158]	-0.454 [0.424]
College grad			-1.938 ^{***} [0.275]	0.805 [0.719]
Constant	-1.000 ^{***} [0.144]	-0.580 [0.301]	-0.780 ^{***} [0.151]	-0.745 ^{**} [0.325]
Observations	5,569		5,569	

Source: National Longitudinal Study of Youth, 1979–1984.

Note: Robust standard errors in brackets.

*
 $p < 0.05$;**
 $p < 0.01$;***
 $p < 0.001$.