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THESIS

**SOCIOECONOMIC STATUS AND PERFORMANCE
IN THE US NAVY AND US AIR FORCE**

by

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March 1998

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FOREWORD

This thesis is part of a research project conducted at the Naval Postgraduate School (NPS) in 1997-1998. The project--"Study of Socioeconomic Status and Personnel Performance in the Military"--was supported by the Office of the Secretary of Defense and undertaken by a team of researcher that included Dr. Mark J. Eitelberg, Dr. Michael D. Cook, Captain Kevin M. Schmiegel, USMC, Captain Stefan J. Booth, USMC, and the authors of this thesis. The background work, literature review, database development, and statistical analyses for the NPS study were thus accomplished as a team effort. For ease of exposition, team members decided to prepare two separate master's theses: one that focused on the Navy and Air Force; and another that looked exclusively at the Army and Marine Corps. It should be noted that, because of the nature of the research project and combined contributions of team members, both theses draw heavily from the same background information and general findings. Consequently, major portions of this thesis are duplicated in the other work: Kevin M. Schiemgel and Stefan J. Booth, *Socioeconomic Status and Performance in the US Army and US Marine Corps*, Master's Thesis, Naval Postgraduate School, Monterey, California, March 1998. Additionally, selected results of the two theses will be incorporated in a separate study by Eitelberg and Cook, scheduled for publication as an NPS technical report in 1998.

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IN THE US NAVY AND US AIR FORCE**

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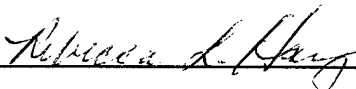
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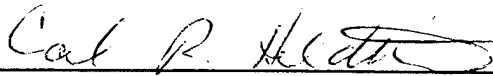
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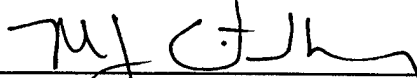


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ABSTRACT

Policy makers concerned about population representation in America's armed forces have frequently referred to the "unfair burden" of military service borne by young people from lower socioeconomic backgrounds. The purpose of this study was to examine the socioeconomic status (SES) of recruits in the Navy and Air Force and to analyze the relationship between a recruit's SES background and his or her performance in the military over time. Data for this study were obtained from three sources: the Department of Defense Survey of Recruit Socioeconomic Backgrounds (SES survey), Military Entrance Processing Command enlisted cohort files, and personnel data files provided by the Navy and Air Force. After merging these data files, the SES survey respondents were tracked longitudinally, and several analyses were undertaken to assess the relationship between SES and performance in the military. The results of this research show that recruits in both services come from slightly lower SES backgrounds than do youths in the general population; and, most of this difference can be explained by the fact that sailors and airmen are consistently underrepresented in the highest measures or correlates of SES and overrepresented in the lowest ones. Additionally, it was found that, while SES is not a strong predictor of first-term enlisted attrition in either service, it does explain differences in recruits' performance on-the-job in the Air Force. Further research is recommended, especially that which incorporates supervisors' ratings of military performance.

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LIST OF ACRONYMS

AFQT	Armed Forces Qualification Test
AFPC	Air Force Personnel Center
AFSC	Air Force Specialty Codes
AVF	All-Volunteer Force
BMTC	Basic Military Training Center
BUPERS	Bureau of Naval Personnel
CPS	Current Population Survey
DMDC	Defense Manpower Data Center
DoD	Department of Defense
EPR	Enlisted Performance Report
ISC	Interservice Separation Codes
Logit	Logistic regression analysis
MLE	Maximum Likelihood Estimation
MEPCOM	Military Entrance Processing Command
MSEI	Male Socioeconomic Index
NPS	Non-prior service
OLS	Ordinary Least Squares
OSD	Office of the Secretary of Defense
POPREP	Population Representation in the Military Services
SAS	Statistical Analysis System
SEI	Socioeconomic Index
SES	Socioeconomic Status
SES Survey	Department of Defense Survey of Recruit Socioeconomic Backgrounds
SSN	Social Security Number
TSEI	Total Socioeconomic Index
USA	United States Army
USAF	United States Air Force
USMC	United States Marine Corps
USN	United States Navy
WAPS	Weighted Airman Promotion Score

E-1 through E-3 are junior enlistees

E-4 through E-6 are mid-grade enlistees

E-7 through E-9 are senior enlistees

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I. INTRODUCTION

"We have in the service the scum of the earth as common soldiers," observed Lord Wellesley, Duke of Wellington, in 1813. Similar descriptions have been used to characterize U. S. enlisted forces both before and after the All-Volunteer Force (AVF) was introduced in 1973. During its first two centuries of existence, America, like most other nations, depended heavily on the poor, uneducated, and underprivileged to serve as enlistees. The soldiers of America's first army were considered, by most U. S. officers, to be the "dregs of all the countries" from "the same class of men who composed the common soldiers of Europe."¹

In the 18th and 19th centuries, the burdensome life of the rank-and-file was typically endured by America's less valued citizens; and virtually anyone willing to withstand the hardships of service life was accepted for duty. While the sons of poor farmers, laborers, and immigrants were forced to join out of economic necessity, others who were bright or skilled enough to find civilian employment typically ignored the call to serve as enlistees. In times of peace, no one seemed to question the harsh conditions of military service. The issue of socioeconomic representation in the military, however, received significantly more attention during times of war, when men of poor backgrounds were drafted and died on the battlefield in larger proportions than the more privileged or occupationally skilled.

Throughout America's history, its wellborn sons have found ways to "dodge" the country's draft laws, which often provided them with the necessary escapes and

¹ From Mark J. Eitelberg, *Manpower for Military Occupations* (Washington, DC: Office of the Assistant Secretary of Defense [Force Management and Personnel], 1988), p. 4.

exclusions to forge ahead with their education and careers. During the Revolutionary and Civil Wars, for example, compulsory service was often avoided by the "rich," who could hire "poor" substitutes to fight on their behalf. The draft system implemented during World War I was designed to shelter the educated and skilled as it categorized and conscripted Americans according to their "value to society." And statistics from the battlefields of Vietnam further supported arguments that America's lower social classes were overrepresented in times of war.

Policy makers concerned about the disproportionate use of recruits from lower socioeconomic backgrounds to man U. S. forces have frequently referred to the "unfair burden" of military service borne by these citizens. When the post-World War II draft officially ended in 1973, concerns about the social composition of the force not only continued, but intensified. In addition to several studies that evaluated the socioeconomic status (SES) of recruits in the post-draft military, the Department of Defense (DoD) has paid particular attention to the demographic composition of its service members. Continuing interest in identifying the SES of military recruits, and tracking changes in SES representation, led to development of the DoD Survey of Recruit Socioeconomic Backgrounds (commonly referred to as the "SES survey") in March of 1989. The general results of the survey have been presented since 1991 in DoD's annual report on *Population Representation in the Military Services* (POPREP).

Another area of particular interest to military manpower officials involves the possible relationship between a recruit's SES background and his or her performance in the military. For example, differences in SES may help to explain the high rates of attrition among first-term enlisted personnel as well as several performance measures that

determine promotion in each of the services. In light of these interests, a special database was created by the authors of this study. The SES survey results were linked with historical data files for each cohort of new recruits entering the Navy (USN) and Air Force (USAF) during fiscal years 1989 through 1995, making it possible to track the composition of enlisted forces and the service careers of persons who participated in the survey.

The purpose of this thesis is twofold: to examine the SES background characteristics of recruits in the USN and USAF in comparison with the general population; and, to analyze the relationship between a recruit's SES background and his or her performance in the military over time. This study follows several steps to accomplish these objectives. In Chapter II, the authors provide a detailed background and historical perspective of socioeconomic representation in the armed forces. The background discussion also includes a review of several studies that are related to the topics of SES and performance in the military. Chapter III explains how the database was created for this study as well as the methodology used to determine the relationship between SES and performance in the USN and USAF. The results of the cross tabulation analysis and linear and logit multivariate models are provided in Chapter IV. And, finally, in Chapter V, the authors draw several conclusions based on these results and offer recommendations for future research using this study's database.

II. BACKGROUND

A. INTRODUCTION

In the military's ongoing efforts to recruit and retain the "right kinds of people," manpower policy makers have struggled not only to regulate the quantity and quality of new soldiers, sailors, airmen, and Marines but to monitor the background characteristics of enlisted forces.² Although socioeconomic representation in the military received significant attention with the introduction of the AVF in 1973, imbalances in the social composition of U. S. forces have existed since our colonial fathers "stood up" an army at Concord in 1775. A review of the history of conscription and volunteerism in the United States reveals striking similarities between the socioeconomic composition of the force under the draft and the AVF.³ Similarly, military manpower policies in both eras have been shelved, altered, and implemented based on considerations for socioeconomic representation.

One of the more persistent concerns about the AVF has been its presumed inability to attract a representative cross section of the American population and the related issue of social equity or "fairness."⁴ Representativeness in the armed forces has been pursued for several reasons. Critics of the AVF argued that a "professional" army would not only create gaps between the military and the rest of society, but that military

² Sue E. Berryman, "Images and Realities: The Social Composition of Nineteenth and Twentieth Century Enlisted Forces," in D. R. Segal and H. W. Sinaiko, eds., *Life in the Rank and File* (McLean, VA: Pergamon Brassey's International Defense Publishers, 1986), p. 10.

³ Richard V. L. Cooper, *Military Manpower and the All-Volunteer Force* (Santa Monica, CA: RAND Corporation, 1977), p. 206.

⁴ Martin Binkin, *America's Volunteer Military: Progress and Prospects* (Washington, DC: The Brookings Institution, 1984), p. 20.

effectiveness would suffer as a result of the AVF's failure to recruit youth from middle-to upper-class backgrounds. Yet, the estimated effects of the AVF on military isolationism and readiness were highly subjective and difficult to measure. Several politicians, therefore, relied on the issue of "fairness" to discredit the concept of volunteerism.

History--two hundred years of the disproportionate and inequitable treatment of our less fortunate citizens--fueled arguments against the AVF. With statistics from past wars, government officials possessed the historical data that they needed to voice their positions. In the 1980s, social equity served as the platform for senators and representatives who called the AVF a "glaring civil wrong," and echoed concerns, first expressed during the Civil War, with the familiar words: "it is the poor of the country whose blood is shed."⁵ Social composition became a debate about the "benefits" and "burdens" of military service borne by the lower classes during times of peace and war, respectively.

The definition of who constitutes the "right" young recruit has changed in concert with the growing technological demands of the military. Nevertheless, the basic need for good manpower and concerns about the demographic composition of our fighting forces have remained constant over time and will continue throughout the unforeseeable future.⁶ Recent controversy over possible subgroup differences in the performance of military-specific tasks has focused attention on the possibility that performance differences may be attributed to SES, not simply to membership in a specific demographic category. When choosing the "right" force, policy makers must carefully balance issues of social

⁵ Senator Ernest F Hollings and Representative Paul Simon, quoted in Binkin, *America's Volunteer Military: Progress and Prospects*, pp. 20-21.

⁶ Eitelberg, *Manpower for Military Occupations*, p. 3.

representation and concerns for inequity with differences in individual and unit performance and the ability of each service to accomplish its assigned mission.

Historically, and most likely in response to recurring concerns about social equity, manpower analysts have used SES to compare the composition of enlisted forces with the rest of American society. Yet, the effect of SES on military performance has never been explicitly measured. If history repeats itself, we can expect that concerns about "social representation" will resurface in debates about the AVF--ultimately affecting the policies used when choosing the "right" people.⁷ The question is: In assessing what is "right" in the future, should manpower policy makers consider the relationship between SES and performance or strictly concentrate on mirroring a broad cross-section of American society to achieve fairness or representativeness?

B. LITERATURE REVIEW

A review of the literature that addresses socioeconomic status in the military reveals some noteworthy trends. Although several authors cite the term "socioeconomic status" in their studies, "there is no general consensus regarding how to define and measure this construct."⁸ Conversely, most authors agree that a detailed historical perspective is necessary to support a systematic analysis and conclusions about social representation in the military before and after creation of the AVF. Several authors--including Cooper (1977), Fredland and Little (1982), and Fernandez (1989)--have found that differences between the social composition of the enlisted force and the general

⁷ From Berryman in *Life in the Rank and File*, p. 10.

⁸ Department of Defense, *Population Representation in the Military Services, Fiscal Year 1995* (Washington, DC: Office of the Assistant Secretary of Defense [Force Management and Personnel], 1996), p. 7-2.

population are relatively modest and have changed little since the inception of the AVF. No studies, however, could be found that examined the effect of SES on performance in the military.

Previous literature provides several significant "lessons learned" regarding the study of SES in the military. Although SES is generally defined as an indicator of economic and social position,⁹ the definition used in this study largely depends on the measures and background characteristics contained in the SES survey. Second, a study of SES in the military requires an understanding of its history before and after DoD implemented the AVF. Third, the composition of enlisted accessions under both the draft and volunteer systems resembles the population as a whole with a slightly lower average SES value due to underrepresentation of the top quartile of SES among military members.¹⁰ Finally, by examining the effects of SES on performance in the military's sea and air forces, this study explores an aspect of military manpower policy not previously mentioned in debates about social composition and the AVF.

1. Defining Socioeconomic Status

Within the general populace, socioeconomic status is most commonly referred to and understood as social class. SES is typically used as a "shorthand expression for variables such as education, occupation, income, employment status, family background, and tangible possessions that characterize an individual's capacity to create or consume

⁹ Cathy A. Stawarski and David Boesel, *Representation in the Military: Socioeconomic Status* (Alexandria, VA: Human Resources Research Organization, 1988), p. 8.

¹⁰ See *Population Representation in the Military Services*, FY 1991-1995.

goods that are valued in our society.”¹¹ Research suggests that occupation best explains socioeconomic position and that additional variables, such as education and income, can significantly increase explained variance in social class. Although education, occupation, and income are consistently used to assess SES, most studies define and measure this construct differently because of the “convenience and availability” of certain measures that may explain unique dimensions of SES and represent the construct more completely.¹²

One way of measuring SES is the socioeconomic index (SEI), devised by Stevens and Cho in their 1985 study, *Socioeconomic Indices and the New 1980 Census Occupational Classification Scheme*, which attempts to quantify socioeconomic status based on parental occupation alone. Stevens and Cho devised a summary statistic for SES in their 1985 study using predicted prestige scores based on levels of annual income and education within occupations.¹³ Their study utilized the work of Duncan (1961), who attempted to estimate socioeconomic scores in an effort to counteract the lack of prestige scores for most occupational titles.¹⁴ Duncan estimated SEI scores by regressing prestige scores from a 1947 study on age-standardized occupational levels of earnings and education for a limited set of occupations obtained from 1950 census data. He then

¹¹ Robert M. Hauser and John R. Warren, *Socioeconomic Indexes for Occupations: A Review, Update and Critique* (Madison WI: Center for Demography and Ecology, June 1996), p. 3.

¹² Department of Defense, *Population Representation in the Military Services, FY 1995*, p. 7-3.

¹³ Gillian Stevens and Joo Hyun Cho, “Socioeconomic Indices and the New 1980 Census Occupational Classification Scheme,” *Social Science Research*, 14 (1985), pp. 142-168.

¹⁴ Otis Dudley Duncan, *A Socioeconomic Index for All Occupations*, in A. J. Reiss, Jr., eds., *Occupations and Social Status* (New York, NY: Free Press, 1981), pp. 139-161.

applied the weights for earnings and education levels to all other occupations to obtain predicted prestige scores.

While Stevens and Cho found that SEI scores for 1980 occupational titles appeared to describe socioeconomic distances between occupations in a manner consistent with Duncan's findings,¹⁵ the more recent work of Hauser and Warren (1996) argues that prestige-validated socioeconomic indices are of limited value, because they give too much weight to occupational earnings. Differences in definitions of variables, functional form, and treatment of outliers result in significant changes in SEI in their study. Hauser and Warren found that levels of occupational education alone, as opposed to weighted combinations of educational levels and earnings, better defined the main dimension of occupational persistence across and within generations and provided a more useful estimation procedure to index occupations.¹⁶ Despite their differences, the development of an SEI in all three studies provides future researchers with important frameworks to better measure occupation, the best single indicator of SES.

2. Historical Perspective

Socioeconomic status of enlisted accessions in the military became a controversial social and political issue with the introduction of the AVF in 1973. Although a primary goal of the AVF was to correct the injustices of conscription borne by the lower classes of American society, opponents of the volunteer system often referred to issues of social misrepresentation when arguing against the removal of the draft. Fears that the poor and blacks would bear an "unfair" burden in the nation's defense--and that a volunteer

¹⁵ See Stevens and Cho, pp. 167-168.

¹⁶ See Hauser and Warren, pp. 2, 68-69.

military would distance itself from the rest of society as an "employer of last resort"--were unfounded in light of the draft's sordid history and its consistent failure to represent the general population.¹⁷

Before we determine whether or not social class can be linked to differences in military performance, we should first consider the make-up of our enlisted forces in a larger historical context. As history and traditions continue to serve both proponents and opponents of an all-volunteer military, we should examine the background characteristics of the common soldier in armed forces that have enjoyed success under systems of nationwide conscription and varying degrees of volunteerism.

a. *The Colonial Era*

With the birth of the "citizen militia" in 1775, the upper class relinquished the noble privilege of military service, and the right and obligation of citizen participation in armies became the future standard of American military tradition. Although every able-bodied man was considered part of the colonies' "defense establishment" prior to the War of Independence, consolidation into a continental army became necessary with the Revolution.¹⁸ The harsh conditions and hardships associated with service life did not attract the well-educated, skilled, or those with a propensity to marry and raise children; the enlisted men of the colonial era were poor--penniless drifters with no property or family ties and "a bad reputation

¹⁷ Cooper, p. 204.

¹⁸ Ibid., p. 47.

with the general public.”¹⁹ The colonial forces of the Revolutionary War filled its rank and file with men who possessed the minimum requirements of an “able body.” A continental army with no concerns for the morale and welfare of its troops was forced to accept almost any man who could walk, talk, see, and hear, and would continue to do so for the next 50 years under conditions of military service that could be characterized as “criminally negligent.”²⁰

Implementation of a standing Federal army following the Revolution received some consideration, but never materialized. State militias continued to provide the necessary military manpower through the end of the 18th century and American expansionist efforts in the War of 1812. Consistent with opposition to a federal system of conscription and the infeasibility of a career enlisted force, no great effort was made to improve the burdensome life of enlistees. Enlisted volunteers in times of peace before the Civil War “comprised a rather sorry lot, recruited from the dregs of American society and the scum of the population of the older states.”²¹ Individuals with the skills and talents to earn a competitive wage as laborers and mechanics avoided peacetime military service, leaving those “infected with some moral infirmity” to pursue the menial, uninspiring existence of a recruit.²²

¹⁹ Joseph Warren, “The Dangers of Standing Armies,” *The Military in America*, pp. 21-44, as cited in Eitelberg, *Manpower for Military Occupations*, p. 4.

²⁰ Hayes, *Evolution of Armed Forces Enlisted Personnel Management Policies: Executive Summary*, p. 61 as cited in Eitelberg, *Manpower for Military Occupations*, p. 4.

²¹ Prucha (1953) as quoted in Sue E. Berryman, *Who Serves? The Persistent Myth of the Underclass Army* (Boulder, CO: Westview Press, 1988), p. 21.

²² *Ibid.*, p. 22.

b. The Civil War

Negative images of the “dregs” and “scum” who endured the “physically arduous, dirty and thankless job” of military service are part of the history and tradition of the American military during both eras of volunteerism and the draft. Less fortunate citizens would bear an unfair burden of the hardships of enlisted service life under both systems, because individuals from higher social classes chose to ignore voluntary service, joined the officer corps, or purchased substitutes to avoid conscription. While volunteerism resulted in “economic conscription” of the poor and underprivileged, draft laws typically provided escapes and exclusions for the more privileged, educated, and occupationally skilled, as evidenced in the country’s first draft laws, which effectively shackled society’s lower classes.

Under systems of conscription implemented in the South and North during the Civil War, the burden of war was disproportionately borne by individuals who had not “enjoyed a fair share of society’s benefits.”²³ For example, the Union’s Enrollment Act of 1863 allowed the rich to pay others to serve for them, or, worse yet, pay the government \$300 to buy a substitute on their behalf. “Rich man’s money, poor man’s blood” became a popular complaint of the masses as the Civil War dragged on, and the battlefields were no longer stained with the blood of “men who had given up good situations to enlist.” From the Revolution to the Civil War, the poor and unskilled endured “starvation, rags, dirt and vermin,” and ultimately gave their lives in alarmingly unfair proportions. Meanwhile, wellborn citizens, protected by their roles and status in

²³ Martin Binkin, *Who Will Fight the Next War? The Changing Face of the American Military* (Washington, DC: The Brookings Institution, 1993), p. 61.

society, were able to elude military service in the enlisted forces using their socioeconomic advantage.²⁴

c. The World Wars

Little changed with the draft system established during the First World War, as the government classified all male registrants according to their "value" to the civilian sector. Conscription became the basis for all enlisted accessions in 1917, and the working class again shouldered an unrepresentative portion of the warfighting effort.²⁵ Registrants were ranked and inducted according to their value to society, generally measured by income, educational attainment, skill level, and marital/family status, leading to an over-representation of the poor and black on the battlefield. One in eight draftees was black at this time, and one in six was an immigrant. Individuals deemed most valuable to the civilian sector were categorized as Class V, while the least-valued individuals were drafted first as Class I registrants. It is no wonder that the average World War I draftee was an uneducated, unmarried man in his early twenties who was more likely to be illiterate, unskilled, and poorer than the average man of the same age in the civilian sector.²⁶

The military draft would be used to fill the ranks of the U. S. Army for the next three episodes of war from 1940 to 1973. Except for an 18-month lapse just after World War II, conscription was necessary to enforce foreign policy and ensure preparedness. Although American society had accepted the obligation of its citizens to

²⁴ This paragraph contains several excerpts from Eitelberg, *Manpower for Military Occupations*, p. 7.

²⁵ Cooper, p. 51.

²⁶ Berryman in *Life and the Rank and File*, p. 21.

serve as World War II came to an end, opposition to the draft would continue to reappear over the next three decades. During the world's largest war, 16 million Americans served in the armed forces, and escapes and exclusions for the skilled and educated became the exception rather than the rule. In fact, a study of SES and educational attainment of veterans and non-veterans from World War II to 1973 found that veterans prior to Vietnam came from families with higher SES backgrounds than non-veterans. However, the data may have represented upwardly biased estimates of the characteristics of U. S. enlisted forces in World War II and the Korean War, because officers were included as veterans.²⁷ In the wake of massive mobilization and the "fair" representation of enlisted forces during the Second World War, policy makers began to reexamine the usefulness of conscription. Proponents of volunteerism raised issues of preparedness and questioned the cost-saving methods of "standing up an Army for the next war."²⁸

Draft systems imposed on the American population from the Revolution through the First World War heavily overrepresented the poor. Higher classes of men either benefited from draft boards, which inducted "less-valued" citizens, or they avoided service by pulling strings and hiring substitutes. Although discrimination was less overt with the introduction of peacetime conscription following World War II, the rich could still find ways to avoid service if they had the will to pursue self-serving goals. College deferments and draft-exempt jobs resulted in a system of conscription that continued to

²⁷ Berryman, *Who Serves? The Persistent Myth of the Underclass Army*, p. 39.

²⁸ Cooper, p. 49.

exploit the poor, as less fortunate citizens were called upon to serve in disproportionately large numbers and were paid far less than the market-clearing wage.²⁹

d. The Vietnam Era

Debates about the social representativeness of the military resurfaced during the 1950s and 1960s, as classes of people were “channeled” in opposite directions by a Selective Service System that acted as a human resource planner, creating excuses and escape routes for the wealthy.³⁰ As the Vietnam conflict began to resemble “wars” of the past, reports from Southeast Asia showed a disproportionate number of young men from relatively poor backgrounds dying on the battlefield. Early casualty reports from the Vietnam War showed that African-Americans accounted for 20 percent of Army combat deaths from 1961 to 1966.³¹ These reports prompted civil rights leaders to criticize the nation and its military for unjustly using disadvantaged minorities as “cannon fodder.”

Concerns about possible racial and social class connections with the draft prompted the establishment of the National Advisory Commission on Selective Service. In its February 1967 report, the commission emphasized social equity and argued that various racial, social, and economic groups should be represented in the military in times of peace and war in rough proportion to their percentage in the general population.³² At about the same time, the Johnson Administration was introducing “Project 100,000,” a

²⁹ Ibid., p. 205.

³⁰ Martin Binkin and Mark J. Eitelberg, *Blacks and the Military* (Washington, DC: The Brookings Institution, 1982), p. 76.

³¹ Ibid.

³² Binkin, *Who Will Fight the Next War? The Changing Face of the American Military*, p. 69.

program specifically designed to lower aptitude standards for draftees and voluntary enlistees. Project 100,000 opened the doors of military service even wider to America's lower classes and helped to bring social representation to the forefront as a sensitive political issue.

When Richard Nixon first proposed ending the draft during the 1968 presidential campaign, opponents and proponents of an all-volunteer force had already established their arguments and chosen sides. The deaths of tens of thousands of young American men sparked the debate about conscription among scholars and legislators, and claims that most servicemen came from relatively poor backgrounds added fuel to the fire.³³ Experts from both sides argued about the consequences of removing the draft and offered alternatives to shift the unfair burden borne by the lower classes. While advocates of volunteerism argued that no system of military conscription could ever be considered "fair" and promoted the AVF as a remedy for the injustices of conscription borne by the poor and blacks, supporters of the draft system examined ways to change existing draft laws to better represent the general population. Opponents of the AVF warned against "economic conscription," arguing that removal of the draft would force the nation's poor to enlist in the military--selected by the "invisible hand of their own poverty."³⁴

³³ See, for example, Lawrence M. Baskir and William A. Strauss, *Chance and Circumstance: The Draft, The War, and The Vietnam Generation* (New York, NY: Random House, Inc., 1978) and Gilbert Badillo and David Curry, "Social Incidence of Vietnam Casualties," *Armed Forces & Society*, Vol. 2, May 1976, p. 397.

³⁴ Eitelberg, *Manpower for Military Occupations*, pp. 7-8.

e. *All-Volunteer Force: 1973 to the 21st Century*

Arguments against ending the draft were reviewed by the President's Commission on an All-Volunteer Armed Force soon after Richard Nixon's election in 1968. When addressing the issue of socioeconomic representation and related concerns for fairness, the President's Commission asserted that the AVF would not differ significantly from a force composed of volunteers and conscripts. The Commission emphasized the consistent use of enlistment criteria to answer claims that only the lowest economic classes would be attracted to the AVF. According to the Commission, "maintenance of current mental, physical, and moral standards for enlistment will ensure that a better paid, volunteer force will not recruit an undue proportion of youths from lower socioeconomic backgrounds."³⁵

Similar concerns about the social composition of U. S. enlisted forces intensified in the 1970s and 1980s and continued to surface as the nation approached the 21st century. Images of America's founding fathers and the quality of the common Revolutionary soldier spring to mind in the words of a *Washington Post* article entitled "Draft," written in 1981: "the very poor, the ill-educated, the hapless, the hopeless and, by some accounts, the incompetent, are paid to do the defending the rest of us are loath to do."³⁶ Similarly, the inequities of the draft systems imposed during the Civil War and World War I resound in a 1988 report by the Democratic Leadership Council, which warns that "we cannot ask the poor and under-privileged alone to defend us while our

³⁵ The President's Commission on an All-Volunteer Force, *The Report of the President's Commission on an All-Volunteer Force*, p. 16.

³⁶ Quoted in Eitelberg, *Manpower for Military Occupations*, p. 8.

more fortunate sons and daughters take a free ride, forging ahead with their education and careers.”³⁷

As history repeats itself, and manpower policy makers, congressional committees, and government agencies wrestle with the task of selecting the “right” force in today’s technologically-advanced world, particular attention will be paid to social representation. When the draft officially ended in 1973, critics anticipated the dangerous consequences of a system that recruited primarily from the underclass. Fears that the military would become a substitute for the nation’s welfare system and visions of a mercenary force motivated by pay prompted scathing objections to the AVF, particularly among members of Congress who had been opposed to Nixon’s initiative. While government officials voiced opposition to a program that failed to equitably represent society, analysts and political commentators predicted the creation of a serious cleavage between the military and the rest of society under the AVF.³⁸ At congressional urging, DoD began to carefully monitor the military’s ability to represent a broad cross-section of American society. DoD was also instructed by Congress to prepare an annual report that would track the demographic characteristics of recruits. At the same time, social and behavioral scientists began to study the implications of changes in population representation within the military.

³⁷ Democratic Leadership Council, *Citizenship and National Service: A Blueprint for Civic Enterprise* (Washington, DC, May 1988), p. 25.

³⁸ Morris Janowitz, "The All-Volunteer Military as a 'Sociopolitical' Problem," *Social Problems*, February 1975, pp. 432-449.

3. Measuring Socioeconomic Status

Prior to 1977, many of the assertions about the social “representativeness” of the military were based on “gut” feelings, “war stories,” and emotions rather than on systematic analyses of data. Qualitative analyses often emerged during debates over the composition of the enlisted forces. The 1991 edition of DoD’s POPREP cites three systematic analyses of the socioeconomic composition of accessions prior to the development of the SES survey in 1989. All three studies found relatively modest differences between large samples of military and civilian populations. Military members, however, tended to come from backgrounds that were somewhat lower in SES than the civilian average.³⁹

a. Prior Studies

The first systematic attempt to evaluate socioeconomic representation in the post-draft military is Cooper’s 1977 study.⁴⁰ Cooper developed a proxy for socioeconomic background by identifying the postal ZIP codes of recruits and calculating the per capita income for each ZIP code, average family income, average educational attainment and mental aptitude, racial/ethnic composition, and other census measures. Cooper found that “there had been very little overall change in the macro distribution of enlisted accessions since the beginning of the all-volunteer force.”⁴¹ The use of mean income by ZIP code became the primary method for estimating SES representation in the military for the next 13 years.

³⁹ Department of Defense, *Population Representation in the Military Services, FY 1991*, pp. 44-45.

⁴⁰ Cooper, *Military Manpower and the All-Volunteer Force*, 1977.

⁴¹ *Ibid.*, p. 223.

In 1982, Fredland and Little used data from the National Longitudinal Survey of Youth Labor Force Behavior in a study of the socioeconomic characteristics of military personnel.⁴² Fredland and Little focused on differences between military and civilian samples (18-22 years old) based on socioeconomic backgrounds, quality as measured by education, training, health, and educational aspirations. The sample populations were also examined according to race/ethnicity, branch of service, and, for the civilian group, expression of interest in military service. The work by Fredland and Little differs from that of Cooper in terms of methodology and the treatment of demographic groups. Nevertheless, both studies were consistent in finding only minor differences between the social composition of the enlisted force and that of the general population.⁴³

A 1989 study by Fernandez used the ZIP code approach previously employed by Cooper. Fernandez analyzed more recent data on military recruits but arrived at a similar conclusion: "The socioeconomic characteristics of recruits' home areas are broadly similar to those of the general youth population, although recruits tend to come from areas with somewhat lower family incomes and education levels."⁴⁴ Due to limitations on information in personnel data files, Fernandez (like Cooper) assumed that a proxy for socioeconomic background could be developed by analyzing the distribution of recruits according to income levels in their home areas.

⁴² J. Eric Fredland and Roger D. Little, *Socioeconomic Characteristics of the All-Volunteer Force: Evidence from the National Longitudinal Survey (1979)* (Annapolis, MD: U. S. Naval Academy, 1982).

⁴³ *Ibid.*, pp. 2-3.

⁴⁴ Richard L. Fernandez, *Social Representation in the U. S. Military* (Washington, DC: Congressional Budget Office, October 1989).

Each of the three studies summarized above--that of Cooper, Fredland and Little, and Fernandez--provides useful information for demographic, advertising, and marketing analyses. These studies are not as reliable, however, when comparing socioeconomic representation in the military with that of the general population.⁴⁵ For example, in Fredland and Little, several important SES variables--such as family income and SEI--are not included, and military sample sizes are exceptionally small.⁴⁶ While the direction of the bias is not clear, variances of the estimates tend to be inflated in cases of small sample size. Additionally, the authors use only five broad categories to define parental occupation. Therefore, estimates of the socioeconomic differences between military and civilian populations may not be as accurate as estimates from studies that examine a wide range of occupational categories--such as DoD's annual POPREP.

There are also several problems in using postal ZIP codes to evaluate SES representation in the military. Cooper asserts that "differences in the socioeconomic characteristics of individuals residing in any given ZIP code (intra-ZIP code variations) are relatively minor" when compared with inter-ZIP code variations; yet, many of his findings may be biased due to the treatment of individuals as aggregates. Applying community characteristics to estimate individual SES backgrounds could result in attenuation, a "smoothing" or "blending" effect, in which parameter estimates tend to be

⁴⁵ Department of Defense, *Population Representation in the Military Services FY 1995*, p. 7-3.

⁴⁶ In their analysis of SES background characteristics, Fredland and Little report sample sizes of 33, 82, and 122 for Hispanics, blacks, and whites, respectively.

biased toward zero.⁴⁷ This problem is exacerbated by the methodology used by Cooper. At the time of the study, nine digit ZIP codes were unavailable, and the analysis only uses the first few digits of the ZIP code--rather than the entire five-digit code--thus amplifying the problem of aggregation.

Several anecdotal examples are particularly useful when explaining this type of bias: A young lawyer with a lifelong subscription to *Harvard Law Review* can take a wrong turn outside of his high-rise studio apartment in Los Angeles and bump into a street-wise teenager whose only membership in life is to a local gang. A difference of one city block in Manhattan can equate to differences of millions of dollars in income and several degrees of educational attainment. And, expensive homes often share the same ZIP codes with those on the "other side of the tracks" in many urban, suburban, and rural areas throughout America. Thus, the use of mean or community SES characteristics may not always capture the "true" SES backgrounds of individuals.

In addition to these problems of attenuation, military applicants and recruits may not actually come from the background indicated by the ZIP code for their current address. Studies using ZIP codes do not account for individuals who may be raised in a specific area but move to a different location before their time of enlistment--a practice that may be significant among individuals coming from lower socioeconomic backgrounds who typically rent or have never owned a home. Data in the Cooper and Fernandez studies include ZIP codes for the recruit's latest address and may not

⁴⁷ William H. Greene, *Econometric Analysis* (New York, NY: Macmillan Publishing Co., 1990, pp. 294-297.

necessarily reflect the “true” background characteristics of an individual who spent most of his or her life at a different address.

b. The SES Survey

Limitations in the data on the socioeconomic backgrounds of military recruits and continuing interest in SES representation in the military prompted DoD to initiate a survey of recruits’ socioeconomic backgrounds. The SES survey was first administered by the Defense Manpower Data Center (DMDC) in March 1989. The objective was to collect individually-identifiable family background information from new recruits on a continuing basis, and then match the survey data with DoD personnel files to track the socioeconomic composition of active-duty enlisted personnel. Results from the SES survey have been reported in the annual DoD POPREP report since 1990; but analyses have, thus far, been limited to cross-sectional data on the marital status of parents, education of parents, home ownership status of parents, employment status of parents, occupational category of parents, and SEI scores (based on education, income, and prestige ratings of parents’ occupations computed from responses to the survey and data from the Current Population Survey [CPS], conducted by the Bureau of the Census for the Bureau of Labor Statistics).⁴⁸ The present study attempts to extend these analyses by tracking recruits over time and examining whether SES levels are in any way connected with individual performance in the military.

4. Measuring Performance in the Military

Several studies have attempted to measure individual performance in the military. This is a difficult task for a number of reasons. First, past studies tend to define

⁴⁸ See *Population Representation in the Military Services*, FY 1991-1995.

performance as well as its independent variables differently. For instance, in 1984, Marcus and Quester used supervisors' evaluations to indicate future performance or net productivity.⁴⁹ In 1992, Cooke and Quester defined "successful" service in terms of an individual recruit's status at the end of his/her first term of enlistment.⁵⁰ Scribner et al. compared the effects of Armed Forces Qualification Test (AFQT) scores on actual tank-crew firing scores in 1986.⁵¹ And, a year later, Horne examined the relationship between scores on the AFQT and the Army Skills Qualifications Test (SQT).⁵² Second, measures of performance tend to vary across services. Personnel in the Army, Navy, Marine Corps, and Air Force are promoted for different reasons, based on criteria that typically differ by service. Variations in measures, weighting methods, and promotion rates both within and between services compound the problems encountered when measuring performance in "the military."

a. Cooke and Quester

In their 1992 study entitled, "What Characterizes Successful Enlistees in the All-Volunteer Force: A Study of Male Recruits in the U. S. Navy," Cooke and Quester examine the relationship between recruit background characteristics for men enlisting in the U. S. Navy and three successful outcomes--completion of initial obligated

⁴⁹ Alan J. Marcus and Aline O. Quester, *Determinants of Labor Productivity in the Military* (Alexandria, VA: Center for Naval Analysis, 1984).

⁵⁰ Timothy W. Cooke and Aline O. Quester, "What Characterizes Successful Enlistees in the All-Volunteer Force: A Study of Male Recruits in the U. S. Navy," *Social Science Quarterly*, Vol. 73, No. 2, June 1992, pp. 239-251.

⁵¹ Barry L. Scribner, D. Alton Smith, Robert H. Baldwin, and Robert L. Phillips, "Are Smart Tankers Better? AFQT and Military Productivity," *Armed Forces & Society*, Vol. 12, No. 2, Winter 1986, pp. 193-205.

⁵² David K. Horne, "The Impact of Soldier Quality on Army Performance," *Armed Forces & Society*, Vol. 13, 1987, pp. 443-456.

service, completion of first term of enlistment at the rank of petty officer (E-4), and retention beyond the initial enlistment contract. The authors hypothesize that attrition behavior is strongly associated with recruit characteristics observed at the time of enlistment and appearing on personnel records established at the time; and, that characteristics associated with contract completion are also generally predictive of promotion and retention. Cooke and Quester found that regular high school diploma graduates, persons with higher test scores, black or Hispanic recruits, and recruits who enter the Navy through the Delayed Entry Program are most likely to have successful outcomes. The study by Cooke and Quester demonstrates that adaptivity to military life is a strong indicator of successful job match.⁵³

b. *Marcus and Quester*

In their study, *Determinants of Labor Productivity in the Military*, Marcus and Quester provide useful models when examining the relationship between SES and performance in the military. Marcus and Quester provide a useful approach to account for the systematic biases that arise from the inherent subjectivity of supervisor's evaluations and differences in "location" and "scale" between supervisors.⁵⁴ Subjectivity bias, or the fact that evaluations reflect individual tastes, performance standards, and perceptions of the performance of others, is not a significant problem when the assignment of individuals to supervisors is random and the sample size is large. Systematic biases caused by differences in location (a supervisor's rating of average performance) and scale (the supervisor's perception of differences between the best and worst performers) are

⁵³ Cooke and Quester, p. 239.

⁵⁴ Marcus and Quester, pp. 9-11.

accounted for by controlling for (weighting) differences between supervisors in the regression equations.

Subjective supervisors' evaluations are currently utilized by all four services as proxies for performance. For example, the "recommendations" of immediate supervisors are major determinants in the promotion process for personnel in paygrades E-4 through E-9 in the USN and USAF. Time-in-service and training performance are the primary determinants used for promotion of personnel in paygrades E-1 through E-3. Evaluations have been important indicators of performance in the military for many years. Although evaluations are subjective, and biases exist, they are a good single source of performance measure because of the variety of quantitative and qualitative information contained in the score.

5. Performance in the USN and USAF

The present study focuses on the effect of SES on performance in the USN and USAF; therefore, an examination of differences in performance measures between the USN and the USAF is also useful. Since this study examines cohorts with up to seven years of service, particular attention is paid to first-term attrition and promotion procedures for personnel in the ranks of E-1 through E-5. While both services base promotion for junior enlisted personnel--E-1 through E-3--on time-in-grade, time-in-service, and supervisor recommendations, some differences exist between the two services regarding promotion procedures for noncommissioned officers.

The USN uses a final multiple score for promotion to the ranks of E-4 through E-6, based on, but not limited to, standard advancement examination scores, awards,

performance factor evaluations, length of service, and service in paygrade. Table 2.1 illustrates how the USN computes an individual's final multiple score. The relative weights applied to standard advancement examination scores, awards, performance factor evaluations, length of service, and service in paygrade indicate their significance as determinants of performance. Approximately two-thirds of the USN enlistee final multiple score is accounted for by a person's standard advancement examination score, and a supervisor's evaluation of performance, which alone determines almost one-third of the total score. Once sailors are eligible for promotion to E-7, their promotion is exclusively determined by the standard advancement score and evaluation of performance, and they go before a promotion board for advancement. Promotion to the senior enlisted ranks is determined--almost entirely--by subjective supervisors' evaluations called "fitness reports."

Table 2.1. Computation of USN Final Multiple Score

Promotion Factor	E-4/E-5 Maximum Points/Percent	E-6 Maximum Points/Percent	E-7 Maximum Points/Percent
Standard Score	80 / 35	80 / 30	80 / 60
Performance Factor	70 / 30	92 / 35	52 / 40
Length of Service	30 / 13	34 / 13	--
Service in Paygrade	30 / 13	34 / 13	--
Awards	10 / 4.5	12 / 4.5	--
PNA*	10 / 4.5	12 / 4.5	--
Max Final Multiple Score	230 / 100	264 / 100	132 / 100

*PNA refers to promotion points awarded to enlistees who pass the advancement examination but were not promoted due to quota limitations.

Source: Bureau of Naval Personnel Instruction 1430.16D.

The USAF uses a compilation of performance factors to determine promotion for all of its ranks. The USAF's Weighted Airman Promotion Score (WAPS) uses factors

similar to that of the USN. Table 2.2 provides a breakdown of the USAF's promotion WAPS system.

**Table 2.2. USAF Weighted Airman Promotion Score (WAPS)
Distribution for Advancement**

Performance Measure	Maximum Points	Minimum Percentage of WAPS
Skills Classification Test	100	21.5
Promotion Fitness Exam	100	21.5
Time in Service	40	9.0
Time in Grade	60	13.0
Military Decorations	25	5.0
Enlisted Performance Record (EPR)	135	30.0

Source: AFPAM 36-2241, Vol. 1, 1 July 1997.

Unlike the USN, the USAF includes a weighted Enlisted Performance Report (EPR) as a major determinant of promotion. The weighted EPR score theoretically ranges in value from 0 through 135 and represents nearly one-third of the WAPS. The EPR is time-weighted, based on a maximum of the last five years of service, not to exceed ten reports.⁵⁵ The time-weighted factor begins with 50 for the most recent report and decreases in increments of five (50-45-40-35-etc....) for each report on file. The product is then multiplied by an EPR factor of 27. This step is repeated for each report. After calculating each report, the value of each report is summed to achieve the total weighted EPR.

The USAF--like the USN--also uses centralized boards for its senior enlisted ranks. E-7s and above are selected for promotion by an assigned board, which carefully examines the following performance factors in the selection process: scope and variety of

⁵⁵ AFPAM 36-2241 Vol. 1, 1 July 1997 p. 91

assignments; estimate of potential as reflected on evaluations; trends in efficiency, length of service and maturity; awards; military and civilian education; moral standards, integrity, and character; and general physical condition.

Differences in advancement criteria, occupational specialties, and the timing of promotions between services make it important to control for type of service in models that estimate the relationship between SES and performance. Although the USN and USAF use similar measures to gauge individual effectiveness, inherent differences in testing procedures and promotion philosophies exist between the two services. Problems that arise from these differences are exacerbated by variations in weighting methods across services as well as differences in advancement rates for Air Force Specialty Codes (AFSCs) or enlisted ratings common to both services.

Advancement rates typically differ within and between services as a result of fluctuations in the promotion "cutoff" scores established by the USN and USAF, respectively. These scores are determined by the needs or strength constraints for each AFSC/rating in both services and frequently change due to "ebbs" and "flows" in the manpower planning process. Additionally, shortages and overages are common in a number of AFSCs/ratings in which first-term attrition is difficult to predict. Although use of timing to promotion would be an ideal measure of performance to compare across services, differences in advancement rates due to changing manpower constraints would be difficult to control. Within-service comparisons may also be limited by variations in promotion "cutoff" scores between AFSCs/ratings and periodic adjustments to individual cutting scores made by each service to meet ever-changing personnel requirements.