Waivered recruits: An evaluation of their performance and attrition risk

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Photo credit line: Company C recruits conquer Basilone's Challenge, one of the last obstacles they must overcome before calling themselves U.S. Marines. Photographer's Name: Pfc. Michael Ito
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14. ABSTRACT

OSD-Accession Policy asked us to identify ways in which the Services can minimize the risk of misconduct separation and early attrition among waivered recruits. If the Services can identify recruit characteristics associated with these negative outcomes, they can use them as an additional screen. We obtained Service FY99-FY08 waiver and personnel information from the Defense Manpower Data Center (DMDC). We first characterized the demographic and military characteristics of waivered recruits. Next, we examined whether accession-related characteristics (such as ship month) or other personal characteristics (such as Tier 1 status) are associated with lower risk of misconduct separation or early attrition for waivered recruits. Performance measures included 6-, 24-, and 48-month attrition, as well as the likelihood of being a fast promoter to E5. For the Navy and the Marine Corps, we analyzed some additional performance indicators. Overall, we found that waivered recruits are not inherently risky and often perform better than Tier II/III recruits. There are, however, still ways in which the Services could minimize the "riskiness" of the waivered population. For example, some waiver combinations are more likely to lead to early attrition; additional screening or mentoring of these recruits could potentially decrease their attrition risk.

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Contents

Executive summary

In this report, we examine the characteristics, performance, and attrition risk of waivered recruits in each of the Services and compare them with their nonwaivered counterparts. Our goal is to first identify what, if any, risks the accession of waivered recruits creates for the Services and then identify ways to mitigate these risks. The Services have historically relied on enlistment waivers to increase the size of their potential applicant pool because there are deserving people with a desire to serve who have made mistakes or do not meet *all* of the standard qualifications.

The current recruiting climate is good—unemployment rates are high and overall propensity to serve appears to be rising—causing some to question the need and rationale for waivers. The Department of Defense (DoD), however, believes that waivers should continue to be a part of the recruiting and accession processes; DoD's concern is to minimize the risks taken by the Services in doing so. In this light, OSD-Accession Policy asked CNA to evaluate whether the Services' current use of enlistment waivers leads to recruitment of quality personnel and whether, once accessed, waivered recruits impose any additional risks to the Services.

Our comparison of the demographic characteristics of recruits reveals that waivered recruits, in *all* Services, are more likely than their nonwaivered counterparts to be male, older, and Tier II (i.e., holders of nontraditional high school degrees). The waivered population also has a greater proportion of whites (thus, a smaller proportion of minorities) and is more likely to be married. When comparing the military characteristics at accession of these two populations, we find that waivered recruits, on average, spend less time in the delayed entry program than their nonwaivered counterparts (highly correlated with the fact that waivered recruits tend to be direct ships) and, with the exception of the U.S. Air Force (USAF), tend to access at lower paygrades. Finally, we find that waivered recruits are more likely

to come from the East North Central region and less likely to come from the Pacific and Mid-Atlantic regions than their nonwaivered counterparts. These geographic differences likely highlight the variation in recruiting difficulties that exist in different areas of the United States. We use these demographic and geographic differences between waivered and nonwaivered recruits in each of the Services to inform our analysis of attrition and military performance.

Our comprehensive analysis of the attrition risk of waivered recruits reveals that, in most cases, waivered recruits attrite at lower rates than Tier II/III recruits, suggesting that they are, in fact, not the riskiest accessions. We identify *which* waivered groups have the highest inherent attrition risk, after controlling for a variety of demographic and military characteristics. These findings tell us which waivered groups, in each Service, have higher risk based on behavioral and unobservable characteristics—characteristics that the Services have little power to influence. For each Service, we choose a few waivered groups in which there is potential to screen on observable characteristics, and we identify ways in which the Services could reduce attrition within these populations. All of these findings are highly Service-specific and vary depending on whether the aim is to reduce 6-, 24-, or 48-month attrition.

Finally, we evaluate the performance of waivered recruits relative to nonwaivered recruits. Using time to E5 promotion as our principal metric, we compare the prevalence of "fast" promoters in a select number of occupational specialties for each of the Services, and then compare this with the nonwaivered population. When separating the populations by waiver type, those without waivers are *in no cases* among the Services' top performers, as measured by time to E5 promotion. This reveals that many waivered recruits become high-quality Servicemembers and, therefore, may not be the Services' greatest accession "risks."

Overall, we find that waivered recruits are not *inherently* risky and are often better performers, with lower attrition risk, than Tier II/III recruits. There are, however, still ways in which the Services could minimize the "riskiness" of the waivered population. For example, each Service has a number of waiver combinations that are most likely

to lead to early attrition; additional screening or mentoring of these recruits could potentially decrease their attrition risk.

Our analyses have allowed us to identify, within each Service, the types of waivered recruits that impose the greatest *risk*, although these findings depend on how the Services choose to define such risk. Thus, moving forward, each Service must identify its objectives, expectations, and most appropriate risk measures before determining how best to manage its waivered recruits.

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Introduction

Background

Each year, the Services require thousands of new recruits to support the military's capabilities and long-term force health. The Services' primary recruiting pool consists of 17- to 24-year-olds from a cross section of society. The ideal recruit would be physically and mentally fit, would meet height and weight standards, and would have no history of serious legal problems or family issues. But the Services waive some of these criteria because, among these youth, there are some who warrant the opportunity to serve. Roughly one in four young Americans is too overweight to serve, and another third have other health problems that keep them from qualifying for service, such as diabetes, asthma, or hearing impairments [1]. About 25 percent of young adults lack a high school diploma or do not score high enough on the Armed Services Vocational Aptitude Battery (ASVAB) to qualify for enlistment. Roughly 10 percent of young Americans have had legal problems, such as a felony or serious misdemeanor offenses. Others are ineligible for medical reasons or because they are single custodial parents.

All told, it is estimated that only a quarter of American 17- to 24-year-olds meet military qualification standards [1]. This figure, however, masks considerable variation by Service, gender, and ethnicity. Taking into consideration education, test score, weight, dependents, drug, and legal qualification standards, one study estimates that less than 15 percent of black men could meet USAF standards, but 32 percent could meet USMC standards; the corresponding numbers for white men would be 31 percent for the Air Force and 46 percent for the Marine Corps, respectively [2].

To compensate for the small percentage of recruits who meet all entry criteria, the Services allow some portion to enter with marks on their record that would otherwise disqualify them for service. Making

these exceptions requires an enlistment waiver.[1] For example, Services can waive their usual requirements in such areas as physical fitness (e.g., weight waiver), family status (e.g., a dependent waiver), or legal matters (e.g., having a misdemeanor or felony waiver). Over the years, each Service has developed and maintained its own waiver categories and standards. The Services have adjusted the categories and their definitions over time in response to recruiting conditions and policy decisions.

The selective use of waivers helps the Services to meet their recruiting missions and, it is hoped, allows them to recruit deserving young Americans who will make good military personnel. Past research has shown that in some cases waivered recruits do as well as, or better than, those who enter without waivers [3, 4]. Using waivers saves the Services money by enlarging the supply of those potentially eligible for service, but it costs the Services when waivered recruits attrite and don't fulfill their service obligations. Reference [5], for example, estimated that the annual cost of first-term non-end-of-active-service (non-EAS) attrition in the Marine Corps exceeded $100 million in 1993.

This study

OSD-Accession Policy asked CNA to investigate whether there are ways that the Services can minimize the risk of early attrition associated with waivered recruits. This study comes at a time of high unemployment and a rising propensity to serve in the military, making it the first time in 35 years when all the Services have been able to meet their recruiting missions [6]. During this good recruiting climate, policy-makers are asking whether the considerable resources that DoD allocates to recruiting and retention programs are really necessary. Annual funding for these programs more than doubled from 2004 to 2008, increasing from $3.4 billion to $7.7 billion [7].

1. Others refer to these as moral or moral conduct waivers. We use the terms *waivers* or *enlistment waivers* throughout this document.

If there are categories of waivered recruits that perform as well as nonwaivered recruits, selective waiver use could compensate for potential budget cuts in recruiting and retention programs. Furthermore, even in today's environment, there are a few specialties that still face shortages of available, qualified Servicemembers to fill them (e.g., ones that require high technical aptitude or specialized language skills). In addition, the Services cannot expect current recruiting success to continue when the economic situation improves. As a result, OSD would like answers to such long-term questions as the following:

- In each Service, are there accession-related characteristics associated with lower risk of early attrition for those accessed with enlistment waivers?
- Could changes in the way that recruits with waivers are accessed in each Service reduce the risk of early attrition?
- Are there other personal characteristics, such as high Armed Forces Qualification Test (AFQT) scores or Tier I status, that are associated with lower risk of early attrition for recruits accessed with enlistment waivers?
- Could changes in accession policies reduce the risk of early attrition?

In the past, the Services have had fairly heterogeneous waiver criteria. These differences have historically made it difficult to make cross-Service comparisons of the behavior of those accessed with any particular type of enlistment waiver. DoD, however, has required that the Services standardize the reporting of enlistment waivers to OSD. Under the Directive Type Memorandum (DTM), which took effect in 2008, the four major categories of waivers are conduct, dependent, drug, and medical waivers [8].

This study involves two major tasks, each of which we address in this research memorandum (inclusive of both waiver and no-waiver data before the 2008 DTM). Within each Service:

1. We compare the performance of recruits accessed with and without waivers.

2. We examine whether the presence of certain accession/personal characteristics can predict success for those with enlistment waivers (e.g., does being a Tier I recruit compensate for having a misdemeanor conviction?).

Throughout this report, we compare our findings relevant to the waivered population with those relevant to Tier II/III recruits. We make these comparisons in an effort to illustrate that, although public perception is often that waivered recruits are among the poorest performers and are the most likely to attrite, Tier II/III recruits are in fact a "riskier" population.

In this study, we conduct only *intra*-Service analysis. That is, we evaluate the attrition risk and performance of waivered recruits as compared with their nonwaivered counterparts within each Service, but we do not make cross-Service comparisons. This is because, before FY09, each Service had its own criteria regarding the behaviors and characteristics that would necessitate a waiver. In the Marine Corps, for example, any recruit who admits to one-time marijuana use requires a drug waiver. This is not true in any of the other Services. As a result, the percentage of USMC accessions with drug waivers is much higher than in the other Services. Simply comparing the populations with drug waivers in the Marine Corps and the Navy, for example, would lead to inaccurate conclusions. In other cases, the Services were using different waiver codes to represent the same waiver *type*, increasing the possibility for data misinterpretation.

In the next section, we review the existing literature in this area and highlight our contributions. Then, we discuss the data sources used in our analysis. The remaining sections focus on characterizing waivered recruits (and how they differ from their nonwaivered counterparts), analyzing their attrition behavior (and how this differs by waiver *type*), and comparing their likelihood to be fast promoters to the rank of E5 with that of nonwaivered recruits. Finally, we provide policy recommendations and conclusions.

Existing literature

Over the last 20 years, enlistment waivers have been the subject of many studies, newspaper pieces, and journal articles. This section provides a high-level overview of these works as they relate to three issues: (1) differences in the Services' waiver regulations, (2) number of waivers granted by Service, and (3) performance of waivered recruits. The purpose of this overview is to help inform our analyses of data on the performance of waivered and nonwaivered recruits for FY99 to FY08.

Differences in Services' waiver regulations

As mentioned earlier, each Service historically had its own enlistment waiver standards, which made it difficult to compare the waivered populations across Services and time. A 1999 Government Accountability Office (GAO) study summarizes some of the explicit differences across the Services' waiver policies (see table 1) [9].

According to the GAO, as table 1 shows, for each offense, there was at least one Service that used criteria different from the others. The Navy (USN) and Air Force (USAF) allowed felony waivers for recruits having more than one felony, whereas the Army (USA) and Marine Corps (USMC) did not. But the Army and Marine Corps were different from each other, too. The Army, for example, required a waiver for two or more serious (not minor) offenses, whereas the Marine Corps required a waiver for even one such offense. In short, no two Services had exactly the same regulations regarding enlistment waivers. This suggests that our initial analyses, which include data only from those years *before* the implementation of the DTM, must focus on comparing waiver types *within* each Service, rather than *across* Services.

Table 1. Number of offenses requiring an enlistment waiver, by Service[a]

Offense	USA	USN	USMC	USAF
Felony	1; no waiver allowed for more than 1.	1 or more.	1; no waiver allowed for more than 1.	1 or more.
Serious misdemeanor	2; no waiver allowed for 5 or more.	1 or 2; no waiver allowed for 3 or more.	1 to 5; no waiver allowed for 6 or more.	1 or more.
Minor misdemeanor	Category not used.	3 to 5; no waiver allowed for 6 or more.	Category not used.	1 or more.
Minor non-traffic	3 or more; 3 convictions for a combination of misdemeanors and minor non-traffic offenses.	3 to 5; no waiver allowed for 6 or more.	2 to 9; no waiver allowed for 10 or more.	Depending on seriousness of offense: 1 or more; 2 in the last 3 years; or 3 or more in a lifetime.
Serious traffic	Category not used.	Category not used.	2 or more; no waiver for 6 or more.	Category not used.
Minor traffic	6 or more where fine exceeded $100 per offense.	Within 3 years before enlistment, 6 or more in any 12-month period or 10 or more in total.	5 or more.	Depending on seriousness of offense: 2 in last 3 years or 3 or more in lifetime; 6 or more or 5 minor traffic and 1 minor non-traffic-related offense in any 1-year period in past 3 years.
Drug	1 arrest for drug possession or use, no waivers for sale of drugs, those with history of drug use coded as medical waivers.	11 or more incidents of marijuana use, prior dependence on any drug, 2 or more drug-related offenses.	1 or more uses of marijuana or other drugs, to include *experimentation.*	15 or more incidents of marijuana use, *any* illegal use of amphetamines, other stimulants, barbiturates, or steroids.

a. Sources: [9] and additional input from the Services' recruiting commands.

Historical trends in the number of waivers

The percentage of waivered accessions has varied considerably from year to year and across the Services. As reviewed in [9], in FY90, across the four Services, the percentage of recruits issued waivers was highest in the Marine Corps, at 60 percent, and lowest in the Air Force, at 2 percent. By 1994, however, the Services began to converge: waivered recruits made up 29 percent of USMC accessions, 16 percent of USN accessions, 6 percent of USAF accessions, and 5 percent of USA acces-

sions. We might guess that the Marine Corps issued more waivers than the other Services in the early 1990s (because of the first Gulf War) and fewer during the military drawdown of the mid-1990s. The main reason for these sizable differences, however, is likely that the Marine Corps is the only Service to require a drug waiver for admission of one-time marijuana use. The Army and Navy also decreased the percentage of waivers in the early 1990s. The Air Force followed an opposite trend by increasing the number of waivers in the early 1990s (from 2.0 to 6.7 percent of accessions).

These trends demonstrate that the Air Force might be quite different from the other Services in its need for, and use of, waivered recruits. The Air Force is the most selective of the four Services in terms of aptitude test scores. Based on these scores, the smallest percentage of the youth population is eligible to serve in the Air Force, in comparison to the other Services [2]. The civilian economy was growing fairly rapidly during the 1990s, so the Air Force likely competed with the civilian sector for high-aptitude recruits. The other three Services, in contrast, were trying to shrink during the early and mid-1990s in reaction to the end of the Cold War. These overall trends suggest that each Service has its own patterns and should be analyzed separately.

Performance of waivered recruits

We briefly summarize past findings on the performance of waivered recruits in the Army, Navy, and Marine Corps.[2] We then discuss the one previous study that considers all four services. This section ends with conclusions about what this previous work means for our current analyses.

Army

A 2008 Naval Postgraduate School thesis by Distifeno looked at the effects of enlistment waivers on Soldiers' first-term attrition [10]. This study found that the success of waivered recruits varied depending on

2. Likely because of the relatively small size of the USAF waivered population, we found no studies evaluating the performance of waivered recruits in the Air Force.

when success was measured. For example, Distifeno found that attrition rates for waivered Soldiers were lower than for nonwaivered Soldiers at the beginning of the first term, but they were higher at the end of the first term. This study also found differences in attrition rates based on the type of offense waivered. Specifically, Distifeno found that recruits with serious traffic and minor non-traffic-related waivers had lower attrition rates, especially early attrition rates. Recruits with serious non-traffic-related and felony waivers (for such offenses as aggravated assault, breaking and entering, and carjacking) seemed to be driving the general conduct waiver attrition pattern—lower attrition rates at first, but higher attrition rates by the end of the first term.

Distifeno also reported that waivered Army recruits had more disciplinary problems and faced more courts-martial than nonwaivered recruits. Apparently, the pattern of pre-enlistment offenses mattered because the study found that recruits with a pattern of minor offenses were more likely to misbehave than those who had only a single major offense.

Other Army studies have shown that waivered recruits can have varying levels of success. A 2008 study, for example, examined the performance of 276,231 USA recruits from FY03 to FY06. Nearly 18,000 of these recruits had enlistment waivers. According to the Associated Press (in an *ArmyTimes* article [4]), the study found that Soldiers with enlistment waivers had higher rates than their nonwaivered counterparts of desertion, misconduct, court-martial appearances, and alcohol rehabilitation failure:

- Desertion (4.3 vs. 3.6 percent)
- Misconduct (6.0 vs. 3.6 percent)
- Court-martial appearances (1 vs. 0.7 percent)
- Alcohol rehabilitation failure (0.3 vs. 0.1 percent).

However, the article also stated that the Soldiers with waivers:

- Were more likely to reenlist (28.5 vs. 26.8 percent)
- Promoted faster to sergeant (34.7 vs. 39 months, on average)

- Had a lower rate of dismissal for personality disorders (0.9 vs. 1.1 percent)
- Had a lower rate of dismissal for unsatisfactory performance (0.3 vs. 0.5 percent).

These Army findings have two implications. First, it is important to look at the attrition rates of waivered recruits at multiple points in time because short-term and long-term results may be quite different. Second, a thorough assessment of the performance of waivered recruits should consider both negative performance indicators (e.g., desertion and misconduct rates) and positive indicators (e.g., speed to promotion).

Navy

There have been many studies on the performance of waivered USN recruits; we discuss two in this subsection. Reference [11] looked at the attrition rates of USN waivered recruits from FY95 to FY96. Using both logistic regression and classification trees in its analyses, the study found that:

> [enlistment] waivers do have a significantly higher rate of unsuitable attrition than that of recruits without [enlistment] waivers ... [and] that recruits who are not high school graduates and receive [an enlistment] waiver are the most likely unsuitable attrition losses.

Reference [12] examined 36-month attrition for recruits in all Services who completed the National Guard Youth ChalleNGe Program. The authors found the following:

1. Heavy smokers, recipients of General Education Development (GED) certificates, and high school dropouts were most likely to attrite.
2. Although a USN waiver predicted attrition, it was not as strong a predictor as being a heavy smoker, a GED recipient, or a high school dropout.
3. Number of months in the delayed entry program (DEP) was a significant predictor of 36-month attrition—shorter periods in

DEP were associated with greater attrition, whereas longer DEP periods were associated with lower attrition.

4. The effect of having a waiver varied considerably across the Services. The marginal effect of an Army waiver was very small (0.5 percentage point), but the effect for the Navy was considerably larger (5.6 percentage points).

Marine Corps

In his Naval Postgraduate School thesis, Etcho analyzed the relationship between demographic characteristics, enlistment waivers, and first-term "unsuitability attrition" in the Marine Corps [13].[3] Etcho defines unsuitability attrition as Marines who serve fewer than 4 years of active duty *and* are separated for "failure to meet minimum behavioral or performance criteria." Examples of unsuitability attrition include fraudulent enlistment, motivational problems, behavior disorder, financial irresponsibility, unsatisfactory performance, misconduct, and drug use.[4]

This study used data from the Defense Manpower Data Center (DMDC) for USMC cohorts FY88 through FY91; each cohort ranged from 28,000 to 34,000 recruits per year. Waivered recruits included those who had prior involvement with law agencies (minor and serious traffic offenses, non-traffic-related offenses, serious offenses, and felony offenses) or past drug or alcohol abuse. At the time of Etcho's

3. CNA has analyzed the performance of waivered USMC recruits several times in the past, but results were presented in informal memoranda and briefings (i.e., they are not citable).

4. Separation codes, however, have been found to be unreliable in general. In the case of FY99–FY09 bootcamp separations, for example, 60 different separation codes were used, but 5 codes represented 91 percent of the separations. This suggests that data entry may be inaccurate or that it may be difficult to distinguish different separation reasons. In addition, losses often occur for more than one reason, but only one code can be used, and there is no predefined hierarchy. As a result, it is unclear which code should be used, and this decision is left to the data entry clerk [14].

study, about 60 percent of all USMC accessions were receiving enlistment waivers.

The study found that the demographic groups with the highest predicted probability of unsuitability attrition for the combined USMC cohorts were:

- Nongraduates of high school
- Recruits from mental categories IV, IIIB, or IIIA (in that order)[5]
- Black recruits.

Demographic characteristics associated with lower probability of unsuitability attrition included:

- Hispanic recruits
- Male recruits
- Younger recruits.

The study also analyzed which categories of enlistment waivers were the most (and least) likely to have unsuitability attrition. The categories of recruits most likely to attrite for unsuitability were those with:

- Felony waivers
- Drug waivers
- Less than three minor non-traffic-related waivers
- Serious offense waivers
- Alcohol waivers.

However, the study did not find a significant relationship between other categories of enlistment waivers, such as those for three or more minor non-traffic-related offenses.

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5. These mental categories are based on AFQT scores. Specifically, category IV recruits are those who scored between 10 and 30 on the AFQT, while IIIB includes those scoring between 31 and 49, and IIIA includes those scoring between 50 and 64.

Based on these findings, the study recommended that the Marine Corps deny enlistment to anyone with a felony conviction. It also recommended denial of enlistment to anyone who would require a waiver for serious offenses, drug/alcohol use, or less than three minor non-traffic-related offenses. In FY08, however, implementing all but the minor offense restriction would have reduced accessions from 36,546 to 23,630 recruits (35 percent)—mostly because of the Marine Corps' use of drug waivers.

The study found that the strength of the relationship between waiver category and attrition varies depending on the type of waiver granted. Recruits with felony waivers were much more likely to attrite than those with alcohol waivers, for example. This study suggests that our work must distinguish the performance of recruits in different waiver categories and must quantify the strength of the relationship between waivers status and performance outcomes.

A DoD-wide study

In 2004, Putka et al. of the Human Resources Research Organization evaluated the effects of moral waivers on attrition and "in-service deviance" in each of the Services [15]. They found that 18-month attrition rates were higher for those with moral conduct waivers, with Service-by-Service variation in *which* types of waivered recruits were most likely to attrite. While Drug/Alcohol Test Positive (DAT) waivers were highly predictive of attrition behavior in all Services, adult felony and serious non-traffic-related waivers were important predictors in the Army, and waivers for marijuana use and serious non-traffic-related waivers were significant in the Navy. The authors also found marijuana use waivers and serious non-traffic-related waivers to be significant predictors of 18-month attrition in the Marine Corps. In the Air Force, however, only adult felony waivers were found to have a positive impact on 18-month attrition. Their tests of in-service deviance were conducted only for the Marine Corps and the Army. Putka et al. found a higher prevalence of deviances among waivered recruits in the Marine Corps, but no significant difference in the Army.

Implications of previous research for this study

This brief overview of previous research shows that there are several important factors to consider in our analyses of the effects of waivers on military performance. Specifically, our analyses:

1. Should be primarily within Service since waiver policies were different between Services until 2008
2. Should consider both short-term and long-term effects of waiver status on performance because groups that perform well in the short term do not always perform well in the long term
3. Should include both positive and negative effects of waiver status, preferably using the same metric, because waivers have been associated with both positive and negative performance
4. Should compare the performance of waivered recruits with that of other relevant recruits, such as those who lack a traditional high school diploma
5. Should consider the effect of multiple waivers on performance since previous research has not addressed this issue.

Keeping these insights in mind, the next sections describe our research sample, methodology, and findings.

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Data

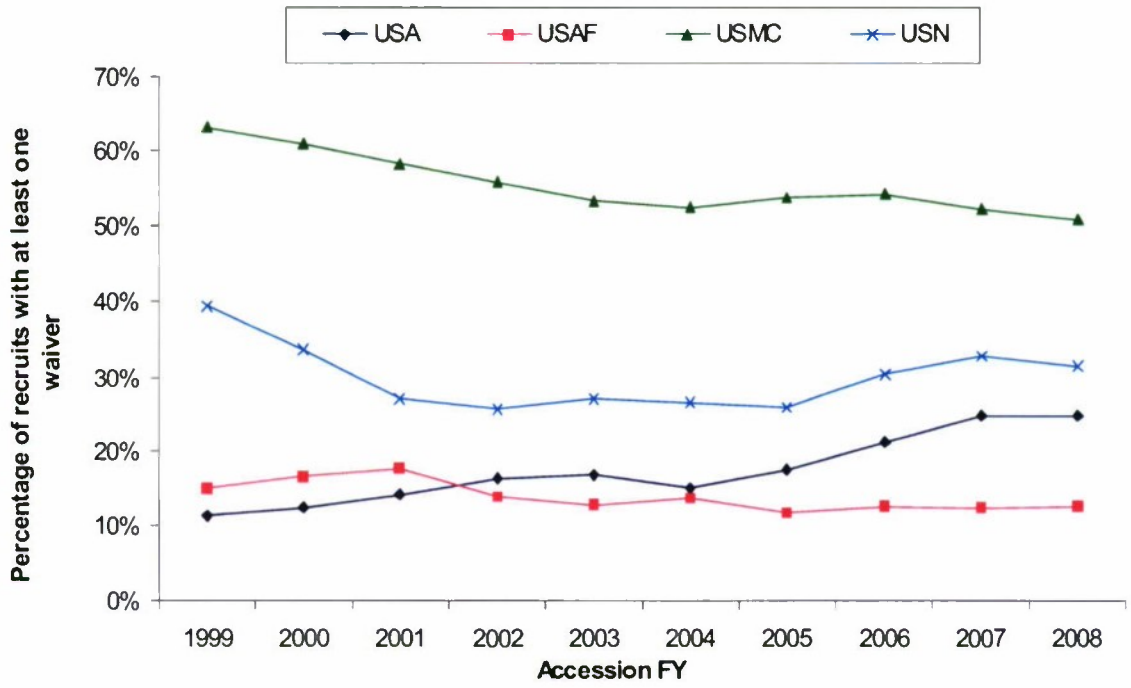
The data in this study are from four source files. DMDC provides three: the accession file based on Military Entrance Processing Command (MEPCOM) transactions, the active-duty master file (quarterly snapshots), and the active-duty transaction file. We supplement the analysis using data from CNA's military personnel files.

From the MEPCOM accession file, we extract data for FY99 through FY08 for each Service. Any information about a Servicemember collected at accession comes from this file, including AFQT score, months spent in DEP, race/ethnicity, age, and waivers. We include only non-prior-service (NPS) accessions because it is important to be able to track Servicemembers' careers and estimate their service lengths. In addition, our analysis relies only on whether a recruit has any waiver or a particular type of waiver, *not* a count of the number of waivers he/she has.[6] Figure 1 illustrates the percentage of waivered recruits accessed with *any* type of waiver in each Service. Throughout the sample period, we see that the percentage of waivered recruits generally fell in the Marine Corps, the Navy, and the Air Force, while increasing in the Army.

Figure 2 shows intra-Service time trends by waiver type. We find significant variation within each branch. The increase in USA waivered accessions, for example, can be explained mainly by the increased prevalence of serious and physical waivers. Figure 2 also shows that the higher percentage of waivered recruits in the Marine Corps is mainly a result of its stricter drug policy. Roughly 30 percent of USMC accessions have required a drug/alcohol waiver over time.

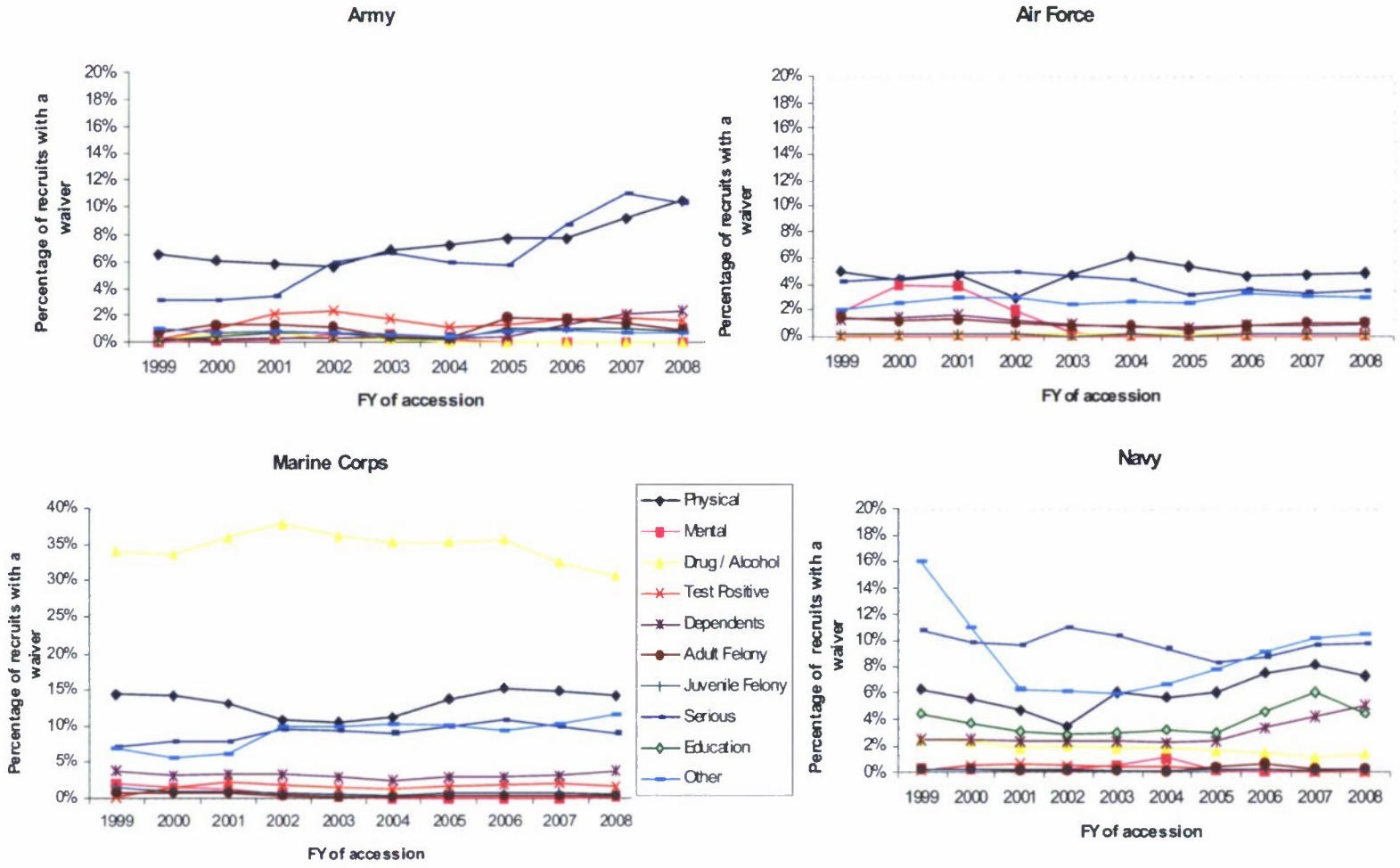
6. The MEPCOM file contains separate DEP and accession waivers, and a maximum of three data fields for each. MEPCOM advised us that, in the case of the multiple waivers, some of the waivers that were recorded in a recruit's DEP section were carried over to his/her accession waiver section—in essence, resulting in double-counting for that recruit.

Figure 1. Percentage of waivered recruits by Service: FY99 through FY08



The remaining data components for the study are the active-duty master file, the active-duty transaction file, and CNA's military personnel files. The active-duty master file tracks NPS accessions quarterly through time, so we can identify if (and when) a recruit attrited. The active-duty transaction file provides loss reasons, which were used to help define attrition. Not all losses are "bad losses" and thus should not be considered attrites. We did not want to categorize, for example, those enlisted members who are "lost" because of a transition to officer training programs or because they reached their end of active obligated service (EAOS).

Figure 2. Trends in waivered accessions FY99 through FY08, by waiver type[a]



a. At the Navy's request, education waivers are reported separately for that Service (they are included in the "other waiver" category for all other Services).

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Characterizing waivered and nonwaivered recruits

In this section, we compare the average characteristics of waivered and nonwaivered recruits in each Service. We compare how they differ on a variety of demographic and military characteristics, including education, marital status, age, gender, time spent in DEP, and paygrade at accession. In addition, we compare the geographic areas from which these populations originate. We find a variety of significant differences in the characteristics of waivered and nonwaivered recruits—differences that we ultimately consider when we compare performance metrics and attrition behavior across these groups.

We present differences across the groups that have *any* waiver vice no waiver, and we do not differentiate by waiver type. As expected, the groups are systematically different; these findings motivate our analysis of behavioral differences in the two populations. Table 2 summarizes our findings for a number of demographic characteristics.[7] Across Services, waivered recruits are more likely to be male, married, older, and white than their nonwaivered counterparts.

As noted in table 2, we also find that waivered recruits are less likely to hold traditional high school diplomas and more likely to be Tier II recruits. They also are more likely to be Tier III in the Army, while less likely in the Navy, and the difference was insignificant in the Air Force and Marine Corps. Figure 3 displays the percentages of waivered and nonwaivered recruits in each Service that are not Tier I (i.e., that are either Tier II or Tier III).

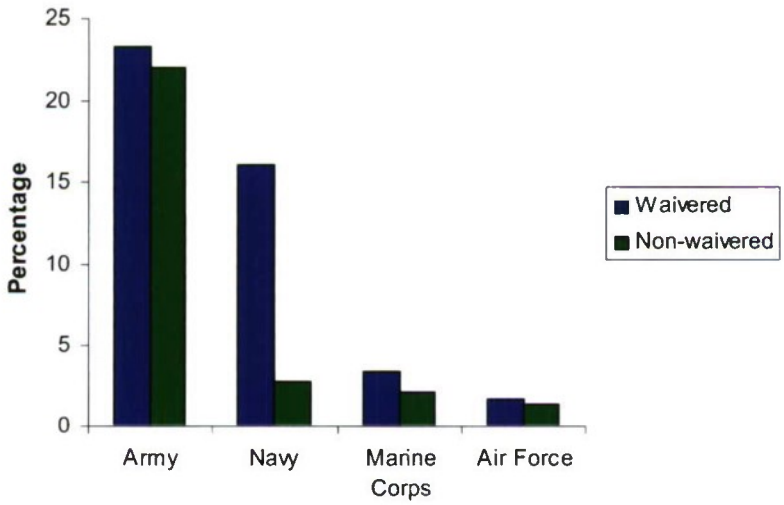
7. Appendix A shows the values for these variables and the magnitude of differences across the waivered and nonwaivered populations.

Table 2. Demographic characteristics of waivered vice nonwaivered recruits, by Service

Characteristic	USA	USAF	USMC	USN	**Waivered recruits are**
Gender	More likely male	More likely male	More likely male	More likely male	More likely male
Age	Older	Older	Older	Older	Older
Ethnicity	More likely white	More likely white	More likely white	More likely white	More likely white
Marital status	More likely married	More likely married	More likely married	More likely married	More likely married
High school degree graduate (HSDG)	Less likely	Less likely	Less likely	Less likely	Less likely
Nontraditional HSDG[a]	More likely	More likely	More likely	More likely	More likely
Tier II	More likely	More likely	More likely	More likely	More likely
Tier III	More likely	No diff.	No diff.	Less likely	Inconclusive

a. Nontraditional HSDGs have a homeschool or adult education diploma, or have completed 1 semester of college.

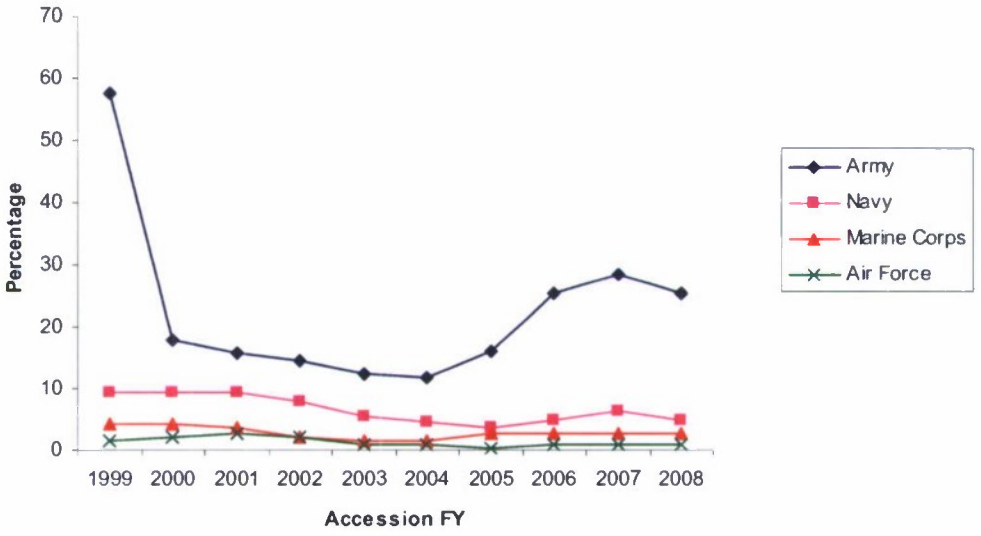
Figure 3. Percentages of waivered and nonwaivered Tier II/III recruits, by Service (FY99–FY08)



The percentage of Tier II/III is higher in the waivered population in all Services, though only barely so for the Air Force. The main reason for the large and significant difference between the percentages of Tier II/III recruits in the waivered and nonwaivered populations in the Navy is that the Navy grants education waivers to nearly half of its Tier II/III recruits. Over the sample period, while the Navy granted

roughly 15,000 education waivers, the corresponding numbers in the Army, Marine Corps, and Air Force were 14, 445, and 13, respectively. Service-specific trends in the percentage of yearly accessions who are Tier II/III are presented in figure 4. In all years, Tier II/III accessions were highest in the Army, followed by the Navy, Marine Corps, and Air Force.

Figure 4. Percentages of Tier II/III recruits, by Service and accession FY (FY99–FY08)[a]

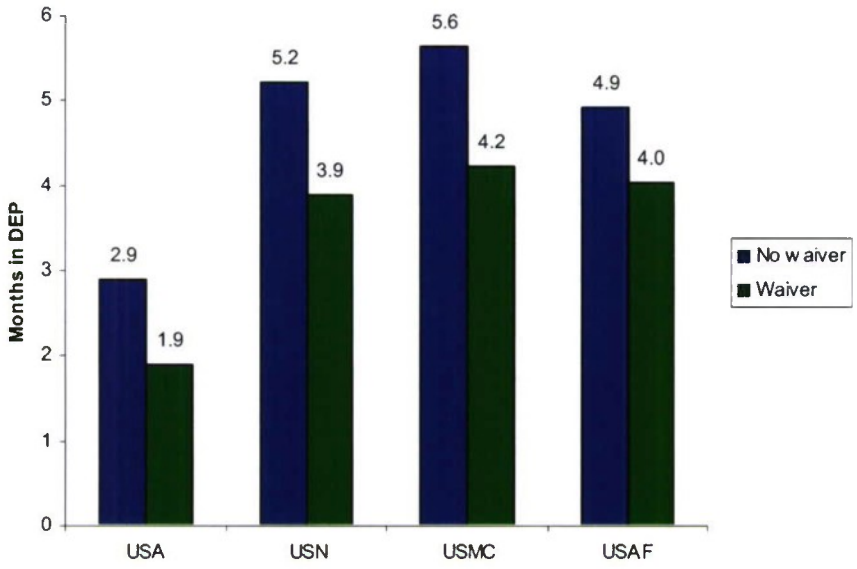


a. The significant decline in the percentage of Tier II/III recruits in the Army from 1999-2000 is as reported in the Enlisted Master File. We note that the precipitous drop seems unlikely and may indicate data entry errors. Results specific to FY99 for the Army should thus be interpreted with caution.

We also find, as shown in figure 5, that waivered recruits, on average, spend less time in DEP than their nonwaivered counterparts. This difference, which is consistent and significant in all of the Services, is likely correlated with the fact that waivered recruits are more likely to be shipped directly to basic training. That is, in all Services, the percentage of waivered recruits that access during the JJAS (June, July, August, September) trimester is smaller than the corresponding percentage in the nonwaivered population. They are less likely to be recruited as far in advance as traditional high school diploma gradu-

ates and, therefore, spend significantly less time in DEP. This also may suggest that, in all Services, if ship dates are approaching and incoming cohorts are still insufficient, there is more flexibility and an increasing number of those who would require a waiver are accepted.

Figure 5. Average number of months spent in DEP (FY99–FY08)



Finally, we examine whether waivered recruits are more or less likely than nonwaivered recruits to come from particular regions of the country.[8] We find, overall, that waivered recruits are more likely to come from the East North Central region and less likely to come from the Pacific and Mid-Atlantic regions than their nonwaivered counterparts. These findings are consistent across all Services. In addition, for all Services except the Marine Corps, waivered recruits are more likely to come from the West South Central, West North Central, and Mountain regions. With the exception of the Marine Corps, waivered recruits also are underrepresented in the South Atlantic and East South Central regions. As evidenced by these trends, recruiting is

8. Appendix B contains our methodology and detailed findings.

more difficult in some areas of the country than others. As a result, recruiters in some regions find it necessary to make more "exceptions to policy" via waivers to meet their recruiting missions.

These findings suggest a variety of theories as to how the performance of waivered and nonwaivered recruits may differ, which will be explored in this study. On one hand, the fact that waivered recruits tend to be older and married, for example, suggests that they may have more stability in their personal lives, potentially allowing them to devote more energy to their careers and, hence, be less likely to attrite. On the other hand, they tend to have nontraditional high school diplomas, a characteristic that is correlated with poorer performance and higher attrition. In addition, waivered recruits' higher likelihood to access at the rank of E1 in the Army and Marine Corps indicates that they are not among the highest performers at bootcamp (see appendix A).[9] Similarly, the fact that waivered recruits spend less time in DEP suggests that they may have higher attrition risk.[10]

The fact that these groups have differing demographic, geographic, and military characteristics suggests that they also may differ in unobservable ways. Taste for long-term service or career stability, political affiliation, and overall personal motivation are but a few examples. Such differences would likely cause members of these groups to behave differently. Knowledge of how these groups differ is used to inform the analysis in the remaining sections, where we estimate attrition probability and performance metrics for both the waivered and nonwaivered populations.

9. Those recruits with stellar bootcamp performance are often accessed at the rank of E2. In addition, some in the nonwaivered population are promised the E2 rank prior to arrival at bootcamp.

10. For a discussion of the relationship between time in DEP and attrition, see [16].

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Determinants of attrition

In this section, we compare the attrition behavior of waivered and nonwaivered recruits. Early attrition—defined as early termination of a Servicemember's contract—occurs for a variety of reasons, including involuntary discharge, early retirement, and involuntary separation. As discussed earlier, we do not consider a Servicemember to have attrited if his or her loss was for a "good" reason, such as transition to the officer corps, reaching EAOS, or a reduction in force.[11] The Services view early attrition as problematic and costly because they fail to receive the full return on their training investments and, in a time of high demand, must replace attriting Servicemembers. In this section, we evaluate *how* the attrition behavior of waivered recruits differs from that of their nonwaivered counterparts, and we explore feasible methods for narrowing any gap. We begin by comparing average attrition rates across the waivered and nonwaivered populations. We then present findings on *which* waiver types are the most likely to attrite and whether, after controlling for other observable characteristics, recruits with certain waivers are still significantly more likely to attrite. Finally, we determine the predictors of attrition *given* a particular waiver type. This will allow us to advise the Services as to how to minimize attrition risk within their waivered populations.

Average attrition rates: how do waivered groups compare?

Here, we evaluate the validity of the assumption that waivered recruits attrite at higher rates than their nonwaivered counterparts. After controlling for demographics and other characteristics, we calculate—at various points in time—the marginal effect of particular waivers on attrition. This lets us evaluate whether waivered groups share unobservable characteristics that affect their attrition risk. We also

11. While a reduction in force may not be considered a "good" thing, it is certainly legitimate because it is beyond the Servicemember's control.

estimate the expected probability of attrition for each waivered group.

Figures 6 through 9 show average attrition rates at various points in time (from 6 to 48 months) for the waiver subpopulations in each Service.[12] In all Services, and for all waiver groups (including those without waivers), attrition rates increase with time. That is, the percentage of those who attrite by 48 months is greater than the percentage of those who attrite by 36 months, which is greater than the percentage of those who attrite by 24 months, and so on, down to those who attrite by 3 months (while in bootcamp). This is to be expected; the likelihood of a Servicemember attriting increases with time in service.

There are differences, however, among the Services, as to which waivered groups tend to be the most and least likely to attrite. In the Army, for example, those with a drug/alcohol, DAT, or aptitude waiver (for recruits with insufficient ASVAB scores) are the most likely to attrite. Those with adult felony waivers have the lowest attrition, followed by those without waivers (see figure 6). In the Navy, attrition is highest for DAT and education waivers; attrition is lowest for those with no waiver, followed by physical and adult felony waivers (see figure 7). In the Air Force, those with aptitude waivers tend to have the highest attrition, whereas those with a physical waiver, dependents waiver, or no waiver are the least likely to attrite (see figure 8).

Finally, in the Marine Corps, those with DAT, aptitude, or adult felony waivers are the highest attriters (see figure 9). Those accessed without waivers are the lowest attriters at all points in time. Note that recruits accessed without waivers do not necessarily have the lowest attrition risk in each Service. In addition, Tier II and III recruits, in most cases, have average attrition rates as high as, or higher than, those in the waivered population. There are a few exceptions. Those accessed with DAT waivers, for example, are more likely than Tier II or III recruits to attrite by 48 months in the Army and Navy, and by 6 months in the Air Force. In addition, those with drug/alcohol waivers

12. For the calculation of 48-month attrition, we include only those whose contracts were for at least 4 years.

Figure 6. Attrition by waiver category: Army

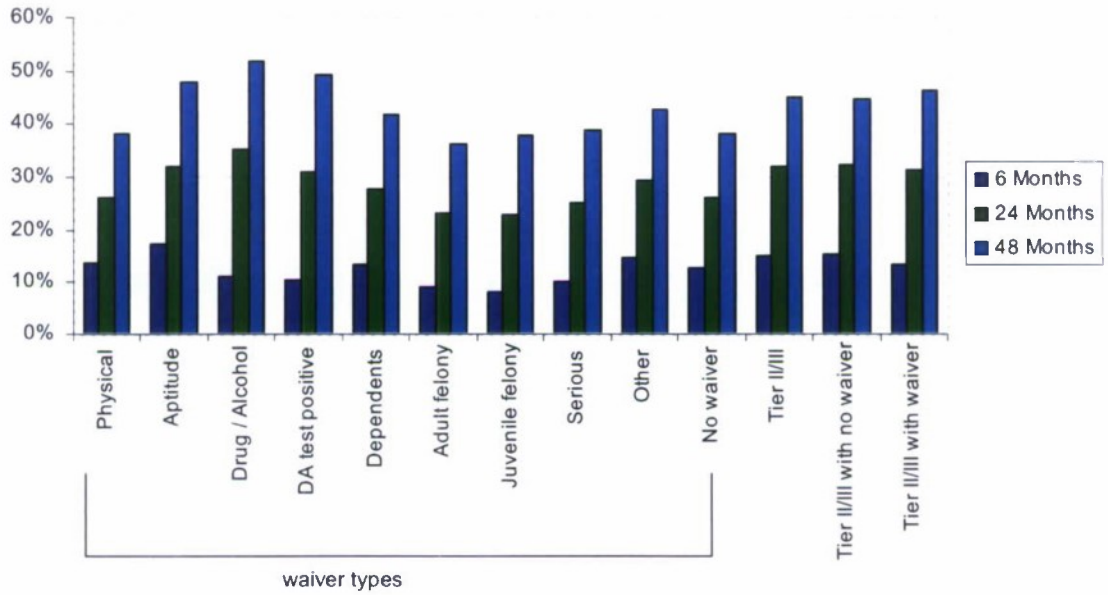
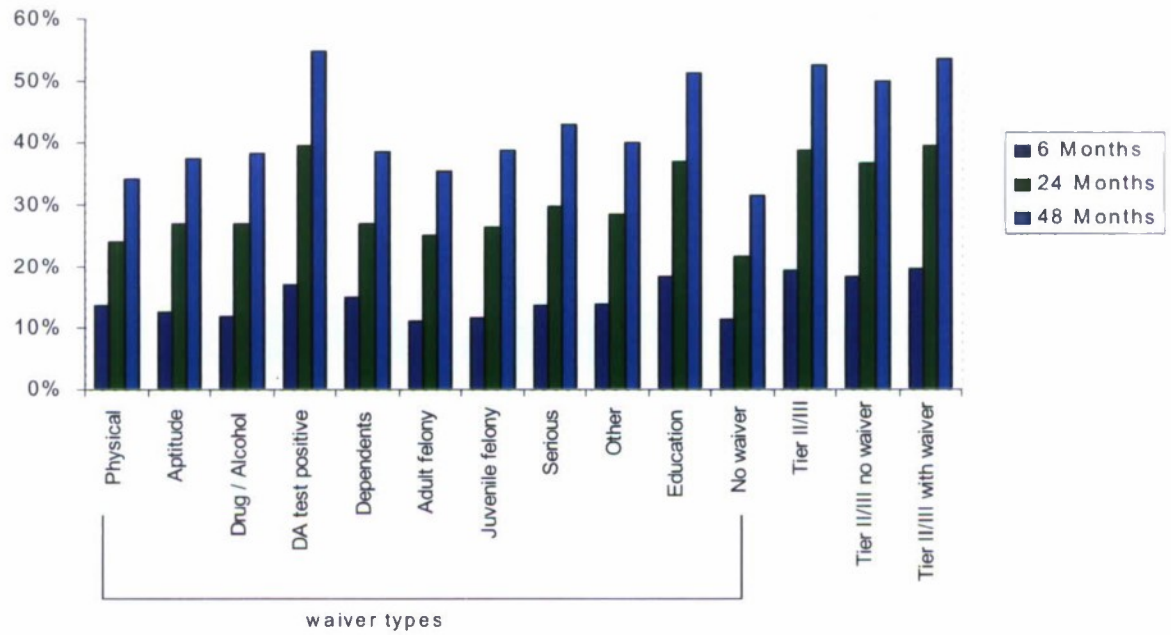


Figure 7. Attrition by waiver category: Navy[a]



a. Education waivers are included in our analysis for the Navy only, at its request. This waiver was not issued sufficiently in the other Services to warrant its inclusion.

Figure 8. Attrition by waiver category: Air Force

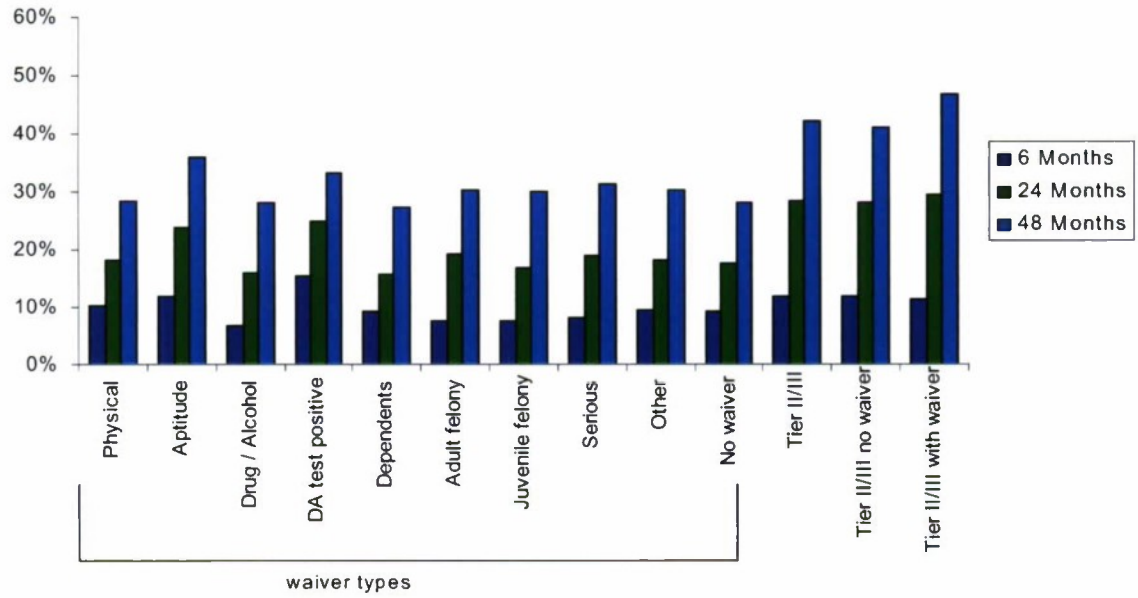
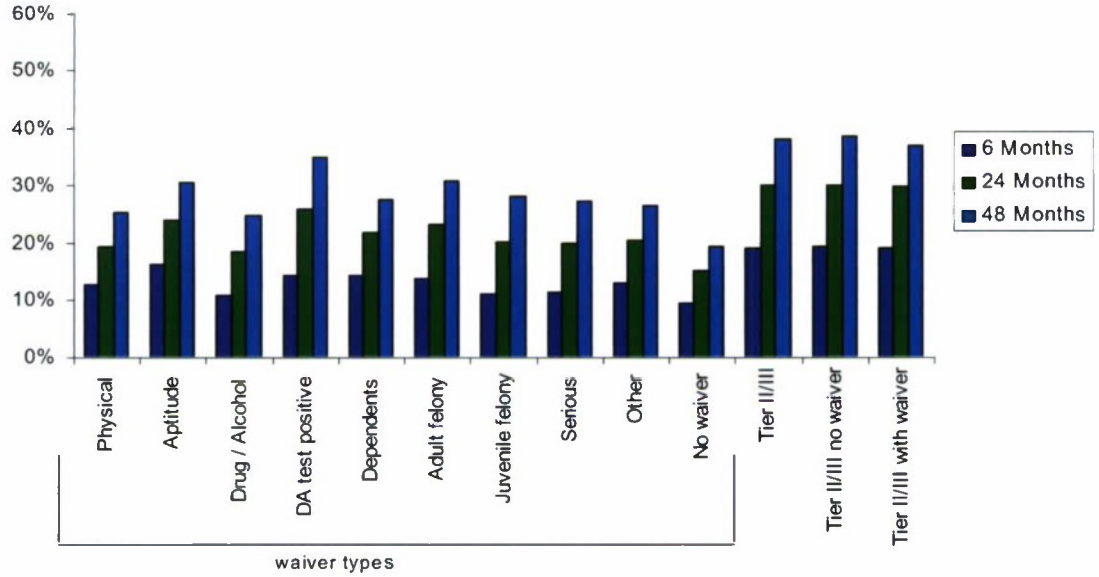


Figure 9. Attrition by waiver category: Marine Corps[a]



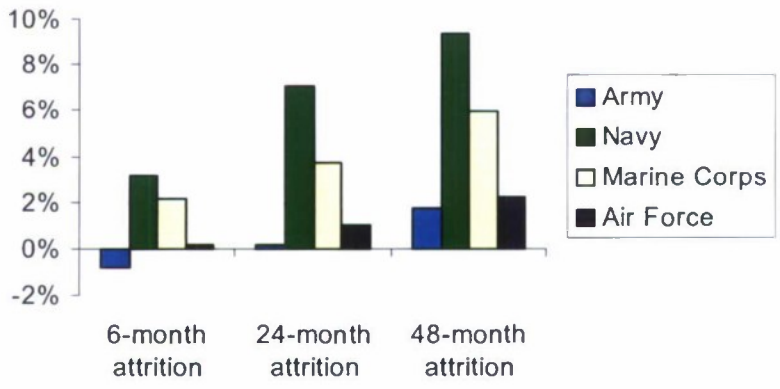
a. As of mid-FY09, the USMC is no longer accepting recruits who require a DAT waiver.

in the Army have higher 24- and 48-month attrition rates than those in the Tier II/III population.

Although these attrition differences across waivered groups may provide insights on quality differences of recruits *within* each Service, these trends should not be compared across Services because of significant variations in Service waiver policies. It cannot, for example, be concluded that recruits with a drug/alcohol waiver in the Army are of worse quality than those with a drug/alcohol waiver in the Marine Corps. Although tempting to jump to this conclusion (since 48-month attrition rates for Servicemembers with drug/alcohol waivers are greater than 50 percent in the Army but 25 percent in the Marine Corps), this assumes that a recruit accessed into the Marine Corps with a drug/alcohol waiver would require the same waiver in the Army. Because of differential waiver policies, this is not the case.

Figure 10 tells a similar story to that of figures 6 through 9. It displays the *difference* in average attrition probabilities for the waivered and nonwaivered populations in each Service. (These values are calculated as the mean 6-, 24-, and 48-month attrition rates for those with any waiver *minus* the corresponding attrition rate for those without, regardless of the number of waivers or waiver type.)

Figure 10. Difference in attrition probabilities (waivered minus nonwaivered)[a]



a. All differences displayed are significant, except Air Force 6-month attrition and Army 24-month attrition.

We find that waivered recruits in the Army have lower attrition rates at 6 months, but higher at 48 months, than their nonwaivered counterparts. Conversely, waivered recruits attrite more frequently at all time intervals in both the Navy and Marine Corps. Finally, Air Force waivered recruits have higher 24- and 48-month attrition rates, but there is no significant difference at 6 months. These attrition rate differences will be explored in greater detail later, when we evaluate whether variation in attrition behavior can be explained entirely by individual characteristics (such as gender, race/ethnicity, paygrade at accession, and AFQT score) or is the result of other observable or unobservable characteristics.

Are recruits with multiple waivers riskier accessions?

The attrition rates presented thus far focus exclusively on whether a Servicemember has *any* waiver and on whether he or she has a particular *type* of waiver, without making any distinction between those who have only one waiver and those who have multiple waivers. We also evaluate whether those with multiple waivers are more likely to be either a greater attrition risk or a poorer performer than those with only one waiver. We conduct both an aggregate analysis—comparing the average attrition rates and E5 promotion rates of those accessed with one, two, or three or more waivers—and a more detailed analysis, in which we compare these same metrics across the ten most common waiver combinations within each Service.[13]

In sum, there are a few waiver combinations (highlighted in italics in what follows) that we find to be particularly risky in each Service, and some stand out as *not* imposing that much additional risk:

13. Appendix C contains a detailed description of our methodology and findings. As previously mentioned, MEPCOM acknowledges that some waivers may be double-counted (as both a DEP waiver and an accession waiver). Because of this, we may have counted some recruits who have only one waiver as having two. In an effort to avoid these potential errors, we focus on waiver *pairs*. If a waiver was double-counted, the same waiver *type* should appear twice on the recruit's record. By focusing on recruits with more than one waiver type, we avoid the potential for data error.

- Army
  - *Medical and serious:* lower 24- and 48-month attrition, higher percentage are fast to E5[14]
  - *DAT and serious:* less likely to attrite at 6 months, more likely at 48
- Navy
  - *Serious and education:* higher 24- and 48-month attrition
  - *Other and education:* higher 6-, 24-, and 48-month attrition
  - *Dependents and serious:* more likely to be fast promoters
- Marine Corps
  - *Drug/alcohol and medical:* higher attrition at all intervals and less likely to promote fast
  - *Drug/alcohol and DAT:* higher attrition at all intervals
  - *Medical and serious:* higher attrition at all intervals
  - *Dependents and drug/alcohol:* higher attrition at all intervals, but more likely to promote fast
- Air Force
  - *Medical and aptitude:* higher attrition at all intervals and less likely to promote fast to E5
  - *Adult felony and serious:* more likely to be fast promoters, but no significant attrition difference.

The Services should keep this information in mind when determining which waiver combinations to prioritize (in terms of accessions) and which should require additional screening.

14. A detailed discussion of our methodology for determining whether a Servicemember promoted "fast to E5" is discussed in appendix D and documented in [17].

Does attrition vary by waiver type?

In this subsection, we estimate the effect of being in a certain waiver group on the probability of attrition (at 6, 24, and 48 months), *after* controlling for a variety of other factors that are known to determine a recruit's attrition risk. Specifically, we control for a variety of demographic and military characteristics, including geographic region of origin, age, race/ethnicity, marital status, number of children, AFQT score, months spent in DEP, education, gender, and FY of accession. We also control for whether a recruit has more than one waiver since we found that those with multiple waivers *do* behave differently than those with only one waiver. We then estimate the effect of a recruit being in a particular waiver group (or having any waiver) on attrition probabilities, taking all of these factors into consideration.

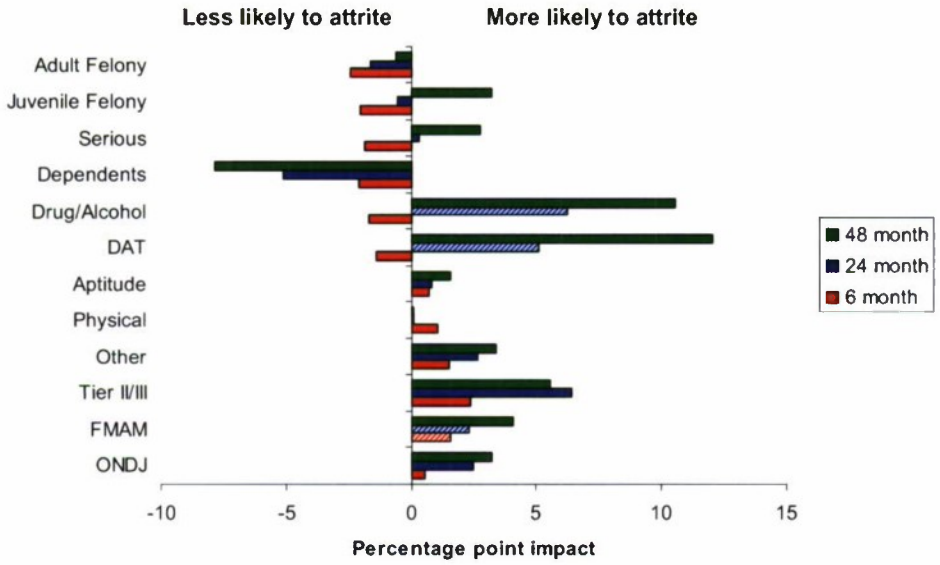
Army

Figures 11 through 14 present the independent effects of particular waiver types. The marginal effects presented are the effect from being in a particular waiver group (or having a particular characteristic) on the probability of attrition, *all else equal.* The ultimate question this estimation strategy answers is: after controlling for all of these observable characteristics, are members of certain waiver groups *still* more likely than their nonwaivered counterparts to attrite? That is, do members of a particular waiver group share unobservable, behavioral characteristics that influence their attrition probability?

Figure 11 presents Army findings. The effect of waiver status on short-term, or 6-month, attrition is—in most cases—negative. Soldiers accessed with an adult felony waiver are, all else equal, 2.4 percentage points less likely to attrite by 6 months than their nonwaivered counterparts. Similarly, those accessed with a juvenile felony, serious, dependents, drug/alcohol, or DAT waiver are all significantly *less* likely to attrite by 6 months than those in the nonwaivered population. Conversely, those with aptitude or physical waivers have higher short-term attrition rates, all else equal. The most significant contributions of waiver status on attrition probabilities, however, are for the 24- or 48-month attrition rates of those with a dependents waiver, and for the 48-month attrition rates of those with a DAT or drug/alcohol

waiver. Although those with a dependents waiver are significantly less likely than their nonwaivered counterparts to attrite at all time intervals, those with a DAT or drug/alcohol waiver are significantly more likely to attrite by 48 months. For example, all else equal, Soldiers accessed with a DAT waiver are 12 percentage points more likely to attrite by 48 months than the nonwaivered. In addition to the marginal effects of waiver type, these figures also present the effects of being a Tier II/III recruit (relative to Tier I) and accessing in the October–January (ONDJ) or February–May (FMAM) trimesters (relative to JJAS). These are included simply as a comparison, to illustrate how the marginal effect of waiver status compares with that of other variables related to attrition. In the Army, the effects of having a dependents, drug/alcohol, or DAT waiver on 48-month attrition are significantly greater than these other effects. These findings suggest that, on average, Army recruits with a dependents waiver have an *inherently* low attrition risk, whereas those accessed with a DAT or drug/alcohol waiver have an inherently high attrition risk.

Figure 11. Marginal effects of waivers on 6-, 24-, and 48-month attrition rates: Army[a]



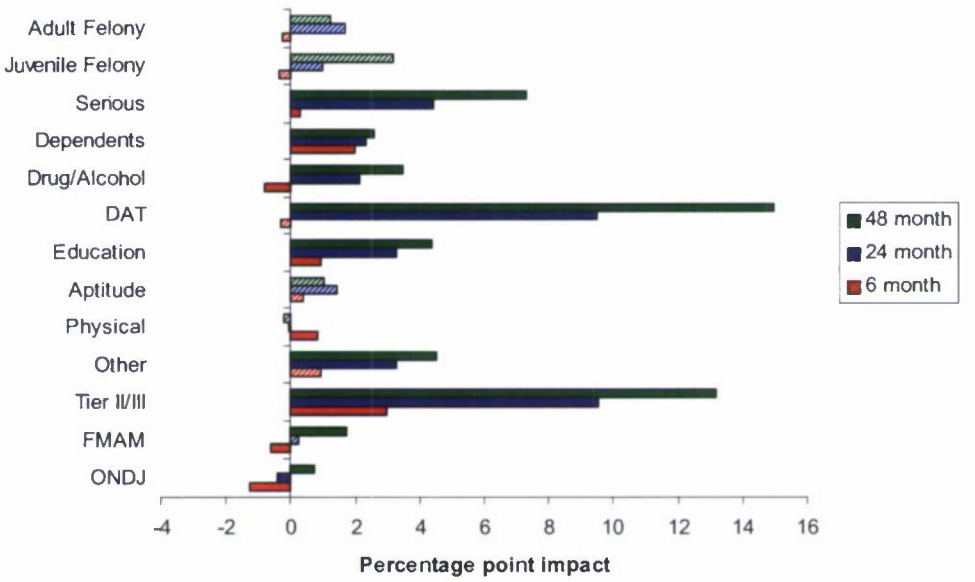
a. These marginal effects are the resulting percentage-point changes in the probability of attrition from having a particular characteristic, all else equal. Marginal effects for each waiver type are the independent effect of that waiver type relative to accessing without a waiver. Similarly, ONDJ and FMAM marginal effects represent the effect from accessing in these trimesters *relative* to JJAS, and the Tier II/III effect is that *relative* to Tier I. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5-percent level or better.

Note that the findings in figures 6 and 11, although different, are not inconsistent. These two approaches answer somewhat different questions. The fact, for example, that the *independent* effect of a having a dependents waiver is negative and significant (suggesting that, all else equal, those in this waiver group have a lower attrition probability) is not inconsistent with the fact that the average attrition probabilities for this group (refer back to figure 6) are slightly higher than those in the nonwaivered population. This simply means that the main attrition drivers in that population are the observable characteristics we control for, *not* unobservable, behavioral characteristics associated with waiver status. This suggests that this (as well as other groups with these differential effects) is potentially an area for improved screening. We will discuss this further in a later section.

Navy

In the Navy, the marginal effect of a particular waiver type on attrition probabilities, all else equal, is almost always positive, as revealed in figure 12. The only negative effects are for 6-month attrition, and the size of these effects is small, generally 1 percentage point or less. The most sizable effects of waiver status on attrition occur for those with a serious or DAT waiver. Those with serious waivers, for example, are 4.4 and 7.2 percentage points more likely to attrite by 24 and 48 months, respectively, than their nonwaivered counterparts. The independent effect of a DAT waiver on these medium- and long-term attrition measures is 9.5 and 15 percentage points, respectively. We conclude, therefore, that those accessed with DAT waivers have inherently high attrition risk. This also is revealed by the fact that the effect of being in this waiver category on 24- and 48-month attrition rates is equal to or greater than the effect of being a Tier II/III recruit.

Figure 12. Marginal effects of waivers on 6-, 24-, and 48-month attrition rates: Navy[a]



a. These marginal effects are the resulting percentage-point changes in the probability of attrition from having a particular characteristic, all else equal. Marginal effects for each waiver type are the independent effect of that waiver type relative to accessing without a waiver. Similarly, ONDJ and FMAM marginal effects represent the effect from accessing in these trimesters *relative* to JJAS, and the Tier II/III effect is that *relative* to Tier I. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5-percent level or better.

Within the Navy, average attrition rates by waiver type were greatest for those with education or DAT waivers, as illustrated in figure 7. These rates are comparable to those of the Tier II/III population (regardless of waiver status). This suggests that, once accounting for both observable and unobservable (associated with waiver type) characteristics, those accessed into the Navy with either education or DAT waivers pose the greatest attrition risk.

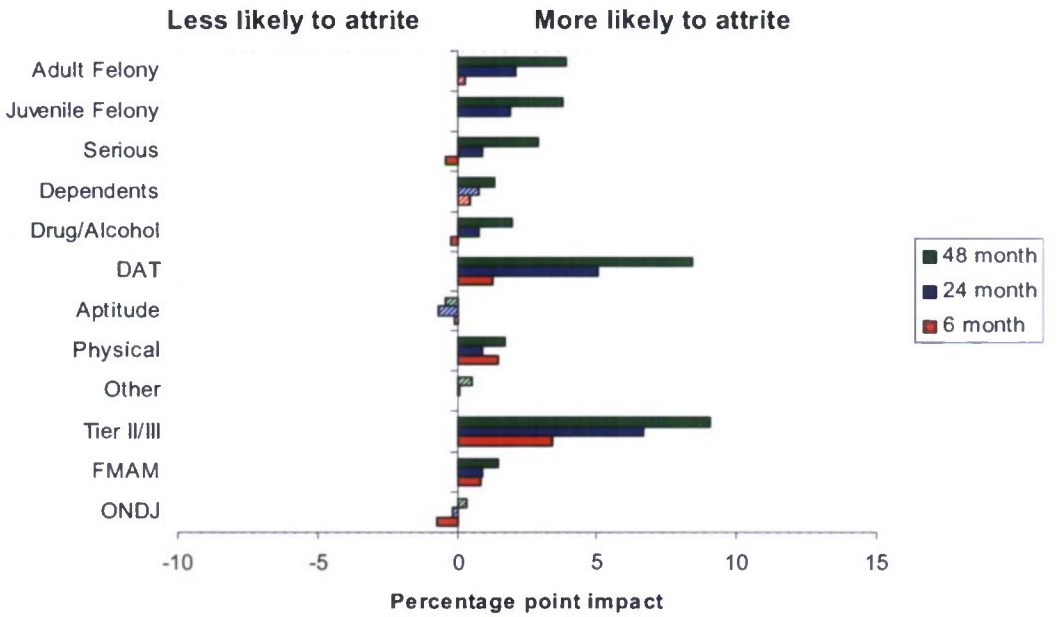
Marine Corps

We find similar results within the Marine Corps, presented in figure 13. As with the Navy, DAT waivers have the greatest *independent* effect on attrition probabilities. Those accessed with a DAT waiver, for example, are 5 and 8.4 percentage points more likely to attrite by 24 and 48 months, respectively.[15] They also have the highest average attrition rate of all waiver types, as was displayed in figure 9. The average attrition rates of those accessed with DAT waivers are comparable to those of the Tier II/III population, suggesting that they are an equally high attrition risk. With the exclusion of those requiring DAT waivers from the Marine Corps accession pool, the overall attrition risk of the waivered population should decline, as the independent effect of all other waiver types is much smaller, at less than 5 percent. In addition, there are no other waiver groups whose average attrition

15. As of mid-FY09, the Marine Corps is no longer accessing recruits who require a DAT waiver.

rates approach those of the Tier II/III population, as was displayed in figure 9.

Figure 13. Marginal effect of waivers on 6-, 24-, and 48-month attrition rates: Marine Corps[a]



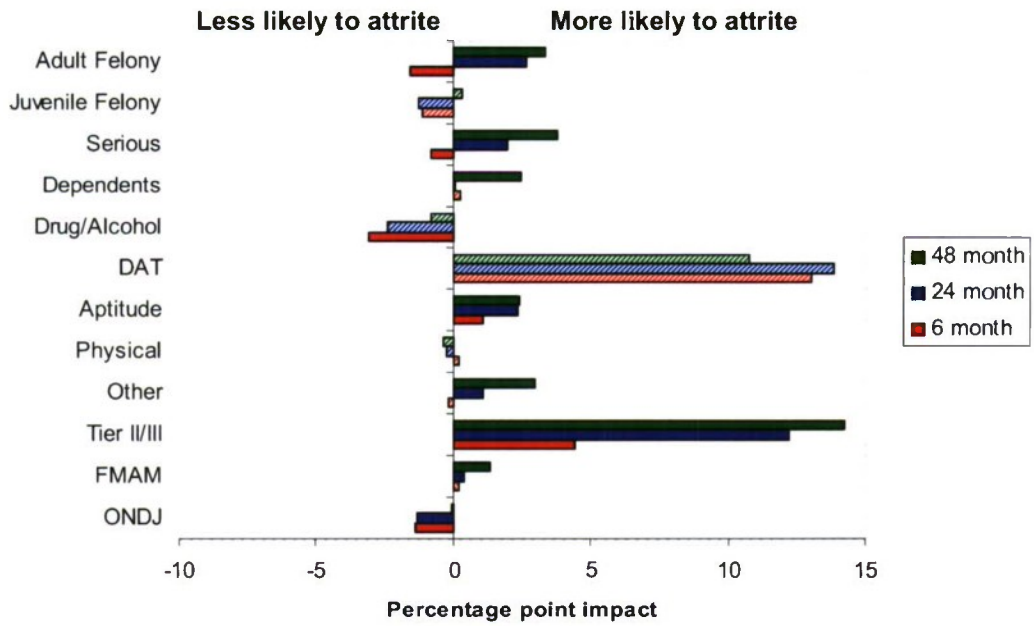
a. These marginal effects are the resulting percentage-point changes in the probability of attrition from having a particular characteristic, all else equal. Marginal effects for each waiver type are the independent effect of that waiver type relative to accessing without a waiver. Similarly, ONDJ and FMAM marginal effects represent the effect from accessing in these trimesters *relative* to JJAS, and the Tier II/III effect is that *relative* to Tier I. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5-percent level or better.

Air Force

Finally, figure 14 reveals the independent effects of waiver status on attrition at 6, 24, and 48 months for the Air Force. The marginal effects of waiver status in the Air Force are small—less than 5 percent for all waiver types and all attrition rates. The effect of having a DAT waiver is large, but insignificant, because the Air Force granted only 13 DAT waivers over the entire sample period. As figure 14 shows, the independent effect of being a Tier II/III recruit is much greater than any of the waiver effects: Tier II/III recruits are more likely to attrite at 48, 24, and 6 months, by 14, 12, and 4 percentage points, respec-

tively, than a comparable Tier I recruit. Due to the small size of the Air Force DAT population, this suggests that the Tier II and III populations are riskiest in terms of 24- and 48-month attrition.

Figure 14. Marginal effect of waivers on 6-, 24-, and 48-month attrition rates: Air Force[a]



a. These marginal effects are the resulting percentage-point changes in the probability of attrition from having a particular characteristic, all else equal. Marginal effects for each waiver type are the independent effect of that waiver type relative to accessing without a waiver. Similarly, ONDJ and FMAM marginal effects represent the effect from accessing in these trimesters *relative* to JJAS, and the Tier II/III effect is that *relative* to Tier I. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5-percent level or better.

In this subsection, we have identified the waiver statuses that have the greatest independent effect on attrition probability, holding all else equal. As mentioned earlier, members of waiver groups that have relatively high average attrition rates but small or insignificant marginal effects are those that have characteristics on which the Services could potentially screen. That is, for these groups, higher attrition probabilities are driven by *observable* characteristics. These characteristics, once identified, could be restricted in waivered recruits—potentially decreasing their attrition risk. In the following subsection, we identify

a few such groups within each Service and provide examples of potential screening mechanisms.

How might the Services reduce attrition probabilities for waivered recruits?

In this subsection, we evaluate whether there are ways the Services could reduce the attrition probabilities of particular groups of waivered recruits. G*iven* that a recruit has a particular waiver type, we investigate which characteristics significantly affect his or her attrition likelihood. These are the characteristics on which the Services could potentially screen these waivered recruits to reduce their attrition risk. In each Service, we have tried to identify those waiver groups where improved screening could have the greatest effect on attrition. In the previous subsection, we presented both marginal effects and average attrition rates for each waiver type, in each Service. Although the former is meant to capture unobservable or behavioral characteristics shared by those with a particular waiver type, *after* controlling for characteristics we can observe, the latter incorporates *both* observable *and* unobservable information.[16] If the average attrition probability is positive and the marginal effect is either negative or very small, it suggests that predicted attrition is being driven mainly be observable characteristics. These are precisely the traits on which the Services could screen these recruits because this is information available at accession. Thus, these are the waiver groups where additional screening has the largest potential for reducing attrition probabilities. Table 3 identifies these groups, which will be the focus of our discussion.

We evaluate the effect of a variety of *observable* characteristics on attrition probability at 6, 24, and 48 months, given that a recruit was accessed with one of these waivers. Table 4 defines the variables considered in this analysis. Not all are included in every estimation within

16. Specifically, the predicted probability incorporates the product of each characteristic and its marginal effect. We include demographic and military characteristics (the observables) and the additional *behavioral* effect from accessing with a certain waiver type (the unobservables).

each Service because, in some cases, there are no recruits within that particular waiver group who have a certain characteristic.[17]

Table 3. Waiver groups included in *minimizing attrition risk* analysis

Army	Navy	Marine Corps	Air Force
Physical	Physical	Physical	Physical
Dependents	Adult felony	Dependents	Adult felony
DAT	Juvenile felony	Drug/alcohol	Serious
Aptitude	Aptitude	Aptitude	Aptitude

Table 4. Characteristics considered in this analysis

Variable	Description
ONDJ	Equals 1 if the accession occurred in October, November, December, or January; 0 otherwise
FMAM	Equals 1 if the accession occurred in February, March, April, or May; 0 otherwise
CAT IV	Equals 1if AFQT < 31; 0 otherwise[a]
CAT IIIB	Equals 1 if 30 < AFQT < 50; 0 otherwise
CAT IIIA	Equals 1 if 49 < AFQT < 65; 0 otherwise
CAT II	Equals 1 if 64 < AFQT < 93; 0 otherwise
Long DEP	Equals 1 if a recruit spent more time in DEP than the majority of those in that Service (1 month + for Army, 3+ for Navy, 3+ for Marine Corps, 4+ for Air Force); 0 otherwise
Tier II/III	Equals 1 if a Tier II or Tier III recruit; 0 otherwise
E2	Equals 1 if access as an E2 or achieve paygrade E2 within first quarter; 0 otherwise
E3	Equals 1 if access as an E3 or achieve paygrade E3 within first quarter; 0 otherwise
E4	Equals 1 if access as an E4 or achieve paygrade E4 within first quarter; 0 otherwise
Number of children	Number of children at accession
Married	Equals 1 if married at accession; 0 otherwise
Age	Age at accession
Male	Equals 1 if male; 0 otherwise

a. In our sample, category IV recruits are largely USA recruits. That is, of the roughly 20,000 category IV recruits accessed into the Services between FY99 and FY08, 15,000 were accessed in the Army, and 4,000 were accessed into the Marine Corps. The majority of the category IV Army accessions occurred between FY05 and FY08, while the category IV Marine Corps accessions were mainly concentrated in FY07 and FY08.

17. For example, no Marines had a physical waiver *and* accessed at either E3 or E4, so we exclude the E3 and E4 variables in this case.

Army

For the Army, we identify characteristics that have the largest effect on attrition for those with physical, dependents, DAT, or aptitude waivers. Figures 15 through 18 present our findings; we discuss the determinants of attrition for each waivered population in turn.

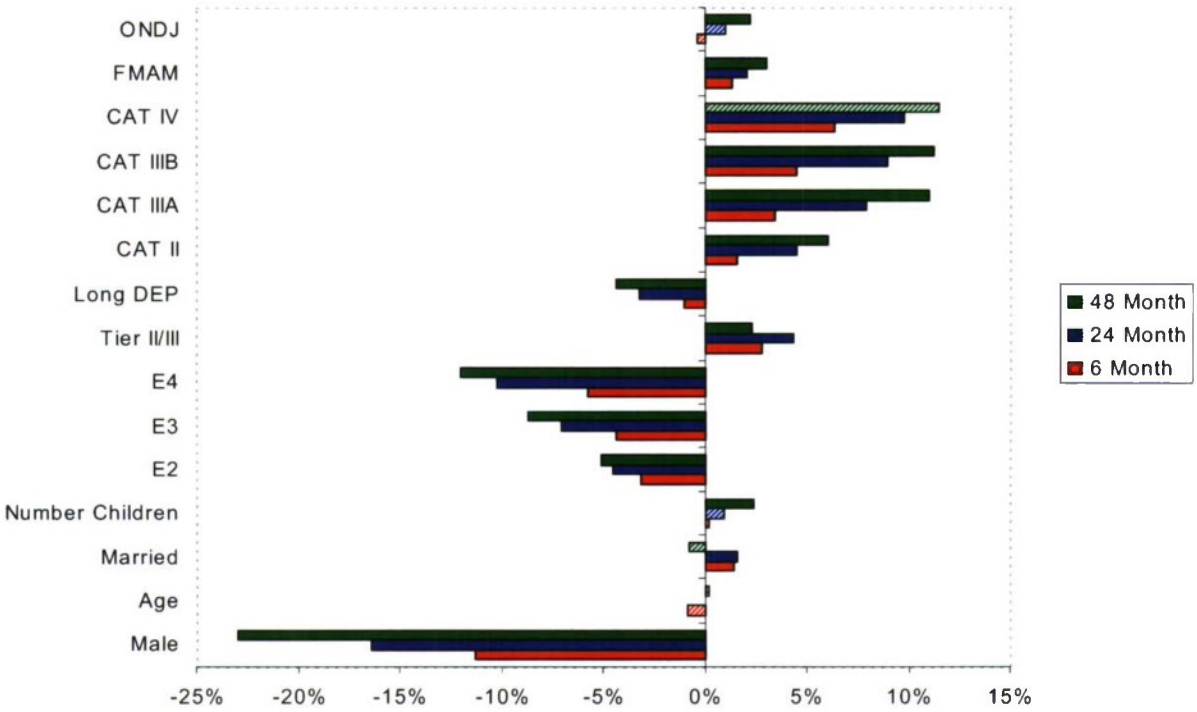
From FY99 to FY08, there were 47,113 Army recruits with physical waivers. Figure 15 displays the marginal effect of a number of characteristics on the attrition probabilities. Positive values indicate that Soldiers with that characteristic were *more* likely to attrite by 6, 24, or 48 months; negative values correspond to a *lower* attrition probability. We find that physically waivered recruits who are male, who access at paygrades E2, E3, or E4 (relative to E1), or who spend a long time in DEP are significantly *less* likely to attrite at all three intervals. As the figure shows, being male decreases the probability that a physically waivered recruit will attrite by 11, 16, and 23 percent for 6-, 24-, and 48-month attrition, respectively.

The effects of paygrade on attrition vary from 3 to 5 percent for E2 to 5 to 13 percent for E4. That is, the higher the paygrade at accession, the less likely that the recruit will attrite. Spending more than 1 month in DEP also decreases attrition probability, by 5 percent or less; however, those with AFQT scores less than 93 (AFQT categories II through IV) and those who are Tier II or III are *more* likely to attrite.

The most sizable effects occur for those in AFQT categories IIIA through IV. In addition, note that the independent attrition effects from being a category IIIA, IIIB, or IV recruit are not substantially different. That is, category IVs do not have drastically higher attrition risk than category IIIs. In sum, given a pool of recruits requiring a physical waiver, these results suggest that the Army could reduce the attrition risk of this population by selecting those who are male, access in paygrades E2 to E4, have AFQT scores greater than 92 (or at least greater than 64), and/or are Tier I recruits.[18] Although a recruit with all of these characteristics would be ideal, selecting recruits with only some of these attributes still would reduce attrition risk.[19]

18. Accessions at the rank of E2 or above occur, for example, based on education qualifications or for referrals that a poolee provides (provided that these referrals sign contracts).

Figure 15. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a physical waiver: Army[a]

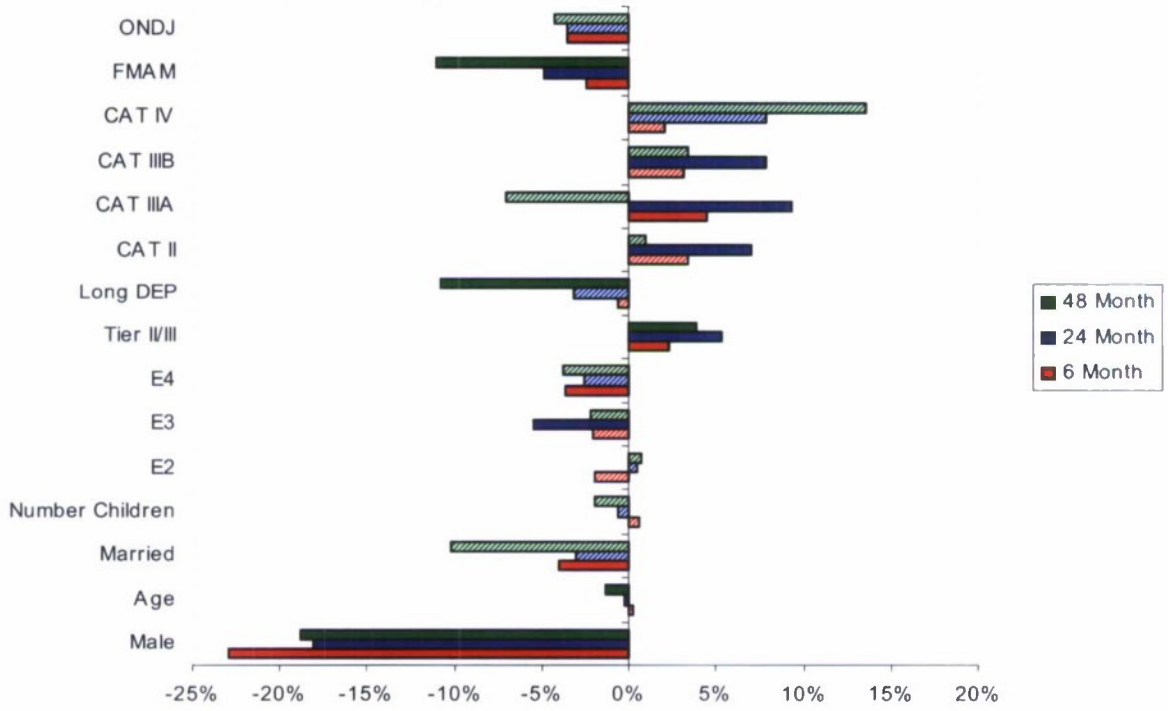


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

The number accessed with a dependents waiver is significantly smaller (5,251 from FY99 to FY08), but still worth studying. The marginal effect of having a dependents waiver on attrition probabilities (the unobservables effect) is negative, as we presented in figure 11. As figure 16 illustrates, recruits with dependents waivers who are male and who access during FMAM are significantly less likely to attrite at all intervals. In addition, Tier II or III recruits are more likely to attrite. The remainder of the results vary by attrition interval. Spending 3 or more months in DEP, for example, substantially decreases 48-month attrition, but not 6- or 24-month attrition.

19. We recognize, for example, that screening recruits on gender will be a legal impossibility.

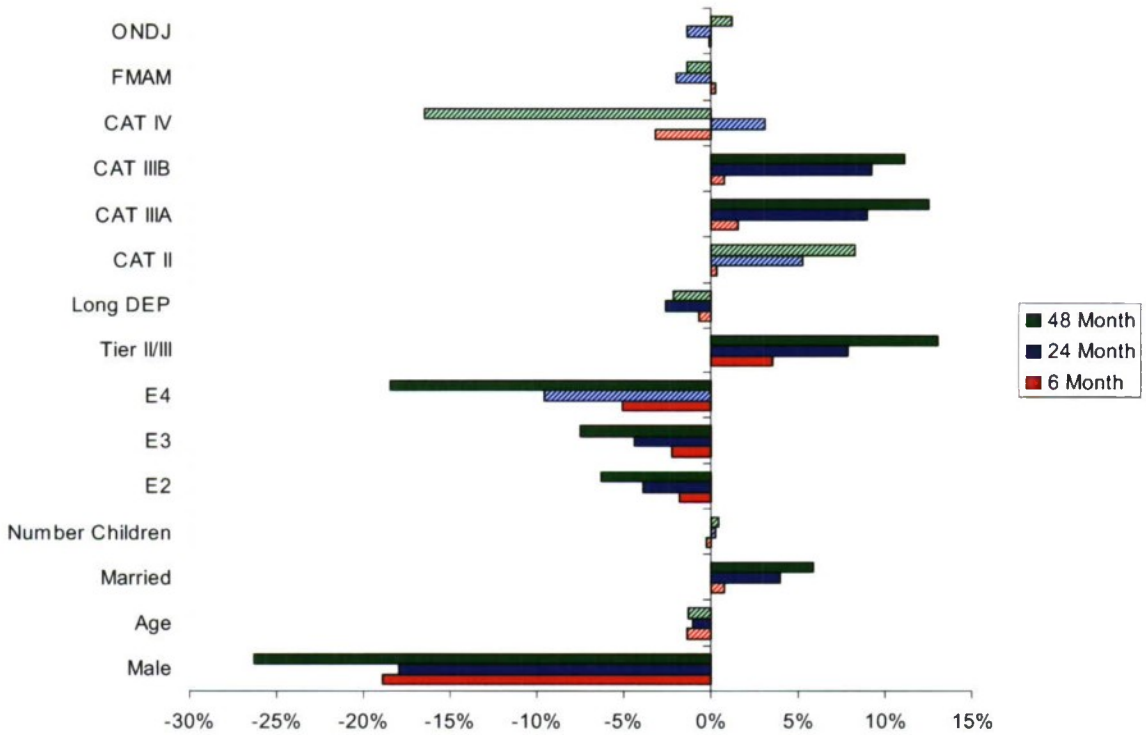
Figure 16. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a dependents waiver: Army[a]



a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Finally, we evaluate factors that contribute to the attrition probabilities for those accessed with DAT and aptitude waivers. From FY99 to FY08, there were 9,940 Army accessions with DAT waivers. Within this population, the probability of attriting at 6, 24, and 48 months is 18 to 26 percentage points lower for men than for women, as illustrated in figure 17. We also find significant and sizable negative effects from accessing as an E2, E3, or E4 (as opposed to E1). Conversely, being a Tier II/III recruit or having an AFQT score in categories IIIA or IIIB makes a recruit more likely to attrite in the medium and long term. AFQT scores have no predictive power for short-term attrition. Similarly, spending more than 1 month in DEP reduces only 24-month attrition, and the effect is relatively small; the likelihood of attriting decreases by less than 5 percentage points.

Figure 17. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a DAT waiver: Army[a]



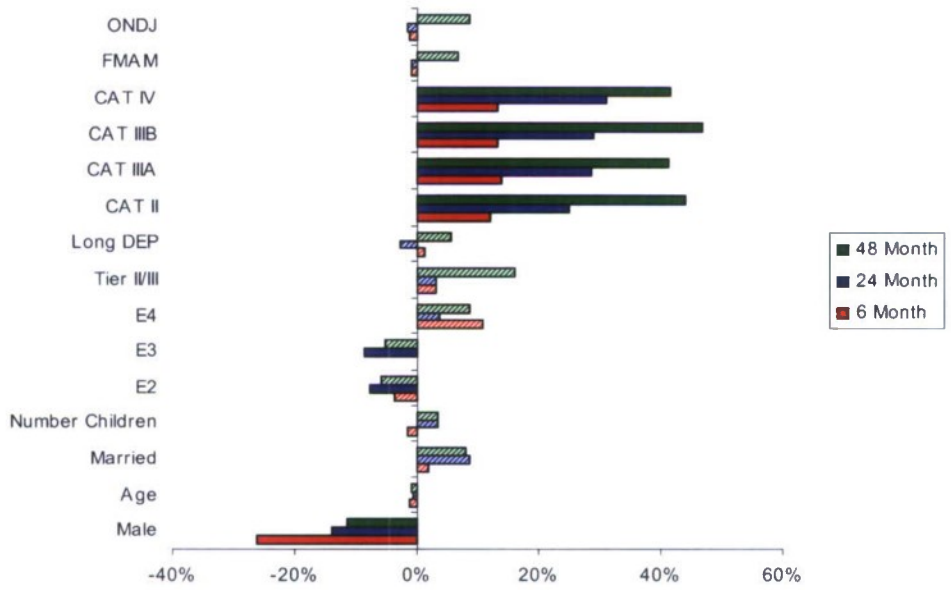
a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Findings for the population with aptitude waivers are somewhat similar. From FY99 to FY08, there were 1,217 Army accessions with aptitude waivers. As illustrated in figure 18, those with AFQT scores in categories II through IV are all significantly more likely to attrite at all intervals—approximately 12, 29, and 40 percent more likely to attrite than those in the highest range of AFQT scores at 6, 24, and 48 months, respectively. In addition, men with aptitude waivers are much less likely to attrite than women. The resulting reduction in attrition probability from being male ranges from 26 percent at 6 months to 11 percent at 48 months.

For these four Army waiver categories, we found that gender, paygrade at accession, time in DEP, and AFQT score are all significant predictors of attrition probabilities, with the size and significance of these effects varying by waiver type. In general, attrition is less likely

for men, those with higher AFQT scores, those who access at a pay-grade higher than E1, and those who spend a "long" time in DEP.

Figure 18. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* an aptitude waiver: Army[a]



a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

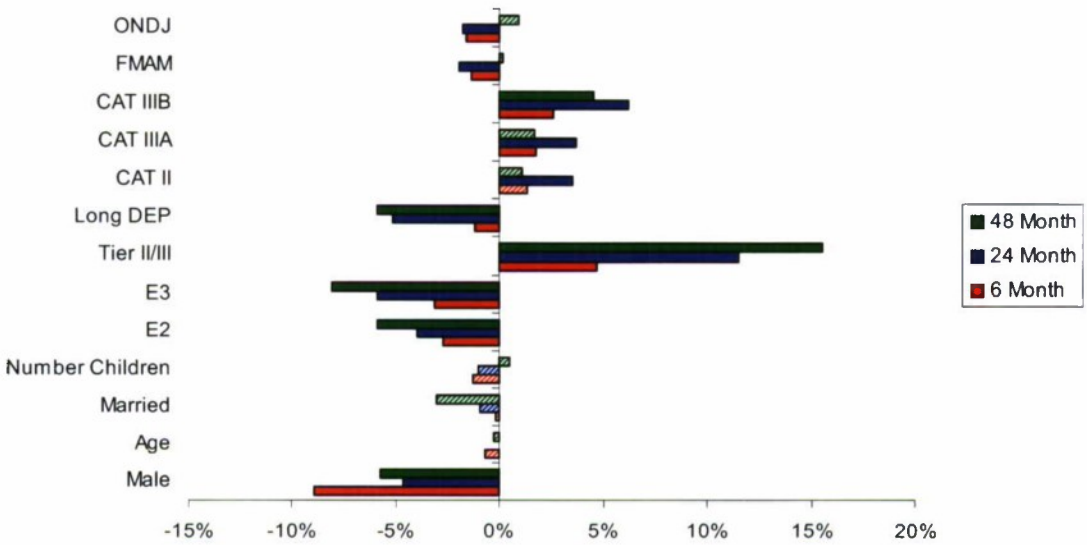
Navy

In this subsection, we conduct a similar analysis for the Navy and focus on those accessed with either a physical, aptitude, juvenile felony, or adult felony waiver.[20] In our sample, there are a total of 23,260 Navy recruits with physical waivers. The effects of their demographic and other characteristics observable at accession on their attrition probabilities are shown in figure 19. As noted in the figure, we find that Tier II/III status and having an AFQT score in category IIIA or IIIB significantly increases the probability of attrition. Similarly, those

20. These four groups were chosen based on the same selection criteria discussed in the previous subsection.

who spend a particularly long time in DEP, access at E2 or E3, and are male are significantly *less* likely to attrite at all time intervals. This suggests that AFQT scores, gender, education tier, and time in DEP would be the most effective screens if aiming to reduce the attrition risk of this population.

Figure 19. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a physical waiver: Navy[a]

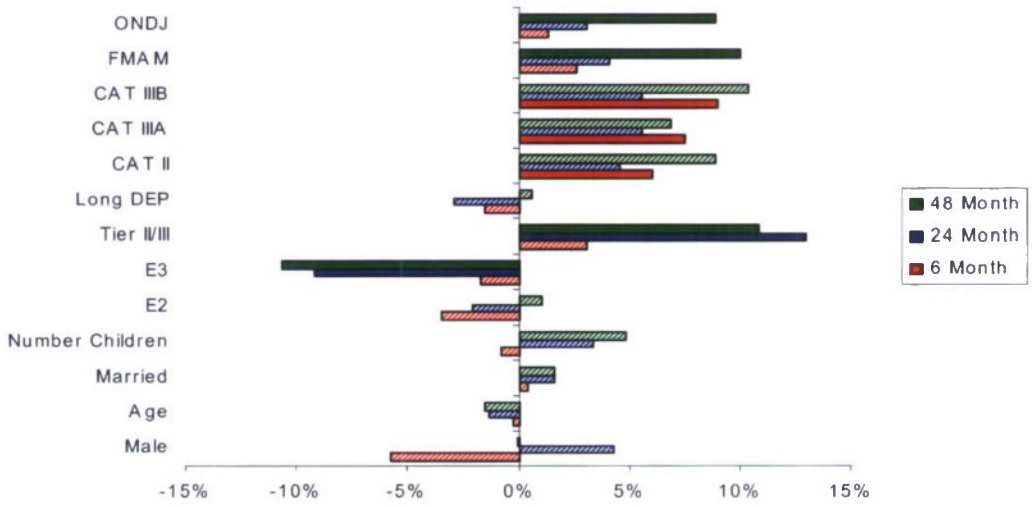


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Findings are different for those with aptitude waivers (1,211 recruits in our dataset), as shown in figure 20. Here, gender and time in DEP are insignificant attrition predictors, and AFQT scores are significant only when predicting 6-month attrition. In this case, those with lower AFQT scores are *more* likely to attrite. Similarly, Tier II/III status and accessing at the E3 paygrade are characteristics that only predict 24- and 48-month attrition. Those in Tier II/III are 10 to 15 percentage points more likely to attrite by 24 and 48 months than recruits with aptitude waivers who are Tier I. The predictive power of accessing at E3 is equally large at 24 and 48 months. In addition, those who access during the ONDJ or FMAM trimesters are significantly more likely to

attrite by 48 months than those who access with an aptitude waiver during JJAS, while lower AFQT scores have a positive effect only on the likelihood of 48-month attrition. In this instance, there are no characteristics that predict attrition at all three intervals. The determination of which characteristics to use as an additional screen will thus be highly dependent on whether the aim is to decrease the probability of attrition at 6, 24, or 48 months.

Figure 20. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* an aptitude waiver: Navy[a]

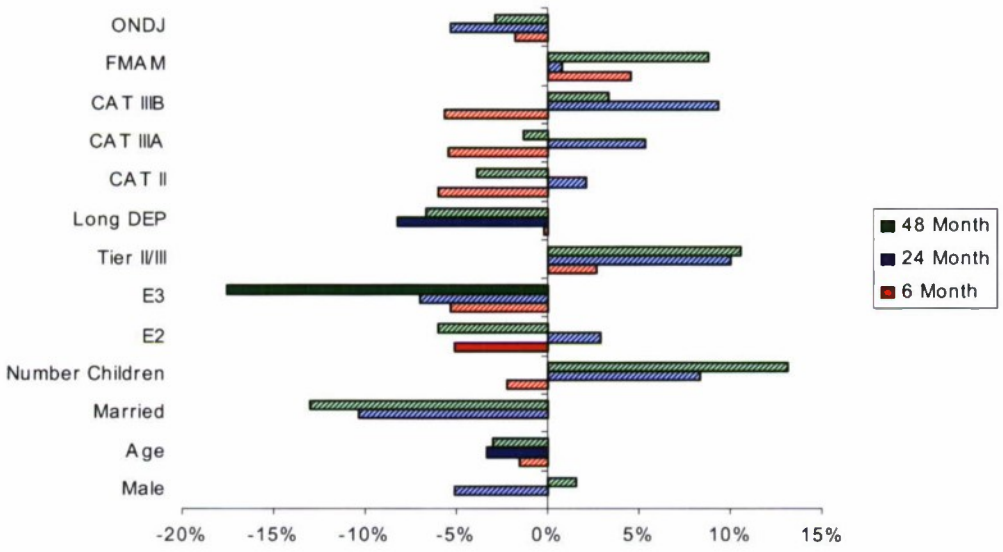


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Finally, we estimate the marginal effects of observable characteristics on attrition probabilities for those with felony waivers, either juvenile or adult (see figures 21 and 22). Both of these populations are small—a total of 793 accessions with a juvenile felony waiver and 851 with an adult felony waiver from FY99 to FY08. In the juvenile felon population, we find that those who access at E2 are roughly 5 percentage points less likely to attrite by 6 months than those who access at E1, and those who access at E3 are 17 percentage points less likely to attrite by 48 months. In addition, those who spend a long time in DEP

(3 or more months) are 9 percentage points less likely to attrite by 24 months than those who spend less than 3 months in DEP. Once again, the appropriate screening mechanism will depend on which attrition rate the Navy is trying to minimize. If the aim, for example, is to decrease the 48-month attrition rate in this population, requiring those with a juvenile felony to access as E3s would have the largest effect based on these results.

Figure 21. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a juvenile felony waiver: Navy[a]

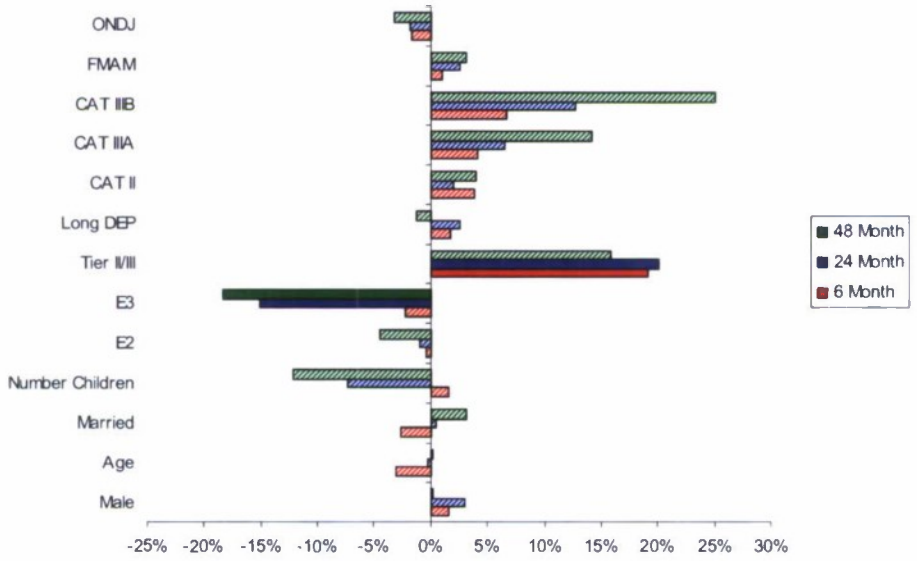


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

In the adult felon population, shown in figure 22, having paygrade E3 at accession greatly reduces the likelihood of both 24- and 48-month attrition, by roughly 15 and 18 percentage points, respectively. There are similarly large effects from Tier II/III status: those in this group are roughly 20 percentage points more likely to attrite by 24 or 48 months than those in Tier I. In the Navy, we find less consistent results across waiver types than in the Army. This suggests that the decision to screen waivered recruits according to any additional char-

acteristics should be made with care, and the appropriate screening mechanism will vary greatly depending on the waiver type in question.

Figure 22. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* an adult felony waiver: Navy[a]



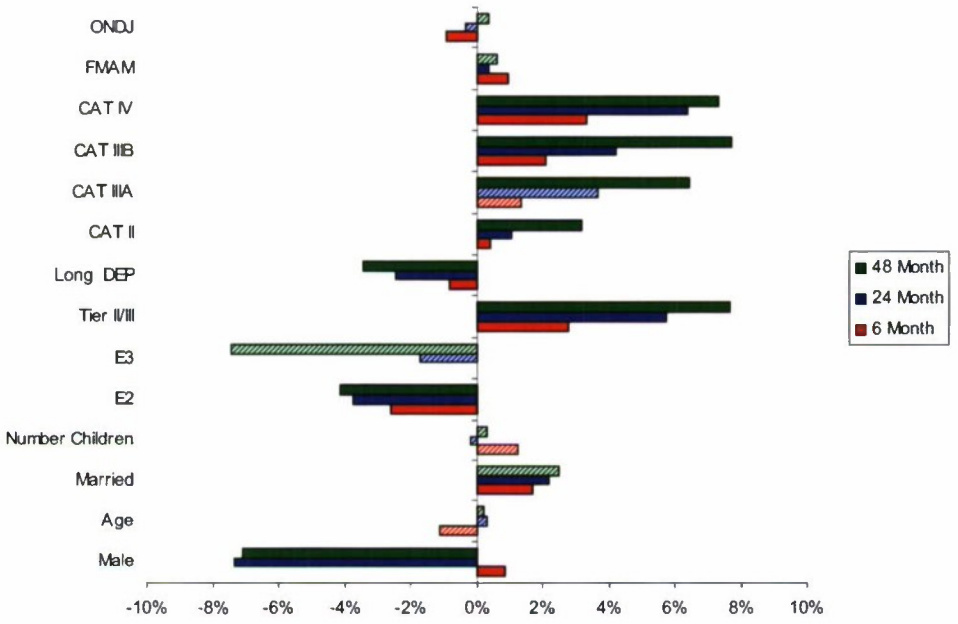
a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Marine Corps

We now turn to identifying the characteristics most correlated with attrition probability for those accessed into the Marine Corps with either a physical, dependents, drug/alcohol, or aptitude waiver. From FY99 to FY08, there were 42,056 USMC accessions with physical waivers. Figure 23 shows the effect of their demographic and military characteristics on attrition likelihood. We find that men with physical waivers are roughly 7 percentage points less likely to attrite by 24 and 48 months than women, and that having an initial paygrade of E2 (as opposed to E1) decreases all three attrition rates by 2 to 4 percentage points. There also are negative, although slightly smaller, effects on attrition from spending 3 or more months in DEP. We find that attrition rates are higher for those with lower AFQT scores and for those

in the Tier II/III education category. In this particular waiver group, gender, Tier II/III status, and AFQT score are the characteristics with the greatest marginal effect on attrition probability. These are thus the characteristics that the USMC could potentially use as an additional screening for those accessed with physical waivers.

Figure 23. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a physical waiver: Marine Corps[a]

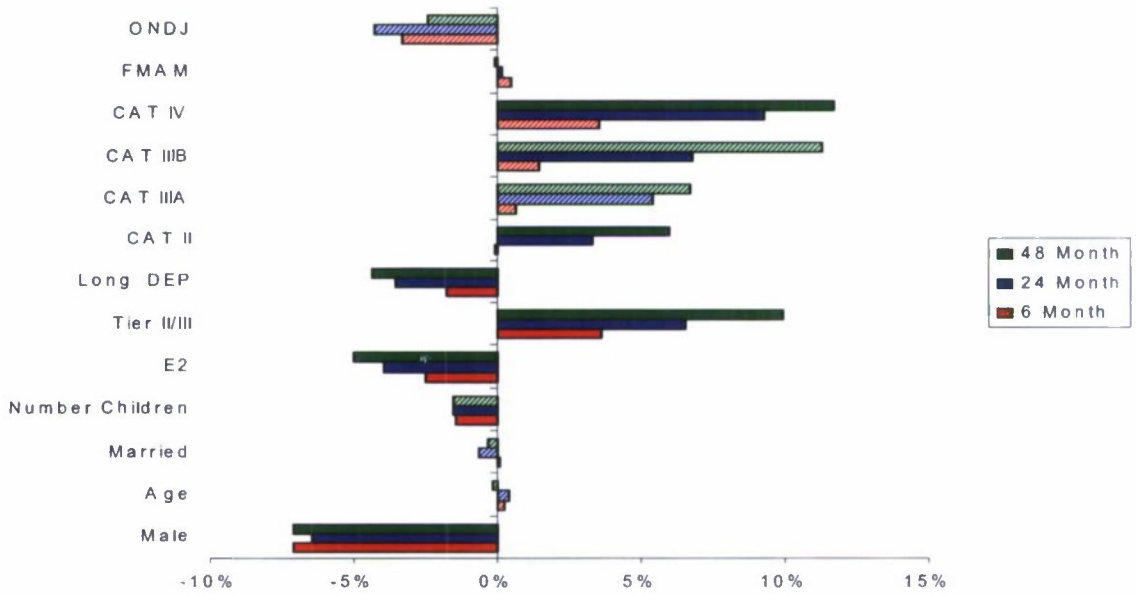


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Findings are similar for recruits with dependents waivers. Namely, as displayed in figure 24, they are less likely to attrite at all intervals if they are male, access at E2, or spend more than 3 months in DEP. In addition, Tier II/III recruits are significantly more likely to attrite. AFQT scores, however, appear to have inconsistent effects because not all categories are significant. In addition, having a lower AFQT score only increases the probability of attriting by 24 or 48 months in this population; there is no correlation between 6-month attrition and AFQT. Using AFQT as an additional screen for this population

should only be considered when aiming to reduce medium- and long-term attrition. Tier II/III status, gender, time in DEP, and paygrade at accession, however, are characteristics that have consistent effects on attrition probabilities at 6, 24, and 48 months. If the Marine Corps placed restrictions on these categories, or at least examined physically waived recruits with these characteristics with extra care, the attrition risk in this population could likely be reduced.

Figure 24. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a dependents waiver: Marine Corps[a]

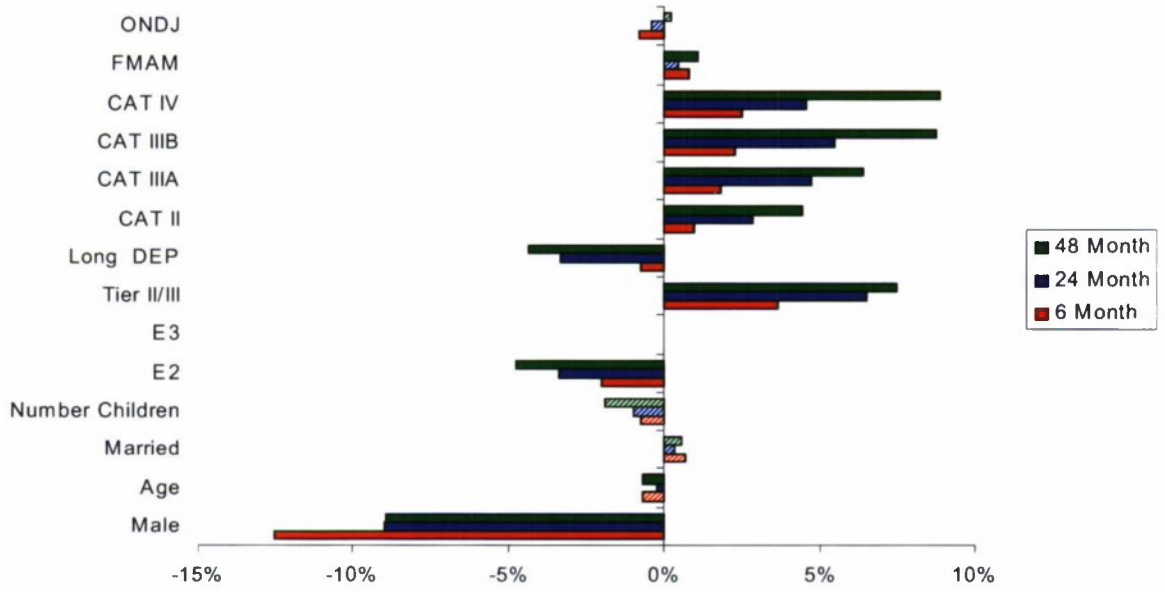


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

The same characteristics are found to be significant predictors of attrition in the population with drug/alcohol waivers. This is a sizable population in the Marine Corps, mainly because of its policy that admission to one-time marijuana use necessitates drug waivers. In our sample period, there are a total of 109,822 USMC accessions with a drug/alcohol waiver. As shown in figure 25, men are significantly less likely than women to attrite, as are those who access at E2 or spend 3 or more months in DEP. In addition, recruits in Tier II/III and whose

AFQT score falls in categories II through IV are *more* likely to attrite at all intervals. Any aims to reduce attrition risk in the USMC population of those with drug/alcohol waivers should focus on either restricting the number of accessions with these characteristics or carefully monitoring their behavior.

Figure 25. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a drug or alcohol waiver: Marine Corps[a]

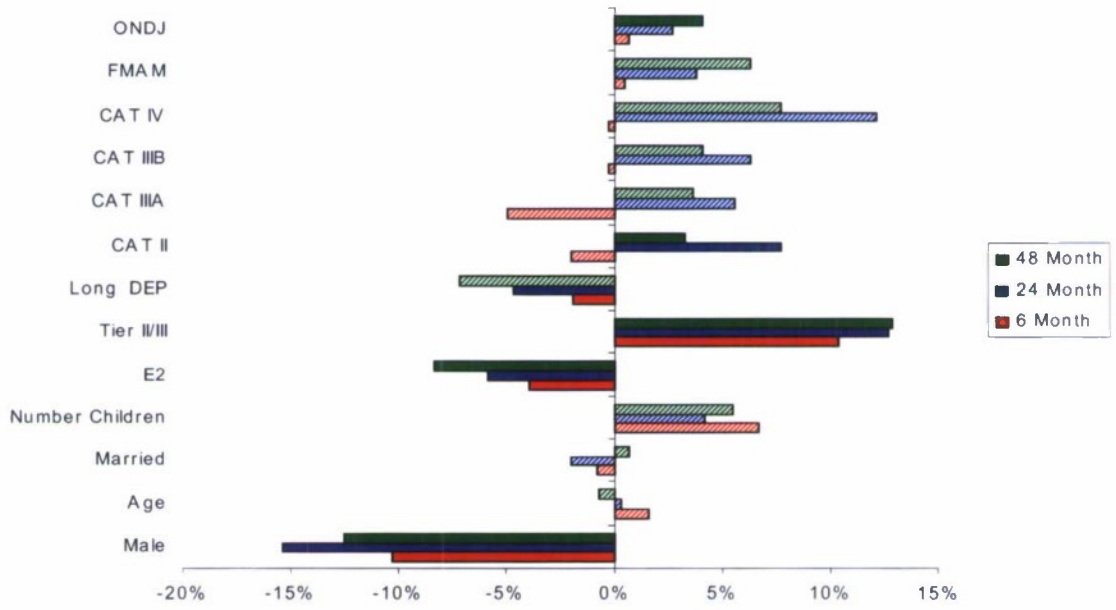


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

The final USMC waiver population we analyze is the group with aptitude waivers. It is a considerably smaller population—only 1,865 in our sample. Among them, we find that those who are male or access as E2s are significantly less likely to attrite at all intervals, and those who spend 3 or more months in DEP are less likely to attrite at 6 and 24 months (see figure 26). In addition, Tier II/III recruits attrite at significantly higher rates at all three intervals; being in this education group increases the probability of attrition by 10 to 13 percentage points.

In sum, for these four waiver categories in the Marine Corps, we have found that gender, paygrade at accession, time in DEP, Tier II/III status, and AFQT score are all significant predictors of attrition probabilities, with the size and significance of these effects varying by waiver type. In general, attrition is less likely for men, those with higher AFQT scores, those who access at a paygrade higher than E1, those in the Tier I education category, and those who spend a relatively longer time in DEP.

Figure 26. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* an aptitude waiver: Marine Corps[a]



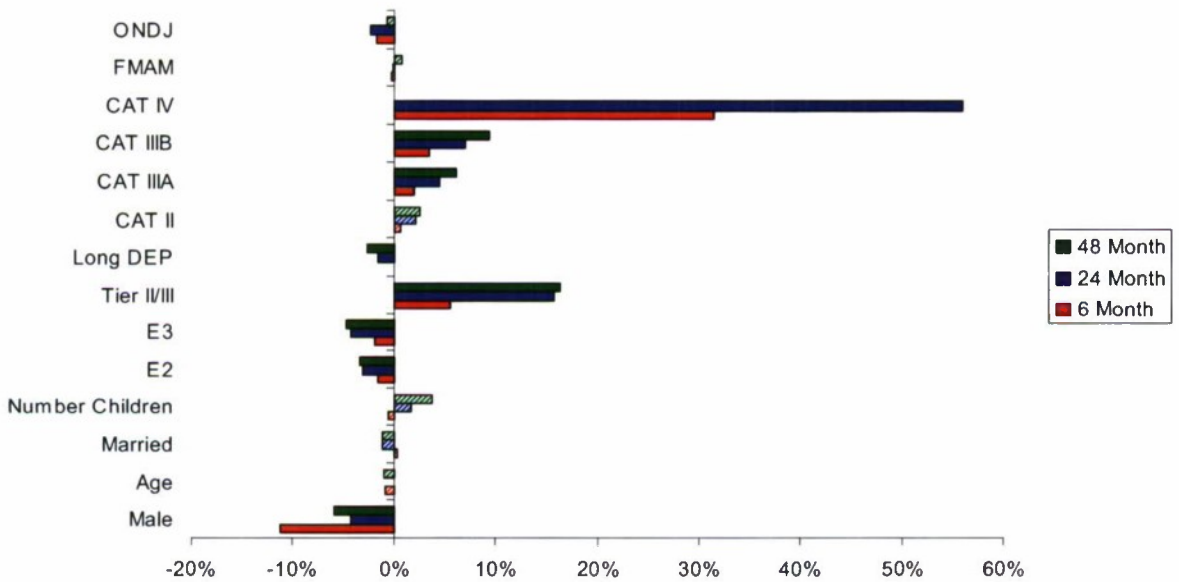
a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Air Force

Finally, we address the characteristics that the Air Force might potentially use to identify, in advance, those accessed with physical, aptitude, serious, or adult felony waivers who may have higher attrition risk. From FY99 to FY08, there were 14,066 USAF accessions with physical waivers. As shown in figure 27, those who were also Tier II/

III recruits and/or had low AFQT scores were more likely to attrite. There are sizable, positive effects from having an AFQT score under 30 (category IV) on 6- and 24-month attrition. Specifically, being in this AFQT category increases the probability of attriting by 6 or 24 months by 30 and 55 percentage points, respectively. In addition, men and those who access at paygrades E2 or E3 are less likely to attrite at all intervals. Limiting the number of recruits who require physical waivers *and* have an AFQT score under 30 would have significant effects on short- and medium-term attrition.

Figure 27. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a physical waiver: Air Force[a]

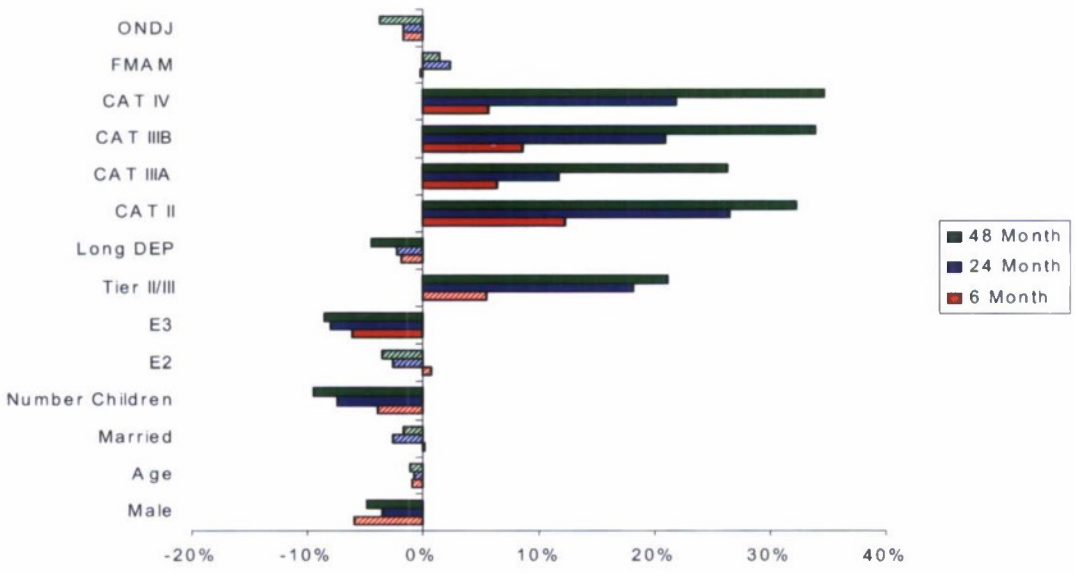


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

In the case of those with aptitude waivers (a significantly smaller population of 3,794), we find that AFQT and Tier II/III status are the strongest attrition predictors (see figure 28). It will likely be difficult, however, to make restrictions on the education tier and AFQT score required for those receiving aptitude waivers since these waivers are

given for failure to meet ASVAB requirements. Those whose ASVAB scores are below the necessary cutoff likely also have lower overall AFQT scores and may be in Tier II or III. Imposing AFQT and education tier restrictions on this population would likely eliminate most candidates. In addition to these variables, we also find that those who access as E3s are 7 to 10 percentage points less likely to attrite at all intervals, and men are 3 to 5 percentage points less likely to attrite in the medium and long term. Those with more children also are less likely to attrite at 24 and 48 months; each additional child decreases these attrition rates by 8 and 10 percentage points, respectively. Finally, those who spend 4 or more months in DEP are roughly 5 percentage points less likely to attrite by 48 months.

Figure 28. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* an aptitude waiver: Air Force[a]

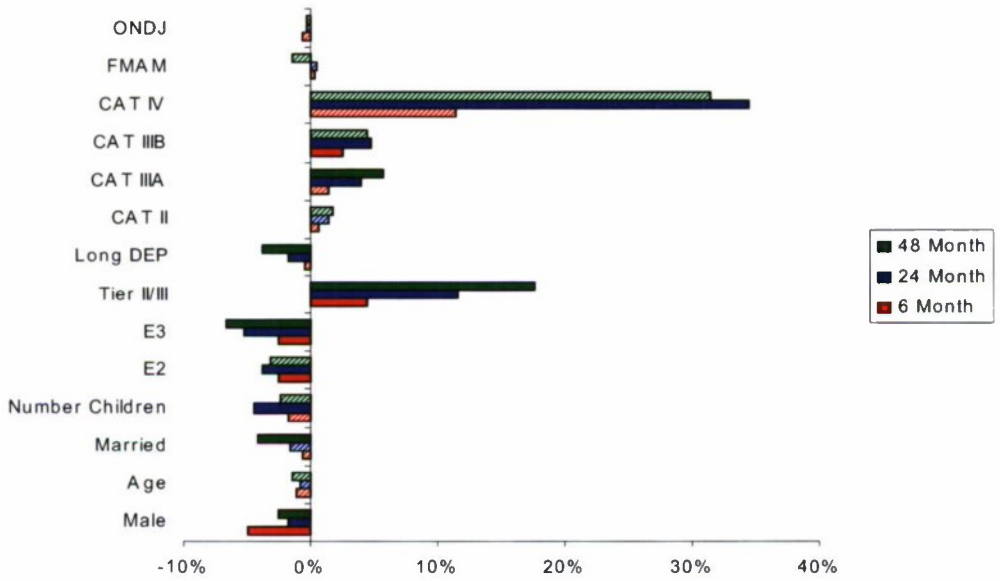


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

For those accessed into the Air Force with a serious waiver (a total of 12,458 in our sample), the most significant predictors of attrition are Tier II/III status and having an exceptionally low AFQT score (less

than 30), as shown in figure 29. The latter, however, only serves as a predictor of 24-month attrition; being in this AFQT category increases attrition probability by 34 percentage points. Other significant effects include accessing as an E2 or E3, being male, and spending more than 4 months in DEP, although not all are significant predictors of attrition at all intervals, and most effects are 5 percentage points or less. In this population, the Air Force would likely see a large decrease in attrition risk if restrictions were made on the number that could be Tier II/III and/or category IV recruits.

Figure 29. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* a serious waiver: Air Force[a]

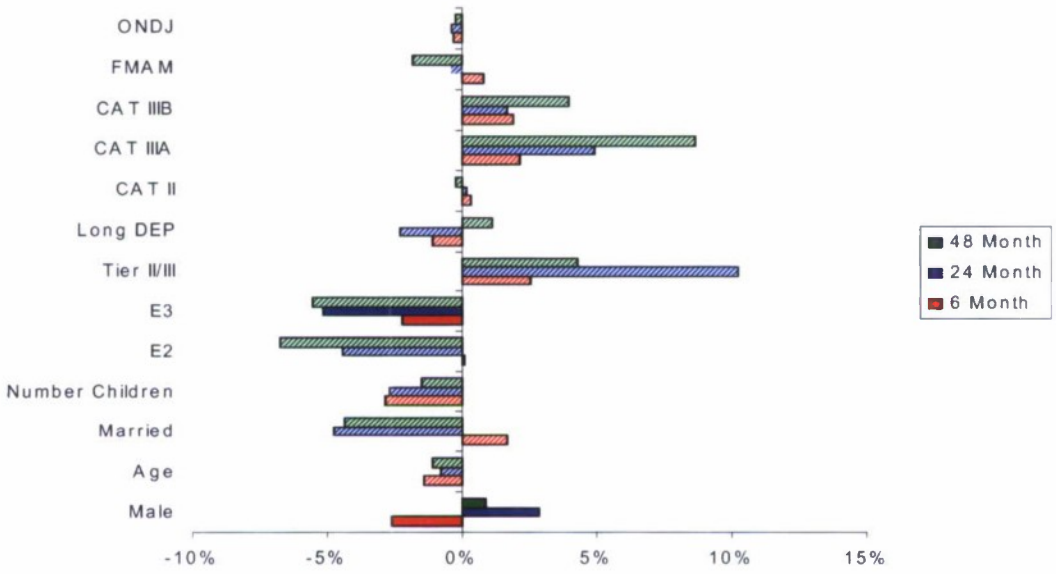


a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

The final USAF population we analyze is the group with adult felony waivers (2,957 from FY99 to FY08). As figure 30 shows, there are few significant attrition predictors in this group. This suggests that there is little that additional screening could do to decrease attrition risk. The only significant effects found are for gender (men are less likely to attrite by 6 months, but more likely by 24 and 48 months) and pay-

grade E3 at accession (lower 6- and 24-month attrition). The size of these effects is small—all 5 percentage points or lower.

Figure 30. Marginal effects of accession characteristics on 6-, 24-, and 48-month attrition, *given* an adult felony waiver: Air Force[a]



a. Hatch-marked bars denote statistical insignificance. All other findings are significant at the 5% level or better.

Overall, for all the waiver types discussed in this section, restricting waivered recruits to be Tier I or to have an AFQT score greater than 30 would reduce much of the attrition risk associated with these USAF recruits.

In the remaining sections, we compare the performance of waivered and nonwaivered recruits. Poor performance, in addition to attrition, is the other "risk" potentially imposed on the Services from accepting waivered recruits.

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Time to E5 promotion: waivered recruits vs. their nonwaivered counterparts

In this section, we compare the performance of waivered and nonwaivered recruits within each Service. Our principal metric is time in service before being promoted to E5. For each Service, we have selected a handful of occupations; for each occupation, we identify a Servicemember as being *fast to E5* if he or she is among the fastest 25 percent of promoters for the corresponding occupation-accession year cohort.[21]

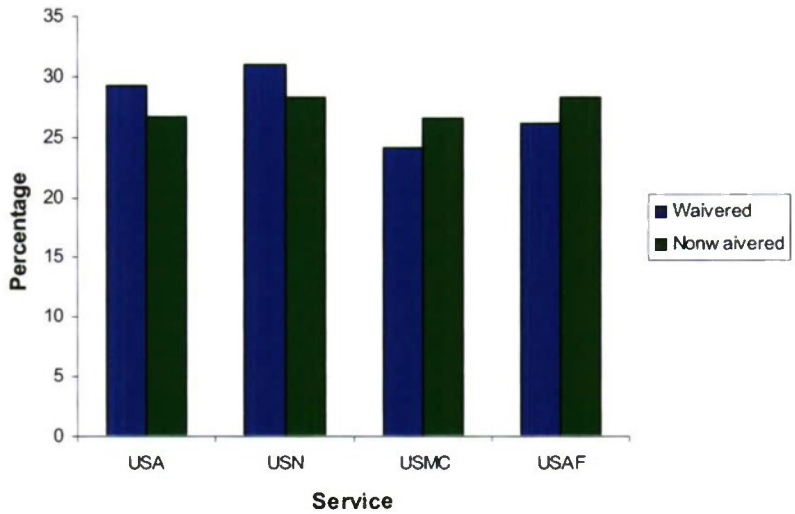
Because promotion rates are determined not only by a Servicemember's relative quality but also by the demand *for* and supply *of* personnel within that occupation at any point in time, we compare time to E5 only among those *within* an occupation-accession year cohort.[22] Looking at a select number of occupations within each Service, we identify each Servicemember as being either a "fast" or "not fast" promoter to E5. Here, we compare the percentage of Servicemembers within the waivered and nonwaivered populations who are fast promoters. As figure 31 shows, there are differences across the Services as to whether fast promotions to E5 are more common in the waivered or nonwaivered populations. In both the Army and the Navy, for example, waivered recruits are more likely to promote fast to E5 than their nonwaivered counterparts; the converse is true in the Marine Corps and the Air Force.

In addition, we find that there are significant differences in the likelihood that a Servicemember is a fast promoter depending on the type of waiver received. We summarize these findings, for each Ser-

21. The methodology used in this section was first adopted in [17]. A more in-depth discussion is available there.

22. See appendix D for a list of included occupations.

Figure 31. Percentage of Servicemembers who promote "fast" to E5, by Service and waiver status (FY99-FY05 accessions)



vice and waiver type, in table 5. In this table, a plus sign reveals that Servicemembers in that group were *more* likely to promote *fast* to E5 than their nonwaivered counterparts; the converse is true for a minus sign.

Table 5. Summarized "fast to E5" results, by Service and waiver type[a]

	Army	Navy	Marine Corps	Air Force
Waiver	+	+	-	-
Dependents waiver	+	+	+	+
Aptitude waiver	-	Insignificant	-	-
Medical waiver	Insignificant	+	-	Insignificant
Drug/Alcohol waiver	Insignificant	+	Insignificant	Insignificant
DAT waiver	Insignificant	Insignificant	-	Insignificant
Adult felony waiver	+	Insignificant	Insignificant	Insignificant
Juvenile felony waiver	Insignificant	Insignificant	Insignificant	Insignificant
Serious waiver	+	+	Insignificant	Insignificant
Minor waiver	Insignificant	+	+	-
Other waiver	+	-	-	+
Education waiver	N/A	-	N/A	N/A
Tier II/III	-	-	-	Insignificant

a. See figures 50 and 51 in appendix D for more information on the relative size of these effects.

As illustrated, Army and Navy waivered recruits (as a whole) are *more* likely to promote quickly to E5 than their nonwaivered counterparts, suggesting that they are, in fact, better performers. Conversely, recruits accessed with a waiver are *less* likely to promote fast to E5 in the Air Force and Marine Corps. There is, once again, significant variation in performance by waiver *type*. In the Army, for example, those accessed with aptitude waivers have the slowest promotion rates, while those accessed with a dependents, adult felony, serious, or other waiver are among the fastest, and are in fact faster promoters than those without waivers. In the Navy, those with a dependents, medical, drug/alcohol, serious, or minor waiver are more likely to promote faster to E5 than their nonwaivered counterparts. In addition, there are *no* waiver groups in the Navy that are less likely, on average, to be fast promoters than the no waiver group. Although the Navy waivered group as a whole promotes more slowly than the nonwaivered group, when we differentiate by waiver type, there are no groups with statistically significantly slower promoters. In the Air Force, those with a dependents or other waiver are significantly faster promoters than the no-waiver group, while those with aptitude or minor waivers promote more slowly. And finally, in the Marine Corps, those accessed with a dependents or minor waiver tend to promote more quickly, while those accessed with an aptitude, medical, DAT, or other waiver are among the slower promoters. Across *all* Services, those with dependents waivers appear to be among the least risky accessions (in the sense that they are not among the poorest performers), while those with aptitude waivers (for all Services except the Navy) are among the slowest promoters and hence are recruits of lower quality and higher risk.

Contrary to public perception, we do not find indisputable evidence that waivered recruits are slower promoters and hence poorer performers across the Services. With the exception of the USMC, those without waivers do not appear among the five fastest promoting categories in each Service. When separating the populations by waiver status, as we have done earlier, those without waivers are, in no cases, among the Services' top performers (as measured by time to E5 promotion). This reveals that many waivered recruits become high-quality Servicemembers and may therefore not be the Services' greatest accession "risks." Tier II/III recruits are among the least likely to

be fast promoters in the Army, Navy, and Air Force. The percentage of Tier II/III recruits in the Navy who promote quickly to E5 is lower than that of all waiver types, indicating that Tier II/III recruits in the Navy are of lower quality than waivered recruits. In the Army and the Air Force, only those with an aptitude waiver are less likely to promote quickly to E5. Finally, in the Marine Corps, Tier II/III recruits are more likely than those in a number of waiver groups to promote fast to E5. This suggests that those accessed, for example, with an aptitude, medical, DAT, or other waiver are lower quality recruits, and therefore a greater "risk" to the Marine Corps, than the Tier II/III recruits.

Policy recommendations

Based on our study of the characteristics, attrition behavior, and overall performance of waivered recruits in each of the Services, we offer several policy recommendations. These should help the Services to first identify and then minimize the "riskiness" of waivered recruits.

Identify objectives and determine the most relevant risks

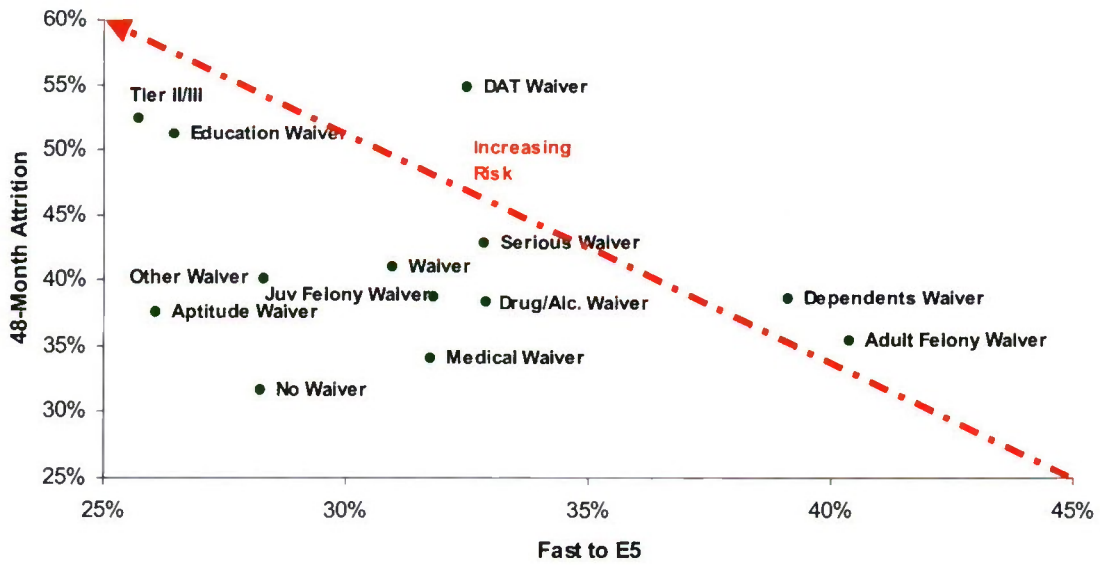
All Services must first identify their expectations for waivered recruits: are they an extra source of labor only to be relied on when recruits who don't need waivers are unavailable? That is, are waivers a policy response to labor shortages? And, if so, what is the most important goal for this group? Is it that they complete their first terms? Is it that a particular number of them reenlist? By identifying such goals and expectations, the Services can more easily identify *which* metrics are most important in assessing the performance and risk of the waivered population. If, for example, waivered recruits are not, on average, expected to become careerists, time to E5 promotion may not be the most appropriate measure of whether the Services achieve a sufficient return on these investments.

In cases where there are two overall objectives (such as minimizing 48-month attrition and increasing the number of fast promoters), we recommend that the Services conceptualize these tradeoffs using a type of grid analysis. In figures 32 through 35, we present a technique for comparing the "risk" associated with each waiver group. In these examples, risk is measured by a high likelihood of 48-month attrition and a low probability of being a *fast* promoter to E5. With "fast to E5" on the x-axis and "48-month attrition" on the y-axis, risk is highest in the upper left quadrant of the figures (this is where those waiver groups with high attrition probability and low promotion speed are clustered). In addition to the waiver groups, we include the Tier II/III population.

Figure 32. Army risk tradeoff: 48-month attrition vs. fast to E5[a]

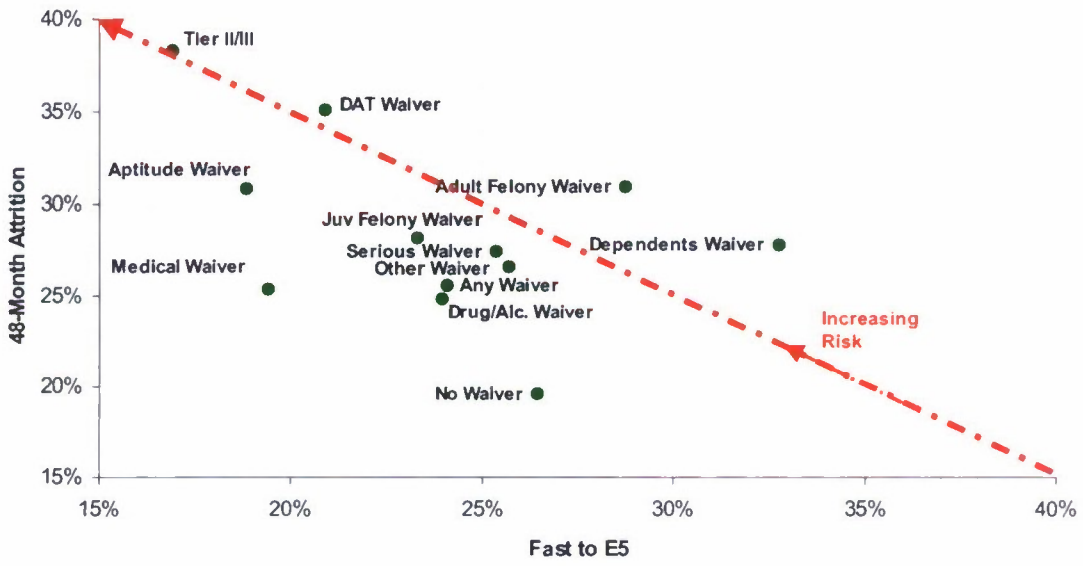
a. The origin of this graph is *not* (0,0).

Figure 33. Navy risk tradeoff: 48-month attrition vs. fast to E5[a]



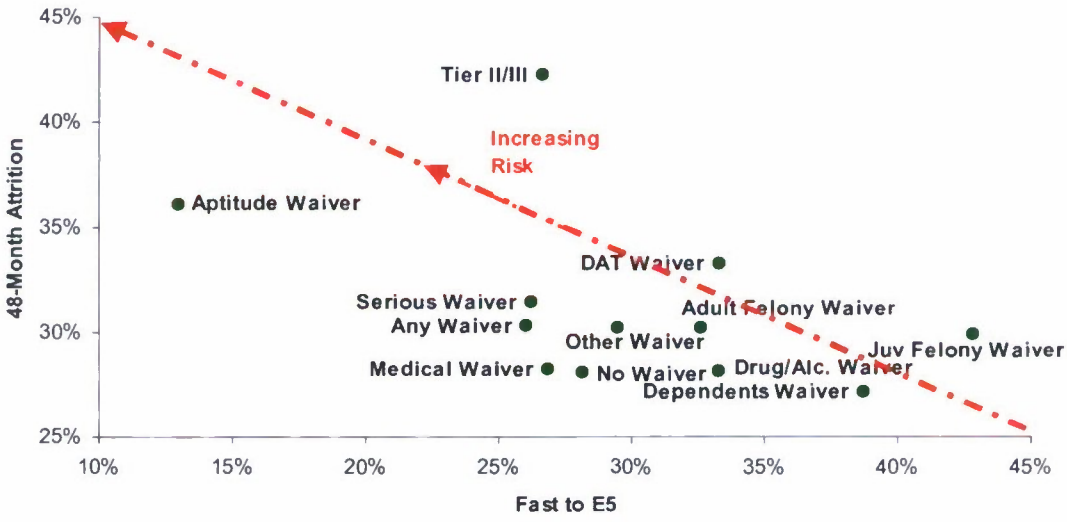
a. The origin of this graph is *not* (0,0).

Figure 34. Marine Corps risk tradeoff: 48-month attrition vs. fast to E5[a]



a. The origin of this graph is *not* (0,0).

Figure 35. Air Force risk tradeoff: 48-month attrition vs. fast to E5[a]



a. The origin of this graph is *not* (0,0).

Using these two metrics to define risk, we find that the "riskiest" waiver groups in each of the Services are as shown in table 6.

Table 6. Waiver groups with relatively high 48-month attrition risk and low probability of promoting "fast to E5", by Service

Army	Navy	Marine Corps	Air Force
Aptitude waiver	Tier II/III	Tier II/III	Tier II/III
Tier II/III	Education waiver	DAT waiver	Aptitude waiver
Drug/alcohol waiver	DAT waiver	Aptitude waiver	
DAT waiver			

As noted above, it is essential for each Service to determine its goals and expectations for the waivered population and thus to determine the most appropriate "risk" measures. These figures are meant to provide a framework and examples that the Services can use to identify especially risky categories of waivered recruits. We are *not* suggesting that a tradeoff between promotion time to E5 and 48-month attrition is most appropriate for each Service.

Minimize risks

Eliminate the use of DAT waivers

Using a variety of performance metrics, we consistently find that recruits who access with DAT waivers are among the riskiest accessions in the Army, Navy, and Marine Corps.[23] In addition, we find that DAT-waived Marines are at greater risk of bad behavior (misconduct separations, demotions, courts-martial, and NJPs) and are less likely to receive awards or be recommended and eligible for reenlistment. Similarly, we find that DAT-waived Sailors are at greater risk of demotion by 48 months than their nonwaivered counterparts. We therefore recommend that the Army follow the lead of the Air Force, Navy,

23. The Air Force assessed only 13 recruits with DAT waivers during the sample period.

and Marine Corps and discontinue use of DAT waivers.[24] The Army has granted roughly 1,000 DAT waivers in recent years.

Consider providing commanders of recently accessed Servicemembers with waiver information

Anecdotal conversations with military officers suggest that commanders currently do not know the waiver status of their personnel. According to OSD-Accession Policy, however, waiver codes are part of the official personnel record, although most commanders do not know they are there. In addition, determining the type and level of waiver requires investing a great deal of time and energy because there is no associated table that defines waiver codes. We suggest providing commanders with waiver information that is easier to understand and ensuring that commanders know that this information is available.

Doing so would allow commanders to give waivered recruits extra guidance and leadership. As was revealed in previous sections, many waivered recruits share unobservable, behavioral characteristics that make them more likely to attrite. Increased guidance and encouragement could potentially change this behavior. A number of report findings reveal that many waivered recruits who do not attrite become above-average performers. More specifically, waivered Marines are *more* likely to promote meritoriously than their nonwaivered counterparts, and waivered Soldiers and Sailors are more likely than their respective nonwaivered equivalents to promote *fast* to E5. This suggests that exposure to directed leadership, discipline, and other aspects of the military lifestyle may improve the behavior of waivered recruits who are retained. Any efforts that can *decrease* the probability of early attrition for these recruits will *increase* the probability that such positive behavioral changes will occur.

More carefully screen those with "risky" waiver combinations

Our analysis examined whether recruits who access with more than one waiver are particularly *risky* recruits, and whether certain waiver combinations matter more than others for performance and attri-

24. This was a relatively recent change in the Marine Corps. It stopped accepting recruits who required a DAT waiver in the middle of FY09.

tion. We evaluated the ten most common waiver pairs in each Service and identified those combinations that are most problematic, as well as those that do not inherently impose more risk (see table 7).

Table 7. Waiver combinations with higher and lower risk

Army	Navy	Marine Corps	Air Force
Higher risk pairs			
DAT & serious	Serious & education	Drug/alcohol & physical	Medical & aptitude
	Other & education	Drug/alcohol & DAT	
		Physical & serious	
		Dependents & drug/alcohol	
Lower risk pairs			
Medical & serious	Dependents & serious		Adult felony & serious

If the Services agree with our definition of riskiness as slow promoters and likely attriters, we recommend more careful screening of recruits accessed with the waiver combinations identified in the upper portion of table 7. If the Services think that the riskiness of waivered recruits should be defined differently, we suggest that they conduct similar analysis, identify which waiver combinations are the most problematic, and minimize the number of recruits who require these combinations or more carefully screen them.

Regularly identify those waiver populations with additional screening potential

Waiver groups with a small or insignificant marginal effect on attrition probability *and* a relatively high average attrition rate offer the greatest screening potential. Specifically, these are the groups where observable characteristics, as opposed to behavioral characteristics, drive the attrition rate. Although behavioral tendencies are difficult to identify, such characteristics as AFQT score, trimester of accession, education tier, paygrade at accession, marital status, and the number of dependents are known at the time of accession. We recognize that the Services will not likely be able to screen on marital status or the number of dependents, but AFQT scores, accession trimester, education tier, and paygrade at accession are all characteristics on which the Services could screen and potentially restrict the number of acces-

sions with *both* a waiver *and* a particular characteristic. We conducted this analysis for only a few waiver groups within each Service, particularly those with small or insignificant marginal effects on attrition. The waiver types included in this analysis are listed in table 8.

Table 8. Waiver types included in *minimizing attrition risk* analysis

Army	Navy	Marine Corps	Air Force
Physical	Physical	Physical	Physical
Dependents	Adult felony	Dependents	Adult felony
DAT	Juvenile felony	Drug/alcohol	Serious
Aptitude	Aptitude	Aptitude	Aptitude

Table 9 summarizes the findings from this analysis, in which we identify the demographic and military characteristics that are most correlated with attrition risk for each Service. If the Services were to place additional emphasis on screening the waivered population or to apply different requirements to this group, these are the characteristics on which they should focus their efforts.

Table 9. Characteristics that are correlated, on average, with a lower attrition risk (for the waiver types considered)

Army	Navy[a]	Marine Corps	Air Force
Male	Male	Male	Higher AFQT scores
Higher AFQT scores	Tier I	Higher AFQT scores	Tier I
Paygrade of E2 or greater at accession	Paygrade of E2 or greater at accession	Paygrade of E2 or greater at accession	
Long time in DEP		Long time in DEP	
		Tier I	

a. For the Navy, we find significant variation by waiver type. Men, for example, are less likely to attrite only in the physical waiver population, while Tier II/III status is a significant predictor for all but the juvenile felony waiver group. This suggests that any screening decisions for the Navy should be made with great care; screening techniques will vary with the overall objective.

A way to reduce the size of the waivered population

It appears, based on the geographic distributions of waivered and nonwaivered recruits, that certain areas of the country are simply more challenging recruiting terrain. That is, propensity to serve and qualifications vary significantly from state to state, and thus from one recruiting district to another. *If*, and only *if*, the Services aim to reduce the size of the waivered population, it may be worth considering shifting recruiting missions from the "waiver overrepresented" areas to the "waiver underrepresented" areas. These findings are repeated in table 10.

Table 10. Geographic distribution of waivered recruits, relative to the nonwaivered population

	USA	USAF	USN	USMC	Consistent findings
West South Central	+	+	-	+	
West North Central	+	+	-	+	
South Atlantic	-	-	+	-	
Pacific	-	-	-	-	Less likely from Pacific
New England	-	-	+	+	
Mountain	+	+	-	+	
Mid-Atlantic	-	-	-	-	Less likely from Mid-Atlantic
East South Central	-	-	+	-	
East North Central	+	+	+	+	More likely from East North Central
Non-U.S.	-	+	-	-	

It is possible that a sufficient number of quality recruits with an interest in military service may not exist in some parts of the country. To the extent that any of the Services have as a primary goal a reduction in the size of the waivered population, it may be worth evaluating the geographic distribution of recruiting missions, and whether they could be updated to reflect the demographic and population changes that have occurred. We recognize that demographic characteristics of regional populations may change frequently (e.g., as a result of broader economic conditions), and, if so, constant adjustments of missions to reflect these changes would be unwarranted and unrealistic. In addition, we understand that the Services recruit based on the "whole recruit" concept and therefore take a number of char-

acteristics into consideration—waiver status being only one of them. We therefore are not suggesting that a realignment of recruiting missions and the potential decrease in the number of waivered recruits will necessarily improve the overall quality of the Services' personnel. With these caveats in mind, we suggest that a historical evaluation of how recruiting missions have aligned with the recruitable U.S. population may indicate that the size of the waivered population could be reduced if recruiting missions were redefined.

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Conclusion

In this paper, we compared the characteristics, performance, and attrition risk of waivered and nonwaivered recruits in each of the Services. Waiver policies varied greatly among the Services through FY08, restricting our ability to make cross-Service comparisons. As a result, our analysis has been segmented into two distinct parts: an FY99–FY08 intra-Service analysis (included in this report) and an inter-Service analysis for FY09–FY10 accessions (in a later report). Our analytical aim in this paper was twofold:

1. Identify the demographic and military characteristics of waivered recruits, in an effort to better define the waivered population within each Service and understand how it differs from the nonwaivered population.
2. Compare the performance of waivered and nonwaivered recruits within each Service, as measured by attrition risk and speed of promotion to E5.

These analyses allowed us to identify, within each Service, the types of waivered recruits that impose the greatest *risk*, although these findings are largely dependent on how the Services define such risk.

Our demographic results suggest that waivered recruits, in *all* of the Services, are more likely than their nonwaivered counterparts to be male, older, and Tier II (or holders of nontraditional high school degrees). In addition, the waivered population has a greater proportion of whites, and a correspondingly smaller proportion of minorities, and is more likely to be married. We also compare military characteristics at accession and find that waivered recruits, on average, spend less time in DEP than their nonwaivered counterparts (highly correlated with the fact that waivered recruits tend to be direct ships) and, with the exception of the Air Force, tend to access at lower paygrades. Finally, we evaluated whether waivered recruits were particularly likely to come from certain areas of the country and

found that, when comparing the home of record for the waivered and the nonwaivered, the East North Central region is *overrepresented* (more waivered recruits come from this region than expected), while the Pacific and Mid-Atlantic regions are *underrepresented*. These findings highlight the variation in recruiting difficulty throughout the country, likely due to differences in both recruitability and propensity to serve from one region to another. Our demographic analysis informed the estimation strategy we used to evaluate the relative attrition risk and performance of the waivered population.

We conducted a comprehensive analysis of the attrition risk of waivered recruits in each Service. First, we compared average attrition rates across waiver types and found that, in most cases, attrition rates were lower in the waivered population than in the population of Tier II/III recruits, suggesting that they are, in fact, not the riskiest accessions. We then identified *which* waiver groups have the highest inherent attrition risk, after controlling for a variety of demographic and military characteristics. These findings showed us which waiver groups, within each Service, have higher risk based on behavioral and unobservable characteristics—characteristics that the Services have little power to influence. In the Army, Navy, and Marine Corps, those accessed with a DAT waiver were the most likely to attrite, independent of their demographic and military characteristics. In addition, our analysis of those with *multiple* waivers revealed particular combinations with high attrition risk and few fast promoters for each Service. Finally, combining these results, we chose a few waiver groups within each Service with low or insignificant behavioral effects on attrition, and identified the characteristics that serve as significant attrition predictors, which the Services could therefore use as an additional screen if they aim to reduce attrition within these populations. All of these findings are highly Service specific and vary depending on whether the aim is to reduce 6-, 24-, or 48-month attrition.

Finally, we evaluated the performance of waivered recruits relative to nonwaivered recruits. Using time to E5 promotion as our principal metric, we compared the prevalence of "fast" promoters in a select number of occupational specialties for each Service and then compared this with the nonwaivered population. With the exception of the Marine Corps, nonwaivered recruits do not appear among the

five fastest promoting categories in each Service. That is, when separating the populations by waiver type, those without waivers are, in no cases, among the Services' top performers, as measured by time to E5 promotion. This reveals that many waivered recruits become high-quality Servicemembers and therefore may not be the Services' greatest accession "risks."

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Appendix A: Demographic characteristics of waivered and nonwaivered populations, by Service

Table 11. Mean demographic characteristics of waivered and nonwaivered recruits, by Service (FY99–FY08)[a]

	US Army		US Navy		US Marine Corps		US Air Force	
	Waivered	Nonwaivered	Waivered	Nonwaivered	Waivered	Nonwaivered	Waivered	Nonwaivered
Male	86%	81%	87%	80%	93%	93%	81%	75%
Married	20%	14%	10%	3%	4%	2%	17%	9%
Number of Dependents	0.32	0.15	0.14	0.03	0.04	0.00	0.09	0.02
Tier III	4%	7%	6%	1%	0%	0%	0%	0%
Tier II	19%	15%	10%	2%	3%	2%	2%	1%
Traditional HSDG	64%	68%	73%	89%	92%	94%	94%	95%
Nontraditional HSDG	6%	4%	7%	5%	4%	3%	1%	1%
HSDG with College	7%	5%	3%	3%	1%	1%	3%	3%
Age	21.99	20.34	20.70	19.63	19.52	18.87	20.52	19.59
E1 at accession	55%	55%	59%	57%	78%	72%	74%	76%
E2 at accession	24%	24%	22%	22%	22%	28%	9%	9%
E3 at accession	15%	17%	19%	21%	0%	0%	16%	15%
E4 at accession	5%	4%	0%	0%	0%	0%	0%	0%
AFQT	60.55	58.81	62.65	59.60	58.34	60.79	63.66	65.00
Months in DEP	1.91	2.89	3.89	5.22	4.23	5.64	4.04	4.92
ENcentral	17%	13%	15%	13%	17%	14%	15%	14%
EScentral	6%	6%	6%	6%	6%	5%	6%	7%
Midatlantic	10%	10%	9%	12%	11%	12%	9%	10%
Mountain	8%	8%	9%	7%	7%	7%	9%	7%
NewEng	3%	3%	3%	2%	5%	4%	3%	3%
NonUSer	1%	2%	0%	1%	0%	0%	1%	1%
Pacific	12%	15%	16%	18%	14%	17%	13%	15%
SAtlantic	21%	22%	20%	20%	20%	18%	20%	22%
WNCentral	7%	6%	6%	6%	6%	7%	9%	7%
WSCentral	15%	15%	15%	15%	13%	15%	16%	15%
White	70%	63%	63%	54%	70%	68%	72%	69%
Black	14%	17%	15%	20%	10%	10%	14%	16%
Hispanic	9%	12%	12%	15%	15%	16%	9%	9%
Asian	2%	2%	3%	4%	2%	2%	3%	3%
Native American	1%	1%	5%	4%	1%	1%	1%	1%
Other Race	0%	0%	1%	1%	0%	1%	1%	1%
Unknown Race	4%	4%	1%	2%	2%	2%	1%	2%
Number of Accessions	111,979	532,133	119,821	276,396	175,513	141,343	42,185	257,959

a. Red text indicates that waivered and nonwaivered recruits in that Service do not differ significantly in terms of that characteristic. All other findings are statistically significant at the 10-percent level or better.

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Appendix B: Geographic distributions of waivered and nonwaivered recruits

In this appendix, we examine whether waivered recruits are more or less likely than nonwaivered recruits to come from particular regions of the country. Using the ten geographic areas identified by the U.S. Census (see figure 40), we begin by noting the percentage of nonwaivered recruits that come from each region.

Figure 36. U.S. Census map

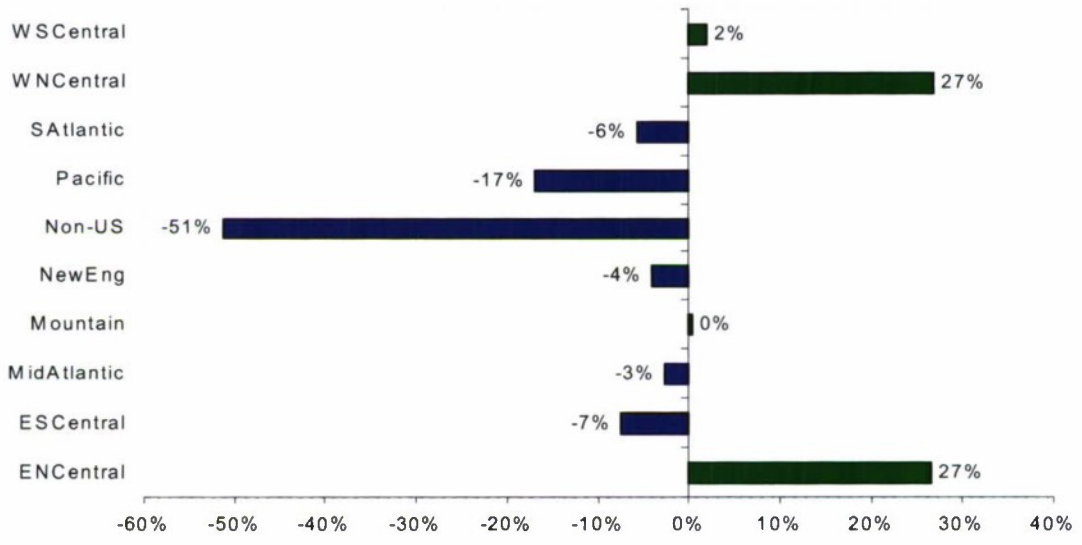
If there is no difference in the geographic distribution for the two groups, waivered recruits should access from the ten regions in similar proportions as nonwaivered recruits. Thus, multiplying the total number of U.S.-wide waivered recruits by the percentage expected to come from a particular region yields the number of waivered recruits expected to access from that area. For example, the expected number of waivered recruits from the Northeast (NE) region, is calculated as:

Expected number of waivered recruits from Northeast region =

[Percent of nonwaivered recruits from NE]*[total number of waivered recruits (US-wide)]

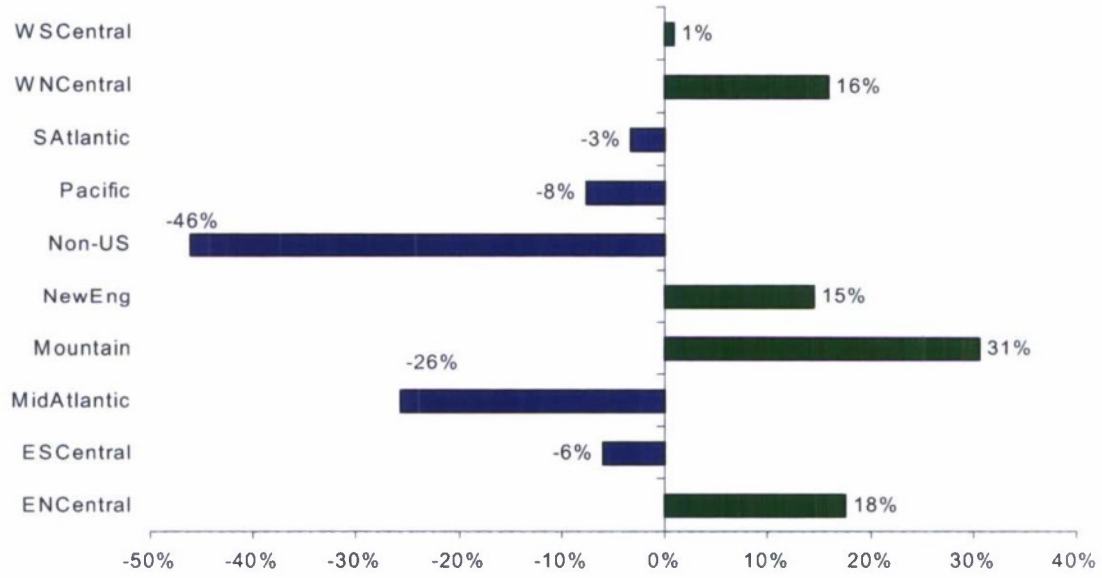
This is based, of course, on the underlying assumption that waivered and nonwaivered recruits are distributed evenly across the United States. A statistically significant deviation in the *actual* number of waivered recruits coming from a region from the *expected* number will reveal that the waivered population is either overrepresented or underrepresented in that region. Figures 41 through 44 show the size and significance of these deviations by region for each Service. Table 16 summarizes these findings.

Figure 37. Percentage differences between observed and expected numbers of USA waivered recruits by geographic origin[a]



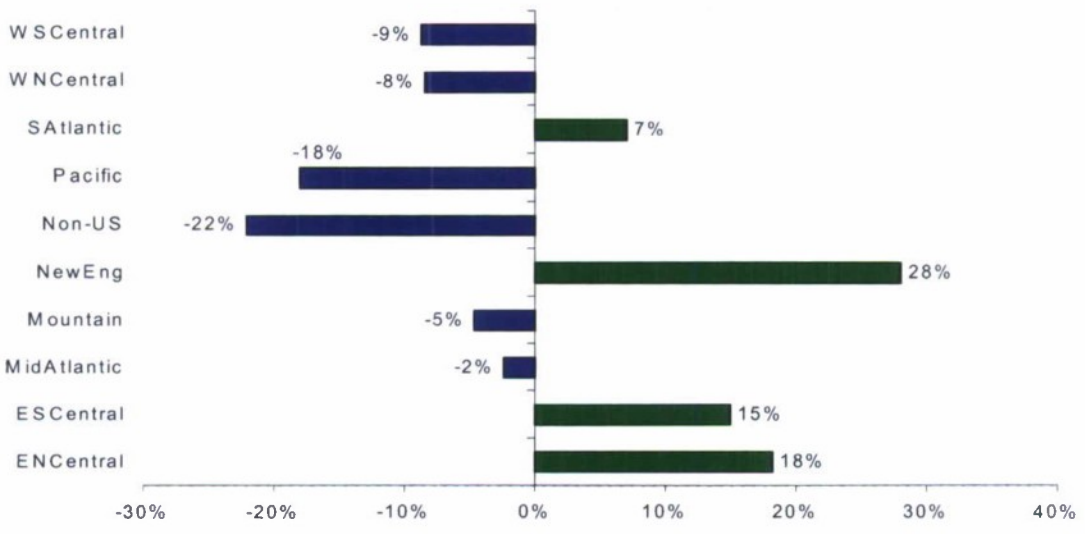
a. Bars to the right of zero indicate that *more* waivered recruits than expected came from that region of the country. The converse is true for bars to the left of zero.

Figure 38. Percentage differences between observed and expected numbers of USN waivered recruits by geographic origin[a]



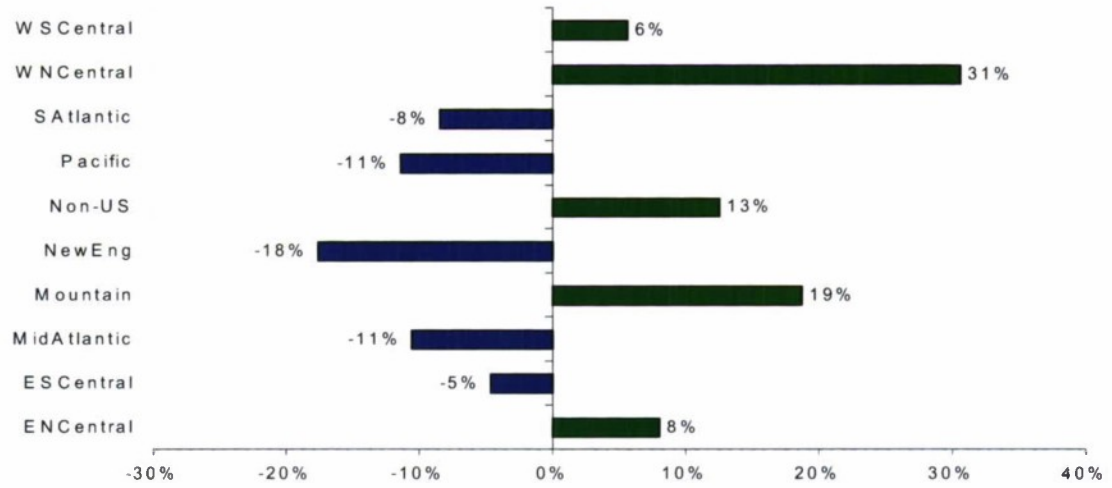
a. Bars to the right of zero indicate that *more* waivered recruits than expected came from that region of the country. The converse is true for bars to the left of zero.

Figure 39. Differences between observed and expected numbers of USMC waivered recruits by geographic origin[a]



a. Bars to the right of zero indicate that *more* waivered recruits than expected came from that region of the country. The converse is true for bars to the left of zero.

Figure 40. Differences between observed and expected numbers of USAF waivered recruits by geographic origin[a]



a. Bars to the right of zero indicate that *more* waivered recruits than expected came from that region of the country. The converse is true for bars to the left of zero.

Table 12. Geographic distribution of waivered recruits, relative to nonwaivered recruits

	USA	USAF	USN	USMC	Consistent findings
West South Central	+	+	-	+	
West North Central	+	+	-	+	
South Atlantic	-	-	+	-	
Pacific	-	-	-	-	Less likely from Pacific
New England	-	-	+	+	
Mountain	+	+	-	+	
Mid-Atlantic	-	-	-	-	Less likely from Mid-Atlantic
East South Central	-	-	+	-	
East North Central	+	+	+	+	More likely from East North Central
Non-U.S.	-	+	-	-	

It appears, based on the geographic distributions of waivered and nonwaivered recruits, that certain areas of the country are simply more challenging recruiting terrain. That is, propensity to serve and qualifications vary significantly from state to state and, thus, from one recruiting district to another. *If* the Services aim to reduce the size of

the waivered population, they may consider shifting recruiting missions from waiver-overrepresented areas to waiver-underrepresented areas. That may present significant challenges, however, since frequently changing economic conditions are likely to change their relative distributions over time.

It is possible that a sufficient number of quality recruits with an interest in military service may not exist in some parts of the country. It is important that recruiting missions be updated sufficiently frequently to reflect demographic and population changes that occur.

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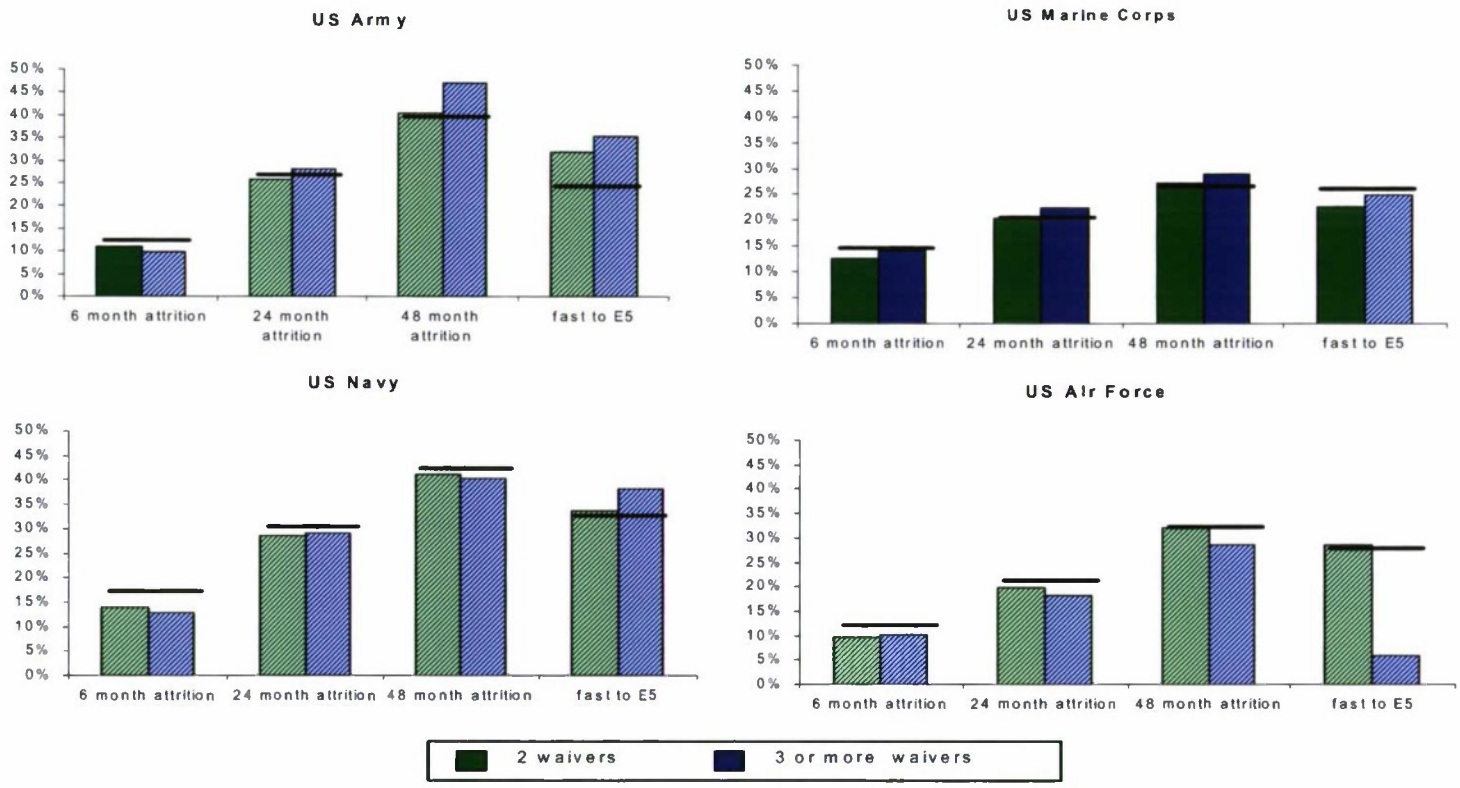
Appendix C: Analysis of those with multiple waivers

Comparing populations

In this appendix, we evaluate whether those with multiple waivers are more likely to be either a greater attrition risk or a poorer performer than those who access with only one waiver. We begin by comparing the average attrition rates at 6, 24, and 48 months among those who access with one, two, or three or more waivers. We exclude those without waivers from this analysis because the ultimate objective is to evaluate if recruits accessed with more than one waiver behave differently from those accessed with *only one* waiver. The group of those with one waiver is therefore the relevant comparison population.

As displayed in figure 45, we find only a few significant differences in these average "performance metrics," depending on the number of waivers that a recruit required. The horizontal, black bars in this figure represent the average for the one-waiver population. In the Army, we find that those with two waivers are less likely to attrite by 6 months than those with only one waiver. In addition, in the Marine Corps, we find that the two-waiver population has higher attrition at 6, 24, and 48 months, *and* is more likely to promote "fast to E5" than the one-waiver population. In the Navy and Air Force, we find no significant differences at the aggregate level (before taking the *type* of waivers into account) in attrition rates or E5 promotion rates between the multiple-waiver and single-waiver populations.

Figure 41. Performance metrics of multiple- vs. single-waver populations[a]



a. Horizontal black lines represent control group averages. That is, these are the average attrition rates and likelihood of being fast to E5 for the group with *one* waiver. Hatch-marked bars denote statistical insignificance. All other findings are significantly different from the one-waiver population at 5% level or better.

Do particular waiver combinations result in higher risk?

To determine if certain waiver combinations are more likely to lead to attrition or poorer performance (and thus to highlight any combinations that the Services should be concerned about), we compare these indicators across the ten most common waiver combinations in each Service. We restrict this analysis to those with two waivers since the majority of the multiple-waivered population has only two.[25]

The ten most common waiver combinations for each Service are identified in table 17, along with the percentage of the multiple-waivered population that are accounted for by these categories. As reported in the table, these ten pairs account for a majority of the two-waiver population, with a minimum of 56.8 percent in the Air Force and a maximum of 91.6 percent in the Navy.

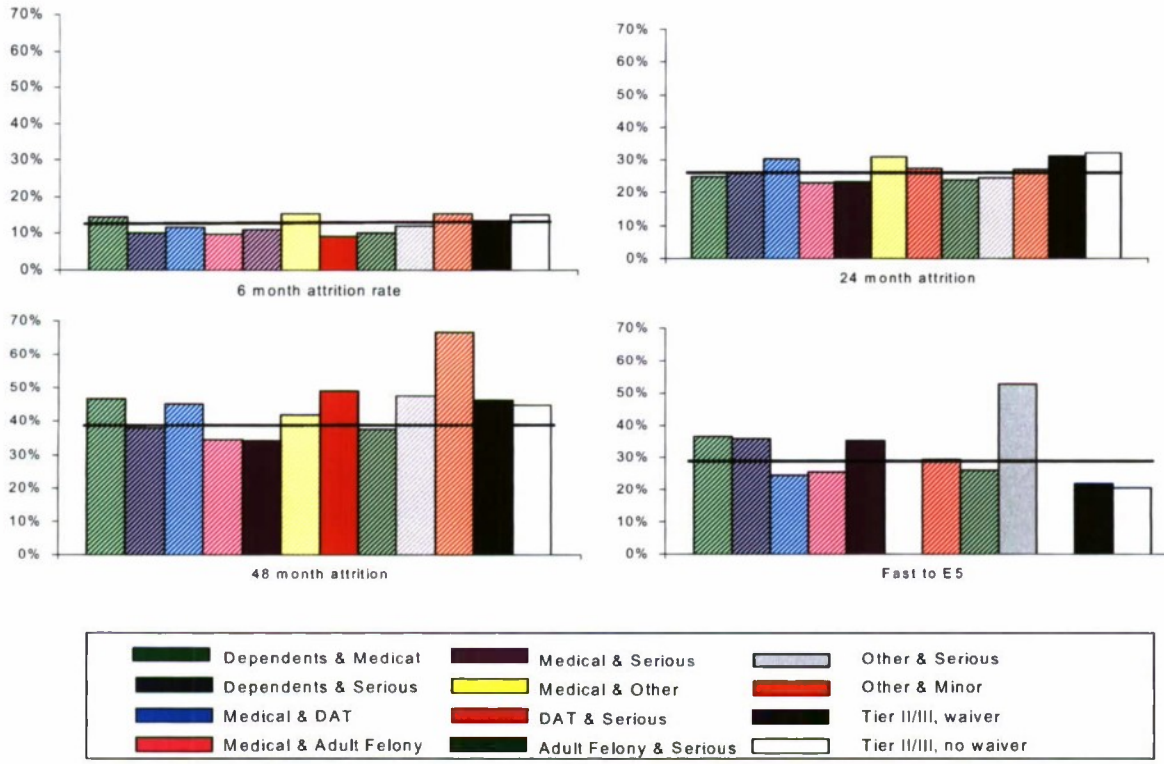
Table 13. Ten most common waiver pairs, by Service

	USA	USN	USMC	USAF
Waiver combination 1	Dependents-Medical	Dependents-Serious	Dependents-Drug/Alcohol	Dependents-Medical
Waiver combination 2	Dependents-Serious	Medical- Serious	Drug/Alcohol-Medical	Dependents-Serious
Waiver combination 3	Medical-DAT	Medical-Other	Drug/Alcohol-DAT	Dependents-Other
Waiver combination 4	Medical-Adult Felony	Drug/Alcohol-Serious	Drug/Alcohol-Serious	Medical-Aptitude
Waiver combination 5	Medical-Serious	Drug/Alcohol-Other	Medical-Serious	Medical-Serious
Waiver combination 6	Medical-Other	Serious-Minor	Medical-Other	Medical-Other
Waiver combination 7	DAT-Serious	Serious-Other	Drug/Alcohol-Minor	Adult Felony-Serious
Waiver combination 8	Adult Felony-Serious	Serious-Education	Drug/Alcohol-Other	Serious-Minor
Waiver combination 9	Serious-Other	Minor-Other	Serious-Other	Serious-Other
Waiver combination 10	Minor-Other	Education-Other	Minor-Other	Minor-Other
Percentage of 2-waiver population accounted for	72.3%	91.6%	84.3%	56.8%

25. The percentages of those with two waivers are 95 percent (USA), 89 percent (USN), 80 percent (USMC), and 95 percent (USAF).

In figures 46 through 49, we present the average 6-, 24-, and 48-month attrition rates for the ten most common waiver pairs in each of the Services, as well as the percentages of these groups that promote fast to E5. The horizontal, black lines denote the values for waivered recruits who have only one waiver, regardless of waiver type. The bars *without* hatch marks indicate that recruits with that particular waiver combination have statistically significantly different behavior from their single-waiver counterparts.

Figure 42. Average time to E5 promotion and attrition rates for the ten most frequent USA waiver pairs[a]



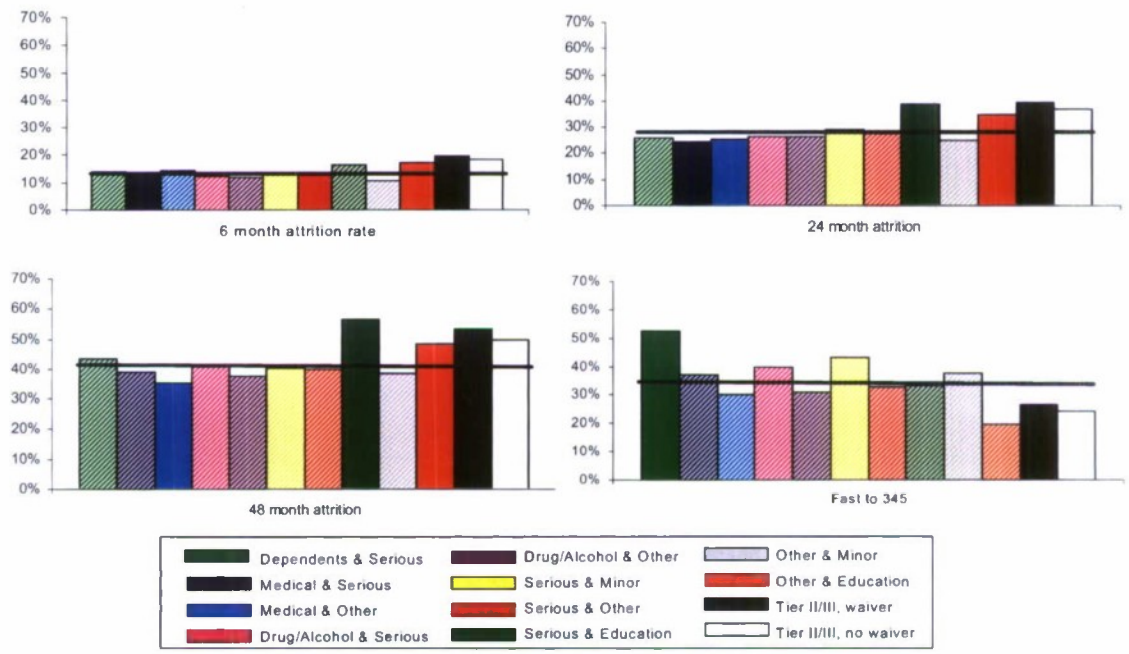
a. Hatch-marked bars denote a statistically insignificant difference from the population with only one waiver. All others are significant at the 5-percent level or better.

In the Army, for example, we find that those accessed with a DAT waiver *and* a serious waiver are less likely to attrite by 6 months than those accessed with only one waiver, but they are more likely to attrite by 48 months (see figure 46). This suggests that this is a population

with particularly high long-term attrition risk. Conversely, those with a medical waiver and a serious waiver are a relatively *less* risky population, as they are less likely to attrite by 24 and 48 months and *more* likely to promote fast to E5.

In the Navy (see figure 47), those with an education and other waiver are more likely to attrite by 6, 24, *and* 48 months. Those with an education and serious waiver, however, have higher attrition rates only at 24 and 48 months. Recruits accessed with a medical waiver and a serious waiver are more likely to attrite by 6 and 24 months, but the difference is insignificant for longer term attrition. Those accessed with dependents and serious waivers are significantly more likely to be fast promoters, and they have attrition rates that do not differ significantly from the single-waiver population. This suggests that these Sailors are among the least risky of those with multiple waivers.

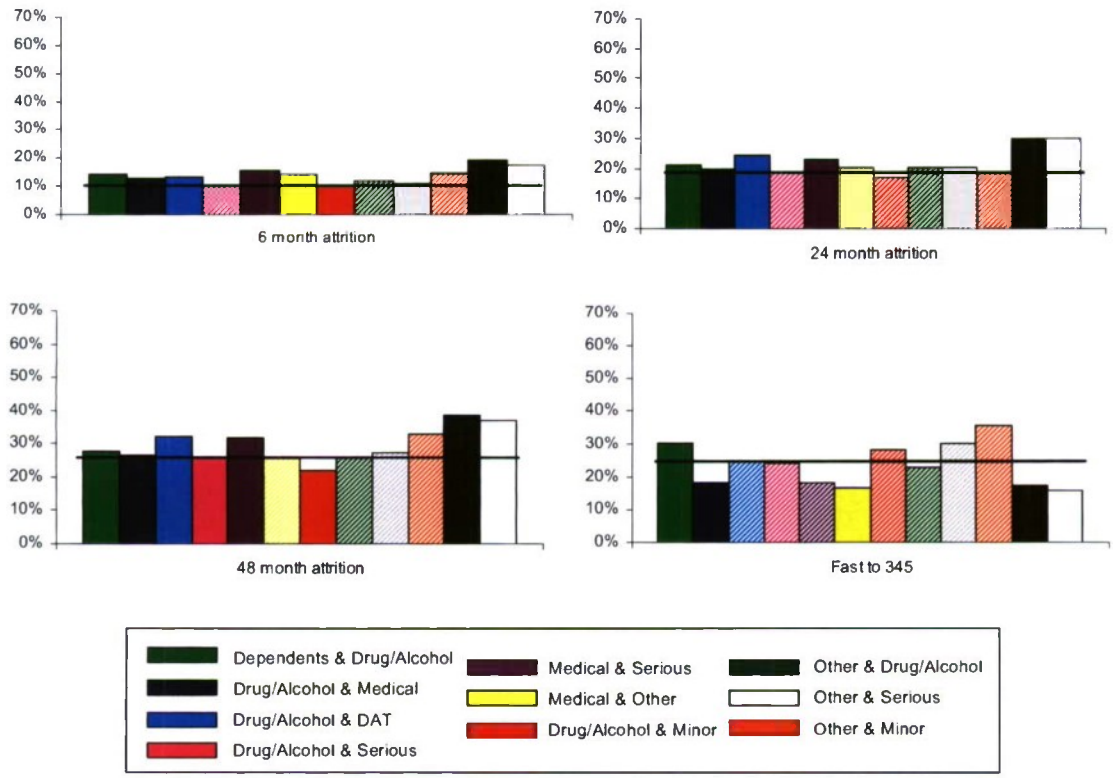
Figure 43. Average time to E5 promotion and attrition rates for the ten most frequent USN waiver pairs[a]



a. Hatch-marked bars denote a statistically insignificant difference from the population with only one waiver. All others are significant at the 5% level or better.

Findings for Marines with two waivers are presented in figure 48. There are four waiver pairs whose attrition rates are consistently significantly different from the group with one waiver only. These are dependents and drug/alcohol, drug/alcohol and medical, drug/alcohol and DAT, and medical and serious. All of these groups have higher attrition rates at 6, 24, *and* 48 months than their one-waiver counterparts. Those with dependents and drug/alcohol waivers, however, also are more likely to be fast promoters. This suggest that those who do not attrite are, on average, better performers than their peers.

Figure 44. Average time to E5 promotion and attrition rates for the ten most frequent USMC waiver pairs[a]

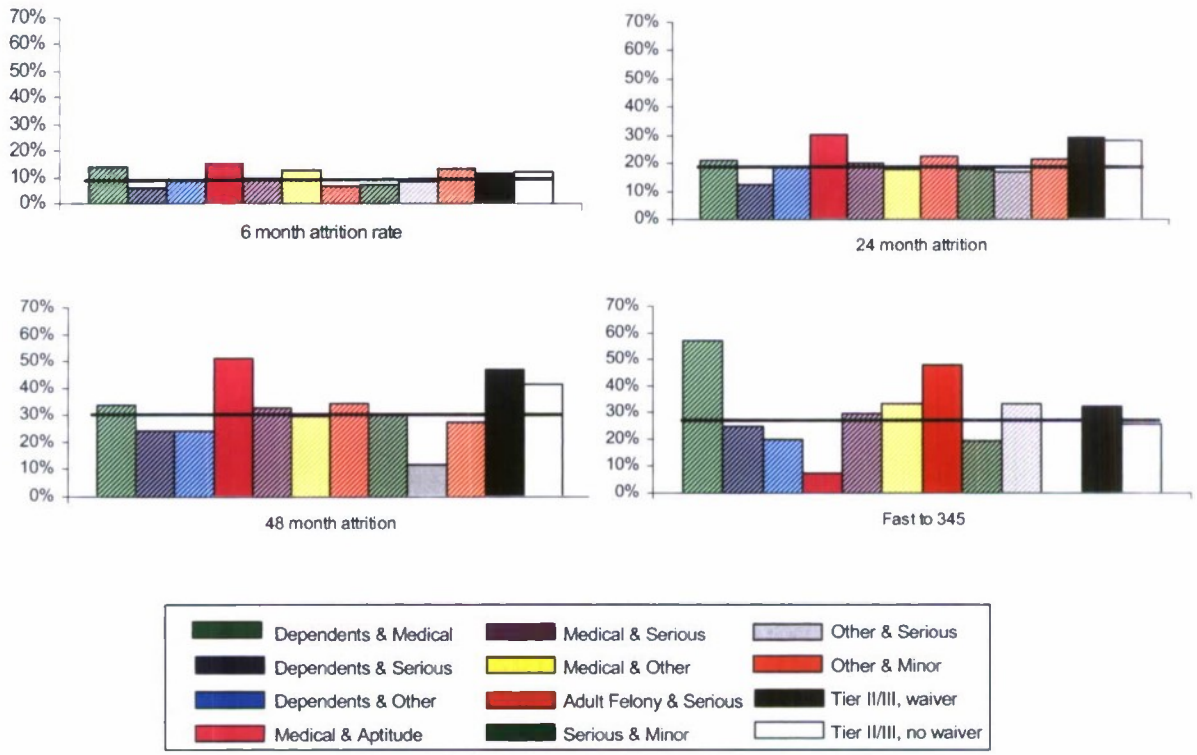


a. Hatch-marked bars denote a statistically insignificant difference from the population with only one waiver. All others are significant at the 5% level or better.

Finally, figure 49 contains Air Force findings. Two sets of findings stand out. First, those accessed with both a medical waiver and an apti-

tude waiver tend to be poorer performers than the single-waiver population. Specifically, they are more likely to attrite by 6, 24, and 48 months and are less likely to be fast promoters. In addition, those accessed with an adult felony waiver and a serious waiver are much more likely than their one-waiver peers to promote fast to E5. In addition, their attrition rates are not significantly different. This suggests that Airmen with this waiver combination, although politically contentious, are not a particularly risky accession group.

Figure 45. Average time to E5 promotion and attrition rates for the ten most frequent USAF waiver pairs[a]



a. Hatch-marked bars denote a statistically insignificant difference from the population with only one waiver. All others are significant at the 5% level or better.

This is information that the Services should keep in mind when determining which waiver combinations to prioritize (in terms of accessions) and which should require additional screening.

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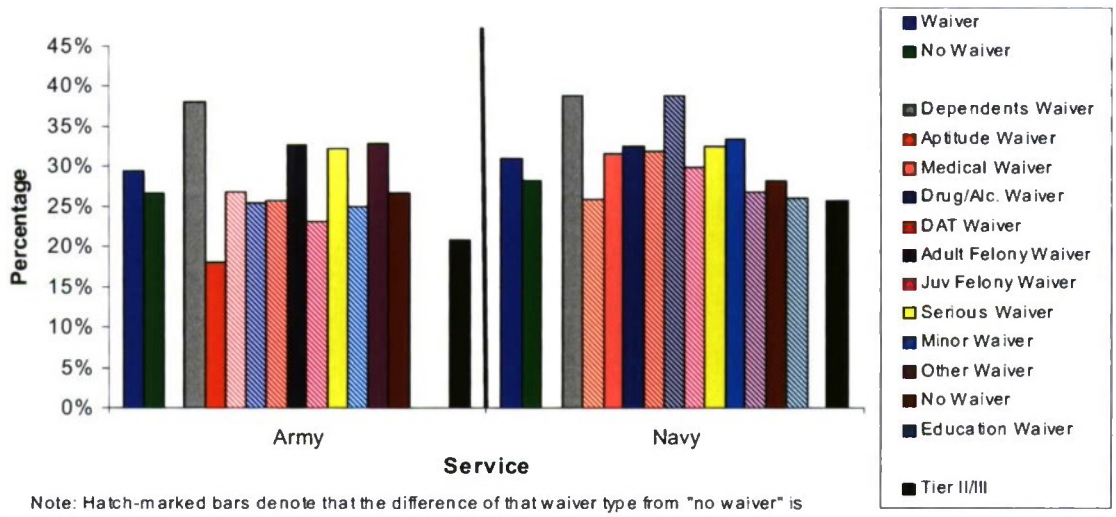
Appendix D: "Fast to E5" occupations and results

Table 18 lists, by Service, the fast-to-E5 occupations. Figures 50 and 51 present the percentages of those who promote fast to E5 within waiver categories.

Table 14. Occupations included in fast-to-E5 calculations

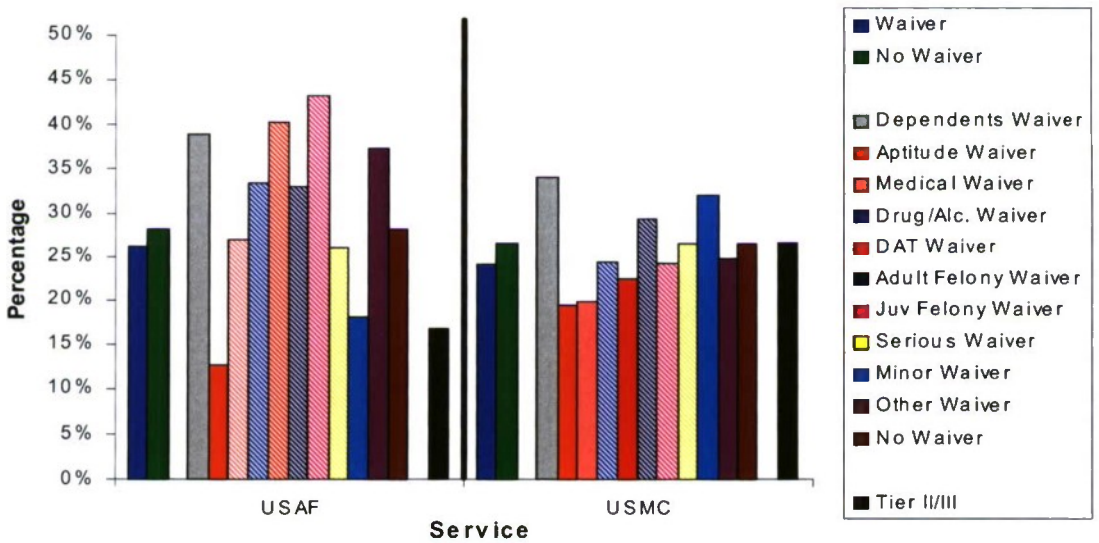
Service	Occupation	Description	Service	Occupation	Description
Army	11B	Infantryman	**Marine Corps**	0121	Personnel Clerk
	11C	Indirect Fire Infantryman		0151	Administrative Clerk
	19K	Armor Crewman		0311	Rifleman
	31B	Military Police		0621	Field Radio Operator
	92A	Automated Logistical Specialist		1371	Combat Engineer
Air Force	2A5X1	Aerospace Maintenance		2844	Ground Communications Organizational Repairer
	2A6X1	Aerospace Propulsion		3521	Automotive Maintenance Technician
	2T2X1	Air Transportation		3531	Motor Vehicle Operator
	2W1X1	Aircraft Armament Systems	**Navy**	AE	Aviation Electrician's Mate
	3A0X1	Knowledge Operations Management		FC	Fire Controlman
	3C0X1	Communication-Computer System Operations		HM	Hospital Corpsman
	3E7X1	Fire Protection		IT	Information Systems Technician
	3P0X1	Security Forces		MA	Master-at-Arms
	4N0X1	Aerospace Medical Service		OS	Operations Specialist

Figure 46. Percentage who promote fast to E5, within a waiver category, USA and USN (for those in select occupations)



Note: Hatch-marked bars denote that the difference of that waiver type from "no waiver" is statistically insignificant. All other findings are significant at the 5% level or better.

Figure 47. Percentage who promote fast to E5, within a waiver category, USMC and USAF (for those in select occupations)



Note: Hatch-marked bars denote that the difference of that waiver type from "no waiver" is statistically insignificant. All other findings are significant at the 5% level or better.

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List of figures

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List of tables