FAMILY STATUS OF ENLISTED PERSONNEL

John Cadigan
Principal Analyst
Congressional Budget Office

August 2000

2000-6

| | | | Form Approved |
| | | | OMB No. 0704-0188 |

Report Documentation Page

1. REPORT DATE **AUG 2000**	2. REPORT TYPE	3. DATES COVERED **00-00-2000 to 00-00-2000**

4. TITLE AND SUBTITLE **Family Status of Enlisted Personnel**	5a. CONTRACT NUMBER
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Congressional Budget Office,Ford House Office Building, 4th Floor ,Second and D Streets, SW ,Washington,DC,20515-6925**	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT **Approved for public release; distribution unlimited**

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**20**	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

FAMILY STATUS OF ENLISTED PERSONNEL

INTRODUCTION

Family patterns for military personnel have changed dramatically since the institution of the All-Volunteer Force in 1973. Foremost among those changes has been an increase in the proportion of enlisted members with families. The percentage of enlisted service members who are married rose from approximately 40 percent in fiscal year 1973 to a peak of 57 percent in fiscal year 1994. Since then, that proportion has dropped slightly, to over 53 percent in fiscal year 1998.

The changing structure of the force raises some difficult policy questions, particularly regarding how to best support young military families. First-term service members and their spouses consistently cite finances and housing as their most pressing concerns. A 1993 study, "Family Service and Initial Term of Service," conducted by the Office of the Assistant Secretary of Defense (Personnel and Readiness) found that 65 percent of first-term married service members, and 82.5 percent of their spouses, report having difficulty paying their bills.

Determining the best way to support junior military members remains an important challenge. Before examining this policy issue, analysts need to address some basic factual issues, including:

1. Are increases in the number of enlisted members with families consistent with trends in the civilian sector?

2. Do military members with dependents perform differently than those without dependents (so-called dependents status)?

The following research is intended to shed light on those two questions. Regarding family status, we find that military personnel are more likely to be married and to have children than their civilian counterparts are even when controlling for a variety of demographic factors. Regarding performance, we find that soldiers with families are less likely to complete their initial term of service than those without. However, soldiers with families are more likely to continue past their initial term of service.

DIFFERENCES IN THE MARITAL STATUS OF MILITARY PERSONNEL AND CIVILIANS

Trends over Time

The percentage of active-duty enlisted personnel who are married has risen in each of the services since 1980. In contrast, the percentage of married civilians ages 18 to 44 has declined significantly over the same period. In fact, the percentage of married military personnel has exceeded that of the civilian population in each year since 1993 (see Figure 1).

Figure 1: Percentage of People Who Are Married, Military Versus Civilian

Source: Data from *Population Representation in the Military Services*, 1998 OASD Accession Policy Office.
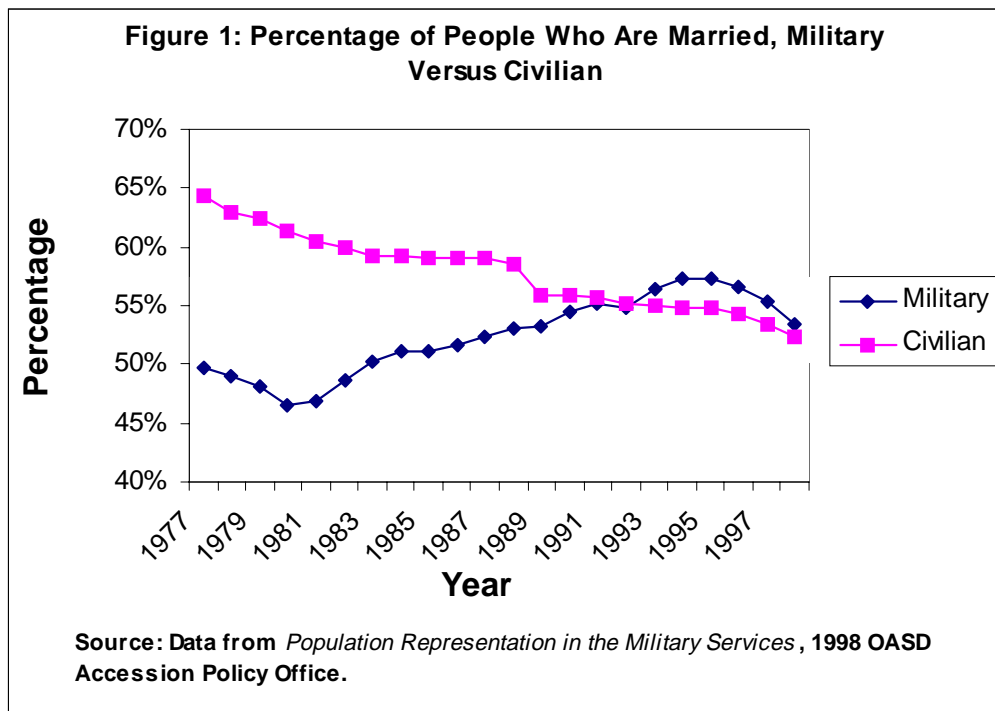
The difference in marriage trends may be explained in several ways. First, the average age for enlisted personnel has increased from approximately 25 in fiscal year 1980 to over 27 in fiscal year 1998, and as people age, they are more likely to marry. So the increase in age of the military group may be responsible for the increase in percentage married. Also, other differences between military personnel and civilians with respect to demographic factors including income, education, and sex may account for the difference.

Alternatively, practices or policies enacted by the military may either make marriage more attractive to military personnel or lead those who are more likely to

get married into military service. The structure of military compensation, with its focus on pay, allowances, and the provision of certain goods in kind, may make military service more attractive than jobs in the private sector for individuals with families. Also, policies for those already in the military may favor members with families. For example, military members with families are offered either family quarters or larger allowances than single members. Other benefits that differ according to dependents status (including transportation and travel allowances, separation pay, etc.) may encourage a greater percentage of enlisted personnel to marry.

Differences Today

While previous research indicates that enlisted personnel are more likely to be married than their civilian counterparts,[1] we find that those differences persist today even when controlling for a variety of demographic factors. This can be seen both in comparison of military and civilian data at aggregate levels and in more rigorous analysis of individual-level data. To establish this result, we compared data on marriage in the military obtained from the Defense Manpower Data Center (DMDC) with data drawn from the March Supplement to the Current Population Survey (CPS) over the 1995-1999 time frame.[2] To control for age, we calculated the percentage of males in the military who are married for each age from 18 to 30 as well as the percentage for two civilian comparison groups. The first group consists of the entire pool of responses to the March Supplement (over 22,000 observations for each year between 1995 and 1999). The second group, a subset of the supplement, consists of male high school graduates who were employed full time (over 2,500 observations for each year). That subset was used to control for

---

1.   See, for example, Segal (1986), Morrison, Vernez, Grissmer, and McCarthy (1989), and Schumm, Bell, and Tran (1993). These studies also found higher marriage rates for those in the military. The need to control for age was demonstrated in Adedeji (1992), which found that 29 percent of enlisted members ages 17 to 24 were married, compared with only 17 percent of similarly aged civilians.

2.   The March Supplement to the CPS focuses on a variety of demographic factors, including race, age, marital status, income, military service, educational attainment, and number of children. The Family Database maintained by DMDC combines information from the Active-Duty Master Database and the DEERS Database to generate demographic information about military members and their families.

differences between the military and civilian populations with respect to sex, education, and employment. The results are displayed in Figure 2.

Figure 2: Percentage Married in the Military Compared with Civilian Groups, 1995-1999
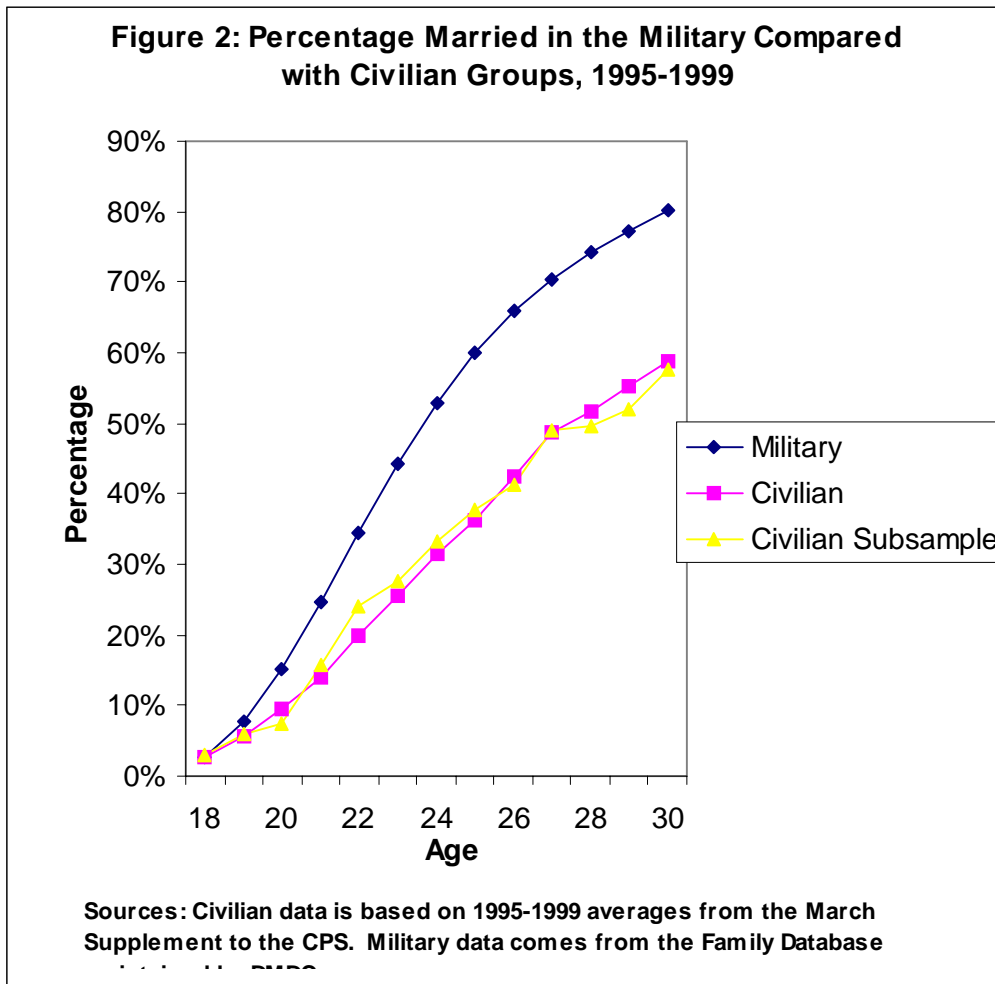
Here we see, as expected, that the percentage married in each group increases with age. At age 18, the percentage married in each of the groups is nearly identical (2.6 percent for the military, 2.5 percent for the civilian group, and 2.8 percent for the subsample). For each year after age 18, however, the military group has the highest percentage married. This suggests that even after controlling for age (by comparing people of similar ages across groups), education, employment status, and sex (by comparing different groups), military members are more likely to be married than their civilian counterparts. We also found differences in marital status based on military service using more sophisticated and rigorous statistical techniques, which are described below.

Regression Analysis of Marital Status

In this section we address the question of whether variation in marital status is related to variation in military status in a statistically significant fashion. Again, we used data on civilians from the 1999 March Supplement to the CPS and data on military personnel from the Family Database maintained by DMDC. Because marriage is a binary variable (one is either married or not), we used the logistic model, which assumes that the probability of an outcome (in this case marriage) is related to a set of explanatory variables according to the following form:

$\ln [P/(1-P)] = \alpha + \beta x$

Where:

P = the probability that the event occurred

ln = the natural logarithm

α = a constant term

x = a vector of independent variables

β = a vector of parameters to be estimated

The ratio P/(1-P), called the odds ratio, is simply the odds in favor of the event occurring. The natural logarithm of the odds ratio is called the "logit," hence the term logistic model. In our model, the dependent variable was marital status (1 if married, 0 otherwise), and the independent variables were the constant, age in years, sex (1 if male, 0 otherwise), income in dollars per year, high school diploma (HSD, 1 if had a high school diploma, 0 otherwise), and civilian status (civstat, 1 if not in the military, 0 otherwise). The regression output is as follows:

$\ln P/(1-P) = -6.3 + .27$ Age $- .54$ Sex $+ (3.51E-6)$ Income $-.27$ HSD $- .92$ Civstat

P-value   (.0001)   (.0001)   (.0001)   (.0001)   (.0001)   (.0001)

P-value for Score statistic with 5 DF =.0001

Percentage of concordant predicted probabilities and observed responses = 77.8

The coefficient on civilian status is negative and significant well below the 5 percent level. This is sufficient to establish a correlation between marriage and military status in this data set. However, correlation does not imply causation.
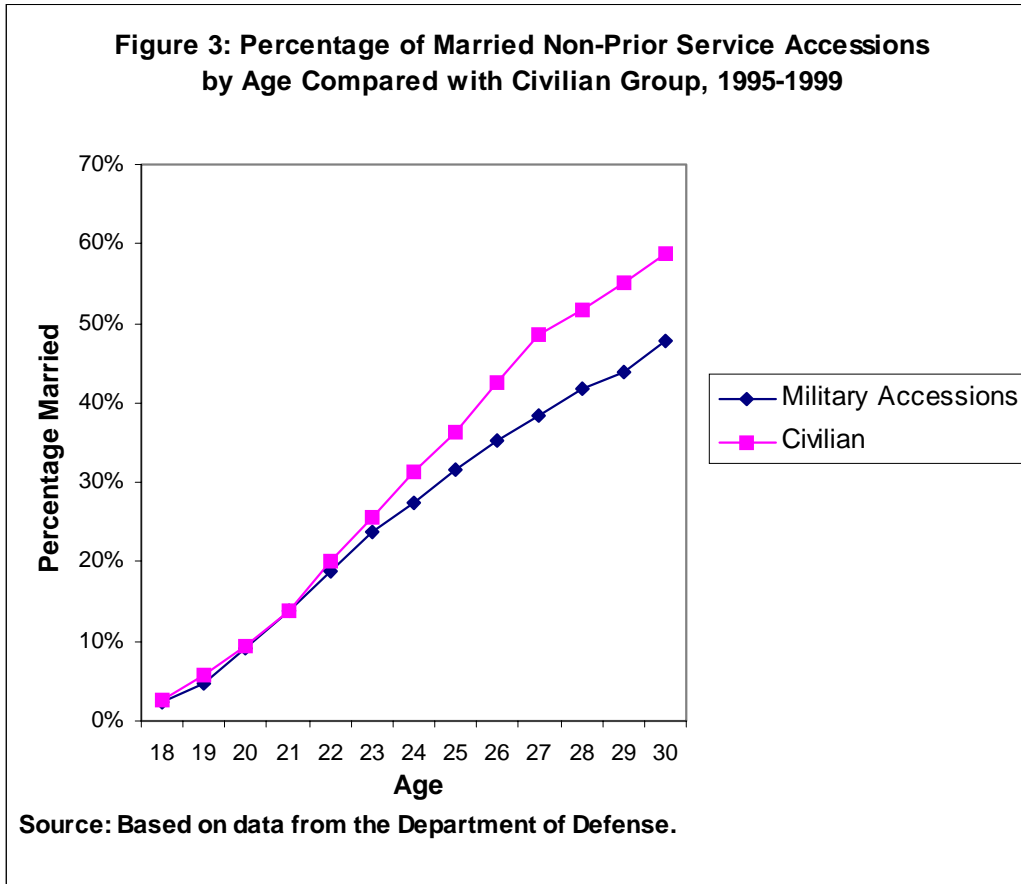
Stated differently, the correlation between military status and marriage does not imply that military service causes marriage. In any event, these results suggest that even after a variety of factors are controlled for, being in the military *is* associated with a higher probability of marriage. Each of the other variables contained in the regression is significant and has a sign consistent with expectations. Also, the Score statistic (which tests for the joint significance of the explanatory variables) and the high percentage of concordant predicted and observed responses (which assess the extent to which higher predicted probabilities are associated with more observances of marriage) suggest the model fits the data well. We estimated two other models, the Probit model and the linear probability model, and both generated similar results.

To gain some insight into the magnitude of the effect of military status on the probability of marriage, we calculated the probability of marriage predicted by the model for a male high school graduate, with the mean age and income, who was not in the military. We compared that with the prediction associated with a person of the same demographic characteristics who was in the military. The probability of marriage estimated from the model for the person not in the military was 16.4 percent, whereas the probability for a person with the same characteristics who was assumed to be in the military was 33 percent. This suggests a very strong effect, but the result should be interpreted cautiously. The actual proportion of 23-year-old military males who were married in 1999 was approximately 49 percent, which is much higher than the probability predicted here. (To generate specific predictions from the logistic model we had to specify a number of demographic characteristics and "create" an observation for which there is no clear analog in our actual data set. This is a limitation commonly associated with the analysis of binary data.)

Taken as a whole, those results--in conjunction with the established findings of previous research--strongly suggest that members of the military are more likely to be married than are civilians. Differences in marriage rates for military personnel and civilians cannot be explained solely on the basis of demographic factors.

As noted earlier, there are at least two interpretations of this result. First, the military may be drawing more married individuals into service. If so, we would expect to see that the percentage of accessions who were married was larger than the

percentage of similar civilians. But that is not the case. For the period from 1995 to 1999, the percentage of Non-Prior Service (NPS) accessions who were married was less than or equal to the percentage married in the civilian population as estimated from the CPS for each age between 18 and 30 (see Figure 3).

Figure 3: Percentage of Married Non-Prior Service Accessions by Age Compared with Civilian Group, 1995-1999

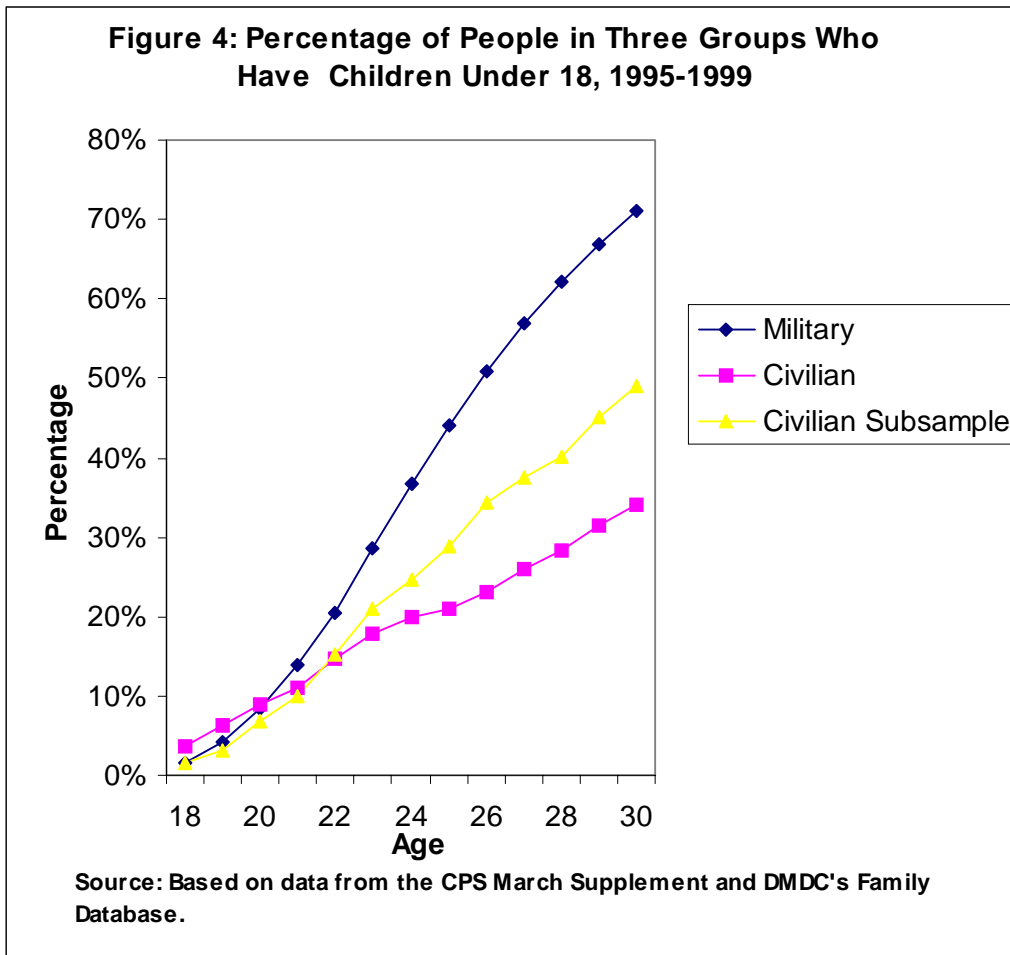Source: Based on data from the Department of Defense.

This suggests a second interpretation: rather than drawing more married people into service, aspects of military service may make it more likely for those already in the military to marry. Although this is not conclusive evidence because the military may be drawing in a higher proportion of people who intend to marry but have not done so at the time of accession, or because those who marry are more likely to stay, it does suggest that the military environment, including practices and policies that favor the acquisition of dependents, may be influencing young military members' decision to marry.

DIFFERENCES IN THE DEPENDENTS STATUS OF MILITARY PERSONNEL AND CIVILIANS

In addition to being more likely to be married, military personnel are more likely to have children than are civilians of similar ages and education levels. Unfortunately, research comparing the number of children in civilian and military families has been limited. The issue is complicated by practices in the military that make it difficult to distinguish between dependents who are children and those who are not. Specifically, in the military, the number of dependents "sponsored" by a service member includes a spouse, dependent parents, and children. What research has been done, however, suggests that significant differences exist between members of the military and civilians.[3]

As was the case when analyzing marital decisions, it is important to control for demographic factors including age, sex, and educational attainment. To examine differences between the military and civilian populations with respect to childbearing, we examined data from the March Supplement to the CPS from 1995 to 1999, and compared it with data from the Family Database maintained by DMDC. For the results below, a member of the military was counted as having a child under the age of 18 if the member was married and the sponsor of at least two dependents, or single and the sponsor of one or more dependents. Although this may introduce some biases into the results presented below (by including those with more than one dependent but without a child), it seemed the most reasonable way to deal with the limitations of the data set. Even so, the results must be interpreted cautiously. For each of three groups (the military, the CPS population as a whole, and a subset of the CPS consisting of male high school graduates employed full time), Figure 4 presents the percentage with children under 18 for the period from 1995 to 1999.

---

3. Morrison, Vernez, Grissmer, and McCarthy (Rand, 1989) found that for the Army, couples have more children than comparable civilians and have them at an earlier age. This result was found to generalize to all services as reported by the Military Family Resource Center in November 1998.

Figure 4: Percentage of People in Three Groups Who Have Children Under 18, 1995-1999

Source: Based on data from the CPS March Supplement and DMDC's Family Database.

The military group had a higher percentage of individuals with children under 18 than the subsample for each age between 18 and 30. Although differences at the lower end of the spectrum were small, this result suggests that military personnel are more likely to have children than are a similar group of civilians. Relative to the entire population surveyed for the CPS, military rates were slightly smaller at the low end of the spectrum but much higher for each age after 23. The size of the differences at the middle and upper age ranges suggests that even if we were able to control for the possible bias introduced in the way the data for the military were calculated, the overall result (military members are more likely to have children) would remain. This result is supported by more rigorous statistical analysis, which is presented below.

Regression Analysis of Dependents Status

   In this section we address the question of whether military service influences the chances that a person will have a child under the age of 18. Here again we must note that while regression analysis of the type presented below can establish correlation between two variables, it cannot be used to establish causation. Because a person either has a child or does not, the appropriate model for the regression is again the logistic one. The data used come from the 1999 March Supplement to the CPS and the Family Database from DMDC. The dependent variable for the model was dependents status (1 if have dependents, 0 otherwise), and the independent variables were the constant, age in years, sex (1 if male, 0 otherwise), income in dollars per year, high school diploma (HSD, 1 if had a high school diploma, 0 otherwise), and civilian status (civstat, 1 if civilian, 0 otherwise). The regression output is as follows:
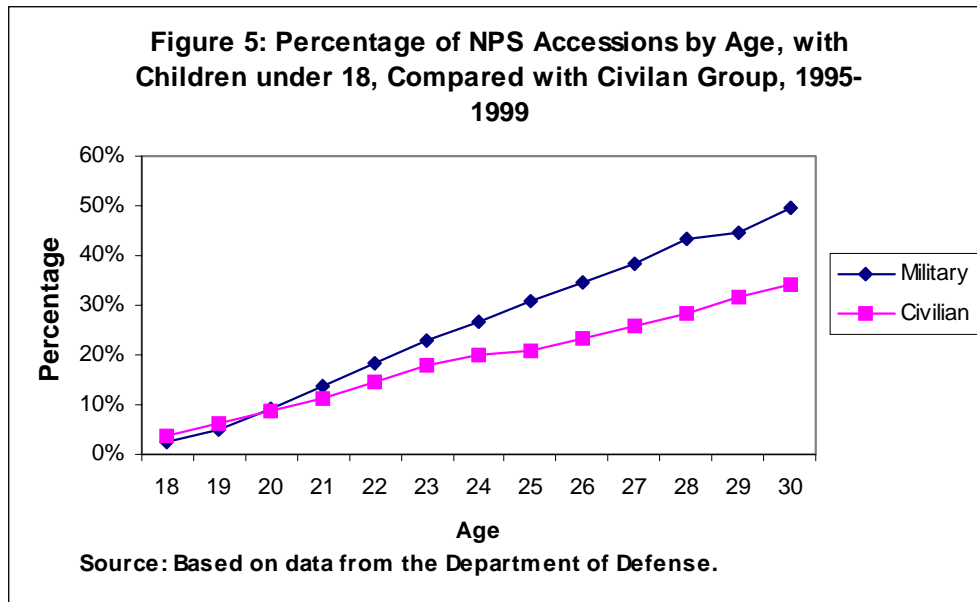
ln [P/(1-P)] = -4.68 + .20 Age - .27 Sex - (2.1E-7) Income -.76 HSD - 1.02 Civstat

P-value (.0001) (.0001) (.0001) (.0001) (.0001) (.0001)

P-value for Score statistic with 5 DF =.0001

Percentage of concordant predicted probabilities and observed responses = 76.8

   The coefficient on civilian status is negative and significant at well below the 1 percent level. These results suggest that even after a variety of factors are controlled for, being in the military *is* associated with a higher probability of having dependents. Each of the other variables contained in the regression is significant and has a sign consistent with expectations. Further, the Score statistic as well as the high percentage of concordant predicted probabilities and observed responses suggest the model fits the data well. We estimated two other models, the Probit model and the linear probability model, and both generated similar results.

   To gain some insight into the magnitude of the effect, we calculated the probability of having a child under 18 that was predicted by the logistic model for a male high school graduate, with the mean age and income, who was not in the military. We compared that with the prediction associated with a person of the same

demographic characteristics who was in the military. The probability of having a dependent estimated from the model for the person not in the military was 11 percent, whereas the probability for a person with the same characteristics who was assumed to be in the military was 26 percent. This suggests a very strong effect, but, again, the result should be interpreted cautiously. The actual proportion of 23-year-old military males who had a child in 1999 was approximately 36 percent, which is higher than the probability predicted here.

Those results strongly suggest that military personnel are more likely to have children than their civilian counterparts. As was the case for marital status, there are at least two interpretations of that result. First, it may be the case that the military draws people with children into service. If so, one would expect that the percentage of accessions with children under 18 would be higher than that associated with the civilian population. There is limited support for that view. Figure 5 displays the percentage of accessions with children under 18 for the time period 1995-1999, as well as that for the entire civilian population as estimated from the CPS.

Figure 5: Percentage of NPS Accessions by Age, with Children under 18, Compared with Civilian Group, 1995-1999

Source: Based on data from the Department of Defense.

For each year after age 20, the military rate is higher than the civilian rate, suggesting that the military draws in a higher percentage of people with children. At the lowest end of the age spectrum, however, the civilian rate is equal to or slightly

higher than the military rate. This is particularly important as the majority of NPS accessions are under the age of 20.

The policy implications associated with the results mentioned above depend, in part, on how much it costs to support members with dependents, as well as how members with dependents perform relative to those without dependents. Having either a spouse or a child, or both, may make for more committed and responsible soldiers. Alternatively, increased family responsibilities may make it more difficult for soldiers to fulfill their duties. Unfortunately, research attempting to identify the relationship between dependents status and performance has been limited. The process is complicated by difficulties in measuring what is in practice an unobservable variable. Several measures, including survival rates, Armed Forces Qualification Test scores, re-enlistment rates, lost duty time, and disciplinary actions, may provide insight into how well members with and without dependents perform, but no measure completely and accurately captures productivity itself. Therefore, the results discussed below must be interpreted cautiously. Although particular measures may provide insight into a member's productivity, the choice of measure will likely influence the results attained. Thus, it is important to view each measure as a single component of a larger structure.

FAMILY STATUS AND PERFORMANCE
The Civilian Sector

Some analysis suggests that married men may be more productive than single men in the civilian economy. There is widespread agreement that married men (in the United States as well as other industrialized countries) earn more than single men, even when controls for age, education, race, work experience, and occupation are introduced.[4] To the extent that wages reflect productivity, this suggests that married men in the civilian labor market are more productive than single men. However, it

---

4.   In a 1991 paper titled "Does Marriage Really Make Men More Productive," Korenman and Neumark found that married men were more likely to be in higher paying positions than single men, and they received higher performance ratings from their supervisors. Their research provides support for the hypothesis that marriage does make men more productive.

should be noted that wage differentials related to marriage may be explained in other ways. For instance, it may be the case that employers favor married men, that certain characteristics preferred by employers (such as responsibility and the ability to commit) are also favored in "marriage markets," or that men with higher wages make more-attractive mates and are more likely to be married. Further, even if the wage differential were entirely attributable to productivity differences, productivity in the civilian labor market may not translate into productivity in the military. Thus, even if marriage makes civilian men more productive, it may not have the same effect on those in the military.

Family Status and Performance in the Military

Existing studies of family status and performance in the military yield mixed findings. On the one hand, a 1992 Rand study titled "Army Families and Soldier Readiness" found that relative to single soldiers, married soldiers in the Army report fewer job-related problems, are more committed to the Army, and expect to serve in the Army longer. Similarly, a 1993 OASD (Personnel and Readiness) study, "Family Status and Initial Term of Service," reports that for the 1987 accession cohort, married soldiers for Department of Defense (DoD) had lower attrition rates and higher retention rates than single soldiers. Also, according to that report, married soldiers had proportionally fewer indiscipline and substance abuse discharges.
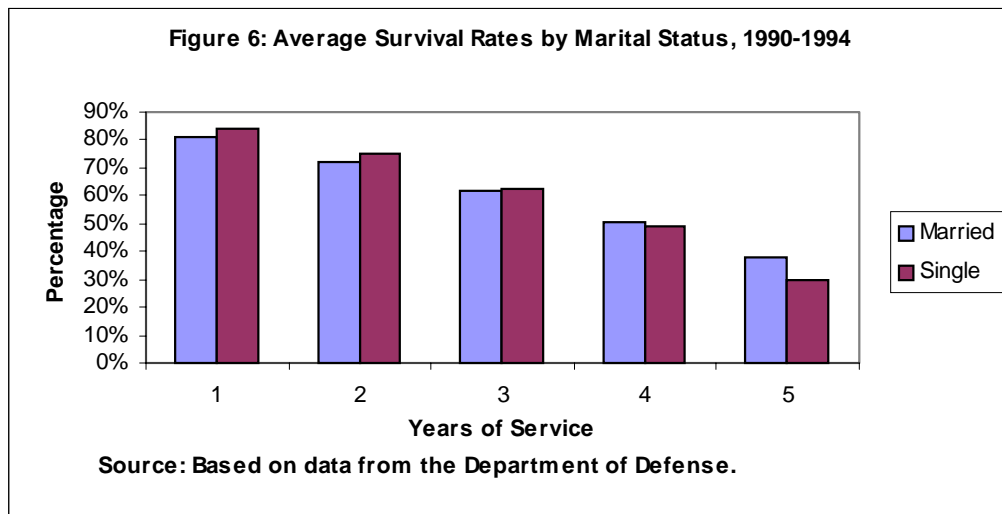
On the other hand, the OASD study reports that although married soldiers get promoted to E-4 in a similar time frame as those who are single, promotion to the more competitive enlisted grades (E-5 to E-9) typically occurs at a faster rate for single soldiers. Further, single soldiers report having fewer problems responding to No-Notice alerts and to No-Notice unit deployments. Finally, for the Army, Sadacca and DiFazio (1991) found that family status was not significantly related to individual readiness, and Pliske (1988) found that marital status was not a significant predictor of performance on the Skill Qualification Test.
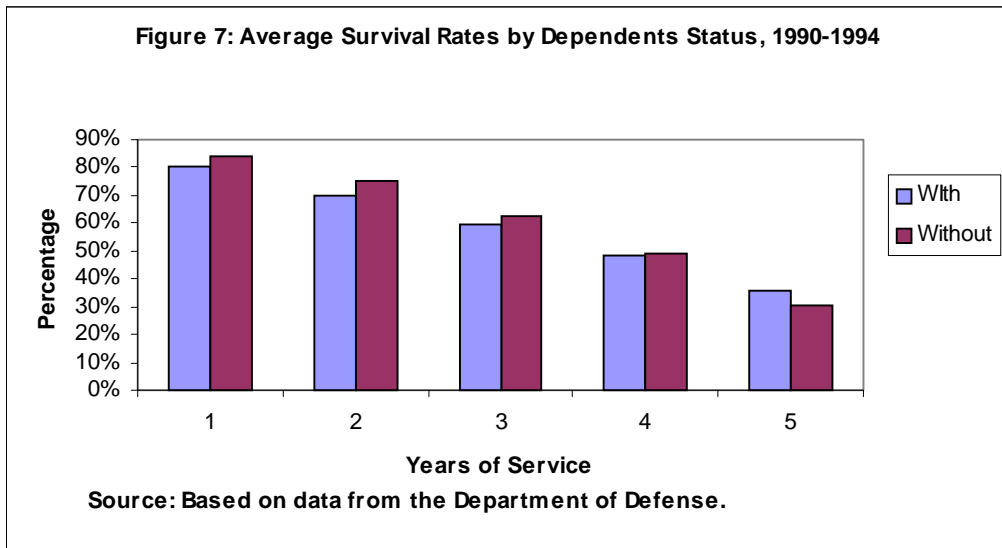
Those results demonstrate the difficulties associated with measuring differences in the performance of military members based on family status. While married members may seem to be more stable than single members, single soldiers

may be less encumbered by responsibilities detracting from the time and effort they are able to put toward their work. Because of potential cost issues, more research that systematically evaluates this issue is necessary. Of particular importance is how long new recruits stay in the military. DoD incurs significant up-front costs to train new recruits. The longer they stay, the higher the payoff to training. Further, increases in expected length of service are associated with decreases in turnover costs, and they promote unit cohesiveness and a sense of stability that benefits the services. This highlights the importance of survival rates, which measure the length of time a new recruit stays in the military.

Family Status and Performance of Recruits: Survival and Continuation Rates

Differences in survival rates among groups of recruits based on family status provide a key indicator of the merits of policies that affect the marital and dependents status of military members. To examine this issue, we compared the survival rates of new recruits accessing between 1990 and 1994 based on marital and dependents status using data from the Active-Duty Master Database maintained by DMDC. Figures 6 and 7 show the percentage of accessions in the years 1990-1994 who remained in the military for one to five years of service.

Figure 6: Average Survival Rates by Marital Status, 1990-1994

Figure 7: Average Survival Rates by Dependents Status, 1990-1994

Source: Based on data from the Department of Defense.

In comparing survival rates between married and single members, the percentage surviving both one and two years for each of the cohorts entering between 1990 and 1994 was higher for single members. For the third year, survival rates were similar between groups. For the fourth and fifth years, however, survival rates were higher for married members. A similar pattern, with survival rates higher for single members initially but higher for married members in the fifth year, is present in each of the services except the Air Force, where survival rates were higher for married members for each of the first five years. For dependents status, survival rates for soldiers without children are higher for each of the cohorts listed and for each year from one through four. However, a much greater percentage of soldiers with dependents survive five years. Similar patterns exist for each of the services. A comparison of "conditional" survival rates, which show the percentage of the "surviving" cohort that makes it through each additional year rather than the percentage of the initial cohort that survives to a particular year, yields similar results.

One interpretation of these results that is consistent with previous research is that the stresses of adjusting to military life are initially felt more strongly by members with families, but that once the initial adjustment is made they tend to be more committed and stay longer than those without families. If true, we would expect members with families to be less likely to complete their initial term of

service, but having done so they would be more likely to re-enlist. There is support for this conjecture, as shown in Figures 8 through 11. Data for the figures come from the Active-Duty Master Database maintained by DMDC.

Figure 8: Percentage of NPS Accessions Completing their First Term by Marital Status for Accession Cohorts, 1990-1995

Source: Based on data from the Department of Defense.

Figure 9: Percentage of NPS Accessions Completing their First Term by Dependents Status for Accession Cohorts, 1990-1995

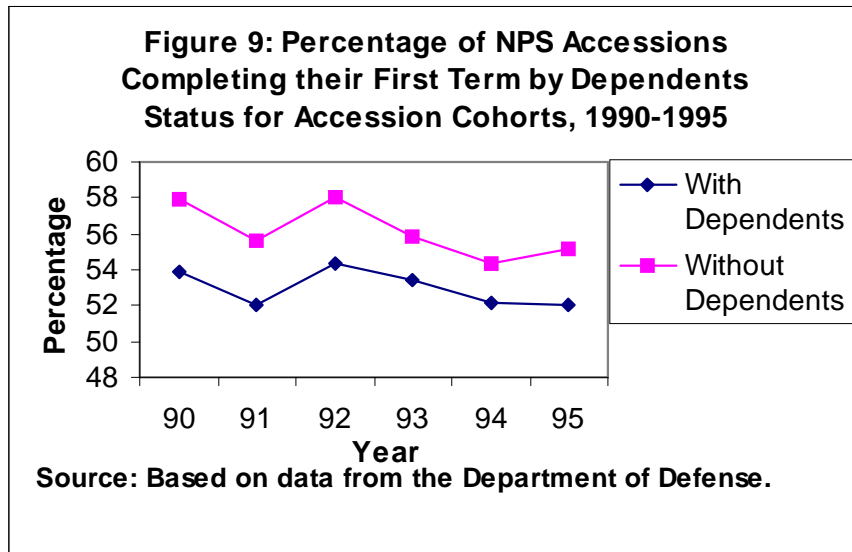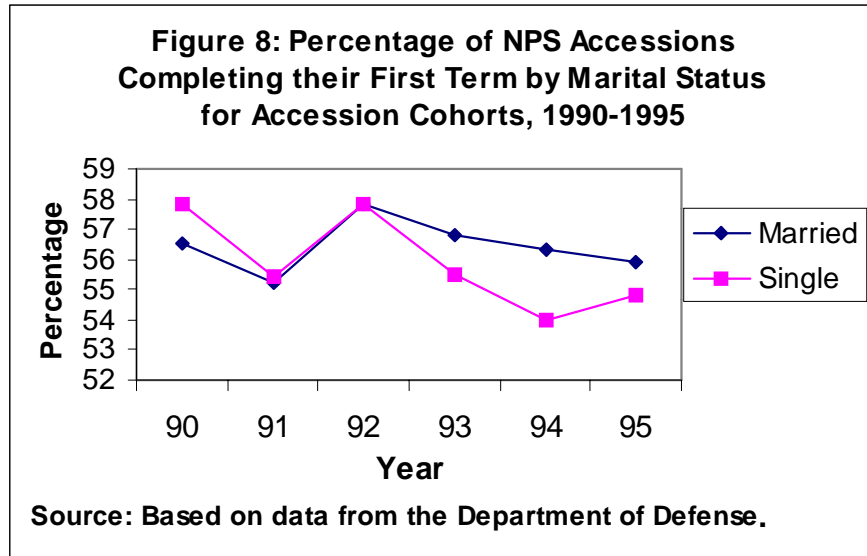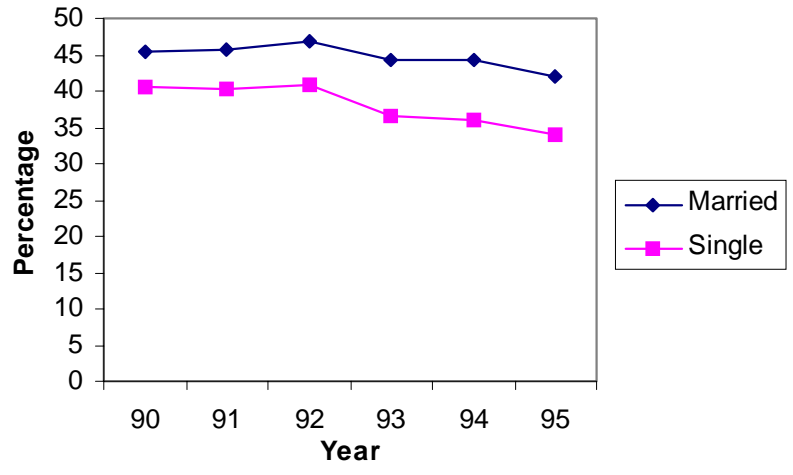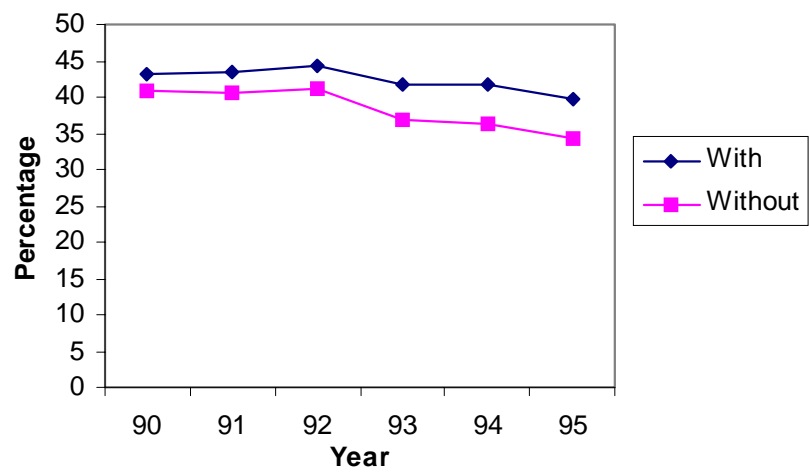Source: Based on data from the Department of Defense.

**Figure 10: Percentage of NPS Accessions
Continuing Past Their First Term by Marital Status
for Accession Cohorts, 1990-1995**

Source: Based on data from the Department of Defense.

**Figure 11: Percentage of NPS Accessions
Continuing Past Their First Term by Dependents
Status for Accession Cohorts, 1990-1995**

Source: Based on data from the Department of Defense.

With respect to dependents status, we see that for the cohorts entering between 1990 and 1995 first-term survival rates were higher for members without dependents in each year, while continuation rates were higher for those with dependents. First-term survival rates in the Army, Navy, and Marine Corps had a similar pattern, whereas the results for the Air Force were mixed. For continuation rates, a similar pattern is found for the Air Force and Marine Corps, whereas the results for the Army and Navy are mixed.

Concerning marital status, the results are not as clear. Continuation rates were higher for married members in each cohort (similar patterns are found by service, with the exception of the Army, for which the results are mixed), but the results regarding first-term survival were mixed. First-term survival rates for married members were higher for the years from 1993 to 1995, but they were less than or equal to those of single members for the years from 1990 to 1992. By service, first-term survival rates were higher for single members in the Army and Marine Corps, higher for married members in the Air Force, and the results were mixed for the Navy. Taken as a whole, these results provide limited support for the hypothesis that military members with families have a more difficult time adjusting early in their careers, but once they do adjust they tend to stay in the military longer than members without families.

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

This paper presents analysis of the family status of enlisted personnel. Comparisons are made with relevant sections of the civilian population. Consistent with previous research, we find that enlisted personnel are more likely to be married and to have children than are their civilian counterparts. These differences cannot be explained by differences between the military and civilian populations with respect to demographic factors such as age, education, and sex. Further, most enlisted personnel who marry and have children do so while they are in the military, rather than entering the military with dependents. Perhaps aspects of the military lifestyle, including policies designed to support members with dependents, are influencing those decisions.

The policy implications here depend on the relative performance of those members with and without dependents as well as the costs associated with supporting members with dependents. The analysis presented in this paper suggests that members with families are less likely to survive the early years of service than those without. However, if they are able to survive the first few years of service, members with families are more likely to stay in the military past their initial term of service.