

BACKGROUND

The early history of women in the military services was largely one of restriction, with stringent limits on where they could serve, what they could do, and what units they could join. Beginning in 1992, marked changes in law and policy have dramatically altered this situation. First, Congress repealed the combat exclusion laws, making it possible for women to fly combat aircraft and serve on combat vessels. Second, the Department of Defense (DoD) replaced the risk rule, which restricted women from assignments based on the “risk of exposure to direct combat, hostile fire, or capture” with a restriction on direct ground combat. The latter restriction was based on the probability of any given occupation or assignment leading to involvement in direct ground combat. These changes had two effects: new skills—and new units—opened to women.

DoD previously asked NDRI to study the effects of these expanded opportunities for women on the readiness, cohesion, and morale of the forces. The results of that study showed negligible effects on these aspects of the military services but also showed that the progress of integrating women into the new occupations was slow (Harrell and Miller, 1997).

Subsequent to the NDRI study, the U.S. General Accounting Office (GAO) published two reports that raised some issues related to gender (GAO, 1998, 1999). More specifically, the reports questioned whether service requirements were being used to exclude women from occupations that were open to them and whether women and men were getting equal opportunities to work in their specialties.

The reports also noted that, while women were moving into untraditional occupations, the closure of some units to them limited the number of women who could enter an occupation. Finally, GAO noted that, because they lacked exposure to certain subject areas, women were scoring low on certain segments of the aptitude test the military uses.

THIS REPORT

Partly in response to the GAO reports and partly to follow up on the earlier study, DoD asked NDRI to examine the extent of gender integration of positions opened to women as a result of the legislative and policy changes of the early 1990s. Specifically, the department wanted to determine whether men and women were getting equal opportunities to work in selected occupations and whether there were barriers that barred women from an occupation even though it was formally open to them.¹

To answer these questions, our research involved two steps. First, we did a broad statistical analysis of female representation in occupations newly opened to women, that is, since the legislative and policy changes. Second, we did a more focused analysis of specific occupations, examining ten in some detail. We sought a cross section of occupations by service, rank, nature of the work, level of gender representation in the occupation, and level of representation in the occupational class (group of occupations). Table S.1 includes the occupations selected for a more detailed analysis and summarizes some of that research.

This table indicates that the occupations selected for case study analysis can be divided into three categories based upon the level of female representation evident in each. The “most progress” category includes one Army, one Marine Corps, and two Navy occupations.

¹In this book, we make the following distinctions between terms: An individual’s *occupation* or *career* is the field in which he or she received training (e.g., cook or infantryman). The *billet* or *position* refers to the need for such individuals within a given unit. For example, there may be billets for four cooks on a particular ship or several hundred infantrymen in an unit. The *unit* refers to the organization to which that individual is assigned, such as a particular ship or battalion.

Table S.1
Summary of Occupations Examined

Occupation	Nature of Work	Female ^a No.	%	Occupational Class	% Female Increasing?	Accessions Compared to Overall	Training Completion Rates Compared to Males	Assignment or Career Restrictions
Little Progress Toward Gender Integration								
Air Force F-16 Pilot (Officer)	Fighter aviation High tech.	21	1.30	Tactical Operations	Yes	N/A: Pilots	Comparable	None
USMC F/A-18 Pilot (Officer)	Fighter aviation High tech.	1	0.25	Tactical Operations	No	N/A: Pilots	N/A—numbers too small	One nonflying assignment closed No career impact
USMC Combat Engineer (1371) (Enlisted)	Heavy, dirty Field conditions	34	1.30	Infantry, Gun Crews, and Seamanship	No	Lower	Comparable or better	Yes—46% closed Career impact

Table S.1—Continued

Occupation	Nature of Work	Female ^a No.	%	Occupational Class	% Female Increasing?	Accessions Compared to Service Overall	Training Completion Rates Compared to Males	Assignment or Career Restrictions
Some Progress Toward Gender Integration								
Army AH-64 Apache Aviator (152F/H) (Warrant Officer)	Helicopter aviation High tech.	14	1.36	Tactical Operations	Yes	N/A: Pilots	Comparable	None
Army Field Artillery Surveyor (82C) (Enlisted)	Dirty Field conditions	52	7.00	Other Technical and Allied Specialist	No	Lower	Comparable	Yes—70% closed Career impact, job being phased out
Navy Gunner's Mate (Enlisted)	Diverse conditions Extensive sea duty	183	4.35	Infantry, Gun Crews, and Seamanship	Yes, slowly	Lower	Comparable	Yes, smaller ships No career impact

Table S.1—Continued

Occupation	Nature of Work	Female ^a		Occupational Class	% Female Increasing?	Accessions Compared to Service Overall	Training Completion Rates Compared to Males	Assignment or Career Restrictions
		No.	%					
Most Progress Toward Gender Integration								
Army Bridg Crewmember (12C) (Enlisted)	Heavy, dirty Field conditions	148	16.53	Infantry, Gun Crews, and Seamanship	Yes	Higher	Lower	None
USMC Air Support (7242) (Enlisted)	Field conditions	27	11.00	Communications and Intelligence Specialists	No	Comparable	Comparable	None currently applied
Navy Sonar Technician-Surface (Enlisted)	High tech Extensive sea duty	389	10.13	Electronic Equipment Repairers	Yes	Comparable	Slightly lower	Yes, smaller ships No career impact
Navy Surface Warfare Officer (Officer)	Extensive sea duty	914	11.30	Tactical Operations	Yes	Higher	Comparable	Very few, very small ships No career impact

^aData as of 2001.

They include both officer and enlisted occupations, a range of environments, and both demanding physical labor and highly technical work. These differences underscore the extent to which gender analysis should consider occupations on an individual basis.

COMPLICATING FACTORS

Several factors complicated our analysis, and these should be kept in mind when reviewing our results. Some of these are specific to a service, and others cut across all services. One service-specific item pertains to the Navy: the process of modifying ships to accommodate women. In some cases, providing separate berthing and sanitary facilities for women on ships can slow the rate of integration, even if a particular skill group is open. Second, service obligations can make it difficult to identify retention trends. For example, going to flight school carries with it a substantial service obligation. The long obligation can mask a retention problem, and it will take some time to determine retention trends accurately. Another issue is that some of the decision processes that affect occupational choices are opaque. For example, the determination of aircraft-specific follow-on training involves student preference, instructor recommendation, and performance in basic flight school. Thus, it may not be clear whether student enrollment for a specific type of flight training results from student choice, performance in basic flight training, or perhaps institutional biases. Finally, relatively few women are involved in many of the occupations, and the retention or resignation of a single individual can skew the results significantly. In addition, it is not clear that the first women in a newly opened occupation will encounter the same experiences or behave similarly to their successors.

For these reasons, we present our statistical analysis primarily as a benchmark for future work. The case study analysis is limited by design but presents some insightful patterns regarding gender integration.

WHAT WE FOUND OUT

Our more-detailed analysis of the ten occupations lead us to a number of conclusions:

Success at achieving gender representation is mixed. Of the ten occupations studied, female representation is increasing in half. For example, in the Army, women are overrepresented in the Bridge Crewmember occupation, and their numbers are increasing. However, they are underrepresented in the artillery surveyor skill, and their numbers are declining. In the Marine Corps, numbers are falling among field engineers. The numbers are not increasing in the air support occupation, but the percentage of women in the skill exceeds that of women in the Marine Corps. Female representation is increasing among Air Force F-16 pilots but not among Marine Corps F/A-18 pilots.

Such metrics as the level of female representation and the percentage of accessions that are female are useful as benchmarks but need to be understood in the context of an individual occupation. There are valid reasons, such as the length of the average career and the time the occupation will take to become fully integrated, that some occupations have less female representation. In these cases, the statistical evaluations are useful as benchmarks for further analysis but cannot be used in a single snapshot to indicate “significant” levels of representation or underrepresentation. Additionally, the rate at which female representation is increasing may also be misleading if the occupation is integrated at an appropriate level (and definitions of “appropriate level” vary), if the occupation is being terminated to all personnel, if the occupation is being closed to women, or if increasing representation in a particular occupation is a result of limited opportunities in other occupations.

Nature of the work does not alone affect gender representation. The nature of the work involved in the occupations does not seem to affect the willingness of women to enter it. Neither the hard physical work of the engineering occupations nor the austere living conditions of the air support skill appear to deter women from seeking to work in the jobs. Additionally, high-technology occupations that operate in relatively more comfortable circumstances do not necessarily draw women in greater numbers. Navy sonar technicians work with sophisticated electronic equipment in relatively comfortable surroundings. This occupation has lower female representation than does the Navy overall.

Accession models and processes may require adjustment. The services determine how many women they want to recruit into a spe-

cific occupation by using different accession models. Some of the data developed in this study suggest that the models may need to be adjusted. For example, the Marine Corps has decided to stop recruiting women for the Field Engineer occupation, but the current female representation in that skill is only 1.3 percent compared with 6 percent overall in the enlisted ranks. Additionally, the Armed Services Vocational Aptitude Battery (ASVAB) tests, which are prerequisites for these occupations, are biased toward test takers with prior exposure to the subjects. This bias disadvantages women. Among the occupations examined herein, the ASVAB test requirements did not preclude the services from meeting the female accession targets. However, this could currently be a barrier in other occupations or in these occupations in the future.

Women do about as well as men in training. The data show that women do about as well as men in the skill training or only slightly worse. The small numbers involved make this a difficult area for analysis, but nothing in this research suggests that women will have difficulty performing well in nontraditional occupations.

Some skills have assignment limitations that make it unlikely for a woman to have a viable career. Assignment constraints can pose a problem for integration. For example, 70 percent of assignments for Army Field Artillery Surveyors and almost half of assignments for Marine Corps Combat Engineers are closed to women. However, the services have different models and methods for translating these assignment limitations into targeted levels of female representation.

Predicting future levels of gender integration is difficult. Several issues make it difficult to predict future levels of integration. First, if the women do not enter directly into a skill and must first undergo a long period of training, as they must to become a pilot, it is difficult to tease out the factors affecting integration. Second, the small numbers involved in many of the skills complicate making future estimates. Service obligations further complicate the problem. Finally, the first women in a field frequently experience a “pioneer effect.” As a result, neither their experiences nor their performance in the occupation may be the same as those of their successors. As the first representatives of their gender in a field, these women may feel extra pressure to succeed. Thus, early completion and retention rates may not be typical. It will not be until some years have passed

and the presence of women is regarded as routine that it will be possible to identify representative trends.

RECOMMENDATIONS AND POLICY IMPLICATIONS

Do not let women join occupations that are going to merge with ones closed to women. The issue for the services is more than ensuring a representative number of women in a given occupation. It is also ensuring that the skill fields offered to women can provide them a viable career. Thus, women should not be encouraged to enter skill areas that a service plans to merge with others that are not open to women. Furthermore, the service needs to develop a plan for how to deal with the women in the occupation when it does merge with another.

Verify and validate the service models that limit female accessions as a result of assignments closed to women. All services need to review the models that determine the targeted number for female accessions to ensure that the assumptions and inputs are not inappropriately limiting female accessions.

Ensure that publicly available information, such as that on official recruiting Web sites, provides accurate information about opportunities available to women.

Account for the pioneer effect. The services should recognize that the initial trends of women entering new occupations may not be representative of what will occur later.

Recognize that female representation needs to be understood by occupation.

Do not assume that female service members will lack interest in jobs with seemingly less-appealing work environments.

Counsel incoming personnel about the career opportunities available to them in various occupations. If no advancement opportunities are available within a given occupation, the incoming recruit should be informed. Lack of opportunities for promotion may dissuade a new recruit from selecting that occupation. However, if the skills to be gained translate well to civilian occupations (as is the case, for example, for Marine Corps Combat Engineers), limited

opportunities within the military occupation may not deter accessions. While this is more likely to be an issue for women entering occupations with limited assignment opportunities for women (and thus limited advancement opportunities), both male and female recruits should fully understand the career opportunities available to them.

Promote analysis of trends in accession, training, assignment, and retention data by gender. “Gender-blind” data records serve little purpose other than to simplify the daily activities of those who maintain the records. Such records obscure both negative and positive trends. As a result, the services recognize neither when they need to address problems nor when they can applaud successful integration and capitalize on positive trends.

Conduct further research into the role of individual experiences and decisionmaking processes in occupation selection, assignment selection, and retention.

Conduct further research to understand the role of individual decisionmaking in aircraft selection. Such research should illuminate the reasons quality flight students, both male and female, are neglecting to fly jet aircraft.