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**CONCLUSIONS, RECOMMENDATIONS,  
AND POLICY IMPLICATIONS**

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**VALUE AND LIMITATIONS OF ANALYSIS**

In the initial statistical analysis conducted for this research, we addressed gender representation in military occupations but did not attempt to determine the correct level of representation. Absent high-level guidance from Congress, policymakers, or the military services, it is unclear what the integration target should be. Lacking policy or legal guidance on integration targets, we chose to compare the level of representation to that of the appropriate service and note statistically significant differences in representation. Representation levels differ among occupations for multiple reasons. A primary factor is time elapsed; completely integrating an occupation does take a full career path cycle. There are also valid reasons, such as limited assignment opportunities, to limit the number of women in some occupations. Thus, we assert that this statistical “underrepresentation” or “overrepresentation” should be considered only as a benchmarking data point for comparison with future studies and in concert with qualitative evaluations of occupations, such as that conducted in the second half of our research.

The qualitative portion of this research investigated only a limited number of occupations; thus, the findings from this research may not be representative of other occupations recently opened to women. Nonetheless, the patterns from these occupations suggest issues that might also apply to other occupations. Additionally, lessons learned from these occupations suggest some policy changes or necessary research to determine whether these findings are indicative of similar situations in other occupations.

## CONCLUSIONS

Table 4.1 summarizes the occupations described in Chapter Three. The columns briefly summarize the nature of the work involved; the current female representation, both by number and by percentage; whether the female representation is increasing; how the percentage of female accessions for the occupation compares to that for the service overall; and whether there are assignment restrictions and resultant career progression issues. The table is organized into three sections, each of which begins on a new page: career areas with little progress in gender integration, those with some progress, and those with more progress. The division into these categories is subjective.

The aviation occupations are among the group of occupations that still have relatively low percentages of women. Within this trio, however, the numbers of women among Army aviators and Air Force pilots seem to be increasing, while the Marine Corps has only a single female F/A-18 pilot. The numbers of women Marine Corps combat engineers have been increasing, but female accessions were zeroed out to reflect restricted assignment opportunities.

Four occupations had integrated to double-digit percentages. While the trend in three of the four is toward increasing representation, the numbers in the fourth, female Marine Corps Air Support Operators (7242), have remained fairly constant over the past few years (resulting in decreasing percentages of women). The trends that emerged from this analysis, some of which are apparent in the table, are discussed below.

It is worth noting, however, that the occupations with the most progress with respect to gender integration include one Army occupation, one Marine Corps occupation, and two Navy occupations. 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 individually.

### Female Representation

Half the occupations considered in this analysis show increasing female representation. The representation of women in one of the Army occupations, Bridge Crewmember, is higher than that of

**Table 4.1**  
**Summary of Occupations Examined**

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

Table 4.1—Continued

Occupation	Nature of Work	Female <sup>a</sup>		Occupational Class	% Female Increasing?	Accessions Compared to Service Overall	Training Completion Rates Compared to Males	Assignment or Career Restrictions
		No.	%					
<b>Some Progress Toward Gender Integration</b>								
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 condition Extensive sea duty	183	4.35	Infantry, Gun Crews, and Seamanship	Yes, slowly	Lower	Comparable	Yes, smaller ships No career impact

Table 4.1—Continued

Occupation	Nature of Work	Female <sup>a</sup>		Occupational Class	% Female Increasing?	Accessions Compared to Service Overall	Training Completion Rates Compared to Males	Assignment or Career Restrictions
		No.	%					
<b>Most Progress Toward Gender Integration</b>								
Army Bridge 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

<sup>a</sup>Data as of 2001.

women in the Army overall and is still increasing. The Army aviation occupation is relatively static. The Army Artillery Surveyor occupation currently includes 7 percent women but should cease to accept any more, given the lack of a future for them. The numbers of women in the Air Force occupation studied (F-16 pilots) and in all the Navy occupations are increasing. It is not clear from this analysis why Marine Corps F/A-18 pilots have not integrated at a rate similar to that of Air Force F-16 pilots. Of the other Marine Corps occupations, female representation among Air Support Operators holds steady at a rate higher than that among Marine Corps enlisted personnel overall. Representation among Marine Corps Combat Engineers is considerably lower, and the Marine Corps plans to keep it at approximately this level.

In three of the four occupations that indicate significant progress in gender integration, representation is increasing. In three of the four occupations that show little progress, gender representation is not increasing. The in-between category is split evenly. Having noted that, however, it is difficult to assign an analytical importance for gender representation to this measure without delving into the particulars of each occupation. If an occupation has reached an ideal level of gender representation, the percentage of women in that occupation should remain relatively static. However, this analysis highlights that the “ideal” level of female representation is not clear. For example, Table 4.1 displays the Marine Corps Combat Engineer occupation among the occupations that show little progress. This placement is a judgment call, given that the Marine Corps could claim that integration of this occupation is complete. On the other hand, female representation among Navy SWOs is increasing. Those who want the SWO community to be fully integrated might consider this a positive trend, while others might view it simply as a reflection of the limited options for female officers in the rest of the unrestricted line (which also includes submarine and aviation officers).

### **Nature of the Work**

The nature of the work, whether it is conducted in field conditions or involves heavy or dirty work, does not drive the number of women who are attracted to an occupation. Being an Army Bridge Crewmember or a Marine Corps Air Support Operations Operator involves living in austere field conditions. Bridge Crewmember is

also classified as having very heavy physical requirements. Nonetheless, the populations of both occupations have greater percentages of female personnel than do their services overall. Other occupations that were analyzed, such as Navy Gunner's Mates and Marine Corps Combat Engineers, are also dirty or physically demanding but have much lower levels of female representation. The Navy Sonar Technician occupation, which is described as cleaner and more highly technical, has lower female representation than does the Navy enlisted population as a whole, but the representation is increasing.

Among the aviation occupations considered—Air Force F-16 pilots, Marine Corps F/A-18 pilots, and Army Apache aviators—none of the populations includes large numbers or percentages of female pilots. Nonetheless, Army Apache aviators includes 1.36-percent women, which is more than either of the other occupations. While the fixed-wing aviation occupations may be perceived to be less welcoming to women, our study was unable to support that assertion. Instead, recent findings show that women are declining opportunities to fly jet aircraft. It is not evident, however, why the Air Force has had slightly greater success in increasing the number of female F-16 pilots than the Marine Corps has had with F/A-18 pilots.

### **Accession and Training**

The occupations vary in whether the female portion of their accessions was higher than, comparable to, or lower than that of the respective service, and this measurement appears key to the overall level of representation in the career. The occupation with the highest accession rates among those we studied (Army Bridge Crewmembers) shows an increasing number of women. Two of the three occupations that have lower accession rates (Army Artillery Surveyor, Marine Corps Combat Engineer, and Navy Gunner's Mates) than their services did not evidence increasing representation within the career, although the percentage of Gunner's Mates who are women is slowly increasing.

The female representation among accessions for all four of the more-integrated occupations was comparable to or greater than that for the respective services. This is not surprising; if the percentage of women brought into an occupation exceeds the percentage of women in the service, the relative percentage of women will always

increase. However, targets for female accessions are dictated by service models that consider the ideal numbers of women in any occupation, given their assignment opportunities. These models limit the overall number of women in occupations, so positive performance and retention of women in these occupations can actually reduce the future accession targets for women (because large numbers are staying). Concurrent RAND Arroyo Center analysis of Army models has suggested that some of the model inputs and calculations may need to be revisited and that the models may thus be more restrictive about female accessions than policy would suggest.

The ideal number of female Marines in any given occupation is an especially difficult issue, and one that the Marine Corps is currently reassessing. The service's models appear to be especially limiting in the case of the Marine Corps Combat Engineer, which is being held at approximately 1.3 percent female, even though over half of the assignment opportunities are open to women. The issue of gender as part of force planning modeling is extremely complex and warrants further examination, such as that conducted for the Army. It does not appear to be in the interest of either the Marine Corps or the individual service member to fill an occupation with more women than can have a viable career, given limited assignment opportunities. However, the decision processes, assumptions, and model calculations that produce accession targets by gender are not immediately evident or easily evaluated, making it difficult to verify that 1.3 percent is the ideal level.

In general, training rates indicated that women could perform on a par with their male colleagues in training. Training graduation rates were often difficult to analyze, given small numbers, but it appeared that women were, over time, performing either as well as their male peers or only slightly lower. In the case of Army Bridge Crewmembers, the male trainees graduated at higher rates than did the female trainees, but the women still graduated at rates above 80 percent. Female Sonar Technicians also tended to graduate from skill training at rates slightly lower than those of their male peers, but nearing 80 percent. This research found nothing to suggest that female trainees will have any problem performing well in nontraditional skill training.

An important consideration in the analysis of accession and training data is whether women are hindered from pursuing military occupa-

tions. The accession process for each occupation examined differs somewhat. To the degree that the services are “hindering” the progress of integration, this research found barriers or resistance embodied only in accession restrictions or assignment (and sometimes resultant advancement) opportunities. For many military occupations, some level of restriction on accessions and assignments is appropriate. However, as stated previously, the logic for determining these levels is not always apparent, and the determinations seem likely to be taking place at relatively low policy levels.

Another accession and training consideration relates to ASVAB scoring. GAO findings suggest that women score less well on certain components of the ASVAB because they lack exposure to certain subjects. Additionally, DMDC research has quantified the effects of prior exposure on four of the ASVAB tests. This research found that exposure to content accounted for a relatively large portion of differences in test scores between males and females. The research also found that while male and female subjects’ Armed Forces Qualification Test scores differed by less than one-tenth of a standard deviation, they differed by more than one-third of a standard deviation on GS and by more than a full standard deviation on Auto and Shop Information (AS) (American Institute for Research, 1997).

While our research did not investigate the ASVAB scores of female recruits in general, we did find that the services did not generally have problems recruiting sufficient numbers of female recruits to these nontraditional occupations to satisfy service recruiting targets and that sufficient numbers of women passed their skill training. Thus, scoring less well than men on certain components of the ASVAB does not currently limit the integration of women into the selected occupations. Nonetheless, it appears likely that the ASVAB prerequisites could limit female participation in some occupations not included among our case studies or that the prerequisites could affect female participation in these occupations if the female accession targets were increased.

### **Occupation Assignment Patterns**

This research explored formal assignment opportunities for female service members in the selected occupations, as well as the effects of gender-limited assignments on male service members. When there

are assignment constraints, gender integration in the occupation is often considered problematic. Two of the occupations considered have severe assignment constraints. The Marine Corps has zeroed out the female accession targets to limit the number of women among Combat Engineers, and the Army is phasing out Artillery Surveyor by merging it with occupations that are closed to women. Neither occupation offers opportunities for advancement and success to female service members. The civilian-transferable skills Combat Engineer provides may compensate for the limited opportunities individuals have while in uniform. Regardless, female recruits should be counseled about the limited number of opportunities available to them if they choose this occupation.

Several of the occupations discussed have much-less-limiting assignment constraints. As described in Chapter Two, female enlisted Navy personnel cannot serve on frigates or smaller surface ships or on ships that are scheduled for integration but that are not yet available to female enlisted personnel. Female officers can serve on almost all surface ships except patrol craft. The smaller ships are not considered necessarily career enhancing for Navy personnel, but then there is also no evidence that male careers are unduly hampered by filling these assignments.

The perceived differences between assignments that are open or closed to women within a career might have two different kinds of effects. If women are precluded from career-enhancing assignments or jobs perceived as being key to occupational development (such as assignments in tactical level units), women are unlikely to be evaluated as highly and are thus unlikely to experience the same levels of career success. If women are precluded from filling assignments that are considered to be less attractive or even detrimental to careers, women might find themselves resented by their male peers. In these instances, a cultural resistance to gender integration can develop. Such cultural resistance is increasingly likely as larger numbers of women populate such occupations, enhancing the perception that men are taking “more than their fair share” of less-appealing assignments.

### **Predicting Future Levels of Gender Integration**

Several issues hamper the ability to predict future levels of gender integration. First, when individuals do not enter directly into an

occupation, such as when there is a lengthy training and selection process (as for aviation occupations), it is difficult to analyze and assess the factors that influence the process of integration.

Second, while the relationships among accession, retention, and representation should be relatively clear in larger populations, small numbers (especially in retention figures) complicate any prediction. Service commitments, such as those for flight training, also complicate and obscure retention conclusions. In these instances, the communities will suffer the problems of extrapolating from small numbers several years hence, and it will be even longer before larger numbers of women progress through their obligated service and contribute to a more-comprehensive understanding of whether women will retain in patterns similar to those of their male peers.

Third, most of the women in these newly opened occupations can still be considered “pioneers.” Given any cultural resistance or other perceived difficulties that pioneers in a field may experience, they may either leave at higher rates or exhibit greater determination and resultant success than will later women who are not part of the pioneer phase. Most of the occupations described in this report might still be considered within the pioneer phase, although currently entering SWOs are likely postpioneer. Occupations in which there has been little or slow progress in gender integration, such as aviation, will take considerably longer to emerge from the pioneer phase. The duration of the pioneer phase makes assessment of progress, as well as the eventual steady state of behavioral patterns and resultant levels of integration, difficult to predict and plan for.

## **RECOMMENDATIONS AND POLICY IMPLICATIONS**

**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 dis-

suade 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.

**When an occupation is to be closed to women or is being merged into an occupation that is closed to women, cease accepting women into the occupation and plan opportunities to be made available to women currently in that occupation.**

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

**Recognize that individual and systemic behavior in newly integrated occupations will be influenced by the pioneer effect for an undefined amount of time and, thus, that assertions about the success of integration, the ability of female personnel to perform on a par with their male colleagues, or retention behavior may be premature.**

**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.

**Verify and validate the service models that limit female accessions as a result of assignments closed to women.**