

# Women in Service Restrictions: Key Issues and Initial Analysis

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A handwritten signature in black ink, appearing to read 'Mark B. Geis', with a stylized flourish at the end.

Mark B. Geis  
Vice President and Director  
Marine Corps Division

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# Women in Service Restrictions: Key Issues and Initial Analysis

CNA's women in service restrictions study team<sup>1</sup>

## INTRODUCTION

The National Defense Authorization Act (NDAA) for fiscal year (FY) 2011 directed the Secretary of Defense and the service secretaries to “conduct a review of laws, policies, and regulations, including the collocation policy, that may restrict the service of female members of the Armed Forces...”

Current Department of Defense (DOD) policy excludes women from assignment to units below the brigade level whose primary mission is direct combat on the ground. In the Marine Corps, this policy restricts women from classification into combat arms military occupational specialties (MOSs), including those in the infantry, artillery, or tank and assault amphibious vehicle occupational fields (occfields). It also restricts the assignment of female Marines below the division level in the ground combat element (GCE)—except for the headquarters battery in artillery regiments.

The Assistant Commandant of the Marine Corps (ACMC) asked CNA to provide information to help inform a decision about whether to change existing policies, and if the Corps decides to make the changes, to better understand their effects on recruiting, retention, manpower management, and training processes.<sup>2</sup>

In this document, we focus on our findings in five areas of particular interest:

1. differences in the physical abilities of men and women
2. differences in the injury rates of men and women
3. experiences of other militaries and organizations in integrating women
4. unit cohesion and combat effectiveness, including how units might be affected by gender integration, and
5. existing survey evidence on the possible effects of a policy change on recruiting and retention.

## Methodology

To understand what is known and unknown in each of these areas, we have conducted extensive reviews of the existing literature; interviews with subject matter experts from other countries' mili-

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1. CNA's study team is led by Ms. Anita Hattiangadi and Dr. David Strauss and includes Dr. Adam Clemens, Ms. Margaux Daly, SgtMaj (ret.) Gary Lee, Dr. Lauren Malone, Ms. Annemarie Randazzo-Matsel, Dr. Shannon Phillips, Dr. Yevgenia Pinelis, Dr. Jennifer Schulte, Dr. Christine Whitmore, and Ms. Jennifer Yopp.
  2. Implementation challenges will not be discussed here.

taries, other organizations, and the Marine Corps; and data analyses of existing survey and Marine Corps training data relevant to prospective policy decisions. We also have developed a force survey and, once approved by Marine Corps leadership, we will present the survey to an Institutional Review Board (IRB). We anticipate IRB approval within the next few months, which should allow the Marine Corps to field the survey to all active component and drilling reserve component enlisted Marines and officers in May 2012. We will submit several study documents for ACMC's review between now and August 2012.<sup>3</sup>

## **HISTORY OF CURRENT POLICIES AND SUMMARY OF NEW INITIATIVES**

After World War II, Congress enacted legislation that provided a permanent status for women in the military services' Regular and Reserve components. However, the law also restricted women's service; women could comprise no more than 2 percent of the military's enlisted endstrength. Women also were prohibited from assignment to combat aircraft and naval vessels.

Over the past five decades, Congress has eliminated these restrictions. Congress lifted the percentage and rank restrictions on female servicemembers in 1967 and repealed the bans on female servicemembers serving on combat aircraft and combat naval vessels in the early 1990s.

Although legislative restrictions on women's service have been lifted, DOD policy still bans women from direct ground combat assignments.<sup>4</sup> In January 1994, Secretary of Defense Les Aspin promulgated the DOD rules for assignment of women in the services in a memorandum [1]. Most notably, the rules prohibit women from serving in "units below the brigade level whose primary mission is to engage in direct combat on the ground."

In addition to this direct ground combat exclusion, the memorandum allows additional restrictions on the assignment of women where

- the Service Secretary attests that the costs of appropriate berthing and privacy arrangements are prohibitive;
- units and positions are doctrinally required to physically co-locate and remain with direct ground combat units that are closed to women;<sup>5</sup>

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3. We will publish a sponsor review version of an interim report focusing on the experiences of other organizations and foreign militaries later this month. This summer, we will publish a sponsor review version of an interim report on our survey results. A final study document will be published for ACMC's review in August 2012.
  4. DOD must notify Congress before lifting these restrictions.
  5. As we discuss below, the collocation restriction is likely to be eliminated in the coming months, following the expiration of the 30-day waiting period after DOD's February 9 notification to Congress.

- units are engaged in long-range reconnaissance operations and Special Operations Forces missions; or
- job-related physical requirements would necessarily exclude the vast majority of women servicemembers.

In accordance with this policy, the Marine Corps excludes women from several MOSs, including those in its three combat arms occfields: Infantry, Artillery, and Tanks/Amphibious Assault Vehicles. In addition, female Marines in “open” MOSs are not assignable to the GCE below the division level (except for the headquarters battery in artillery regiments). Table I shows the percentage of active component billets that are currently open to female Marines and officers.

Table I. Active component Marine Corps billets open to women<sup>a</sup>

<b>Rank</b>	<b>2011 active component billets</b>	<b>Percentage of active component billets open to women</b>
<b>Officer</b>	15,482	78%
<b>Warrant Officer</b>	2,176	86%
<b>Enlisted</b>	151,807	67%
<b>Total</b>	169,465	68%

a. Source: [2].

Based on its findings during the FY 2011 NDAA-mandated policy review, DOD formally notified Congress on February 9 that the services will remove the collocation restriction:

DoD, in coordination with the Military Departments and the Joint Staff, determined that the dynamics of the modern-day battlefield are non-linear, meaning there are no clearly defined front line[s] and safer rear area[s] where combat support operations are performed within a low-risk environment. Therefore, there is no compelling reason for continuing the portion of the policy that precludes female servicemembers from being assigned to units or positions that are doctrinally required to physically co-locate and remain with direct ground combat units [2].

This change will open over 13,000 Army positions; the Marine Corps has decided not to open additional positions pending results of its internal review.

In addition, in accordance with a November 2011 Joint Chiefs of Staff Tank decision, the Army, Marine Corps, and Navy requested an exception to policy that, once the congressional notification period has ended, will allow them to assign female servicemembers in open MOSs to select units below the brigade level (but not below the battalion level) whose primary mission is to engage in direct ground combat. In the Marine Corps, this will include the assignment of unrestricted, female company grade officers (first lieutenants and captains) and staff noncommissioned officers (in the grades of E-6 and E-

7) within open MOSs to up to 371 billets in select active-duty ground combat units at the battalion level.<sup>6</sup> The Navy and Marine Corps have agreed on opening an additional 60 positions for Navy officers and enlisted sailors to serve in support of the Marine Corps. The Army identified 10 officer and 10 enlisted occupational specialties in select units (755 battalion-level positions in nine Brigade Combat Teams) to open as its exception to policy. The services will evaluate information gathered through these assignments during the summer of 2012. The services have stated that they do not intend to make any additional changes to current policy prior to that time.

A separate February 9 memorandum from the Secretary of Defense directs the services to report back through the Under Secretary of Defense (Personnel and Readiness) within six months on “progress towards further reduction of gender-restrictive policies and your assessment of the remaining barriers to full implementation of the policy allowing all servicemembers to serve in any capacity, based on their ability and qualifications” [3]. This report is required to include discussion of:

- Efforts to pursue gender-neutral physical standards
- Assessment of newly opened positions
- Identification of any further positions that can be opened.

In an effort to gather relevant information, the Commandant of the Marine Corps (CMC) recently approved a plan developed by Training and Education Command (with support from the Naval Health Research Center), that will test enlisted Marines and officers (both male and female) on their ability to perform three core physical events derived from GCE Physical Performance Standards.<sup>7</sup> In addition, ACMC approved a plan in which female volunteers will attend the Infantry Officers’ Course (IOC) and performance data will be collected and compared against IOC training standards.<sup>8</sup>

## **RESEARCH AREAS OF PARTICULAR INTEREST**

In what follows, we discuss preliminary findings from our research in five areas: 1) differences in the physical abilities of men and women; 2) differences in the injury rates of men and women; 3) experiences of other militaries and organizations in integrating women; 4) existing literature on unit cohesion and combat effectiveness, and how they might be affected by gender integration; and 5) survey evidence on the possible effects of policy changes on recruiting and retention.

### **Physical abilities**

There are proven differences between women and men that could be significant for female classification to combat arms MOSs or assignments to GCE units. Men and women have notable differences in strength, percent of fat-free body mass, percent body fat, heart size, blood hemoglobin content, and

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6. The Marine Corps is assigning these female Marines and officers to non-infantry, non-reconnaissance units.

7. CMC approved the GCE Physical Performance Standards research on February 25, 2012.

8. ACMC approved the IOC research on March 2, 2012.

aerobic capacity [4, 5]. Three physical aspects in particular where there are notable gender differences are endurance, strength (particularly upper-body strength), and movement under a load.

With respect to endurance, women appear to have an advantage. When researchers tested subjects under repeated cycling sprints, women were found to exert less absolute and relative work than men over the entire test period, even though perceived exertion was the same for both genders [6]. Others have noted that women's muscles fatigue slower and recover faster than men's muscles [7]. One theory for this advantage is that women have a higher percentage of intramuscular fat available for use, which they use with greater efficiency [7].

Men appear to have an advantage in strength. According to testimony for the 1992 Presidential Commission on the Assignment of Women in the Armed Forces, only 5 percent of women demonstrated median male strength levels [8]. Strength differences appear to be most pronounced in the upper-body: one study found that men are 72 percent stronger in the upper body than women [4]; another study notes significant differences in push-up ability [9]. Similarly, the average lifting capacity of women, as tested in one study, was only half that of men (66 pounds versus 119 pounds), and in an Air Force test of participants' ability to lift 110 pounds, 66 percent of men and 1 percent of women succeeded [4]. Our analysis of Marine Corps data was consistent with these findings. We examined, for example, data on Officer Candidate School (OCS) candidates' performance on the ammunition can lift test (part of the combat fitness test (CFT)). We found that, on average, male candidates performed better than their female peers; men averaged 92 repetitions while women averaged 59.<sup>9</sup> These disparities in upper-body strength levels may in part be due to women's smaller muscle cross-sectional areas (men have 30 percent greater cross-sectional area than women [8]) and different muscle fiber type distributions [10].

Women and men also demonstrate differences in physical ability to conduct movement with a load. This appears to be partly due to the upper-body strength differences noted above as well as body size differences. For example, in Australia, smaller women—in terms of height and muscle mass—were shown to have extreme difficulty completing a 15-km march in less than 165 minutes under a load [11]. However, differences in load carriage remain, even when body size and composition are held constant. Specifically, women under a load shorten their stride (as opposed to men, who lengthen theirs), spend more time with both feet on the ground, hyperextend their necks, and bring their shoulders farther forward than men [12].

There are a number of characteristics that researchers have found to be correlated with lifting strength and combat load carriage for women. One study found that body mass index (BMI, a calculation based on height and weight) can predict strength for women. Notably, women with higher BMIs generally performed better on strength tests, although they had slower average run times [13]. Musculature, as demonstrated by fat-free mass (the amount of body mass after fat mass has been sub-

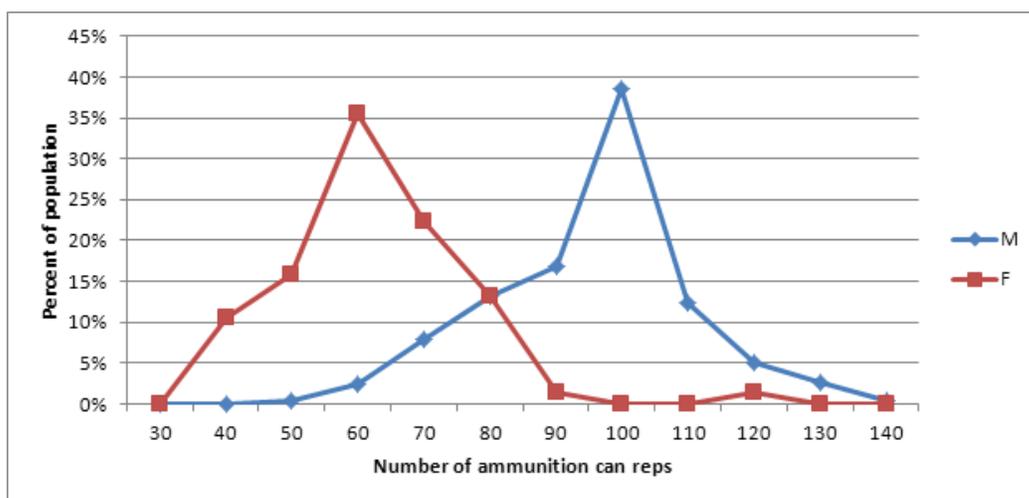
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9. Based on our analysis of OCS CFT scores from three companies from the 2009 and 2010 courses (76 women and 422 men).

tracted), is correlated with strength and, in particular, load carriage. A 2000 study found that fat-free mass predicts load carriage performance in women [14]. Greater height, hip circumference, and overall weight also appeared to be correlated with shorter march times under very heavy loads (90 pounds, or about 67 percent of the average female participant's body weight). Conversely, body fat percentage had no correlation with women's load carriage performance [14].

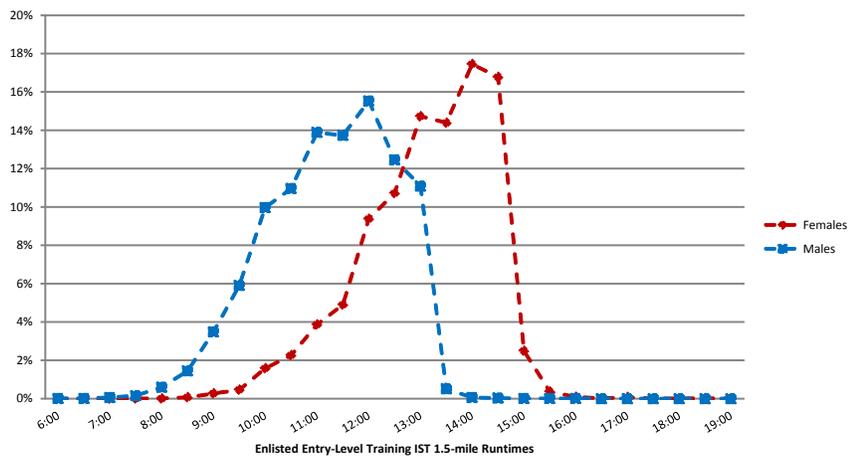
Despite differences in the average physical abilities of men and women, there are some capability overlaps as well. In a 1985 U.S. Navy study that tested arm strength as it related to the most muscularly demanding tasks that sailors might perform, the measured overlap in dynamic lift scores of men and women was 7 percent [7, 8]. According to the 1992 Presidential Commission on the Assignment of Women in the Armed Forces, 3.4 percent of female soldiers achieved male means on the Army Physical Fitness Test (PFT) and 7 percent could do 60 push-ups (compared to 78 percent of men) [8]. A recent brief given by the U.S. Army Public Health Command cited a 1994 study that indicated that there were significant overlaps in upright pull and lifting strength between stronger women and weaker men [15]. Another study showed that the top 10 percent of military women had greater lift capacity than the lowest 10 percent of men [4]. Our analysis also shows overlaps in men's and women's abilities. When we examined OCS CFT scores from three companies from the 2009 and 2010 courses (76 women and 422 men), we found that 75 percent of women were able to perform within the bottom male quartile in ammunition can lifts, 3 percent (2 women) performed above the bottom male quartile, and one female candidate performed above the male average (see figure 1). There were greater overlaps in run times. In our analysis of Parris Island bootcamp initial standard test (IST) 1.5-mile run times for FY08-FY11, 21 percent (2,120) of female recruits ran faster than the bottom male quartile, and 8 percent ran faster than the average male recruit (see figure 2).

Figure 1. OCS CFT ammunition can lift scores<sup>a</sup>



a. CNA analysis of OCS CFT scores from three companies from the 2009 and 2010 courses (76 women and 422 men).

Figure 2. IST run times, by gender<sup>a</sup>



a. CNA analysis of Parris Island bootcamp IST 1.5-mile run times for FY08-FY11 from after action reports (AARs).

The extent to which differences and overlaps in men’s and women’s physical capabilities matter depends on two additional factors: the ability of training to affect these capabilities and the standards to which men and women have to perform.

*Ability of training to improve physical capabilities*

Researchers have found that training programs can improve the physical capabilities of both men and women. For example, although aerobic capacity has a genetic component, it can be increased through training. Similarly, fat-free mass can be increased through weight training—mostly by increasing muscle mass [16]. However, the mass of other elements that make up fat-free mass, to include bone and organs, is less likely to be changed.

Because women often enter the military less fit on average than men, training programs can be particularly effective in improving women’s physical fitness. The results are mixed, however, as to whether these programs can improve women’s fitness to the point where they can perform on par with their male counterparts. In some cases, women have been shown to perform to male performance norms following a training regimen; in others, they do not reach male performance norms. A 2001 study, for example, assessed four female training regimens focused on total strength or upper body strength, using power (rapid movement and few repetitions) or hypertrophy (slower, controlled movements with more repetitions) resistance [10]. For all four training regimens, women achieved performance statistically identical to that of untrained men in a repetitive box lift task (of a box weighing 20.5 kg/ 45 lb), two-mile “loaded” run (i.e., with a 34.1-kg/75.2-lb rucksack), and push-ups. The two upper-body training regimens improved women’s unloaded 2-mile run speeds to statistical equivalence with untrained men’s as well [10].

Other studies found that, although women’s physical abilities markedly improved with training, they were unable to reach male norms. One 1978 study showed that, following a three-week training program of jogging and weight training, female soldiers still loaded Howitzers more slowly than men [5]. In another study, trained women were able to conduct 2-mile road marches while carrying 31.8 kg (70 lb) in 29.6 minutes, but they still lagged the pre-training average men’s time (24.7 minutes) [15]. The U.S. Navy found that, even after training, men outperformed most women in executing damage control tasks involving heavy lifting [7]. Finally, studies have shown that, among women taking the New York City (NYC) firefighters test, pass-rates improved following institution of a training program, but women did not achieve male pass-rates [7].

We do not have data on strength training in the Marine Corps. However, we were able to analyze run times from bootcamp.<sup>10</sup> For men and women who completed bootcamp between FY08 and FY11 at Parris Island, figure 3 shows that both groups run faster after training (as shown by comparison of the two red and two blue lines). We note that women improve more than men (i.e., their distribution shifts further to the left), but their run times remain, on average, slower than male pre-training averages, and they initially had more room for improvement.<sup>11</sup>

#### *Women’s ability to meet job performance requirements*

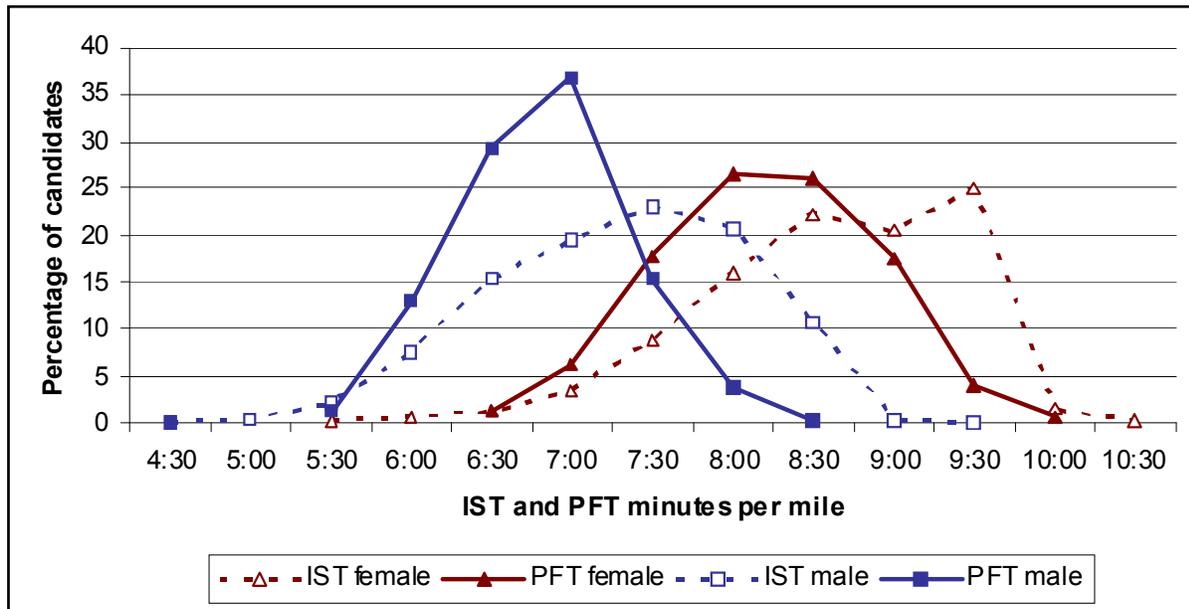
Whether women’s physical abilities—either pre-training or post-training—are sufficient, however, depends on job requirements. As we noted earlier, CMC recently approved research on men and women’s abilities to meet GCE performance standards. Until the Marine Corps completes those studies, we are limited to reviewing existing published research, which reflect mixed results. Several studies find that women are able to meet physically demanding job performance standards. In the 1978 study cited above, although women loaded Howitzers more slowly than men, they were able to load them at the U.S. Army’s required rate [5]. In another study, after 14 weeks of a 28-week training program—in which civilian volunteers performed weight training, running, backpacking, and specialized drills for 5 days a week for 1 to 1.5 hours per day—all female participants were able to lift 100 pounds to table height (the lifting requirements of the “very heavy” Army MOSs) [17]. A 1997 study found that, under a 36-kg (about 80-lb) load, junior female Australian soldiers had a maximum speed of  $4.4 \pm 0.6$  km/hour in a 10-km road march [11]. Notably, this exceeds the infantry standard for 0300-COND-1001, “March under a load,” which requires completion of a 20-km march in 5 hours (or 4 km/hour), albeit for a shorter distance and with potentially less weight. Similarly, all Marine Combat Training (MCT) students (male and female) currently must complete a 15-km hike carrying about 73 lb. According to

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10. Because recruits take the IST at the beginning of bootcamp and the PFT at the end of bootcamp, we converted both scores to minutes per mile to allow comparability. For example, both a 13:30 run-time for the 1.5-mile IST and a 27:00 run-time for 3.0-mile PFT are equivalent to a 9:00-minute mile.

11. Because the PFT is twice as long as the IST, it is likely that improvements are more pronounced than shown here, as people could probably have run the IST’s shorter distance at a faster pace by the end of training.

Figure 3. Parris Island IST and PFT run times for men and women completing bootcamp<sup>a</sup>



a. CNA analysis of Paris Island bootcamp IST and PFT run times for FY08-FY11 from AARs.

MCT staff, nearly all Marines complete the hike within 3.5 to 4 hours (approximately the 0300-COND-1001 pace).<sup>12</sup>

Other studies, however, have found that the majority of women are unable to meet job performance standards. In an Australian Department of Defence test referenced earlier, only 36 percent of female soldiers could complete a 15-km march while carrying 34.6 kg within 165 minutes (the standard in the annual combat fitness assessment) [11]. In a separate test, only 1 of 28 women was able to complete the Australian Armed Forces infantry-based, run-dodge-jump obstacle course in the required 70 seconds [11]. Combining the results of this test and others, the researchers estimated that up to 7 percent (but possibly less than 3 percent) of Australian female soldiers could achieve ground combat physical standards [11, 18, 19]. United Kingdom (UK) studies estimate that just 1 percent of trained women can achieve the physical standards demanded of ground combat soldiers [18]. Reports of a 2001 study by UK subject matter experts suggested that women taking part in trials were not able to complete a number of tasks under battlefield conditions [20]:

- When asked to carry 90 pounds of artillery shells over measured distances, women failed 70 percent of the time (compared to a male failure rate of 20 percent).

12. In accordance with Marine Corps training standards, not all gear is “carried.” The official gear list includes, for example, the boots and utilities that Marines wear during the hike, accounting for about 10 of the 73 lb.

- When asked to march 12.5 miles carrying 60 pounds of equipment followed by target practice in simulated wartime conditions, women failed 48 percent of the time compared to a male failure rate of 17 percent
- Women were generally incapable of digging themselves into hard ground under fire
- Women were generally slower in simulated combat exercises involving “fire and move” drills
- Women suffered much higher injury rates in close-quarter battle tests, such as hand-to-hand combat.

Finally, of recruits passing the written portion of the NYC firefighter test, 57 percent of men passed the physical portion, but only 3 percent of women did [21].

In summary, there are notable differences in the physical capabilities of men and women that could be significant for ground combat service policy considerations. Men consistently outperform women on strength tests. However, tests of women’s performance on physically demanding job-related tests generally show that *some* women are able to meet established standards. How many women meet these standards varies, depending on the strength and/or load carrying requirements of the standards and whether women were trained prior to the tests. For some standards, most women can pass; for others, only a few women can pass.

### **Injury rates**

Based on aggregated Marine Corps and Army statistics, women are injured approximately twice as frequently as men during basic training [15]. According to a British study, female soldiers reported back pain three times as often as men, often as a result of training or work [22]. Women also appear to have body parts that are particularly injury prone: they are more likely to get stress fractures in the hip and pelvis, and are more likely to have overuse ankle injuries than men [23].

Our analysis supports these claims. We obtained OCS data on classes held from FY06 to FY10 and examined three different categories of medical-associated attrition: 1) initial attrition (up to the middle of week-two), 2) attrition from injury sustained during training, and 3) attrition from injury not sustained during training.<sup>13,14</sup> We examined whether and where medical-associated attrition differences between men and women were statistically significant.

First, we found no notable differences in medical-associated attrition for candidates entering OCS. Of medical-associated attrition occurring during OCS (whether or not it was sustained during training),

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13. We did not analyze a fourth category of attrition, injury due to a pre-existing condition, as we focused only on injuries arising during OCS.

14. In analyzing the data, we combined attrition statistics from the six- and ten-week versions of OCS, since injury rates were not statistically different between them.

we identified a statistically significant difference in rates of evident orthopedic injury between men and women. At OCS, women attrited for evident orthopedic injuries, on average, nearly 3.5 times as often as men. Interestingly, rates of evident orthopedic injury sustained outside of training were nearly as high as those sustained during training (table 2).<sup>15</sup>

Table 2. Rates of evident orthopedic injury attrition at OCS, FY06-FY10<sup>a</sup>

Timing of injury	Male injury attrition rate	Female injury attrition rate
Injury sustained during training	1.2%	4.3%
Injury not sustained during training	1.0%	3.3%

a. CNA analysis of OCS data from FY06 to FY10.

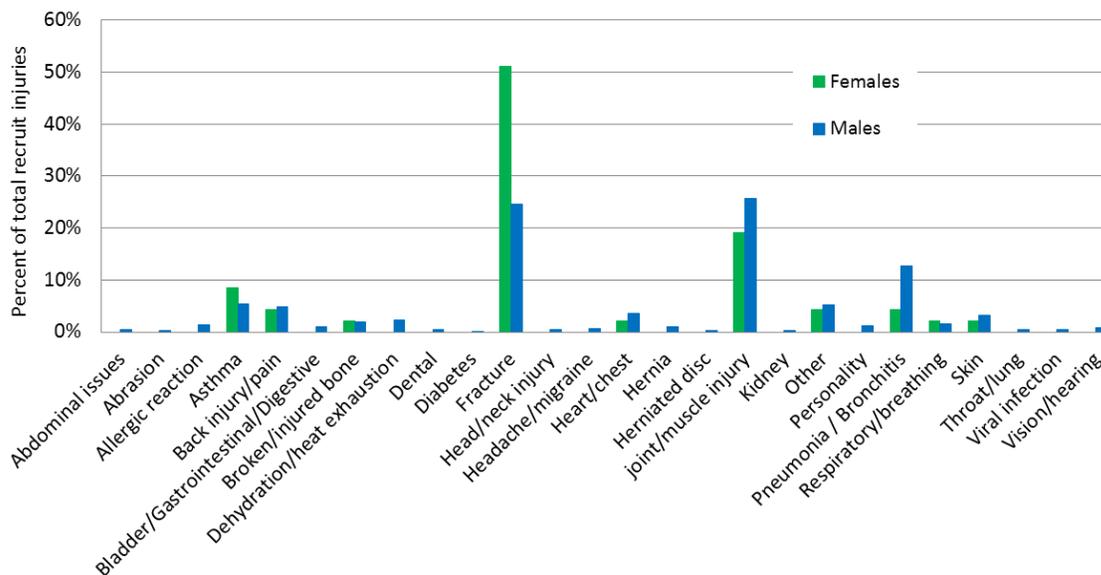
We also examined injury data from Parris Island Recruit Company after action reports (AARs). These data include recruit company cycles with pick-up dates between March 2006 and August 2008—6 female company cycles and 45 male company cycles. Because of limitations in our data sample, we caution that our analysis may not be representative for the entire Marine Corps female recruit population.<sup>16</sup>

We first examined overall injury rates for these recruits. Across all female recruit company training cycles, 47 women were injured out of 912 female recruits—a 5 percent injury rate. Across all male recruit company training cycles, 1,239 men were injured out of 20,800 male recruits—a 6 percent injury rate. Therefore, in contrast to other research, we found that, across all injury types, female and male recruits appeared to get injured at roughly equal rates. We note again, however, that our sample was limited. We also examined injury rates by type of injury, as shown in figure 4. We found that women tend to suffer more fractures (double the rate for men), with over half of all female injuries being fractures. Joint/muscle injuries were the second most common injury for both genders, although men had a slightly higher rate than women. Although men suffer from pneumonia/bronchitis at a higher rate than women, there is a large environmental component to this that might negate the gender effect shown.

15. This could be because many orthopedic injuries, particularly stress fractures and overuse injuries, are not immediately noticeable, so an injured person may only seek medical attention after—instead of during—the training event.

16. Although our data comprised a number of different companies, we only had information for women in N Company. O Company and P Company, the other two female recruit companies at Parris Island, were not represented in the available dataset. Based on FY09 company sizes, it appears that N Company may be, on average, slightly larger than O and P Companies, although differences are not statistically significant.

Figure 4. Parris Island recruit injury rates, by injury site<sup>a</sup>



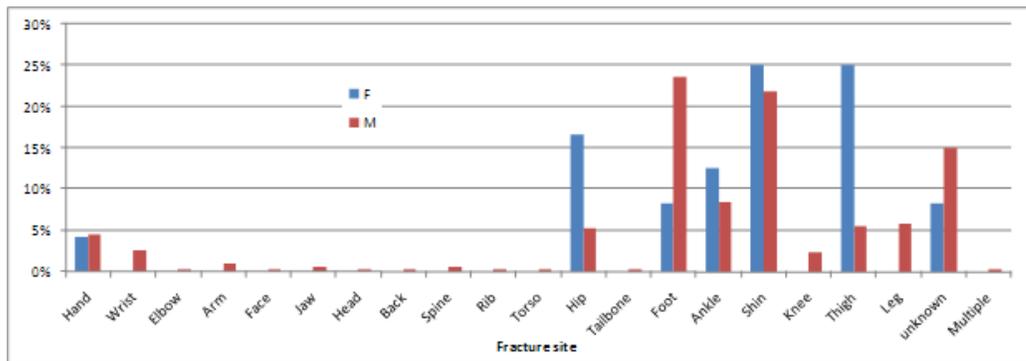
a. CNA analysis of Parris Island Recruit Company after action reports (AARs) from March 2006 through August 2008.

Because fractures represented a significant portion of injuries for both genders, we next explored whether there might be differences in fracture sites (see figure 5). Unfortunately, some fracture site data were incomplete or non-specific. Overall, most fractures occur in the lower extremities for both genders. Women have over five times the rate of thigh (femur) fractures and four times the rate of hip fractures as compared to men; men appear to have almost three times the rate of foot fractures. We note, however, that we do not know the sites at which a large number of the male “leg” fractures occurred, and a significant number of fractures occurred at unknown sites. Without amplifying analysis, we cannot draw strong conclusions about fracture site differences between men and women.

Outside of entry-level training, women in the Marine Corps do appear to be on limited duty (as determined by a Medical Evaluation Board) more often than men. Our analysis of a snapshot of active-duty Marines from Sep. 30, 2011, showed that 4.6 percent of women and 2.8 percent of men were on limited duty.<sup>17</sup>

17. Pregnancy is likely one factor contributing to this difference; we hope to analyze injury rates for men and women in the force, should those data be available.

Figure 5. Site of Parris Island recruit fractures<sup>a</sup>



a. CNA analysis of Parris Island Recruit Company after action reports (AARs) from March 2006 through August 2008.

### *Causes of female injury rates*

Several studies have found that many of the noted differences in injury rates between men and women disappear when researchers account for fitness. For example, a number of studies that compared the injury rates of men and women whose physical fitness levels were the same found that injury rates between the genders were not statistically different. Researchers concluded that the reason for higher injury rates among women entering military service was not something inherent to their gender, but rather that they were less physically fit than their male counterparts at the time they entered the service [24, 25, 26]. The Navy’s Sports Medicine Injury Prevention (SMIP) Program notes that slow IST runtimes are positively correlated with recruit stress fractures [27]. Other studies have found that aerobic fitness, as determined either by  $VO_2$ max (a measure of aerobic capacity based on a person’s maximum rate of oxygen consumption during exercise) or by run time, is inversely correlated with injury likelihood [24, 25]. Thus, less aerobically fit recruits (or smokers) are more prone to injury [28].

We analyzed Parris Island bootcamp data from FY08 to FY11. As we note earlier, overall, female recruits suffer about twice the medical attrition rates of male recruits (7.3 percent for women and 3.5 percent for men). However, for men and women with comparable IST run times, medical attrition rates were more similar. Table 3 shows injury rates for women who ran the IST as fast as the top 70, 80, and 90 percent of men. As the table shows, women who completed the IST run in 13 minutes and 6 seconds or faster (36 percent of women) had medical attrition rates of 4.8 percent. Men who completed the run in the same amount of time (90 percent of men) had medical attrition rates of 3.3 percent.<sup>18</sup> Although the differences in the medical attrition rates for these sub-populations remain statistically significant, the gap in injury rates between men and women narrows considerably. In

<sup>18</sup>. Overall attrition rates for these recruits were also similarly low (about 10 percent).

addition, we note that running is only one component of fitness; other potential measures of initial fitness, however, were not available.<sup>19</sup>

Table 3. Parris Island Initial Strength Test run times and medical attrition rates<sup>a</sup>

Run time (minutes:seconds)	Percent of men and women	Female medical attrition rates (%)	Male medical attrition rates (%)
13:06 or faster	90% of men; 36% of women	4.8	3.3
12:37 or faster	80% of men; 26% of women	4.8	3.1
12:15 or faster	70% of men; 19% of women	4.7	2.9

a. Based on a sample of 8,998 women and 49,207 men for whom we have run times.

Finally, we observe that for the 25 percent of women who arrived to recruit training able to complete the 1.5-mile IST run in less than 12.5 minutes, medical attrition rates were considerably lower than for their slower female counterparts (4.7 percent and 8.1 percent, respectively).

A recent TECOM study of 104 female officer candidates also found that, of the 56 candidates who could complete at least one pull-up, 82 percent graduated from their OCS class. Of the 48 female candidates who could not complete at least one pull-up, only 23 percent graduated. Although the study focused on graduation rather than injury rates, these findings seem consistent with our analysis [29].

### Gender integration experiences in other countries and other organizations

We reviewed the existing literature from four countries—Australia, the United Kingdom, Canada, and Israel—whose experiences may provide insights that are relevant to the U.S. Marine Corps. We chose these countries not only because they have studied the role of women in ground combat, but also because they are somewhat similar to the United States in terms of military employment. Australia is poised to allow women in all trades, including all combat arms trades, by the end of 2013.<sup>20</sup> Canada has allowed women to serve in all occupations and units for over 20 years. The remaining two countries—the United Kingdom and Israel—restrict women from serving in at least some ground close combat positions and units.

19. During the IST, men conduct pull-ups and women conduct a flexed-arm hang. Because these tests measure different physical abilities, we could not use scores from these tests, for example, to identify men and women who began recruit training with comparable upper body strength.

20. Trades are similar to MOSs in the U.S. Marine Corps.

## *Australia*

The Australian military is significantly smaller than the U.S. military—there are approximately 55,000 active-duty servicemembers across the entire Australian Defence Force (ADF) and women account for 13.8 percent of this force [30]. In early 2010, women could serve in 93 percent of all employment categories and 84 percent of billets in the ADF.<sup>21</sup> However, according to official ADF statistics, women were only participating in 16 percent of the categories open to them across the active-duty force [31].

Australia recently repealed its policies that excluded women from certain ground combat positions and will begin assigning officers to all trades (including combat arms and Special Forces) by 2013.<sup>22</sup> To facilitate this, the ADF will rely on gender-neutral Physical Employment Standards (PESs) to determine who is eligible to serve in each of its trades [32, 33]. PESs originally were developed to inform decisions on employment category selection, training, injury prevention, and occupational health and safety. Only later did it become apparent that the PESs also could facilitate women's integration into all trades [34].

The PESs will assess personnel based on four performance aspects:

- Aerobic power: Force March (FM) Assessment
- Anaerobic power: Break Contact Drill (BCD) Assessment
- Muscular endurance: Lift and Carry (LC) Assessment
- Muscular strength: Box Lift and Place (BLP) Assessment

These tests were chosen because they use the movement patterns, muscle groups, and energy systems needed to perform actual Army tasks [35].

The Australian Army will institute two baseline tests, the All-Corps Soldier (ACS) PES and the Combat Arms (CA) PES. The specific standards for these two baseline tests are shown in table 4. Some trades (the ADF's version of Marine Corps occfields) will have higher requirements. Table 5 shows the recently completed PESs for the four combat arms trades. Unless otherwise noted, the assessments for anaerobic power, muscular endurance, and muscular strength are all done wearing fighting gear (22 kg).

It is still unclear whether soldiers in some trades may have to meet different PESs prior to deployment based on certain operational characteristics. For example, combat support and combat service support soldiers assigned to an infantry unit may be required to meet the CA PES or the infantry PES.

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21. Employment categories (which are similar to occfields in the U.S. Marine Corps) are composed of several trades.

22. According to ADF SMEs, women have been serving in ground combat units (in open trades) since the mid-2000s.

**Table 4. All-Corps Soldier and Combat Arms PES<sup>a</sup>**

Assessment	Test	All-Corps Soldier Standard	Combat Arms Standard
Aerobic power	Forced March	5-km march in 55 minutes in fighting order (22 kg)	10-km march in 110 minutes in marching order (38 kg)
Anaerobic power	Fire & Movement	To be determined	16 16-m legs plus an 18-m leopard crawl
Muscular endurance	Jerry Can Carry	Conduct a 125-m jerry can carry (22 kg)	Conduct a 275-m jerry can carry (22 kg)
Muscular Strength	Box Lift and Place	Lift individual field pack weighing 25 kg to 150 centimeters (i.e., the height of a military vehicle tray)	Lift individual field pack weighing 30 kg to 150 centimeters (i.e., the height of a military vehicle tray)

a. Source: [36, 37, 38].

**Table 5. PESs for combat arms employment categories<sup>a</sup>**

Assessment	Artillery	Engineer	Armour	Infantry
Aerobic power	CA PES	CA PES	CA PES	15-km march with 40-kg load
Anaerobic power	CA PES	CA PES	CA PES	Run 1 km in 8 minutes followed by CA PES test for Fire & Move
Muscular endurance	Repetitive lift and carry (10 m): 43-kg round x 26 repetitions	CA PES	CA PES	CA PES plus a 10-m body drag <sup>b</sup>
Muscular Strength	N/A	45 kg	45 kg	35 kg

a. Source: [36, 37].

b. The weight to be used for the 10-m drag has not yet been published.

According to a report in *Army*, initial trials show that, given appropriate lead-up training, the average male or female soldier is capable of passing the ACS PES [39]. Based on initial results, the ADF recommends that soldiers participate in a 6-week lead up program in order to pass the ACS PES. In addition, as different trades maintain different fitness levels, it will be recommended that units conduct a two- to three-month PES lead up program [40]. To date, women have not yet been tested using the CA PES or for the categories/trades that have been gender restricted, such as infantry and armour. The ADF is conducting testing and trials for these throughout 2012.

### *Canada*

The Canadian Forces (CF) also are much smaller than the U.S. military—they have 66,000 active-duty personnel in their Regular Force (they are less than one-third the size of the U.S. Marine Corps) [41, 42]. As of July 2010, women made up 14.1 percent of this force [43, 44]. Unlike the U.S. military, the CF now allows women to serve in all occupations and units—including combat-related roles in

infantry, armored corps, field artillery, air-defense artillery, signals, field engineers, and naval operations [43, 45]. According to Canada's Department of National Defence, "Men and women undergo the same integrated training, meet the same academic standards, and enjoy the same career opportunities" [45]. According to some sources, women have successfully led units in combat in Afghanistan [46].<sup>23</sup>

The CF's gender integration efforts resulted largely from parliamentary and court decisions in the 1980s. In 1985, the Canadian parliament issued an *Equity for All* report that recommended opening some combat roles to women and establishing a task force to examine fully integrating the military [47].

To investigate the impact of opening combat occupations to women, the CF began the Combat Related Employment of Women (CREW) trials in 1987. For the trials, the CF allowed women to serve in select infantry, artillery, armored, signals, and field engineering units in the Army and Navy [48]. The CREW trials were set up so that female integration occurred during the first year, followed by a two-year evaluation period during which mixed-gender units would be compared to all-male units. Two years into the trial, only 1 out of 60 women recruited for infantry had successfully completed the 16-week infantry-training program [49]. The lack of female volunteers and the few who completed training caused some Canadian officials to question the cost of opening and training women in combat occupations [50].

As the task force and associated research continued, the Canadian Human Rights Tribunal ruled in 1988 that the CF did not have a "bona fide occupational requirement" to keep women out of combat roles, and ruled that the designation of all-male occupations and units was discriminatory. In February 1989, the Tribunal ordered that all occupations and units—except the submarine service—be immediately opened to women. Submarine roles subsequently were opened to women in 2001 [43, 45, 48].

Studies showed that, in the early years of gender-integrated combat units, recruiting and attrition were both problematic. According to a 1997 study, some reasons for this were women's lower physical strength and endurance, instructors' negative attitudes toward women, and social and psychological barriers [51].

According to CF SMEs, recruiting women into combat arms occupations is still challenging. Although women now are allowed to serve in all military occupations and units, they comprise only 2 percent of the combat arms occupations. Roughly 6.4 percent of active-duty women serving in combat arms positions were deployed to Afghanistan between October 2001 and July 2011 [52]. As of 2009, no woman had served in the "assault" roles in the elite Joint Task Force 2 (i.e., anti-terrorist unit) [53]. According to a study of women in ground combat roles, although women are not formally

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23. A little over six percent of active-duty women serving in combat arms positions (infantry, field artillery, combat engineers, air defence, and armour) deployed to Afghanistan between October 2001 and July 2011 [52]. And [46] noted the story of Major Eleanor Taylor, who commanded Charles Company, 1<sup>st</sup> battalion in western Kandahar.

excluded from [JTF 2] roles, the physical standards have been set so high that very few women are expected to meet them and, if they do, to subsequently complete the training process that functions to “weed out” candidates [53].

The CF employs three types of physical fitness standards: selection standards, maintenance standards, and course standards. We summarize these in table 6.<sup>24</sup> CF selection standards are designed to ensure that personnel applying for the most physically demanding military occupations are not only physically capable of completing selection and training, but also are capable of being regularly employed in those occupations. Four occupations have selection standards—JTF 2, Canadian Special Operations Regiment (CSOR), the CF Department of National Defence (DND) Fire Fighters, and Search and Rescue Technicians. Maintenance physical fitness standards are aimed at ensuring that CF personnel attain and maintain the necessary level of physical fitness to perform common military tasks or occupation-specific tasks. Course standards are designed to ensure that personnel applying for additional certifications (for example, an analogue to becoming Airborne- or Ranger-qualified in the U.S. Army) have the requisite physical abilities for the certification.

Table 6. Canadian Force physical assessments<sup>a</sup>

	Selection standards	Maintenance standards	Course standards
Purpose	To ensure personnel applying for certain occupations are physically capable	To ensure personnel maintain fitness required for common military tasking or occupation-specific tasking	To determine suitability for certifications that require physical capacities beyond those required by the regular maintenance standards
Description	Four occupations—anti-terrorist (JTF 2), special operations (CSOR), national defence firefighters, and search and rescue	Uses general physical tests to measure strength and endurance required of the five common military tasks; includes the CF ExPRES (Canadian Forces Exercise Prescription Program) and the LFCPFS (land force Army test)	Certain certifications, such as parachutist
Application	General fitness with some occupation-specific task assessments	All personnel	Only those applying for certifications
Gender-neutral	Yes	CF ExPRES is “gender-fair” LFCPFS is gender-neutral	Yes

a. Source: [54, 55, 56].

24. Specifics on each test will be included in our interim report to be delivered later this month.

Canada is also reexamining its minimum physical fitness requirements. Project Force Fitness for Operational Requirements of CF Employment, mandated by Chief Military Personnel, seeks to validate the CF Bona Fide Occupational Requirements with the aim “to develop scientifically valid and legally defensible physical fitness tests and standards that meet current domestic and deployment operational requirement for CF members” [55]. It is expected to be completed by 2013. This multi-year project, led by Director of Fitness Human Performance Research and Development, is reviewing the CF Minimum Physical Fitness Standards to ensure that all CF personnel are operationally fit and meet the Universality of Service principle.<sup>25</sup> The project also hopes to confirm that the common tasks and yearly evaluation components reflect current CF employment and deployment. First, researchers analyzed what tasks any CF member might be reasonably expected to perform in various situations [55]. Researchers are using operational reports, surveys, focus groups, and interviews to determine the most physically demanding common tasks. Second, they measured the physical demands of these tasks, which ultimately will be used to develop a new minimum standards test. They are now in phase 3, or the development of the actual fitness test components to assess the demands identified in phase 2. According to Michael Spivock, a CF research manager, “just because this test must be based on tasks which could be expected of all CF personnel regardless of occupation or environment (for Human Rights reasons), it may not specifically reflect the demands of the combat arms” [55]. For this reason, Canada also has been working to revalidate the LFCPFS. According to Spivock, the team revalidating the LFCPFS has conducted trainability studies showing that women are capable of attaining the new standard established in a matter of weeks [55].

Finally, Canada is conducting the Occupational Fitness Standards project, which is sponsored by the Director of Personnel Generation Requirements. The project’s goal is to establish specific physical and psychological requirements for each of the CF’s 102 occupations. To date, it has examined approximately 20 occupations, but has not yet reviewed the combat arms occupations [55].

### *United Kingdom*

The British Armed Forces is comprised of three branches: the British Army, the Royal Air Force (RAF), and the Royal Navy (which includes the Royal Marines). Together, these three branches include approximately 174,000 active-duty personnel, of whom women make up 9 percent [57, 58]. As of 2006, women could serve in 71 percent of the positions in the Royal Army and Royal Navy, and 96 percent of positions in the RAF [58].

The Sex Discrimination Act of 1975 allows the Armed Forces to exclude women from posts where military judgment is that the employment of women would undermine and degrade combat effectiveness. Under current policies, women can serve in all specialties except those where the primary duty is “to close with and kill the enemy.” In accordance with this policy, women are excluded from the Royal Marines General Service (as Royal Marine Commandos), the Household Cavalry and Royal

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25. The Universality of Service, or “soldier first,” principle requires that all CF personnel be able to perform general military duties in addition to their military occupation or occupational specifications.

Armoured Corps, the Infantry, and the Royal Air Force Regiment. They are also precluded from serving as mine clearance divers. These exclusions do not, however, prevent women from attaching to such units in administrative and support roles. For example, women can serve as medics or clerks at any level (even with companies and platoons). Female medics may go on patrol with their platoon or company in combat. However, while they serve on a daily basis with the infantry regiment or battalion, they are still technically part of the Royal Army Medical Corps, not the ground combat units. In the Royal Marines, women who pass the All Arms Commando Course can serve in support roles (e.g., medical personnel, logisticians, and chefs) in 3 Commando Brigade. Finally, women had been excluded from serving aboard submarines; this restriction, however, is currently being lifted.

The UK's gender-based policy has been challenged, but it was upheld by the European Court of Justice in 1999. The Court did, however, maintain that there was a duty to reassess the activities concerned at least every eight years to decide whether, in light of social developments, the exclusions should remain in effect. This policy has been the subject of two separate reviews in the past 20 years. Both reviews recommended that the policy remain in effect. In the last review, the UK found that a small percentage of women (no more than 1 percent of trained women and 0.1 percent of women in general) could meet its requirements for service in ground combat [59]. The Minister of Defence further stated that gender-integrating such units could have potentially harmful effects on cohesion, which could, in turn, hurt combat effectiveness.<sup>26</sup>

### *Israel*

Israel's military is often considered to be a potentially useful case study because women may serve in a variety of ground combat roles, and Israel has been involved in ground combat operations in the recent past. Today, women may serve in several ground combat positions, such as light infantry; nuclear, biological, and chemical; anti-aircraft, rescue and saving; shallow water diving; dog handling; artillery; pilots; and border control [53]. Despite the potential value of studying Israel's experience, it is difficult to obtain reliable data on the most important elements of the country's gender-integration efforts. Cawkill et al. [53], for example, cite evidence suggesting that when ground combat units deploy, women often do not go with them. However, details of when women are and are not allowed to deploy, and what factors are considered in determining whether women can deploy, are not readily available. Some units, for example, have apparently excluded women because certain religious (Hesder) male soldiers were joining the battalion. [60]. If true, such reasons for excluding women would appear to be idiosyncratic of cultural norms and religious accommodations made in the Israeli military, and therefore likely inapplicable to prospective U.S. experiences. Without further details on the contexts in which women are restricted from deployments, it is not clear what lessons the United States can draw from Israel's gender-integration experiences.

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26. We discuss the UK's findings on gender integration and unit cohesion in more detail in a later section.

### *Other organizations*

Unlike in the military, U.S. law does not permit civilian professions, such as firefighting and Special Weapons and Tactics (SWAT) policing, to exclude women. Several of the most physically demanding civilian professions, including firefighters, smokejumpers, and SWAT police, use gender-neutral physical standards and associated tests developed by professional organizations to determine if male or female candidates can meet job requirements. For example, about 40 percent of professional fire departments use the Candidate Physical Ability Test (CPAT). The CPAT was developed to meet validity criteria established by the Equal Employment Opportunity Commission, the Department of Justice, and the Department of Labor [61]. This gender-neutral test evaluates a candidate's ability to perform eight critical job tasks while wearing a 50-lb vest.<sup>27</sup> Similarly, smokejumpers must meet certain physical fitness standards, which include push-ups, chin-ups, sit-ups, and timed runs. In addition, all smokejumper recruits, regardless of gender, must pass a pack-off test (a 3-mile hike over level ground carrying a 110-lb pack completed in 90 minutes or less) and a work-capacity test at the arduous level (a 3-mile hike over level ground carrying a 45-lb pack completed in 45 minutes or less) [62, 63]. Police departments each have their own SWAT recruiting standards, but some departments use the Cooper "Single Cut-Point" standard endorsed by the Texas Tactical Police Officers Association. This gender-neutral standard has been defended in court and involves two timed runs, push-ups, and sit-ups [64].

The physical demands of these professions have made them unattractive or out of reach to many, but not all, women. For example, from 2005 through 2009, women accounted for 4 percent of the professional firefighting force [65]. The percentage of female smokejumpers is somewhat higher (estimated at 7 percent in 2003) [66]. The number of women entering SWAT is more difficult to find, but only one woman has ever completed SWAT training for the Los Angeles Police Department [67].

### **Unit cohesion and combat effectiveness**

A common concern about introducing women into direct ground combat units is that integration would diminish unit cohesion and combat effectiveness. The UK's Secretary of State for Defence, for example, cited the importance of unit cohesion in justifying that country's current combat exclusion policy [68]. Some U.S. military leaders and commentators have voiced similar concerns, noting that units may be less combat effective if gender integration causes distractions or if men lack confidence in the physical abilities or "courage under fire" of their units' female members.<sup>28</sup> We conducted a literature review and examined experiences from other countries' militaries to explore what available research suggests about the potential effects on unit cohesion of gender-integrating ground combat units.

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27. CPAT pass/fail data by gender will be available in 2012.

28. Concerns about the direct physical capabilities of female servicemembers already have been discussed in previous sections.

To foster the study of cohesion, sociologists and behavioral scientists have distinguished two types of group (or unit) cohesion: social cohesion and task cohesion. These are defined as follows:

- Social cohesion refers to the nature and quality of the emotional bonds of friendship, liking, caring, and closeness among group members. A group displays high social cohesion to the extent that its members like each other, prefer to spend their social time together, enjoy each other's company, and feel emotionally close to one another.
- Task cohesion refers to the shared commitment among members to achieving a goal that requires the group's collective efforts. A group with high task cohesion is composed of members who share a common goal and who are motivated to coordinate their efforts as a team to achieve that goal.

Research has clearly shown that success is an important factor in promoting cohesion. But does cohesion lead to success in combat (i.e., do cohesive units fight better, suffer fewer battle and non-battle casualties, and train to higher standards)? Several studies of cohesion in the civilian and military sectors have, in fact, shown that there is a modest positive relationship between cohesion and performance [71-74]. There is an important caveat, however. Most scientific research shows that only task cohesion, not social cohesion, is important in driving performance or effectiveness. For example, a 1994 study by Mullen and Copper concluded that social cohesion measures (specifically, personal attraction and group pride) were not independently related to performance measures, but that task commitment measures (their task cohesion metrics) were [74]. In light of such studies, many in the scientific community accept that social cohesion is less relevant than task cohesion when it comes to combat effectiveness.

Not everyone, however, agrees that only task cohesion affects performance; there is some evidence that social cohesion also may play a part. In 2003, researchers found that two components of social cohesion—interpersonal attraction and group pride—were positively related to group performance, albeit less so than the group's commitment to task [75]. They maintain that social cohesion should not be ignored when considering policy. This position is somewhat supported by a separate study done by researchers at the Strategic Studies Institute in 2003, which found a link between social cohesion and combat motivation in World War II, Vietnam, Desert Storm, and Operation Iraqi Freedom [76]. The researchers found that soldiers primarily fight for their fellow soldiers. Specifically, soldiers' desire to contribute to unit mission is derived mainly from their social commitment to the group's members. As a result, they concluded that social cohesion was a key component of combat motivation for U.S. soldiers. They did not, however, explicitly address a link to unit performance.

#### *Gender integration and unit cohesion*

Data on the potential relationship between gender integration and unit cohesion and performance are available from three sources: (1) Social science research on factors affecting cohesion, (2) Research on gender integration in non-ground combat units, and (3) Other militaries' gender integration experiences.

## *Social science research*

Researchers have identified several factors that tend to drive cohesion. Some affect task cohesion and others affect social cohesion. We begin with factors that drive task cohesion, which include: group size, leadership, and shared threat.

- **Group size:** Evidence shows that cohesion is inversely related to a group's size, especially in military settings. The smaller the group, the greater the potential for it to be cohesive. It is hypothesized, however, that task cohesion suffers if the group is so small that it lacks enough members to perform its tasks well [74].
- **Leadership:** Two leadership elements that are related to strong cohesion are the leader's behavior and decision style [77]. Social scientists often have studied leadership in the context of athletics. Several studies showed that higher levels of training and instruction behavior, social support behavior, positive feedback, and a democratic style are associated with a higher level of task cohesion in athletes [78-80].
- **Shared threat:** If a group's members are mutually threatened, they focus more on their own similarities and begin to see the group as a means of "winning" or triumphing over others [74].

We find nothing in the literature to suggest that gender would directly or indirectly affect any of these task cohesion factors, assuming that commanders treat men and women equally. Gender does, however, appear to play a role in two of the factors that affect social cohesion, including group homogeneity and expectations for success.

### Homogeneity

Evidence shows that the more similar or homogeneous a group is, the more socially cohesive it is. Social Identity Theory maintains that people feel closer to those whom they perceive as similar to themselves in terms of external characteristics (like age or ethnicity) or internal characteristics (like religion or values). Since a mixed gender unit is less homogenous than a single sex unit (assuming that all else is equal), it is possible that gender would affect social cohesion. How problematic is diversity? Some research confirms that diversity may impede group functioning [81, 82]. Other research suggests that "superficial homogeneity based on race, ethnicity, and gender helps initial cohesion, but underlying values, attitudes, and interests are what motivate social cohesion in the long run" [83, 84].<sup>29</sup> Evidence from previous efforts to socially diversify (e.g., racial integration, openly serving homosexuals, and gender integration of other types of units) shows that the negative effects on cohesion (and thus performance/effectiveness) that some feared either never materialized or dissipated over time [85, 86,

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29. This may be why military units, which often are quite diverse, are nevertheless often considered cohesive units. It may also be why racial integration, gender integration in non-ground combat units/occupations, and the repeal of "Don't Ask, Don't Tell" apparently have not been overly problematic (in the long term, if not the short term) for the U.S. military.

87].<sup>30</sup> In general, U.S. military sociology literature maintains that racial and ethnic differences no longer affect unit cohesion.

#### Expectations for success

The second social cohesion antecedent to which gender might have some relationship is expectations of success. A common concern about lifting ground combat gender restrictions is that women may lack the physical abilities required by ground combat units/occupations. If, in fact, women assigned to ground combat units lack the requisite physical abilities—or if enough unit members believe that to be the case—members’ expectations for the unit’s success may diminish. This, in turn, could affect social cohesion. We note again, however, that research indicates that success expectations drive social cohesion (not necessarily task cohesion) and social cohesion is less related to successful performance or effectiveness than task cohesion.

#### *Gender integration in non-ground combat units*

Several scientists (both military and non-military) have studied the effects of gender on cohesion in military units, specifically focusing on the U.S. Army.<sup>31</sup> Although a few studies indicate that there might be some negative effects, most studies have shown that women did not have significant negative effects on cohesion/performance. In 1985, a study found that “cohesion is based on a commonality of experience, shared risk, and mutual experiences of hardship, not on gender” [85]. Other studies show that, although gender differences have been found to affect unit cohesion marginally, the effects are significantly smaller than those of rank, work group, generation, or leadership [88-93]. A 1994 study showed that mixed-gender basic training had no negative effect on the performance of either gender and, in fact, had positive effects for women [94]. A 1995 study of harassment, cohesion, and readiness in Army support units found no significant relationship between the percentage of women in a group and unit cohesion [95].

Some studies, however, have found gender integration to diminish social cohesion. A Walter Reed Army Institute of Research (WRAIR) study in 1987-1988 showed that there was less cohesion among soldiers from CSS units compared with those from combat units [96]. The study did not specifically examine whether this was due to the presence of women in the CSS units, but it was posited as a theory. A separate 1988 WRAIR study, which examined the relationship between gender compositions and unit cohesion, was more conclusive [97]. It surveyed CSS soldiers from six battalions (four

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30. For example, Project Clear in 1951 found that racial integration had no significant effect on task performance or unit effectiveness. In fact, 89 percent of officers assigned to integrated units found that the level of cooperation in these units was equal to or superior to that of all white units. By 1953, 95 percent of African American servicemembers were serving as members of integrated units. Experience in both World War II and the Korean War showed that integrated units fought well together; racial integration did not undermine unit cohesion and integrated units were effective.

31. Most of these studies are over 15 years old and, therefore, do not incorporate the experiences of the last 10 years.

support battalions, one headquarters battalion, and one nuclear, biological, and chemical group). The study found a negative correlation between the percentage of women in the group and cohesion among male junior enlisted soldiers. More recently, a 1999 meta-analysis of five studies that had previously collected data from combat support and CSS soldiers between 1988 and 1995 was less conclusive [93].<sup>32</sup> Although it found that the increased presence of women negatively affected social cohesion in both deployed and non-deployed settings, its findings were not universal or consistently strong. This analysis examined group-level correlations between measures of horizontal social cohesion (that is, the degree of bonding among peers) and the percentage of women in the group. It found patterns indicating a consistent negative relationship between the percentage of women in the group and social cohesion, but these findings were not consistent across the board. For instance, an analysis of soldiers deployed to Haiti in 1995 did not show a negative relationship at all [98]. In addition, the two most recent studies (both from 1995) showed the least negative effects of all five studies [95, 98].

#### *Lessons from other countries on unit cohesion*

##### United Kingdom

In the early 2000s, the United Kingdom conducted a review of women in the armed forces [59]. In addition to examining physiological and psychological differences between men and women, the researchers conducted a literature review on combat effectiveness and cohesion. The team found that “there was some evidence from the literature that the inclusion of small numbers of women adds to the difficulty of creating the necessary degree of cohesion.” They noted that “it might be easier to achieve and maintain cohesion in a single sex team.” The researchers went on, however, to say that under normal conditions and given proper management and training, “the presence of women in small units does not affect performance detrimentally.” Given the absence of direct empirical evidence in close combat situations, the researchers stopped short of concluding that the same would hold in combat.

The researchers also conducted a field experiment to measure small-group cohesion. It included 53 soldiers (mostly from the Royal Artillery). Mixed-gender sections and one all-male section trained for two weeks in basic infantry tactics and then tested for 12 days. The section members completed questionnaires to evaluate cohesion. The research team concluded that “there is nothing to suggest that the presence of females either harmed or enhanced cohesion.” [99] Although the two consistently highest-rated sections (in terms of cohesion and performance) were mixed-gender, performance varied among sections and the study’s sample size was limited. The researchers also noted that they could not determine whether the results would be applicable to actual ground combat situations.

Following this review, the UK’s Secretary of State for Defence determined that the available evidence (or lack thereof) was not sufficient to conclude that gender integration would not harm unit cohesion

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32. The five studies included two garrison studies (1988 and 1995) and three deployment studies (1991 Persian Gulf, 1993 Somalia, and 1995 Haiti).

under actual ground combat conditions. In the absence of sufficient evidence, military judgment must provide the basis of any decision. Because of military leaders' continued concerns about unit cohesion and the grave risks of failure in combat situations, UK officials decided to maintain gender restrictions [100].

From 2009 to 2010, the UK Defence Department conducted another review of its women in service policies in light of experiences in Iraq and Afghanistan. The review had three components [68]:

- A literature review on the effectiveness of mixed-gender teams in a combat environment
- An assessment of women's roles in recent operations
- Consideration of the experience of other nations in employing women in ground close combat

Overall, the research showed that women had been effective in ground close-combat situations (occasional events), but it was unable to address their effectiveness in ground close-combat roles (engaging in these activities on a daily basis). Questionnaires and interviews showed that gender did not significantly contribute to a lack of cohesion in mixed-gender units experiencing a combat incident. Specifically, results showed [68, 101, 102]:

- Both men and women involved in combat incidents reported higher cohesion than those in non-combat situations
- Cohesion was higher in smaller teams
- Men did not rate cohesion lower when women were present
- Women reported lower overall cohesion in the ground close-combat incidents than men (particularly in terms of leadership and application and understanding of the rules)
- Cohesion was reported as lower when more females were present (specifically when there were three or more women in a section)

The Minister of Defence Personnel, Welfare, and Veterans and the Service Chiefs judged that, overall, "the research's conclusions were mixed and did not provide the basis for a clear recommendation as to whether the policy excluding women from ground close-combat roles should be retained or rescinded" [68]. The Service Chiefs maintained that, although women were fundamental to the operational effectiveness of the UK's Armed Forces, their contributions were not those typical of the small tactical teams in combat arms and ground close-combat [68]. Finally, the Minister concluded that "the consequences of opening ground close-combat roles to women were unknown" [68]. Consequently, in November 2010, the Minister decided to maintain the policy excluding women from ground close-combat roles. This view was endorsed by the Secretary of State for Defence.

## Canada

Canadian researchers have not specifically studied the effects of gender integration on unit cohesion, but several studies suggest that Canada faced some initial gender integration challenges with regard to

recruiting, retention, and servicemember attitudes. In the early years of gender integration (the 1990s), women left the CF at higher rates than men. The difference between male and female attrition rates was greatest in trades that were untraditional for women, such as combat arms [48]. Although not necessarily applicable to women currently in the CF, a 1994 qualitative investigation showed that women left because of a lack of supervisor support, which was exacerbated by supervisor discrimination and harassment; cumulative stresses that resulted from combinations of discrimination based on gender, maternity, family status, and language; and a lack of control over, and perceptions of commitment to, career. [48]. The 1997 Mixed Gender Opinion Questionnaire measured the level of acceptance of gender integration within the CF as the military approached its 1999 complete gender integration deadline. Survey results indicated that, overall, CF members supported the employment of women in all environments and roles, as well as the CF policies and training put in place to support gender integration [48]. The survey found that Air Force members were more likely to express support for complete gender integration than those in the Navy and Army, which reflected the challenge the CF were experiencing in integrating women into operational and deployable units. Another 1997 study revealed additional areas of concern [103]:

- There was a perception that instructors had negative attitudes toward women. Because few women passed training or remained in the combat arms environment, it was felt that women were not capable or motivated enough to be in combat arms.
- Male junior combat arms officers in training expressed a view that women could not be effective leaders because they did not have a commanding presence.
- Some felt that there was inconsistent enforcement of physical standards, and some complained of double-standards. Examples included the retention of women who did not pass standards, the (informal) lowering of battle school standards for women, instructors treating women differently than men (e.g., being more lenient or being afraid to discipline them), and favoritism toward women (e.g., women asked if they need a bathroom break more frequently than men).

Studies of more recent experiences appear to suggest improvements. Studies commissioned in 2004 to support the Canadian Army Campaign Plan found that overall attitudes about gender integration were positive. Acceptance of women, however, was lowest in occupational combat units, which rated “[women’s] presence as unacceptable in combat and the integration process as only marginally successful” [53]. Both men and women did not fully support women serving in combat roles, but women were more likely to be in favor of it. The 2005 Your-Say survey showed that personnel did not believe that women were treated less fairly during training (70.7 percent of the respondents either disagreed or strongly disagreed that women were treated less fairly than men during training, whereas 12.3 percent either agreed or strongly agreed). However, women were more likely than men to believe that women were treated less fairly than men during training (27 percent of women either agreed or strongly agreed with that statement as compared to only 10 percent of men) [104].<sup>33</sup>

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33. Results were similar when men and women were asked about the fairness of merit boards [104].

Despite some continued challenges, the CF maintain that gender integration has been effective and continues to improve. Male and female attrition rates are very similar [52]. Deployments of mixed-gender ground combat units to Afghanistan have been considered by CF leaders to be successful, and at least one Canadian infantry unit deployed to Afghanistan under the command of a female officer [46, 105].

### *Summary*

The prospect of integrating ground combat units by gender continues to raise unit cohesion concerns. Because U.S. military combat units are currently restricted to males, there is no direct evidence on the effects of gender integration on U.S. ground combat units. The only available data are proxies: gender integration in the civilian sector; non-ground combat units; and experiences of other militaries' ground combat units. Data from military units suggest that, over the long term, gender integration tends to have, at most, a marginal effect on performance. Further, most scientific research shows that only task cohesion, not social cohesion, is important in performance or effectiveness. Although gender integration may affect social cohesion, the research we reviewed suggests that gender integration does not reduce task cohesion. Given the complex group dynamics that contribute to cohesion, however, the evidentiary value of these proxies is a matter of judgment. The force survey that we have developed includes questions that will contribute to the Marine Corps' understanding of how policy changes might affect cohesion. Ultimately, however, the Marine Corps may not be able to definitively determine the impact of gender integration on unit cohesion absent actually integrating direct ground combat units.

## **Recruiting**

Currently, prospective enlisted Marines and officers may understand that women cannot serve in GCE units or combat arms MOSs. As such, changing these policies could affect the willingness of "recruitable" civilians (both male and female) to serve in the Marine Corps. Although research finds that stated intentions do not always track well with actual behavior [69, 70], we examine existing survey data to report evidence that may inform the Marine Corps' understanding of possible effects on recruiting that could be associated with a change in current gender restriction policies.

We first analyzed data from the Joint Advertising Market Research and Studies (JAMRS) Ad Tracking Survey.<sup>34</sup> Since January 2011, the survey has included questions about a change to current policy restricting women from serving in combat roles.<sup>35</sup> Respondents are asked whether they would be

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34. We obtained data directly from JAMRS for this analysis.

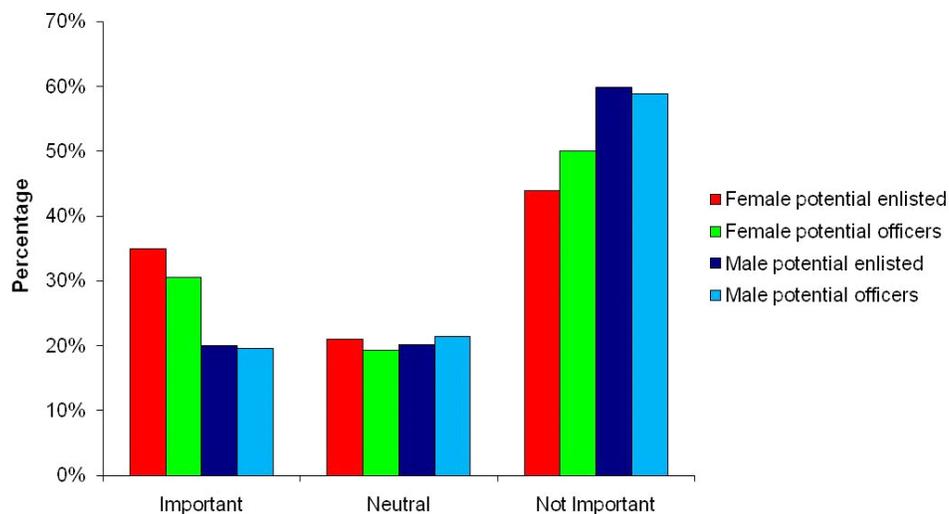
35. The following questions are asked: "How important is the policy prohibiting women in combat roles to your enlistment decision?" and "Would repealing [the policy prohibiting women in combat roles] make you more or less likely to join the military?" According to JAMRS representatives, the questions are intentionally vague because they doubt the ability of youth to understand more specific notions (for example, classification into closed occupations or assignments within particular units).

more or less likely to enlist as a result of a change, and how important the policy is to their overall military service decisions. Similarly, influencers (parents, teachers, coaches, etc.) are asked how important the current policy is to their decisions to recommend the military and whether a repeal of current policy would make them more or less likely to do so.

*Estimated effects for potential recruits and potential officers from JAMRS data*

The most prevalent answer among young men and women in each group<sup>36</sup> was that the policy prohibiting women from serving in combat roles did not affect their enlistment decisions (see figure 6). About 60 percent of male potential enlisted and 59 percent of male potential officers said it is not important, compared with 44 and 50 percent of the comparable female populations. About 20 percent of all groups surveyed said that the policy is neutral to their enlistment decisions. Finally, about 20 percent of the male potential enlisted population said that the policy is an important factor in their enlistment decisions, compared with 35 percent of the female potential enlisted population. Within the potential officer populations, 20 percent of males and 31 percent of females said it is an important factor.

Figure 6. Responses to “How important is the policy prohibiting women in combat roles to your enlistment decision?” by importance, potential enlisted/officer group, and gender<sup>a</sup>



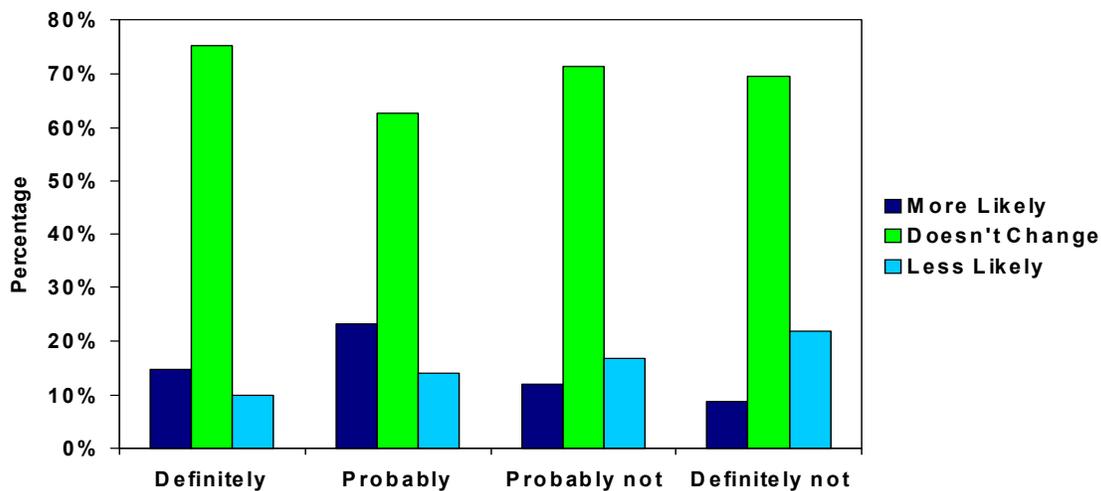
a. JAMRS Ad Tracking Survey waves 28-35 (January 2010-December 2011). We define “potential enlisted” as those with at least a high school degree, and the “potential officers” as those who are either enrolled in college or already have a college degree.

36. We define “potential enlisted” as those with at least a high school degree, and “potential officers” as those who are either enrolled in college or already have a college degree.

We divide the groups further based on their initial relative interest in joining the military. For purposes of interpretation, the share reported as saying that they are less likely to enlist because of a policy change should be viewed differently if the youth initially said they would “probably not” or “definitely not” join the military (as compared to those who initially said they would “definitely” or “probably” join the military).

The JAMRS data suggest that a policy change would have a net positive effect on the potential enlisted population who will “definitely” or “probably” join the services, and a net negative effect on those who are less likely to join the military (see figures 7 and 8). Specifically, for the male potential enlisted population, a policy change has an overall positive effect on the likelihood of joining for those “definitely” or “probably” intending to join, and an overall negative effect for those “probably not” or “definitely not” intending to join. For the female potential enlisted population, there also is an overall positive effect for the groups that are relatively likely to join, and an overall negative effect for the groups that are relatively less likely to join. We note, however, the sample of female potential enlisted servicemembers who say that they will “definitely” join the military is very small.

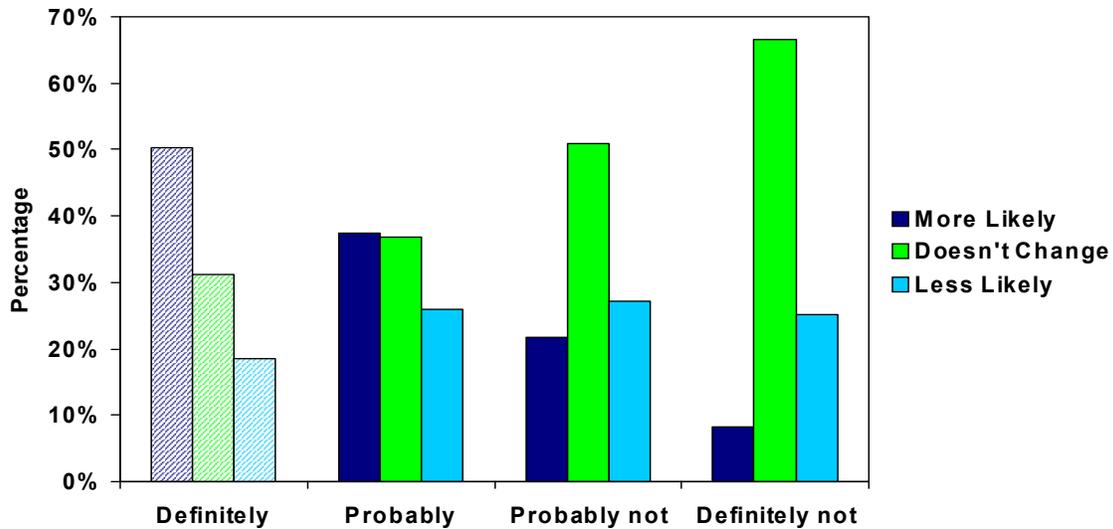
Figure 7. Effect of a policy change on the male potential enlisted population’s likelihood of joining<sup>a</sup>



a. CNA analysis of JAMRS Ad Tracking Survey waves 28-35 (January 2010-December 2011).

Among the potential enlisted population who say that they will “definitely not” join, the difference between the share who are more likely to enlist in the event of a policy change and the share who are less likely to enlist is statistically significant. We can predict from this sample that, among the U.S. potential enlisted population, men and women in the “definitely not” category are more likely to be negatively than positively affected by a change in policy.

Figure 8. Effect of a policy change on the female potential enlisted population’s likelihood of joining<sup>a</sup>



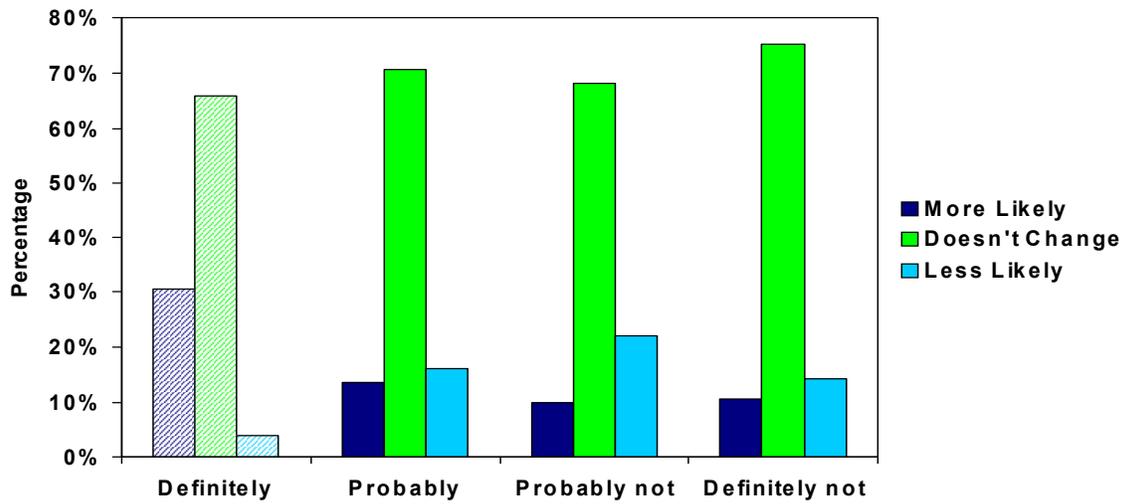
a. CNA analysis of JAMRS Ad Tracking Survey waves 28-35 (January 2010-December 2011). Hatch-marked bars indicate sample size smaller than 50 and therefore the inability to draw any reliable conclusions about the effects on these populations.

We next turn to the potential officer populations (figures 9 and 10). Among male potential officers, the net effect is negative among those who will “probably,” “probably not,” or “definitely not” join the military. The effect appears to be strongly positive among those who are “definitely” inclined to join the military, but the sample size is very small. The same is true for female potential officers, although the “probably” group also is small.<sup>37</sup>

Among male potential officers who say that they will “probably not” join, and female potential officers who say they will “definitely not” join, the difference between the share who are more likely to join in the event of a policy change and the share who are less likely to join is statistically significant. We can predict from these samples that, among the U.S. potential officer population, men in the “probably not” category and women in the “definitely not” category are more likely to be negatively than positively affected by a change in policy.

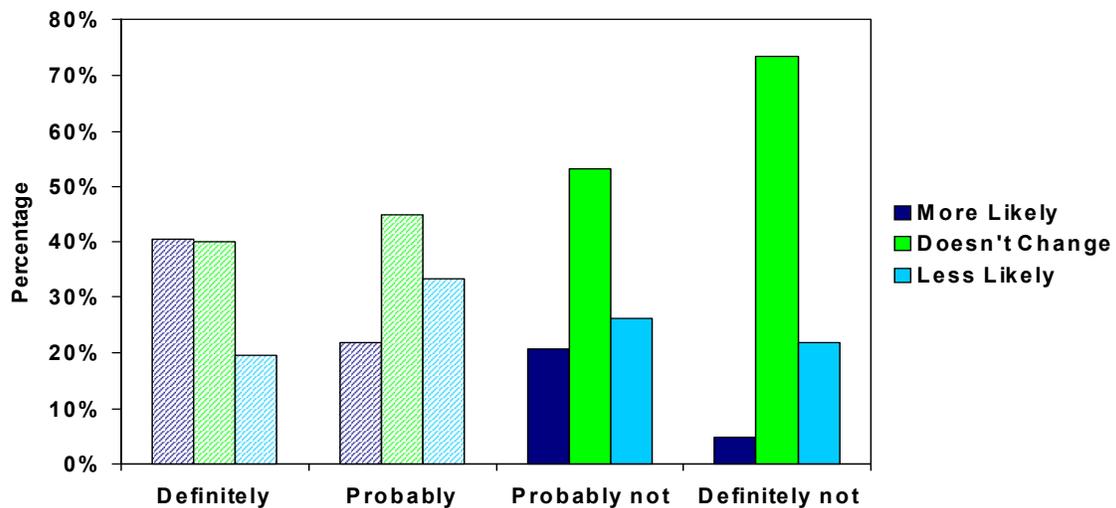
37. Because survey respondents give different responses about the importance of the combat exclusion policy to their enlistment decisions, we examined the effects of weighting responses according to the importance that youth assign to the policy on a seven-point scale. A respondent who believes he or she would be less likely to serve in the event of a policy change, but attaches only an importance of 2 to this, was weighted less than a respondent with the same level of interest who believes that he or she would be more likely to serve in the event of a policy change and attaches an importance of 7. The results in our weighted analysis were similar to the unweighted results presented above.

Figure 9. Effect of a policy change on the male potential officer population's likelihood of joining<sup>a</sup>



a. CNA analysis of JAMRS Ad Tracking Survey waves 28-35 (January 2010-December 2011). Hatch-marked bars indicate sample size smaller than 50 and therefore the inability to draw any reliable conclusions about the effects on these populations.

Figure 10. Effect of a policy change on the female potential officer population's likelihood of joining<sup>a</sup>



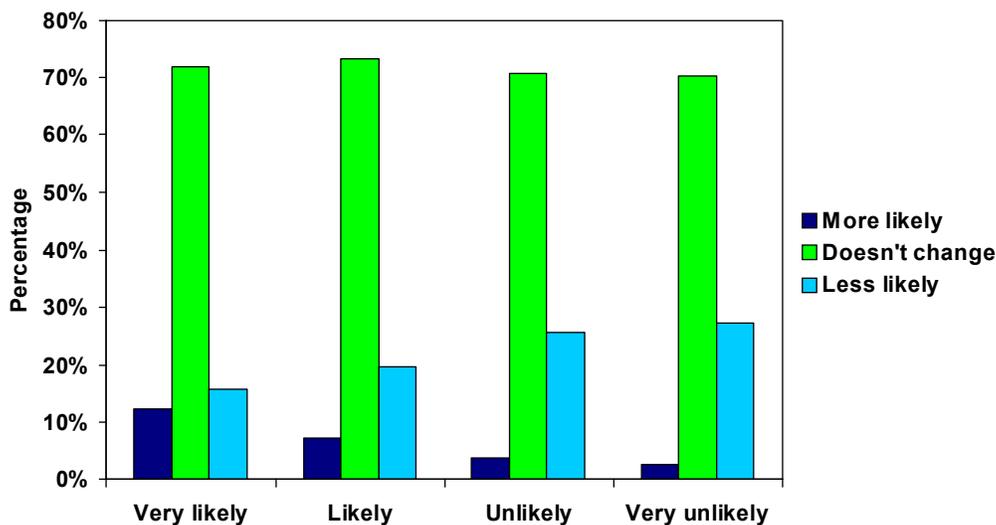
a. CNA analysis of JAMRS Ad Tracking Survey waves 28-35 (January 2010-December 2011). Hatch-marked bars indicate sample size smaller than 50 and therefore the inability to draw any reliable conclusions about the effects on these populations.

*Estimated effects for influencers from JAMRS data*

Information about influencers (parents, grandparents, and other influential adults) is similar to that for youth: we know how many see the combat exclusion policy as important to their decisions to recommend the military, how many say they are likely to recommend the military, and how many say that they would become more or less likely to recommend the military if the policy were changed. But we do not know how this translates into changes in actual behaviors (i.e., the actual number of people recommending the military if the combat exclusion policy were changed). In addition, we do not know how a reversal in the influencers' recommendation would affect young people's decisions: the beliefs and values that affect those decisions likely have been absorbed over a long time.

The majority of influencers report that a change in that policy would not change their recommendations. Among all influencers, a change in policy has a net negative effect, regardless of initial likelihood to recommend military service (see figure 11).

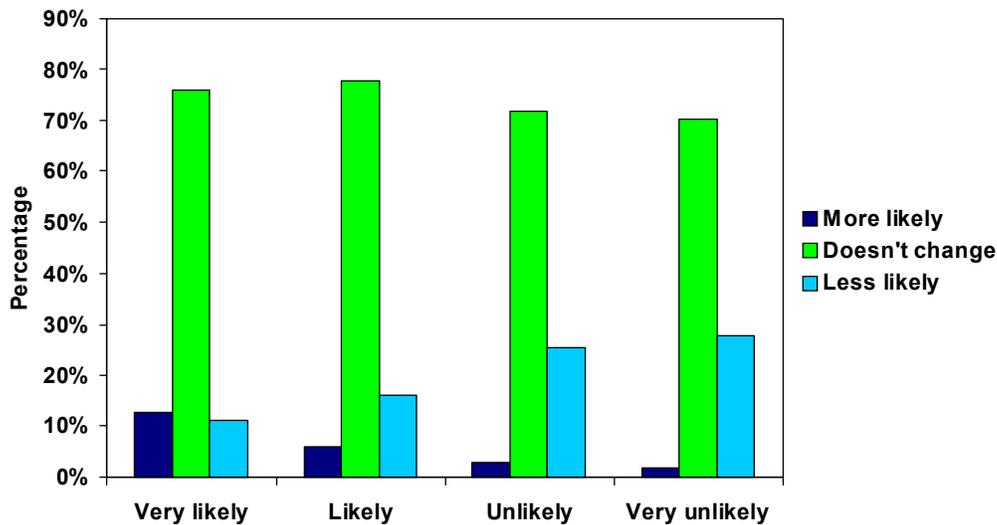
Figure 11. Effect of a policy change on influencers' likelihood to recommend military service, all influencers<sup>a</sup>



a. CNA analysis of JAMRS Ad Tracking Survey waves 28-34 (January 2010-September 2011).

When we focus specifically on parents, we find that a policy change has a net positive effect on parents who are “very likely” to recommend military service, but a net negative effect on those who are “likely” to recommend military service (see figure 12). Among parents who said they were “unlikely” or “very unlikely” to recommend military service, the net affect is also negative.

Figure 12. Effect of a policy change on parents' likelihood to recommend military service<sup>a</sup>

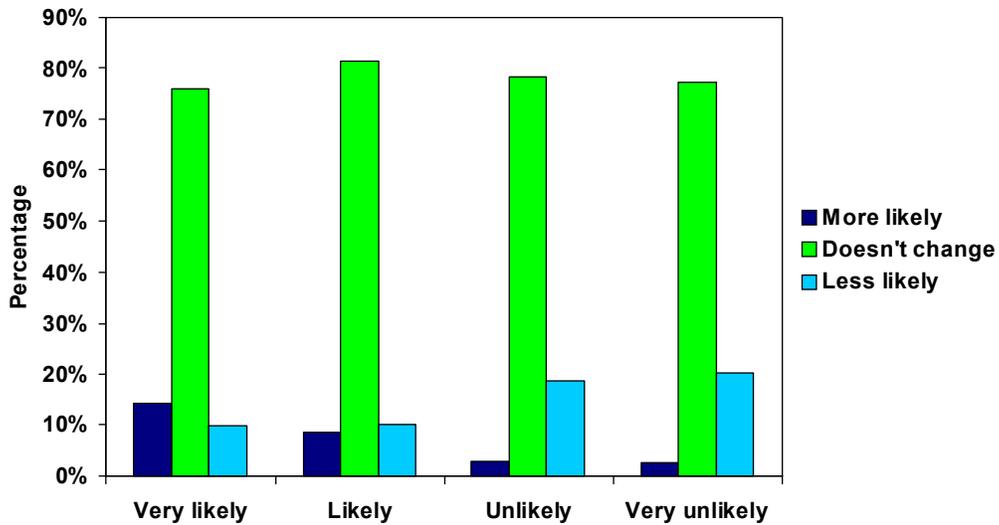


a. CNA analysis of JAMRS Ad Tracking Survey waves 28-34 (January 2010-September 2011).

We then examined two subgroups of parents: those only with sons and those only with daughters (see figures 13 and 14). We find that, among both groups who are “very likely” to recommend military service to their children, the net effect of a policy change is positive. The net effect among the remaining groups is negative, and particularly so for parents who only have daughters.

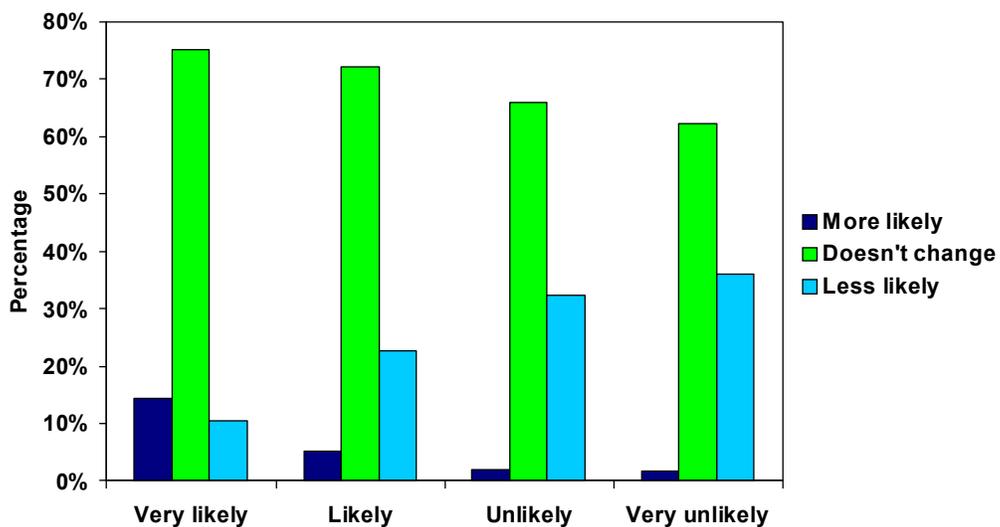
Among our samples of influencers, or of just parents, the difference between the share who say they would be more likely to recommend military service and the share who say they would be less likely to recommend military service is statistically significant for all but the group who are “very likely” to recommend service. We can predict that, among influencers who are “likely,” “unlikely,” or “very unlikely” to recommend military service, more of them will be negatively affected rather than positively affected by a change in policy. The exception is among parents who only have sons, for whom the net negative effect is statistically significant only for those who are “unlikely” or “very unlikely” to recommend the military.

Figure 13. Effect of a policy change on parents' likelihood to recommend military service, parents who only have sons<sup>a</sup>



a. CNA analysis of JAMRS Ad Tracking Survey waves 28-34 (January 2010-September 2011).

Figure 14. Effect of a policy change on parents' likelihood to recommend military service, parents who only have daughters<sup>a</sup>



a. CNA analysis of JAMRS Ad Tracking Survey waves 28-34 (January 2010-September 2011).

### *Findings from other surveys*

Although the JAMRS Ad Tracking survey is the most recent, well known, and likely the most representative survey, there have been other surveys in the past that have attempted to gauge potential recruits' (and servicemembers') attitudes on women's roles in the military. In 1990, the U.S. Army Recruiting Command (USAREC) surveyed nearly 10,000 high school students and their parents [106]. The survey results suggest that a legislative change allowing women to volunteer for combat assignments would have a positive effect on both male and female high school students' propensity.<sup>38</sup> Overall, 38 percent of high school students favored allowing women to volunteer for combat assignments; 22 percent opposed; and 31 percent were indifferent.

As illustrated in figure 15 by the "baseline" case, 11 percent of male and 5 percent of female high school students responded that they would "probably" or "definitely" serve in the Army in the near future. When asked how this response would differ if women were allowed to volunteer for combat assignments, these percentages more than doubled, rising to 26 percent and 11 percent. Of those students considered "high academic" (those whose self-reported grades were mostly A's and B's), 14 percent of men and 10 percent of women were in this high propensity group. When asked to consider their interest in joining the Army in an era of policy change, 22 percent of men and 10 percent of women in this high academic group stated that they would "definitely" or "probably" serve. This is the only study, to our knowledge, that has asked questions about the effect of a combat policy change on propensity within a targeted quality group. The authors of the study also found that, among high school students in this high quality group, 40 percent of men and 41 percent of women opposed limitations on women's service, while 25 percent of men and 19 percent of women thought that the restrictions should remain in place [106].

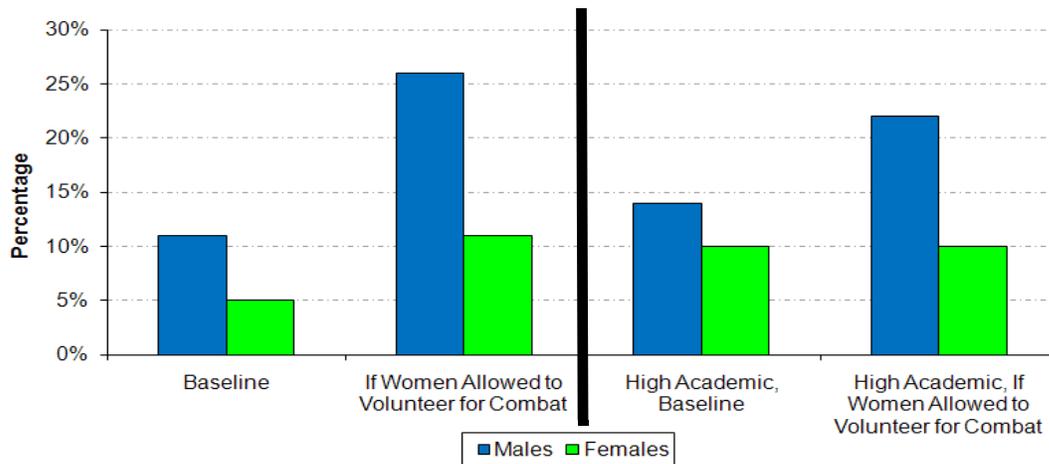
### *Connecting survey responses to actual behavior*

To gauge the effect of a policy change on actual accessions, it would be important to know, among the percentage of youth interested in joining the military who claim to be *more* likely to join the military in response to a policy change, how many would actually enlist in that event. In addition, how many of them would have enlisted without the policy change but are simply further encouraged to do so now? Likewise, among the percentage of youth interested in joining the military who claim to be *less* likely to join the military as a result of the policy change, how many would actually decide not to join because of the prospective policy? In general, answers to such questions are unavailable. As reported in the JAMRS 2009 Propensity Validation Study, only 26.4 percent of those who responded "definitely" and 12.4 percent of those who responded "probably" actually enlisted in the military [107]. In the absence of additional survey data and stronger links between stated intentions and actual behavior, any estimates of the effect of a change to current combat exclusion policy on recruiting should be interpreted with caution.

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38. It is important to note that these data were collected before the United States entered its current conflict and during an era when different restrictions to women's service applied; it may therefore be difficult to determine exactly how the young people who were surveyed interpreted the phrase "combat assignments" and how these results would translate to today's environment.

Figure 15. Percentage of high school students who will “probably” or “definitely” join the Army, by gender, 1990<sup>a</sup>



a. Source: [106].

The particulars of the combat exclusion policy change also may be important. As noted in the next section, people’s opinions of a policy change (and the resulting effect on their enlistment decisions) may differ based on whether assignment to either GCE units or closed MOSs is done on a voluntary or involuntary basis.

### Summary

In the JAMRS data, most young men and women in all groups examined said that the combat exclusion policy was either not important or neutral to their enlistment decisions. The net effect on willingness to join the military appears positive for male and female potential enlisted personnel who said they would “definitely” or “probably” join, and for male and female potential officers who said they would “definitely” join. However, the sample of college-educated youth surveyed who said they would “definitely” join was quite small. Looking at those who said they would “probably not” or “definitely not” enlist—or, in the case of male potential officers, those who will “probably not” join—the net effect of removing the combat exclusion policy appears to be negative. Among other populations, we cannot predict with confidence what the net change would be. Older surveys suggest that, among the high quality population, propensity could increase with a policy change.

The important missing data element is how the relationship between the stated willingness to join and actual enlistment behavior varies among those who say the policy affects their decisions and those who say it does not. If youth who are negatively affected by the change are those who would not have enlisted anyway, there would likely be no impact on military recruiting. If, on the other hand, those affected by the change would have enlisted in the absence of the change, but are deterred from enlisting as a result of the change, then there will be a negative effect on the military. The same can be said of those in the groups that are more inclined to enlist. If the policy change itself draws youth who

would otherwise not have enlisted into the services, then there will be a positive effect felt throughout recruiting. No effect will be felt if the impact of the policy change on enlistment decisions is not strong enough to actually change young people's minds.<sup>39</sup>

Surveys of adult influencers suggest that the net effect of a policy change on likelihood to recommend military service is positive among parents, whether with sons or with daughters, who say they are "very likely" to recommend. However, there is a statistically significant net negative effect on influencers in general, parents in general, or parents with daughters who are otherwise "likely," "unlikely," or "very unlikely" to recommend the military, and on parents with sons who are "unlikely" or "very unlikely" to recommend the military. If adult influencers were to change their recommendations in response to a change in policy, it is uncertain how much this would affect young people's decisions.

## Retention

In this section, we examine information available from past force surveys on the stated retention and continuation behavior of servicemembers, should combat exclusion policies change.<sup>40</sup> We note, however, that much of the information in this section is dated and does not focus on the Marine Corps in particular. Furthermore, most past surveys predate the conflicts in Iraq and Afghanistan. The best and most current information on this topic will be available this summer, after we survey enlisted Marines and officers in both the active and reserve components about how a policy change would affect their continuation and retention behavior.

### *Potential effects on retention behavior*

A 2001 survey of officers at the Naval Postgraduate School (NPS) and enlisted personnel at the Defense Language Institute (DLI) asked how expansion of the role of women in combat would affect their retention decisions [108].<sup>41</sup> Marines constituted 22 percent of the officers and 34 percent of the enlisted personnel. Overall, 86 percent of officers and 89 percent of enlisted said that, if the role of women in combat were expanded, it would not affect their reenlistment or continuation decisions. Of

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39. Ideally, a survey would ask young people how likely they are to join the military under the current policy, and then ask them to evaluate (on the same scale) how likely they would be to join if the policy were changed. This could be matched against data tracking how many of those who chose a given answer actually went on to join the military. Even then, we would have to assume that an answer of "probably" in an actual scenario could be interpreted the same way as an answer of "probably" in a hypothetical scenario; it may be difficult for young people to accurately assess how they feel about a military they have not experienced.

40. As noted previously, research finds that stated intentions do not always track well with actual behavior.

41. Respondents were asked the following question, "If the role of women in combat were expanded from what it is today, would it affect your decision to remain in service?" Possible answers were "Yes, I would leave as soon as possible because of it," "No, I believe I am too senior to separate now, but I would have separated if I were more junior," and "No, it would not affect my decision." The question did not differentiate between opening closed units and opening closed occupations, and the possible answers did not include a positive response that they would be more likely to stay. Also, responses were not tabulated by gender.

the officers who said that they would be negatively affected by a policy change, most said that they were now too senior to leave, but would have left if they were more junior.

A 1992 survey of female soldiers conducted shortly after Operation Desert Storm, also asked about the effect of ground combat on retention [109]. Over half responded that they would leave the Army if assigned to a ground combat unit.

These past surveys, which are at least 10 years old, suggest a risk that some servicemembers, particularly women, might leave the military as a result of a change in the combat exclusion policy. We do not know, however, how many would become more likely to stay, or how this effect differs between men and women. The planned Marine Corps survey will provide a more reliable measure of possible risk.

### *Preferences for policy*

Some surveys ask about servicemembers' preferences for or against changing the current combat exclusion policy. We present the results of these surveys, but caution that respondents were asked only for their opinions about the policy; servicemembers were not asked whether their policy preferences would affect their continuation decisions.

In a 2006 survey of 236 Army War College students, 59 percent agreed or strongly agreed that “the regulation prohibiting female assignment to direct combat units should be revised” [110]. Fourteen percent strongly disagreed. The question did not specify whether the assignment of women to combat units would be strictly voluntary or would entail involuntary assignments. An even larger share, 70 percent, agreed that “the regulation prohibiting collocation of female soldiers with direct combat units should be revised,” with only 7 percent strongly disagreeing.<sup>42</sup>

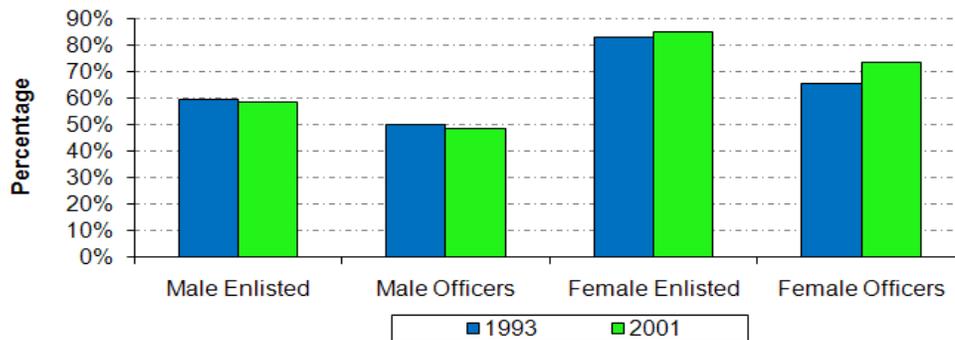
Multiple surveys have asked servicemembers whether they would prefer the current policy, the voluntary assignment of women to combat units, or the involuntary assignment of women to combat units. A 2005 survey asked ROTC students to agree with one of three statements: “infantry units should be closed to women,” “women should be allowed to volunteer for [infantry] units,” or “women should be assigned to [infantry] units the same way men are” [111]. A series of Army surveys between 1993 and 2001 asked officers and enlisted soldiers whether the assignment policy should be “left as is,” “changed so that females can be involuntarily assigned,” “changed so that females can be assigned only if they volunteer,” or “changed so that male and female soldiers can be assigned only if they volunteer” [112]. In focus groups held between 1993 and 1996, soldiers and Marines were asked four separate questions, about infantry units, armor units, submarines, and special operations forces, with three answer options: “these units should remain closed to women,” “qualified women should be allowed to volunteer for these units,” or “qualified women should be assigned to these units the same way men are” [92].

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42. As previously noted, the collocation restriction is likely to be eliminated in the coming months, following the expiration of the 30-day waiting period after DOD's February 9 notification to Congress.

In general, males reported preferences for the status quo in combat exclusion restrictions, followed by a change that would allow women to volunteer for combat roles, and least preferred that women be assigned to combat roles involuntarily [92, 108, 111, 112]. Women, on the other hand, most preferred a change that would allow them to volunteer for combat roles, followed by the status quo, and least preferred involuntary combat assignments [108, 111, 112]. Figure 16 shows that, among Army servicemembers who favored allowing women to serve in combat roles, the voluntary assignment of women was more popular than involuntary assignment, more so for women than men and more so for enlisted personnel than for officers [112].

Figure 16. Of Army servicemembers who favored allowing women in combat, the percentage who preferred voluntary to involuntary assignment, for enlisted and officers, by gender (1993 and 2001)<sup>a</sup>



a. Source: [112].

In the previously mentioned 2001 survey of NPS and DLI students, 22 percent of female officers and 19 percent of enlisted women said that they believed that women should not be assigned to combat units that are closed to women [108].<sup>43</sup> In addition, 47 percent of female officers and 60 percent of enlisted women said that they were not personally interested in a combat arms field, but would recommend them to other women.

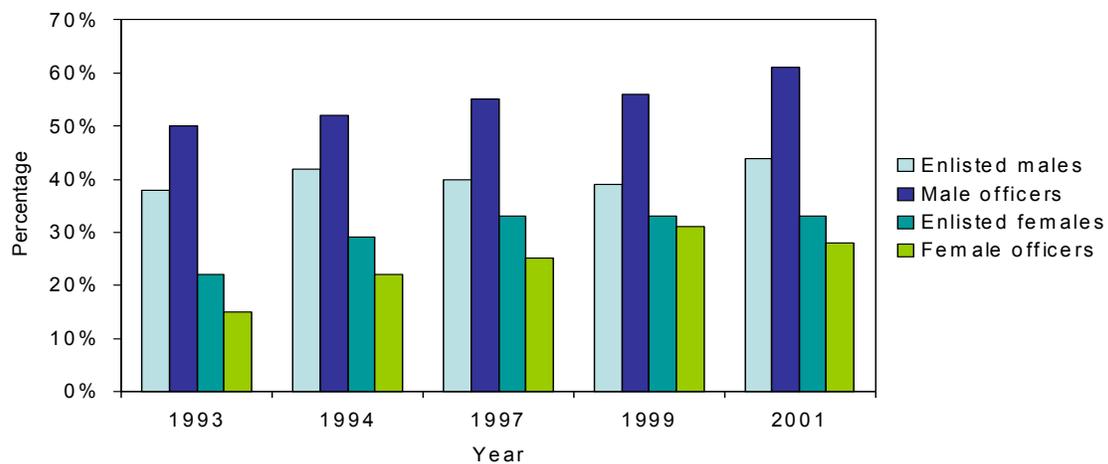
In general, female servicemembers most preferred a change that would allow them to volunteer for combat units, followed by the status quo, and least preferred a change that would involuntarily assign them to combat. However, a majority of female Marines and a plurality of female soldiers in the 1993 to 1996 focus groups preferred that infantry units remain closed to women [92]. Male servicemem-

43. Interpretation of this survey's results is complicated by the fact that the question referred to unit assignment restrictions, whereas the answers offered referred to occupational restrictions.

bers most preferred the status quo, followed by a change that allowed females to volunteer for combat units.

Because the Army survey was repeated in five waves spanning eight years, we focus on trends over time. Between 1993 and 2001, support among soldiers for maintaining the current policy grew, as figure 17 shows. In contrast, a 2006 Army War College survey found that 59 percent of students preferred allowing women in combat units [110].

Figure 17. Percentage of Army officers and enlisted who preferred current ground combat exclusion policy, by gender<sup>a</sup>



a. Source: [112].

Finally, in the previously mentioned 2001 NPS and DLI survey, 25 percent of officers at NPS and 19 percent of enlisted personnel at DLI thought women should be assigned to combat units in the same [involuntary] way that men are [108].

*Women in infantry, armor, or special operations forces*

As described above, the Army and Marine Corps focus groups and the NPS and DLI survey asked separately about policy for infantry, armor, submarine, and special forces units. The responses to these questions suggest that servicemembers make a distinction between “combat” in general and “infantry” in particular. The 2001 NPS and DLI survey found stronger support for excluding women from the infantry than from armor, except among female Marines (71 percent for infantry vs. 60 percent for armor among male soldiers, 78 vs. 72 percent among male Marines, 12 percent vs. 8 percent among

female soldiers, but 31 vs. 32 percent among female Marines) [108]. These numbers represent a mix of officers and enlisted personnel.<sup>44</sup>

In the same survey, soldiers were less supportive of allowing women in the infantry than in special operations forces. In the Marine Corps, support for the policy as applied to infantry and to special operations forces were identical (78 percent among men and 31 percent among women) [108].

The focus groups held between 1993 and 1996 found stronger support for excluding women from infantry than from special operations forces, and from special operations forces than from armor [92]. This was true among men and women, soldiers and Marines.

## **CONCLUSION**

In closing, we have used a variety of research techniques—including reviews of the existing literature; interviews with subject matter experts from other countries' militaries, other organizations, and the Marine Corps; and data analyses of existing survey and Marine Corps training data relevant to prospective policy decisions—to gather information on the five areas of particular interest related to women's physical capabilities, injury rates, and the possible effects of additional gender integration on factors like recruiting, retention, and unit cohesion. Additional data on some of these topics will be available from our force survey, which will be fielded later this spring. Existing scientific literature, however, cannot definitively determine whether or not the current combat exclusion policy should be changed or the full implications of any change. Military judgement and an assessment of relative risk ultimately must play a role in this decision.

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44. We note that armor makes up a smaller share of the Marine Corps and that Marines may therefore be less familiar with armor positions.

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