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Intangible Benefits in the Composition of the Marine Corps

Monterey, California: Naval Postgraduate School

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NPS NRP Executive Summary

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NAVAL RESEARCH PROGRAM
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INTANGIBLE BENEFITS IN THE COMPOSITION OF THE MARINE CORPS: AN OCCUPATION-BASED FRAMEWORK

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EXECUTIVE SUMMARY

Project Summary

Women comprise approximately 8% of the active component in the Marine Corps, a number less than half of female representation in other military services. While the Department of Defense's (DoD's) recent mandate to fully integrate women is not the focus of this project, the policy dramatically increases the set of opportunities the Marine Corps can offer to women. This project seeks to provide a foundation to ultimately help determine the "optimal" number of women in the Marine Corps.

In particular, we determine what a feasible level of gender integration could look like by creating an empirically justified upper bound of female representation across Marine Corps occupations. To establish this, we develop a mapping of Marine Military Occupational Specialties (MOS) to its civilian equivalents using detailed job descriptors. We find previously male-only Marine MOS are equivalent to primarily male-dominated civilian jobs, where the proportions of women still sit at or below five percent. There is substantial variation in female representation across Marine jobs; however, for example, women comprise more than 25 percent in the Manpower/Admin Occupational Field (OCCFLD). The analysis reveals the occupational segregation in the Marine Corps closely mirrors that of the civilian labor market.

Because some Marine jobs do not map well to civilian equivalents, we also examine determinants of success at infantry training. Finding that physical ability is the dominant predictor of success, we use physical fitness data of male and female civilian youth to further estimate the proportions of women we may expect in the infantry OCCFLD. Finally, we develop an analytical framework that can address the costs and benefits of increasing the proportion of women in the Marine Corps.

Keywords: *gender, integration, recruitment, female Marines, occupational specialties*

Background

When the combat exclusion for women in the military was lifted in 2016, the new policy made 54,000 billets - approximately 1/3 of the entire Marine Corps Table of Organization - available to qualified women. In addition, 32 previously closed primary Military Occupational Specialties and 16 additional Military Occupational Specialties were opened to women. While the change in the combat exclusion policy is not the focus of this project, the policy change has dramatically altered the nature and quantity of the opportunities the Marine Corps can offer to women. In light of these changes it is necessary for the Marine Corps to assess the current status of women in the corps, anticipate how the roles female Marines fill may evolve over time, and determine the extent to which resources should be used to shape that evolution.

Women make up approximately eight percent of the active component of the Marine Corps, a number well less than half of the proportion of women in the other military services. Currently, the Deputy Commandant for Manpower and Reserve Affairs has no tools at his disposal to assess whether eight percent is too many or too few. One can imagine a wide array of benefits that additional women would bring to the Marine

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Corps. However, given the unique challenges that life as a Marine offers, it is also the case that Marine Corps tends to draw recruits from a vanishingly small pool of qualified and interested candidates.

Our research goals are three-fold:

- (1) Build a crosswalk between civilian occupations and equivalent Marine jobs, and, under the hedonic approach, econometrically determine feasible upper bound of proportion of women in Marine occupational fields.
- (2) Because some Marine combat occupations do not map well to civilian jobs, determine the factors that predict success at schools that comprise Infantry Training Battalions and use this to predict proportions of women in these occupational fields.
- (3) Develop a cost-benefit analytical framework for thinking about an “optimal” number of women Marines.

As such we intend for our research to provide a point of departure from which the Marine Corps may ultimately determine the “right” number of women in the Marine Corps.

Findings and Conclusions

To address our first research goal, we begin by relating each job specialty in the Marine Corps to its civilian equivalent. We turn to two data sources: a website called My Next Move for Veterans (MNMV) developed by the U.S. Department of Labor to aid military service members transitioning into the civilian labor market, and the Occupational Information Network (O*NET). Occupational data in the O*NET are the result of comprehensive studies of how jobs throughout the U.S. economy are performed, including the required knowledge, skills, and abilities required for job performance. Data from 2000 to 2017 on gender concentration for each civilian Standard Occupational Classification (SOC) code come from the U.S. Census Bureau, while the equivalent data on Marines come from the Total Force Data Warehouse (TFDW). For consistency in analyses over time, we also referenced the U.S. Marine Corps MOS Manual as some Marine job titles were reclassified, merged, or deleted. Using data of detailed job descriptors from MNMV, O*NET, the MOS Manual, and prior literature, we develop a crosswalk of Marine primary military occupational fields (PMOS) to its civilian equivalents (SOC). Major Angela Zunic’s master’s thesis supports these efforts.

Mapping Marine MOS’s to its equivalent SOC, Zunic (2018) finds a very heavily male-dominated civilian sector for equivalent Marine occupations. Specifically, the previously male-only Marine occupations in combat arms are largely equivalent to civilian occupations such as firefighting, where female representation currently still sits at or below five percent. This highlights the occupational segregation across civilian labor markets, indicating a low supply of female workers choosing to be in or being hired for such jobs. Meanwhile, there is substantial variation in these occupational comparisons. For example, the 31xx Distribution Management Marine OCCFLD have similar gender representation (26%) with its civilian equivalent of Logisticians. In contrast, the 01 Manpower and Administration OCCFLD has 25% female while its civilian equivalent, Human Resources, is 80% female.

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Suppose we assume that the civilian labor market is sufficiently close to an equilibrium, where men and women have sorted into occupations that best utilize their skills and abilities for which they get the best possible reward. Under this hedonic assumption and using the occupational crosswalk, we can then develop an econometric model where we regress representation on multiple job characteristics such as skills, abilities, and knowledge required for job performance using data from the O*NET. The coefficients on these regressors have the interpretation as the marginal proportion of women for a one-unit change in that job characteristic. Knowing what the detailed job descriptors of Marine OCCFLDS are, we can then predict the proportion of women for each OCCFLD.

Next, we recognize that the O*NET database may not map well to some Marine occupational fields, particularly occupations in the combat arms. Of course, the combat arms comprise the very occupations that have just opened to women, so there is also a lack of institutional experience with respect to the performance and retention of women in those fields. To mitigate this gap, we examine the determinants of success at the schools that comprise the Infantry Training Battalions (ITB). The thesis by Major John “Jake” Dove and Captain Brian Richmond supports these efforts.

Dove and Richmond (2017) find that physical health and performance account for almost 80 percent of failures at the Marine Corps’ ITB. Using data from several cohorts of enlisted Marines that attended ITB-West and ITB-East, logistic and multinomial logistic regression model estimates show that by and large physical abilities—as measured by performance on constituent events in the physical fitness test (PFT), combat fitness test (CFT), and rifle scores—are the largest predictors of success. Some dimensions of cognitive ability also matters, while characteristics such as height and weight have nonlinear predictive effects.

Our project’s final effort is to devise a way to think about the benefits and costs the Marine Corps may experience as they attempt to increase the number of females on active duty. Captain Viviana Lee’s thesis attempts this by examining the implications of integration on recruiting and readiness.

In particular, Lee (2018) examines aspects of recruiting females into the infantry MOS, extending the findings by Dove and Richmond (2017). She turns to data from the California Department of Education (CDOE) of California high school students’ measures of physical fitness equivalent to the constituent events in the Marines’ PFT (i.e., pull-ups, crunches, mile run). These physical fitness outcomes are for the population of ninth graders in the state of California during the 2016-2017 school year. One limitation of this data is that 9th graders are typically 14 to 15 years old, when we’d ideally like to observe performance of 17 year olds. Using the CDOE dataset and estimates from the predictive model using the ITB data that Dove and Richmond (2017) developed, Lee (2018) finds that the expected probability that the average 9th grade male graduates from ITB is 0.89, while only 0.17 for the average female in the CDOE data. On the other hand, analysis of CDOE data shows some evidence in favor of the idea that young females capable of

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becoming Marines and attaining Marine physical standards are higher in the quality distribution of their gender relative to young males.

Imagine the pool of male civilians from age 18 to 26. Suppose we were to rank those individuals with respect to their quality or their ability to not only earn the title “Marine” but succeed in their first term of enlistment. We are likely to find that the marginal Marine, that is, the Marine who barely succeeds at basic training and/or their MOS school, but then goes on to perform adequately in their first term, is found at or about the 30th percentile of this distribution. It is important to ponder this recruit’s alternatives to joining the Marine Corps. Given his position on this distribution of quality, it is unlikely he is heading to a four-year college. Anecdotally, and given his comparative advantage, we might imagine him as working construction over the summer and will start community college in the fall.

Now instead consider the same quality distribution for female civilians age 18 to 26. Given the physical rigors of Marine Corps entry and training, the marginal female that signs up for a traditionally open MOS (i.e. administrative clerk, logistics, etc.) is likely to be in the 50th or 60th percentile of the quality distribution. Since entry into combat arms MOS is even more physically demanding than non-combat arms MOS, the marginal female capable of succeeding in ITB is likely to be substantially higher on the quality distribution than her non-combat counterpart. It is reasonable to suppose that the marginal female combat arms recruit is a very good athlete relative to her female peers and perhaps has opportunities to play sports in college. She may even have an athletic scholarship.

Such a scenario is in theory, of course, the conditions for which we discuss in more detail in our paper. Findings by Lee (2018) using CDOE data provide suggestive evidence consistent with the scenario. Thus, in order for the Marine Corps to think about costs and benefits of accessing additional females, it must compare the intensity of effort and resources to expend to recruit females in comparison to males, while balancing against relative benefits. A full treatment of benefits would likely require a rigorous structural analysis to appropriately estimate the value of the work the additional women would provide the Marine Corps. For example, one possible method would be to use the value of the candidate’s next best civilian alternative as a measure of the value of their work. Such an analysis is beyond the scope of this current effort, however.

What we instead examine on the benefits side are the likely implications of integration on force readiness. Lee (2018) uses TFDW data from 2009 to 2017 to examine the extent to which males and females differ in maintaining a deployable status and how deployability by gender varies across MOS. The purpose is to get a sense of the manner in which Marines of different genders and occupational specialties contribute to the production of combat effectiveness. While the status “deployable” is an imperfect metric for a Marine’s productivity, one could argue that Marines who are *deployable* are able to contribute more directly to the organization’s ability to produce combat effectiveness; they are ready to be called to perform relevant operational duties. Lee (2018) finds that on average females are less deployable than males during the first

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four years of service, with the differences peaking during months 25-36, with the major cause of a female's unavailability being pregnancy.

Recommendations for Further Research

We recommend further research on constructing an MOS to SOC crosswalk. This can be done using survey instruments administered to Marines in those particular jobs, inquiring on the particular skills, abilities, work styles, work content, and others, for job performance. Such an enhanced crosswalk would be valuable for determining the next best opportunities for Marines in the civilian labor market, which in turn can answer multiple manpower planning policy questions.

We are also in the middle of incorporating additional data on propensity to enlist in the Marines, estimated over the U.S. youth population, as a way to more clearly identify gender differences in recruiting effort intensity.

Since our analysis reveals injuries were a substantial reason for failure from ITB, we also recommend a more focused study on the determinants of injuries at ITB.

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Acronyms

CDOE - California Department of Education
CFT - combat fitness test
DoD - Department of Defense
ITB - Infantry Training Battalions
MNMV - My Next Move for Veterans
MOS - military occupational specialties
NPS - Naval Postgraduate School
O*NET - Occupational Information Network
OCCFLD - Occupational Field
PFT - physical fitness test
PMOS - primary military occupational specialty
SOC - Standard Occupational Classification
TFDW - Total Force Data Warehouse