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Maximizing female retention in the Navy

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MAXIMIZING FEMALE RETENTION IN THE NAVY

by

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March 2014

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This study estimates Navy female officer retention probabilities and identifies individual-level attitudes and perceptions for particular designator categories with female representation in order to better understand the effects of occupation assignment and retention policies. The design of this study included a multivariate logistical regression model and a survey. The data included 368,667 annual Navy officer observations from fiscal years 2003–20012 collected from DMDC for regression analysis and 877 active duty male and female Navy officers who participated in the survey portion of this study. Retention in this study is defined as five years and six months from the officers commissioning date. Through our multivariate logistical regression, our results indicate that there is a point at which the probability of female officers remaining on active duty service increases with the proportion of women in certain designator categories. Furthermore, our survey findings confirm that for some occupations, the perception of women with regards to factors such as career plateau and turnover intention are affected by the proportion of women within their occupational grouping.

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MAXIMIZING FEMALE RETENTION IN THE NAVY

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ABSTRACT

This study estimates Navy female officer retention probabilities and identifies individual-level attitudes and perceptions for particular designator categories with female representation in order to better understand the effects of occupation assignment and retention policies. The design of this study included a multivariate logistical regression model and a survey. The data included 368,667 annual Navy officer observations from fiscal years 2003–20012 collected from DMDC for regression analysis and 877 active duty male and female Navy officers who participated in the survey portion of this study. Retention in this study is defined as five years and six months from the officers commissioning date. Through our multivariate logistical regression, our results indicate that there is a point at which the probability of female officers remaining on active duty service increases with the proportion of women in certain designator categories. Furthermore, our survey findings confirm that for some occupations, the perception of women with regards to factors such as career plateau and turnover intention are affected by the proportion of women within their occupational grouping.

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LIST OF ACRONYMS AND ABBREVIATIONS

AED	aerospace engineering duty
ASVAB	armed services vocational aptitude battery
CEC	civil engineer corps
CNO	Chief of Naval Operations
DCNO	Deputy Chief of Naval Operations
DMDC	Defense Manpower Data Center
DPRB	diversity policy review board
DWG	diversity working group
EOD	explosive ordinance disposal
FY	fiscal year
GUARD	guaranteed assignment retention detailing
JAG	judge advocate general corps
JAMRS	joint advertising market research and studies
LT	lieutenant
LTJG	lieutenant junior grade
MPT&E	manpower, personnel, training & education
N134W	Navy Office of Women's Policy
NFO	naval flight officer
NOOCS	navy officer occupational classification system
NROTC	naval reserve officer training corps
OPNAV	Office of the Chief of Naval Operations
RL	restricted line officer
SCORE	selective conversion and reenlistment
SEAL	seal air land
SRB	selective reenlistment bonus
STA-21	seaman to admiral 21 commissioning program
STAR	selective training and reenlistment
STEM	science, technology, engineering, and math
SWO	surface warfare officer
URL	unrestricted line officer

U.S.	United States
VCNO	Vice Chief of Naval Operations
WAVES	women accepted for voluntary emergency service

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I. INTRODUCTION

A. BACKGROUND OF THE PROBLEM

Since the Navy's inception in 1775, males have primarily filled its fleet; however, it is important to note that females have played an important role in the Navy's mission accomplishment. According to the Office of the Chief of Naval Operations (OPNAV), the Navy currently struggles to attract and retain the skills and talent from female Navy personnel necessary for mission success, even though women make up 50.8 percent of the U.S. population (U.S. Census Bureau, Population Division, 2010). Over 58 percent of these women are college graduates, making them ideal recruits (U.S. Census Bureau, Population Division, 2010). However, active component Navy enlistments among women were only 23.2 percent female in FY 2011 (Office of the Under Secretary of Defense, Personnel and Readiness, 2011). Furthermore, women are half as likely to continue to serve according to the Joint Advertising Market Research and Studies (JAMRS) Youth Poll 20 overview report (2011). Once in the Navy, it is not understood why women have a much higher propensity than men to exit given the different strategies used to retain personnel. Some of those strategies have included the following programs:

- Selective Reenlistment Bonus (SRB)
- Selective Training and Reenlistment (STAR) Program
- Selective Conversion and Reenlistment (SCORE) Program
- Guaranteed Assignment Retention Detailing (Guard) Program (Naval Media Center, 1997)

One explanation is that the amount of emotional and physical support from other women that they serve with may have an effect on their decision whether or not to exit the Navy. Therefore, it is important to understand the dynamics of how the proportions of females within occupations affect long-term retention outcomes as more females are recruited into the Navy. According to the Navy's Office of Women's Policy (personal communication, June 1, 2013);

> It is understood that a minority group is more likely to retain (in the Navy) if the minority group is better represented in the organization. However, it

is not clear whether there is a minimum percentage within the organization that positively impacts minority retention, known as a critical mass.

This research study will analyze whether there is a relation between the proportion of women within an occupation and their retention decisions. The results of this study will possibly assist policy makers in identifying the correct staffing levels to increase female retention. Data collected by the Defense Manpower Data Center (DMDC) for fiscal years 2002–2012 will be used to develop an econometric model to estimate the likelihood of female retention based on the proportion of women that work in similar occupations. This will help the Office of Women's Policy determine if the number of women in an occupation is an important factor when it comes to retention decisions among female officers, and whether they should to shift their focus on recruiting efforts in order to increase the number of female personnel. Furthermore, we administered a survey to over 8000 Navy officers to identify factors that may impact retention decisions that cannot be captured using personnel data.

B. PURPOSE

The purpose of this research is to examine occupational and demographic factors to determine the existence of a critical mass within specific Navy occupations. If a critical mass is found, the objective is to estimate the critical mass necessary to maximize female retention among officers. Additionally, this study analyzes current attitudes and feelings that affect the inclination of women to exit the Navy. The results of this study should allow us to identify any relation between the proportion of women in an occupation, and a female officer's propensity to exit the Navy.

C. SCOPE/METHODOLOGY

This thesis uses qualitative and quantitative research methods to identify trends generated from multivariate logistic regression analysis (logit) and survey analysis conducted with female Navy officers. This research will be conducted in two phases. In the first phase, we examine if there is a correlation between retention and the proportion of females within specific occupations. A logit model is used to determine the existence of critical mass, and if found, to estimate the critical mass necessary to increase female

retention in the Navy given certain occupational and personal demographic factors. In the second phase, participants complete a survey in order to uncover female retention decisions that cannot be observed through regressing personnel data. Through the survey, we are able to identify individual-level attitudes and perceptions that affect women's first-time retention decisions.

D. BENEFIT OF THE STUDY

This thesis seeks to identify the correct staffing levels to optimize female retention in order to meet the Navy's manning requirements. Furthermore, this study seeks to provide a better understanding of current female retention trends by discussing current attitudes and feelings that affect the propensity of women to exit or stay in the Navy. A better understanding of female staffing levels and prevailing female attitudes will assist in reducing the inclination of highly trained, professional women exiting the Navy. It provides potential insight into the problems within specific Navy occupations so that potential strategies or initiatives can be developed to positively resolve the concerns that female officers have. The results of the research can also provide a framework for analysis in other services, leading to a more resilient and diverse military with higher overall levels of readiness.

E. ORGANIZATION OF THE THESIS

Chapter II is divided into four parts: a history of women in the U. S. Navy, diversity in the Navy, and two parts dedicated to reviewing literature related to retention and critical mass. Chapter III details the sample population, survey protocol, data collection procedures and research methodologies utilized. Chapter IV presents the themes developed from the data analysis. Chapter V provides a summary and conclusions for the study, policy recommendations based on the research, and topics for further research.

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II. LITERATURE REVIEW

A. HISTORY OF WOMEN IN THE U. S. NAVY

According to the Navy's Office of Women's Policy (OPNAV N134W), as of March of 2013, the total active and reserve female officers that are serving in the Navy are 11,087. This number comprised just 16.6 percent of all Navy officers. Although proportions of women were higher in certain career fields in the Navy (such as the Restricted Line and the Staff Corps), no proportion of women were higher than 25 percent. Other Navy occupations such as pilots were listed as only having 5 percent of their officers as females. (Office of Women's Policy, 2013)

1. Major Milestones in Naval History

a. Navy Women During the Early Twentieth Century (1900–1940)

Although women served in the U.S. Navy as early as the American Civil War, women did not serve in a regular capacity until after the creation of the United States Navy Nurse Corps in 1908 by Congress. The first women of the Nurse Corps became known as "The Sacred Twenty," because initially there were only 20 women that were appointed to serve. (United States Navy Department, Bureau of Medicine and Surgery [BUMED], 1945)

By World War I, the Navy began to increase in size, and as a result, so did the proportion of women. In addition to the increase of the numbers of female nurses in the Navy, the Naval Reserve Act of 1916 allowed women to serve in other capacities as well in support of the war effort.

b. Naval Women During the Mid-century (1941–1969)

After World War I, women were discharged from active duty. But by the time World War II came about, the Navy again needed women to achieve its mission. The Navy began to recruit women into a specific corps known as Women Accepted for Voluntary Emergency Service, or commonly referred to as WAVES. WAVES served in

a number of different support roles throughout the war period. Though some women were assigned to places such as Hawaii and Alaska, they were not assigned outside of the United States.

During the Korean War era, women in the Navy began serving in extended roles outside of the United States and were assigned to other geographical areas such as Europe and Asia. At this point, the Department of Defense began recruiting efforts to attract women to fill manning gaps. And although recruiting women alone was a challenge, mobilizing them in support of the war proved even more difficult (Women in Military, n.d.).

Interestingly, though women served as WAVES during World War II and as reservists during the Korean War, no enlisted women served in the Navy during the Vietnam War era. Women served as either nurses, or a few served in a non-nurse capacity.

c. Naval Women During the Late Twentieth Century (1970–1999)

The 1970s introduced some expanded roles for women in the Navy. In 1972, Alene B. Duerk of the Navy Nurse Corps was promoted to Flag Rank. And just a few years later, in 1976, Fran McKee became the first unrestricted line officer in the Navy (Navy Personnel Command [NPC], n.d.). This opened the door for women to enter career fields that were traditionally held only by male service members.

Women began serving as aviators and onboard ships (albeit support and noncombatant ships). In 1974, the Navy became the first branch of military service to graduate a female pilot, and in 1979, the Navy qualified its first female Surface Warfare Officer (NPC, n.d.).

d. Present Day Navy Women (2000–2013)

Although the Navy had allowed women to serve as Surface Warfare Officer and Aviators as early as the 1970s, the Navy did not qualify women in its other major warfare area, Submarines, until after 2012 (Commander Submarine Group 9, 2012). Today, we have women serving in almost every aspect of the Navy. Women officers command

combatant ships at sea, hold flag ranks, and serve on submarines. Throughout the Navy's history, women have helped the Navy achieve its manning goals, and ultimately its overall mission.

B. DIVERSITY IN THE NAVY

1. Importance of Diversity

Diversity in the workplace has become an increased focus in America. This is due in part to changing demographics within the United States. As cultural norms change (specifically with women in the workforce), the military is bound to follow suit. For the purposes of this thesis research paper, we will focus this discussion of diversity solely on diversity with regards to incorporating women in the workplace.

According to a report from the Bureau of Labor Statistics (U.S. Bureau of Labor Statistics [BLS], 2013), in 2011 58.1 percent of women were in the civilian labor force. This is up from only 43.3 percent of women participating in the civilian labor force in 1970. This is an increase of 14.8 percent. Meanwhile, though the percentage of women participating in the workforce is growing, the percentage of men participating in the workforce has declined 9.2 percent within the same time period (BLS, 2013).

In related statistics, the Department of Labor shows that the proportion of the workforce as a whole has also changed. In 1970, just 38 percent of those in the workforce were women; however, in 2012 the total workforce was comprised of 47 percent women. This is a total of a nine percent growth in the proportion of the workforce being females (United States Department of Labor, 2012).

Even though we're seeing an increase of women in the civilian labor force, female representation in the Navy still falls far behind their civilian counterparts. As of 2013, women only comprised 16 percent of all Navy officers. Considering that 58 percent of all college graduates are women, and 45 percent of all graduate degrees belong to women as well, it becomes clear that women are vastly underrepresented among Navy officers.

a. Diversity Initiatives in the Workplace

Women currently make 78 cents on the dollar when compared to their male counterparts. This can amount up to a loss of approximately $434,000 of wages over their lifetime when compared to men with equivalent skills and education (Arons, Boushey, & Smith, 2009). Because of issues like this, there have been a number of diversity initiatives over the years that have contributed to the change in the workforce demographics as mentioned above.

Some of the initiatives address issues such as fair hiring practice, equality of pay, education and training opportunities, and work-family balance. These initiatives have brought about stronger anti-discrimination laws and new opportunities to women in the labor force. Although there has been advances made with some of these issues, more work needs to be done.

b. Diversity Initiatives in the Navy

Although diversity seems to have always been important to the Navy, relatively recent initiatives show just how much focus the Navy currently places on obtaining and maintaining a diversified workforce. For one, the Navy has established the Office of Diversity and Inclusion, Women's Strategy and Policy, also known as OPNAV 134W. Furthermore, the Chief of Naval Operation's (CNO) Diversity Vision (2008) stated that in order for the Navy to maintain its war fighting edge, "it is essential that our people be diverse in experience, background and ideas…." It is outlined therein that there will be a focus on: recruiting a diverse force, developing a diverse force, and institutionalizing diversity. Additionally, the Navy has released OPNAV INSTRUCTION 5420.115, which establishes the guideline for the Navy's Diversity Policy Coordination, signed by the Vice Chief of Naval Operations (VCNO). It provides management of the Navy's efforts in recruiting and retaining a diversified workforce. In it, we find guidance for The Diversity Policy Review Board (DPRB), and The Diversity Working Group (DWG).

Per this instruction, the DPRB includes the following members:

- VCNO (Chair)
- DCNO, MPT&E (N1)—Executive Secretary

- Master Chief Petty Officer of the Navy
- Judge Advocate General
- Commander, Naval Air Forces
- Commander, Naval Surface Forces
- Commander, Naval Submarine Forces
- DCNO, Information Dominance (N2/N6)
- Chief of Navy Reserve
- Chief of Naval Research
- Commander, Navy Special Warfare Command
- Commander, Navy Expeditionary Combat Command
- Navy Surgeon General
- Chief of Chaplains
- Commander, Naval Sea Systems Command
- Commander, Naval Air Systems Command
- Commander, Space and Naval Warfare Systems Command

With OPNAV 134 as the chair, the DWG has the following members:

- Naval Air Forces
- Naval Submarine Forces
- Naval Surface Forces
- Naval Reserve Force Command
- Office of Naval Research
- Navy Bureau of Medicine and Surgery
- DCNO (N2/N6)
- Naval Special Warfare Command
- Navy Chaplain Corps
- Navy Expeditionary Combat Command
- Space and Naval Warfare Systems Command
- Naval Sea Systems Command
- Naval Air Systems Command
- DCNO, MPT&E (N1) Fleet Master Chief

- Naval Installations Command
- Naval Education and Training Command
- Supply Corps
- Navy Recruiting Command
- OPNAV Training and Education Division (N15)
- Bureau of Naval Personnel, Military. Community Management Division (Ferguson, 2012)

2. Female Demographics

a. Female Representation within the Services

According to a 2012 report to Congress prepared by the Office of the Under Secretary of Defense for Personnel and Readiness, the breakdown of men and women in the services are as follows.

Table 1. Fiscal Year 2011 Male and Female Statistics by Service (from Office of the Under Secretary of Defense Personnel and Readiness, 2012)

Service	Grade	Number of Active Component Authorized Positions[1]	Percentage of Authorized Positions Open to Women[1]	Percentage of Total Active Component Positions Filled by Women[2]
Air Force				
	Officer	58,716	99.6%	19%
	Enlisted	241,136	99%	19%
	Total	299,852	99%	19%
Army				
	Officer	67,046	81%	17%
	Warrant	13,726	90%	9%
	Enlisted	394,730	63%	13%
	Total	475,502	66%	13%
Marine Corps				
	Officer	15,482	78%	6%
	Warrant	2,176	86%	5%
	Enlisted	151,807	67%	7%
	Total	169,465	68%	7%
Navy				
	Officer	44,030	95%	16%
	Warrant	1,588	88%	5%
	Enlisted	236,125	86%	16%
	Total	281,743	88%	16%

[1]Source: Service authorization data, fiscal year 2011. The table excludes patients, students, trainees, prisoners, and personnel in transition, and thus does not equal end strength.
[2]Source: Defense Enrollment Eligibility Reporting System December 2010; represents the percent of women serving in the Active Component in each Service. Out of 1,226,562 FY11 Active Component authorizations, 252,179 positions (21 percent) are closed to women.

Table 1 shows that the Navy trails only the Air Force in the number of positions accessible to female officers. In comparison to the Army though, the Navy has considerably more positions open to women. Despite this, Table 1 illustrates that the Navy is almost even with the Army in the proportion of female officers within its ranks. So even with the advances that the Navy has made in employing female officers over its history, Table 1 indicates that the Navy may have trouble recruiting and retaining them.

b. Female Representation within Specific Military Occupations

Figure 1 shows that although the number of female surface warfare officers has more than doubled since the year 2000, the Navy's Unrestricted Line community as a whole is still comprised of only seven percent women. Furthermore, the numbers of female naval flight officers (NFO) and pilots have remained relatively stagnant over the same time period. Figure 1 indicates that the majority of Navy female officers serve in the Staff Corps, with the Restricted Line falling to a close second, at 25 percent and 20 percent respectively.

WOMEN IN THE NAVY FACT SHEET

(Information Current as of March 2013)

FEMALE OFFICERS IN THE NAVY:

Total number of Active and Reserve female officers is **11,087** (16.6% of total)

- Unrestricted Line: **2,865** (7%)
- Restricted Line: **1,612** (20%)
- Staff Corps: **6,248** (25%)
- LDO: **279** (7%)
- CWO: **84** (5%)
- Pilots: **500** (5%)
- NFOs: **288** (9%)

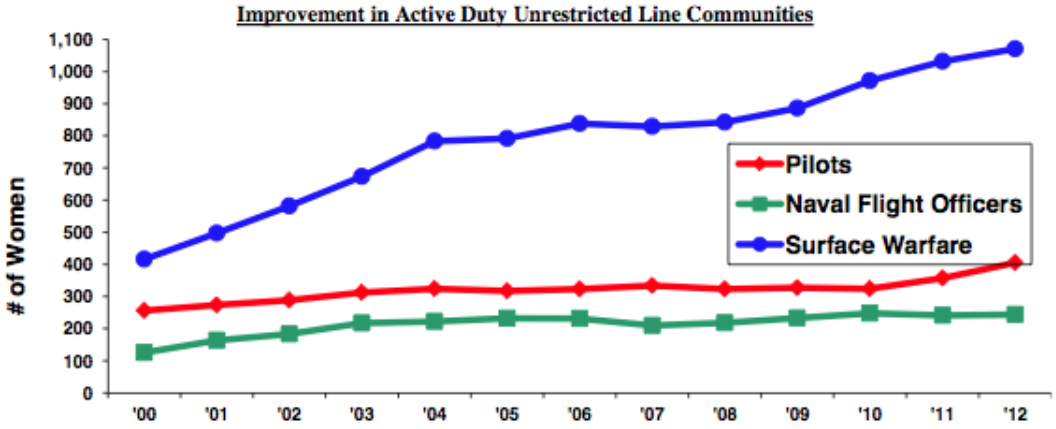

Figure 1. Women in the Navy Fact Sheet (from Office of Women's Policy, 2013)

C. PAST STUDIES OF FEMALE RETENTION IN THE WORKPLACE

1. Female Turnover

a. Civilian Sector

According to a study done from researchers at Cornell University and the University of Texas at Austin, half of the women who work in civilian STEM (science technology, engineering, and math) occupations leave to search for another line of work within the first 12 years of their career. This is a high number compared to women who work in non-STEM fields, where less than 20 percent leave for other occupations (Steele, 2013).

Interestingly, although women make up half of the civilian labor force, less than 24 percent of them work in civilian STEM occupations. Furthermore, women in STEM jobs earn 33 percent more on average when compared to women working in non-STEM fields. What makes the turnover in civilian STEM fields even more curious is that the gender wage gap between male and female STEM workers is smaller than the wage gap between female STEM and non-STEM workers (United States Department of Commerce, 2011).

(1) Identity Theory

Identity theory provides one possible explanation of the gap between female workers who hold traditionally female jobs, and jobs that are traditionally held by males (civilian STEM or military occupations). According to Bruch and Cole (2006), organizational researchers are increasing their application of the theory behind social identity to the workplace (p. 588). This theory posits that a person's role, or identity, is their view of themself relative to a predefined set of social expectations (Thoits & Virship, 1997).

In identity theory, compatibility and identity reinforcement are found in similarities, such as gender (Grissom, Nicholson-Crotty, & Keiser, 2012). As such, an individual's social environment can influence their social identity. Subsequently, social identity could have an influence on one's actions with regards to career decisions (Stryker, 1980). Although some women may seek to fill jobs that are not traditionally held by females, over time this may cause some strain to their self-perception. As a result, this strain may negatively affect female employee attitudes and behaviors towards their non-traditional line of work (Andreason & Kinneer, 2005: Nicholson, 1984). According to Kraimer, Shaffer, Harrison, and Ren (2012), with regards to the workplace, "identity strain, in turn, promotes turnover" (p. 399). Identity theory helps us understand that women (and men), are driven to participate and continue in identity-consistent behaviors (Burke, 1991).

Supplementary to this concept, within the context of identity theory, is the idea of relational demography. Riordan (2000) writes, "... relational demography suggests that the more similar an individual is to a social unit in demographic characteristics, the more positive will be his/her work-related attitudes and behaviors" (p. 131). Furthering this idea, there have been several studies that have linked relational demography to career mobility (McGinn & Milkman, 2013). Identity theory and relational demography suggest probable reasons behind workplace retention and turnover.

b. Military

The military as a career field is very similar to civilian STEM occupations in that the military is not only male-dominated by numbers of service members, but the nature of the work itself is also traditionally male-oriented. Enlistees for example, take a male-centric aptitude battery exam with the Armed Services Vocational Aptitude Battery (ASVAB). There are categories within this exam that pertain to mechanical comprehension, math knowledge, and auto shop. These categories are areas in which males traditionally excel in comparison to females. The ASVAB is not designed in this way to keep women out of the military; rather it is designed to test the aptitude of entrants for working in fields that require these skills. As such, some women may end up working in fields that may not be a good fit for them. Although identity theory can be used as an explanation for lower retention among female Navy officers, other reasons can also be considered as well.

2. Factors Affecting the Retention Decision of Females in the Military

a. Person-Organization Fit Theory

According to Grogan and Youngs (2011), a number of researchers have theorized "… the degree of similarity between profiles of individuals and employing organizations could have important implications for employee selection, job satisfaction, job performance, and retention" (p. 3). This theory is called person-organization fit. The results from studies show that Person-Organization fit could help in providing a predictor for employee turnover (Gupta, 2013). Handler (2004) agrees, stating, "Fit has been shown to be a great predictor of tenure." If this is the case, it could follow that bad fit can

result in low job satisfaction, which can lead to poor job performance, and consequently low retention.

b. Perception of Career Plateau

Whether women leave the Navy because of the concepts behind person-organization fit or because of identity theory, the Navy's inability to retain female officers may cause an unwanted perception of career plateauing among its female officers. This may further influence women on their retention decisions. For the purposes of our research, we look into two different types of career plateau. The first is structural plateau, and the second is content plateau. Salami (2010) distinguishes between the following, "Hierarchical (structure) plateauing results when there is little chance of further vertical movement within an organization whereas job content plateauing occurs when individuals are no longer challenged by their job or job responsibilities, and there is overall staleness of the job itself" (p. 499). Because women are more inclined to leave the Navy earlier in their careers, there is a disproportionate lack of senior female leadership, which may give the impression of career plateauing. Questions concerning these plateaus are incorporated into the survey portion of our research.

D. PAST STUDIES OF CRITICAL MASS

1. Background of Critical Mass Theory

Critical mass is an important concept with implications in political arenas, boardrooms, and universities. The idea of critical mass is, "The discreet point at which the presence of a sufficient number brings about qualitative improvement in conditions and accelerates the dynamics of change…" and is "…defined as a strong minority of at least 15 percent" (Etzkowitz, Kemelgor, Neuschatz, Uzzi, & Alonzo, 1994, p. 51). The theory of critical mass asserts that minorities tend not to have a notable impact until their representation grows to a considerable minority (Broome, Conley, & Krawiec, 2011).

The purpose of this study is to determine if and at which point critical mass exists within the Navy with respect to female retention among officers. There are no previous empirical studies on critical mass and female retention in the Navy to our knowledge.

However, past research suggests that as the number of women increases in an occupation, females are more likely to exert more influence and are less likely to experience turnover. For example, Kramer, Konrad, Erkut, and Hooper (2007, p.19) find "it takes three or more women to achieve the "critical mass" that can cause a fundamental change in the boardroom and enhance corporate governance." In academia, Tolbert, Simons, Andrews, and Rhee (1995), find that a "critical mass" of 35–40 percent must be achieved to increase the retention of female faculty. There are several explanations that support the findings in past studies discussed below.

a. Social Contact theory

Social contact theory is based upon the idea that "social prejudices" are more likely to survive in a culture where interactions between the majority and minority group members are low (Tolbert et al., 1995). This theory contends that with increased interactions of the members of the majority group with the minority group, destruction of stereotypes will occur, thus leading to better intergroup relations (Tolbert et al., 1995). Critical mass is related to social contact theory in that by achieving more similar sized groups by increasing the size of the minority group, the opportunities for cross-group interactions are enhanced, thereby leading to more positive social outcomes.

b. Competition Theory

Competition theory suggests a different impact of minority group size on group dynamics and interaction in that as the proportion of the minority group increases, so does the level of conflict and hostility toward that group (Tolbert et al., 1995). This theory relies on the assumptions that "… members of socially defined groups compete collectively for control of scarce and desirable resources" and also "…that group size is often determinative of the outcomes of such competition" (Tolbert et al., 1995, p. 564). The assertion within this theory is that a small minority group is not perceived as a threat by the majority group, but as the minority group grows in relation to the majority group, an increase in negative feelings towards the minority group will also increase as will "discriminatory actions designed to protect the majority's control of resources" (Tolbert et al., 1995, p. 565). Tolbert et al. (1995) discuss Blalock's (1967) findings, which

conclude that a minority group's ability to assert power will grow as the size of the group increases. Correspondingly, reaching critical mass reverses the negative impact of stereotype upon that minority group (Tolbert et al., 1995).

2. How Critical Mass is Used

a. College and Universities

Studies have shown the existence of critical mass and have led to positive outcomes for student and faculty minority groups. A study by Hagedorn, Chi, Cepeda, and McLain (2007) focused on Latino students enrolled in urban community colleges and sought to determine how the level of representation of Latino students affected the academic outcomes of these students. The finding of this study identified a correlation between positive academic outcomes and a higher ratio of Latino students and faculty on campus, asserting that critical mass exists in this context (Hagedorn et al., 2007). Similarly, a study conducted by Tolbert et al., (1995) determined that critical mass has a positive effect on female faculty turnover at the university level. The authors found that a threshold for critical mass existed when the proportion of female faculty reached 35–40 percent. At that point, turnover among the female faculty began to decline (Tolbert et al., 1995).

b. Boardrooms

An article regarding the role of females on corporate boards by Kramer et al. (2007) discusses a study by the Wellesley Centers for Women. The study concluded that a critical mass of three women exists in this context. When a single female served on a corporate board, interviews revealed that she was viewed as a token, that is "… at once highly visible and invisible, being stereotyped, and being seen representing all women" (Kramer et al., 2007, p. 19). The addition of another female on the corporate board did help the women to feel less isolated. In this case, the women were conscious of behaving in a manner to not appear "…too supportive of each other" (Kramer et al., 2007, p. 20). The study determined that only when the female representation on the corporate board reached three women, with the typical corporate board consisting of between nine and 12

directors, was there a noticeable change, with gender concerns removed at that point (Kramer et al., 2007).

A qualitative study utilizing interviews of 46 female corporate board members by Broome et al. (2011) arrived at varied conclusions regarding critical mass of females in the corporate world. Some support was found for critical mass in that as the number of women increased, so too did the level of comfort they experienced, thereby allowing the females to be more effective members of the board (Broome et al., 2011). However, some participants enjoyed an "outsider" status and viewed themselves as pioneers in the corporate arena (Broome et al., 2011). An outcome of this study also supported the competition theory—majority backlash against the minority as the minority group size increased (Broome et al., 2011).

c. Politics

Politics is another area in which the idea of critical mass has been studied. There are opposing viewpoints on whether or not critical mass exists for females in the political arena. Gender and political scholars propose that women will not be in the position to affect legislative change until a substantial minority is reached rather than just a few individuals, suggesting that only with an increased number of women will a collaborative approach be possible to promote women-friendly policies and to exert influence on male political colleagues (Child & Krook, 2008). Conversely, Child and Krook (2008) discuss the findings of Crowley (2004) that finds women have greater influence on political change when they comprise a small minority.

d. Role Models

The importance of role models cannot be overlooked when discussing the value of critical mass in colleges and universities, boardrooms, and in politics. In the study by Hagedorn et al., the authors identify that the presence of Latino faculty on campus allowed for a greater possibility of role models for Latino students thereby enabling social integration (2007). Etzkowitz et al. (1994) discusses the impact of role models as it relates to female scientists. As the field of science was a male dominated field, the few women who entered the field were met with the choice of either following the "traditional

male" path or "the relational female" path, therefore as critical mass was attained, "…some of the expected effect of critical mass dissipated" (Etzkowitz et al., 1994, p. 52). With increasing numbers of females entering the field of science, the singular male model was weakened, but the lack of female role models was evident, and with this lack of role models, women are less prone to enter into careers in academic science (Etzkowitz et al., 1994). Kanter (1977) also recognized the importance of successful female role models for women in token positions, which allow them to observe forms of acceptable behavior, coping mechanisms, and strategies. Childs & Krook (2008) further discuss the importance of role models in the work of Dahlerup (1988). When discussing the success of women politicians, Dahlerup (1988) conclude that "… it is not numbers that count, but the performance of a few outstanding women as role models" (p. 287)

E. SUMMARY

In summary, we looked at the historical importance of women serving in the Navy. We also examined the importance of diversity to the Navy. Some of the past studies on theories such as identity, person-organization fit, and career plateau can lend some understanding as to why these highly valued female officers leave the Navy at a higher percentage than their male counterparts. We apply these concepts to the questions in the survey portion of our research. We believe that this will allow us to capture individual-level attitudes of female officers with regards to retention. Additionally, past studies pertaining to critical mass in areas such as universities, boardrooms, and other areas, can give credibility to the study of critical mass within the military.

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III. DATA AND METHODOLOGY

A. DATA DESCRIPTION

This chapter describes the data, variables, and methodology used to analyze the effects of the proportion of men and women on active duty Navy officer retention. All data was obtained from the Defense Manpower Data Center (DMDC). For this study, 10 years of panel data was provided for every active duty Navy officer that served from October 1, 2002 through September 30, 2012. Cohorts were divided based on the year of commission. The data included information for 84,935 officers. These active duty Navy officers comprised 502,948 annual observations. Specifically, we analyze the effects of the proportion of men and women within particular occupations with respect to retention for the FY 2003 through 2006 cohorts. These cohorts contain 14,009 Navy officers.

The original data consisted of four separate data files. The first data file consisted of 28 variables and 13,647,734 observations. This data file encompassed the majority of the information used for our regression analysis, such as gender, race, ethnicity, marital status, dependent count, age, file date, rank, joint spouse flag, home of record state, and education level. The second data file contained 455,738 files of separation data on all active duty Navy personnel. The third data file was comprised of active duty Navy officer occupational designator codes. This file contains of 2,052,012 observations. The fourth and last data file, containing, 2,117,823 observations, was used to collect officer commissioning dates. After merging and controlling for unknown designators, missing appointment dates, and occupations that were not used in this study, we reduced the number of observations to 368,667. For this study, chief warrant officers, limited duty officers, naval flight officers, pilots, and enlisted personnel were omitted.

1. Definition of Dependent Variable

The dependent variable, retention, is a dichotomous outcome. This variable indicates whether an officer remained on active duty or exited the Navy before reaching five years and six months of active duty service. The retention variable was set to “1” if

an officer remained in the after reaching five years and six months of service and beyond, and "0" if officers made the decision to exit the Navy prior to reaching five years and six months of active duty within the Navy.

The five year and six month point in an officer's career is defined as retention for several reasons. Typically, an officer incurs a four-year obligation once he or she is commissioned. However, in some instances, an officer obligates a longer commitment of active duty service especially when they participate in an enlisted to officer type program, obtain an undergraduate degree from the United States Naval Academy, or have a scholarship funded by the Naval Reserve Officers' Training Corps (NROTC). These longer obligations are further explained in the sections below.

The five-year point of service covers most naval officer obligation requirements; however, six months is added as a buffer for any administrative delays that may occur in one's separation from the Navy. For the reasons outlined above, the five year and six month point in an officer's career is used as the retention point in our study.

a. Enlisted to Officer Programs

Navy enlisted personnel have several programs in which to become commissioned officers in the Navy. The seaman to admiral-21 (STA-21) program consolidates most naval commissioning paths into this one program. According to the Navy, all commissioning options within the STA-21 program incur a five-year active duty obligation upon commissioning (United States Navy, 2011). The exception of this policy is the pilot option and the naval flight officer option. The flight option for the officer candidate acquires an eight-year active duty obligation upon the date of designation as a naval aviator (United States Navy, 2013). The naval flight officer option for the officer candidate gains an eight-year active duty obligation upon the date of designation as a naval flight officer (United States Navy, 2013). The time at which either of these options receives their respected designations is dependent upon the platform or type of aircraft the officer candidate is selected to fly. This analysis will exclude pilots and naval flight officers because the data provided does not include platform type and therefore is unknown at what point in time an officer begins his or her obligated service.

b. United States Naval Academy

Service academies serve as another commissioning source for naval officers. Graduates from the United States Naval Academy incur a minimum of five years of active duty service as a commissioned officer once accepting appointment and immediately after graduation (United States Naval Academy, n.d).

c. Naval Reserve Officers' Training Corps

Naval Reserve Officers' Training Corps (NROTC) midshipmen are obligated for five years of active duty service dependent upon whether the midshipman was provided a scholarship. A midshipman that attends college using a NROTC scholarship will sustain a five-year obligation (United States Navy, 2013). For those midshipmen that participate in the NROTC program but pay their own expenses or are funded from a source that is non-Navy shall incur a three-year active duty obligation (United States Navy, 2013).

2. Explanatory Variables

a. Cohort Dummies

"Commissioning year" is defined as the date that an individual is appointed to commission officer in the Navy thus the beginning of commissioned service. Fiscal year cohort dummy variables were created from this date for each FY from '03 through '06, with 1 annotating commissioned service beginning during that year. DMDC provided data from FYs '03 through '12. FY '06 was the last cohort year that this study analyzes in order to allow all possible outcomes to be reached, specifically the five year and six month point in an active duty Navy officer's career or "retention" as described above. Additional cohorts after FY '06 were not created for this study because the officers that were commissioned beyond FY '06 did not have enough time in service to reach the retention point with the data provided.

Table 2 shows the percentage of men and women for the FY '03 through '06 cohorts that fall under the definition of retention as described in the earlier sections of

this chapter. There appears to be a downward trend of accessions yet an upward trend in officer retention. This is intuitive because as more personnel stay on active duty, fewer people need to be accessed.

Table 2. Dependent Variable Characteristics for Cohorts FY '03–'06

	Percent Retained Male	Percent Retained Female	Sample Male	Sample Female
Cohort FY '03	48.66%	34.66%	1,915	626
Cohort FY '04	73.45%	61.08%	1,857	573
Cohort FY '05	74.57%	64.39%	1,758	570
Cohort FY '06	77.87%	67.28%	1,744	547

b. Designator Codes

There are 58 different designators that describe the officers within the dataset. Analyzing each designator separately is beyond the scope of this study as we look to identify trends on a much larger scale; therefore, using the Navy Officer Occupational Classification System (NOOCS), we organize and combine the 58 various designators into 12 major designator categories; however, the designator code, fleet support officer, was dropped from the data because there are only 11 observations that exist with this code making it statistically insignificant. Thus, the total number of designator categories is reduced to 11 for this analysis. Table 3 displays how the designator codes were combined to create the designator categories.

Table 3. Designator Categories

Designator Code	Designator Description	Designator Category
110	Unqualified URL	Unrestricted Line Officer (SWO and Other)
111	SWO	
116	Training for SWO	
112	Submarine Warfare	Unrestricted Line (SUB, SEAL, EOD)
117	Training for Submarine	
113	Special Warfare (SEAL)	
118	Training for SPECWAR (SEAL)	
114	Special Operations (EOD,	

Designator Code	Designator Description	Designator Category
	Underwater Mine Counter-Measures, Diving and Salvage, Expendable Ordnance Management)	
119	Training for Special Operations	
120	Human Resources Officer	Restricted Line Officer (Human Resources, Permanent Military Professor)
123	Permanent Military Professor	
121	Nuclear Power School Instructor	Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer)
122	Naval Reactors Engineer	
144	Engineering Duty Officer	Restricted Line Officer (Engineering Duty)
146	Training for Engineering Duty Officer	
150	Flag Officer, former AED	Restricted Line Officer (Aerospace Engineering Duty)
151	Aerospace Engineering	
152	Aerospace Maintenance	
154	Aviation Duty Officer	
162	Now 166X	Restricted Line (Strategic Sealift, Public Affairs)
165	Public Affairs Officer	
166	Strategic Sealift Officer	
167	Now 166X	
171	Foreign Area Officers	Restricted Line (Foreign Area Officer)
172	Under Instruction Foreign Area Officer	
160	Now 182X	Restricted Line (Information Dominance Corps)
161	Now 180X	
163	Now 183X	
164	Now 181X	
180	Oceanography Officer	
181	Information Warfare Officer	
182	Information Professional Officer	
183	Intelligence Officer	
184	Cyber Warfare Engineer	
190	Under Instruction Prospective Nurse Corps	Staff Corps (Medical)
192	Under Instruction Prospective Dental Corps	
194	Under Instruction Prospective Medical Service	

Designator Code	Designator Description	Designator Category
	Officer (Optometry)	
196	Under Instruction Prospective Medical Corps Officer (Medical/Osteopathic Scholarship Program)	
197	Under Instruction Scholarship Program (Medical/Osteopathic)	
198	Under Instruction Scholarship Program (Dental)	
199	Under Instruction Scholarship Program (Medical Service Corps)	
210	Medical Corps	
220	Dental Corps	
230	Medical Service Corps	
290	Nurse Corps	
195	Under Instruction Prospective JAG Corps	Staff Corps (JAG, Supply, Chaplain, CEC)
250	JAG Corps	
270	Flag Officer, accessed from 210X, 220X, 230X and 290X	
310	Supply Corps	
316	Training for Supply Corps	
410	Chaplain Corps	
510	Civil Engineer Corps	

Table 4 indicates the percentage of active duty female officers that fall under their respective designator category at the end of their first year of service by fiscal year cohort. In addition, this table provides the total number of males and females that were assigned under these categories.

Table 4. Percent Female within Designator Categories by Cohort at the End of First Year of Service with Total Number of Observations (Male & Female)

Designator Category	2003 Cohort	2004 Cohort	2005 Cohort	2006 Cohort
Unrestricted Line Officer (SWO and Other)	25.64% / 784	26.55% / 678	23.76% / 745	24.54% / 762
Unrestricted Line (Sub, SEAL, EOD)	.21% / 482	.65% / 464	.48% / 416	0.00% / 391
Restricted Line Officer (Human Resources, Permanent Military Professor)	22.22% / 45	25.00% / 24	34.78% / 23	20.00% / 10
Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer)	12.5% / 8	23.08% / 26	20.59% / 34	14.29% / 35
Restricted Line Officer (Engineering Duty)	12.5% / 24	5.26% / 19	20.00% / 10	9.09% / 11
Restricted Line Officer (Aerospace Engineering Duty)	12.5% / 24	9.01% / 22	12.5% / 24	13.64% / 22
Restricted Line (Strategic Sealift, Public Affairs)	25.00% / 12	25.00% / 8	30.00% / 10	53.33% / 15
Restricted Line (Foreign Area Officer)	0.00%	66.66% / 3	0.00%	0.00%
Restricted Line (Information Dominance Corps)	19.05% / 189	22.59% / 186	18.45% / 168	19.37% / 191
Staff Corps	46.07% / 701	40.14% / 705	48.03% / 583	44.64% / 569

Designator Category	2003 Cohort	2004 Cohort	2005 Cohort	2006 Cohort
(Medical)				
Staff Corps (JAG, Supply, Chaplain, CEC)	16.54% / 272	15.59% / 295	18.09% / 315	17.54% / 285

Table 5 indicates the percentage of all active duty female officers that fall under their respective designator category and includes the total number of male and female officers within that category. Fiscal year 2008 is the first point in an officer's career in which the retention decision (five year and six month point) is made as defined in the beginning of this chapter.

Table 5. Percent Female within Designator Category at Time of Retention Decision by Fiscal Year (Total Sample) with Total Number of Observations (Male & Female)

Designator Category	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Unrestricted Line Officer (SWO and Other)	17.01% / 8,471	17.86% / 8,672	18.24% / 8,976	19.11% / 9,200	19.78% / 9,429
Unrestricted Line (SUB, SEAL, EOD)	.34% / 4,953	.28% / 5,089	.64% / 5,174	.92% / 5,346	1.32% / 5,496
Restricted Line Officer (Human Resources, Permanent Military Professor)	41.84% / 588	40.03% / 517	40.97% / 476	38.60% / 430	35.91% / 401
Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer)	15.30% / 183	15.09% / 212	13.65% / 249	12.96% / 270	11.23% / 285
Restricted Line Officer	7.02% / 784	7.70% / 753	7.94% / 680	7.36% / 652	9.18% / 610

Designator Category	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
(Engineering Duty)					
Restricted Line Officer (Aerospace Engineering Duty)	8.63% / 753	8.62% / 696	8.60% / 6.97	8.33% / 636	7.60% / 592
Restricted Line (Strategic Sealift, Public Affairs)	30.17% / 232	31.44% / 229	32.11% / 218	32.09% / 215	32.16% / 199
Restricted Line (Foreign Area Officer)	7.63% / 118	15.04% / 113	11.81% / 127	9.82% / 112	9.62% / 104
Restricted Line (Information Dominance Corps)	18.36% / 3,339	17.90% / 3,272	17.36% / 3,243	17.59% / 3,166	16.91% / 3,117
Staff Corps (Medical)	36.42% / 10,760	36.85% / 10,834	37.06% / 10,892	37.59% / 11,092	37.95% / 11,293
Staff Corps (JAG, Supply, Chaplain, CEC)	13.55% / 5,498	13.67% / 5,457	13.98% / 5,436	14.45% / 5,424	14.61% / 5,367

Table 6 presents the percentage of females that have chosen to remain on active duty service after the five year and six month point as defined by the dependent variable, retention, and is separated by cohort and designator category. Trends can be seen when comparing Tables 4 and 5 with respect to an increasing percentage of females choosing to stay past their initial obligation as the proportion of females increase within each designator category.

A clear example of this is seen in the designator category "Staff Corps (Medical)." The percentage of females for the 2003, 2004, 2005, and 2006 cohorts have increasing retention percentages of 38.7 percent, 58.3 percent, 66.79 percent and 68.9 percent respectively. The fiscal years of interest are 2008 through 2012, the time at which the retention decision is made. For these fiscal years and still observing the "Staff Corps

(Medical)," an increasing proportion of females as each year passes suggests that a critical mass may exist. Similar events also occur in the designator categories of unrestricted line officer (SWO and other), restricted line officer (engineering duty), and Staff Corps (JAG, Supply, Chaplain, CEC).

However, it must be noted that the opposite effect can occur when examining the "Restricted Line (Information Dominance Corps)." An increasing percentage of females choose retention for the 2003, 2004, 2005, and 2006 cohorts as the total percentage of females within this designator category decrease annually from FY '08 through '12.

Table 6. Percent Female within Designator Categories by Cohort that fall under the Category of Retention

Designator Category	2003 Cohort	2004 Cohort	2005 Cohort	2006 Cohort
Unrestricted Line Officer (SWO and Other)	28.86%	65.55%	57.63%	63.10%
Unrestricted Line (SUB, SEAL, EOD)	0.00%	66.66%	50%	0 observations
Restricted Line Officer (Human Resources, Permanent Military Professor)	20%	33.33%	62.50%	100%
Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer)	0.00%	0.00%	28.57%	0.00%
Restricted Line Officer (Engineering Duty)	100%	100%	100%	100%
Restricted Line Officer (Aerospace Engineering	33.33%	50%	33.33%	100%

Designator Category	2003 Cohort	2004 Cohort	2005 Cohort	2006 Cohort
Duty)				
Restricted Line (Strategic Sealift, Public Affairs)	33.33%	100%	100%	87.50%
Restricted Line (Foreign Area Officer)	0 Observations	100%	0 observations	0 observations
Restricted Line (Information Dominance Corps)	33.33%	69.05%	77.42%	78.38%
Staff Corps (Medical)	38.7%	58.30%	66.79%	68.90%
Staff Corps (JAG, Supply, Chaplain, CEC)	33.33%	60.87%	70.18%	66.00%

c. Percent Female within Each Designator Category

A variable was created to measure the percentage of females within each designator category. An additional variable, percent female within each designator category squared, is used to capture diminishing returns or the marginal decrease of retention among female officers within a designator category while the percentage of female officers within those same designator category increases, holding all other factors constant.

d. Demographic Variables

Demographic variables include age, race, and ethnicity, joint spouse flag, dependent count, marital status, and education level at time of entry in the service. Table 7 summarizes these cohort characteristics.

Table 7. Demographic Composition of Females at Time of Accession by Cohort

Variable	Number of Female Observations By Cohort			
	FY '03	**FY '04**	**FY '05**	**FY '06**
Age (median)	26.96	27.56	27.28	27.43
White	74.60%	76.61%	73.68%	69.47%
Black or African American	11.98%	11.34%	11.40%	13.35%
Asian	5.11%	4.01%	4.04%	4.75%
American Indian or Alaskan Native	.32%	.70%	.53%	.73%
Native Hawaiian or other Pacific Islander	.48%	.35%	.53%	.37%
Unknown Race	5.91%	3.49%	6.84%	5.30%
Other Race	1.60%	3.49%	2.98%	6.03%
Hispanic	6.39%	6.11%	7.72%	7.31%
Non-Hispanic	89.78%	90.75%	87.19%	86.29%
Unknown Ethnicity	3.83%	3.14%	5.09%	6.40%
Married	18.7%	15.18%	20.53%	24.50%
Joint Spouse	5.11%	4.19%	5.61%	7.68%
No Dependents	53.19%	50.26%	51.23%	63.99%
One Dependent	22.68%	22.86%	21.05%	18.28%
Two Dependents	9.11%	12.74%	10.89%	7.68%
Three Dependents	10.06%	9.08%	10.53%	5.67%
Four Dependents	3.99%	3.84%	5.26%	3.29%
Five or more Dependents	.96%	1.22%	1.05%	1.10%
Baccalaureate Degree	34.98%	33.16%	31.40%	25.41%
Master's Degree	.32%	.17%	.18%	0.00%
First Professional Degree	.96%	.87%	1.05%	.91%
Doctorate Degree	5.59%	7.85%	8.77%	8.96%
Unknown Degree	51.12%	51.48%	54.39%	62.16%
n =	626	573	570	547

B. MODEL SPECIFICATION

A female officer's decision to remain on active duty service is potentially affected by the proportion of men and women that serve within their respective designator categories. There are other factors during the span of a female officer's navy career that remains constant, such as demographic information, as well as other factors that can change over time, and can be captured. Given the binary nature of the dependent variable, a multivariate logit regression model is most appropriate to estimate the marginal effect of the various independent variables on a female officer's retention decision probability. The dependent variable "retention," is representative of a female officer's decision to remain on active duty. The model equation is used to estimate the likelihood an active duty female officer will remain on active duty after controlling for observable characteristics. The logit model used is:

$$Y = \frac{e^{X\beta}}{1+e^{X\beta}}$$

Y = Outcome: retention at five years and six months

X = Percent Female within Designator Category

Percent Female within Designator Category^2

Cohort Dummy Variables

Commissioning Date

Separation Date

Years of Service

Demographics (age, race, gender, marital status, dependents, joint spouse flag, education, year dummies)

β = The estimated coefficients on each variable.

C. DATA LIMITATIONS

The data used in this study have some limitations. First, some observations needed to be dropped due to missing designator codes. Furthermore, this data does not include prior enlisted service flags, number of deployments, time spent at sea, or information regarding aptitude such as AFQT scores, fitness reports, or GPA scores that

might have affected retention decisions. Furthermore, it will be difficult to establish causality since male and female Navy officers are not randomly assigned to each designator codes. However, we will be able to provide some insight into retention decisions and rough estimates of retention probabilities.

D. SURVEY

1. Purpose

For our research, we disseminated a survey to better understand female retention decisions that could not be captured through personnel data or regression analysis. Though the regression analysis portion of our research allows us to determine if a critical mass within a specific Navy occupation exists, the survey results allow us to determine how female Navy officers perceive some factors about their occupation. In particular, we attempt to identify individual-level attitudes and perceptions about the effects of proportions of females within given occupations, and if these opinions affect an individual's retention decision. We also take into account other potential factors that may have an effect on their retention decisions as well.

2. Survey Design

The survey is divided into 2 major sections. The first section consists of demographic-type questions, to include the following: gender, race, age, occupational field, pay grade, and years of service. The second portion of our survey consists of questions concerning the individual-level perceptions of the survey participant. Specifically, we assess female Navy officer perceptions about: job satisfaction, structural career plateau, content career plateau, turnover intention, occupational fit, and relational demography. These questions are based on a psychometric 5-point Likert scale. The answers range from 1–5, whereas "1" means "strongly disagree" and "5" means "strongly agree." In addition, 2–4 on this scale account for increasing measures of agreement. In total, the survey, on average, takes 15–20 minutes to complete. Many questions were similar in order to accurately interpret responses. The responses were assigned random ID numbers, and all answers were anonymous.

3. Participant Criteria

The survey was administered via an email to over 8,000 Navy officers with a link to the LimeSurvey program. The email list of participants was received from DMDC and the Naval Postgraduate School. For our research, our survey results capture the current attitudes of those who are within one year of making their initial retention decision, or those within two years of having just made that decision. Because DMDC does not record the end of active obligated service date for Navy officers, we requested email addresses for active duty Navy officers that have held the rank of lieutenant junior grade (LTJG) for at least one year, or full lieutenant (LT) for less than two years. We believe that this criterion allows us to capture the current attitudes of that initial retention decision that we are looking for. The survey went live on January 31, 2014. After one week, we received 877 responses, 361 of which were female. Participation was voluntary, and participants were free to skip any questions or stop the survey at any time without penalty.

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IV. RESULTS

The results of our analysis are presented in the sections below. This section contains statistically significant results and discussion regarding the models that are insignificant. We first discuss the logit results. Next, we present the findings from the 877 responses of survey participants.

A. LOGIT ANALYSES

1. Statistically Significant Results

Table 8 provides the multivariate logit regression results that are statistically significant from four separate regressions to estimate the critical mass. The first regression labeled All Designators Combined includes the females from fiscal year cohorts 2003 through 2006 and across all of their respective designators within the data set. The other three separate regressions within Table 8 are for the designator categories of SWO and Other, Staff Corps (Medical), and Restricted Line (Engineering Duty). These results provide probabilities on the likelihood a Navy female officer is retained 5 years and six months after controlling for demographics and cohort year. The results from Table 8 suggest that a critical mass exists for those females that fall under these four separate categories.

Table 8. Statistically Significant Logit Model Results

	All Designators Combined	SWO & Others	Staff Corps (Medical)	Restricted Line (Engineering Duty)
VARIABLES	Retention at 5.5 yrs	Retention at 5.5 yrs	Retention at 5.5 yrs	Retention at 5.5 yrs
Percent Female within Designator Code	-3.5571***	-18.0015**	-4.2492*	-1,195.3202*
	(0.6135)	(7.4813)	(2.3778)	(634.7383)
Percent Female within Designator Code Squared	4.1086***	29.0708	4.4498*	5,654.5954*
	(0.7723)	(18.4351)	(2.6610)	(3,025.4990)
Age	0.0594***	0.0793***	0.0806***	-0.2871
	(0.0054)	(0.0224)	(0.0069)	(0.7301)
Married	-0.2067***	0.1388	-0.3185***	-0.1386
	(0.0483)	(0.1167)	(0.0611)	(2.3357)
Joint Spouse Flag	0.0926	-0.5593***	0.1399*	-5.1180**
	(0.0634)	(0.1422)	(0.0834)	(2.2972)
Dependent Count	-0.0532***	-0.1724***	-0.0080	-3.4940**
	(0.0174)	(0.0409)	(0.0218)	(1.4328)
Years in Service	-0.0058***	-0.0006	-0.0056**	0.2014
	(0.0022)	(0.0109)	(0.0024)	(0.5456)
Rank	0.1026***	0.4887***	-0.0759	0.9083
	(0.0321)	(0.1048)	(0.0472)	(1.1865)
White	-0.1205	-0.1323	0.0393	-
	(0.0933)	(0.1792)	(0.1297)	-
Black	0.0197	-0.2068	0.3781**	-
	(0.1065)	(0.2126)	(0.1469)	-
Other	-0.3077***	-0.0579	-0.1587	-
	(0.1082)	(0.2491)	(0.1439)	-
Hispanic	-0.4806***	-0.1957	-0.9973***	-
	(0.1202)	(0.2057)	(0.2159)	-
Unknown Race/Ethnicity	-0.1536	-0.4031*	-0.0063	-
	(0.1092)	(0.2247)	(0.1471)	-
No High School Diploma	0.2943***	-16.5853	0.0336	-
	(0.1067)	(852.5587)	(0.1274)	-
High School Grad	-1.0991**	-	-1.4082**	-
	(0.5158)	-	(0.5551)	-
Associate Degree	0.4811	-	-0.4320	-
	(0.2986)	-	(0.4089)	-
Baccalaureate Degree	0.1901***	-16.4841	0.0505	-17.9436
	(0.0432)	(852.5587)	(0.0643)	(6,083.3051)
Master's Degree	0.0176	-16.1918	-0.1208	-18.1654
	(0.0935)	(852.5587)	(0.1323)	(6,083.3049)

Post Master's Degree	-0.6546	-	-2.3924**	-
	(0.7775)	-	(1.1717)	-
First Professional Degree	0.2272	-	-0.1633	-
	(0.2151)	-	(0.2457)	-
Doctorate Degree	0.1294*	-16.5406	0.0349	-16.6591
	(0.0780)	(852.5587)	(0.0983)	(6,083.3062)
1.unkndeg	-	-16.8861	-	-
	-	(852.5587)	-	-
2003 Cohort	-1.1495***	-1.5010***	-1.1097***	-20.9681
	(0.0602)	(0.1612)	(0.0817)	(3,226.1515)
2004 Cohort	0.0657	0.0940	-0.0386	-
	(0.0586)	(0.1376)	(0.0822)	-
2005 Cohort	0.0222	-0.3190***	0.0561	-20.7947
	(0.0560)	(0.1095)	(0.0811)	(3,226.1518)
FY 2003	-1.3417***	-1.0643**	-1.2694***	-
	(0.1461)	(0.4483)	(0.1928)	-
FY 2004	-1.3927***	-1.0191**	-1.4262***	-
	(0.1290)	(0.4146)	(0.1683)	-
FY 2005	-1.3629***	-1.1287***	-1.3395***	-
	(0.1185)	(0.3761)	(0.1536)	-
FY 2006	-1.2838***	-1.1277***	-1.2827***	-
	(0.1113)	(0.3449)	(0.1442)	-
FY 2007	-1.3180***	-1.3324***	-1.2088***	-
	(0.1064)	(0.3216)	(0.1382)	-
FY 2008	-1.1973***	-1.4923***	-1.0095***	-
	(0.1044)	(0.2997)	(0.1360)	-
FY 2009	-0.9661***	-1.4294***	-0.6872***	-
	(0.1054)	(0.2888)	(0.1384)	-
FY 2010	-0.5780***	-1.2665***	-0.3751***	-
	(0.1089)	(0.2878)	(0.1428)	-
FY 2011	-0.1709	-0.4974	-0.0613	-
	(0.1169)	(0.3145)	(0.1520)	-
Constant	-0.2649	13.0229	1.5548*	100.6938
	(0.4246)	(852.5604)	(0.8963)	(6,885.9434)
Observations	16,870	4,766	8,709	83

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

a. SWO and Other, Staff Corps (Medical), All Designators Combined

Regressions are performed separately for the designator categories of SWO and Other, Staff Corps (Medical), all Designators Combined. Consistent with competition theory, the sign on the coefficient for percent female within designator code is negative and is significant for these three designator categories. The retention probabilities are evaluated for the average female navy officer or at the mean value for the other independent variables in the model. Further, we vary the percentage of females in each of these regressions from 10 percent to 95 percent to calculate the different probabilities of retention. The results indicate that as the proportion of females increase within these designator categories, the probability of choosing to remain in the Navy at five years and six months decreases until it reaches a threshold point or critical mass. The positive sign on the squared term of percent female within designator code indicates a positive increase in the probability of a female choosing retention. Once critical mass is obtained, the probability that a Navy female officer will remain on active duty service begins to increase.

For the designator category identified as SWO & other, the percent female within designator code variable is significant at the 95 percent confidence level. Figure 2 displays the probabilities of a female choosing retention as the proportion of females increase within this designator category while using the marginal effects or the mean value for the other independent variables in the model. SWO & other has a critical mass of 30 percent.

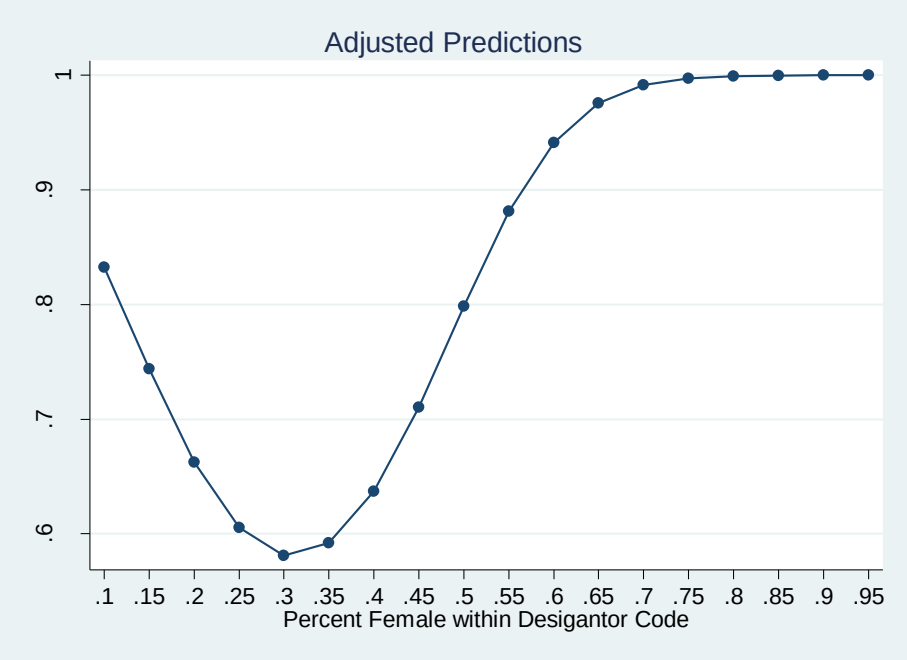

Figure 2. Critical Mass of SWO and Others

For the designator category identified as Staff Corps (Medical), the percent female within designator code variable is significant at the 90 percent confidence level. Figure 3 displays the probabilities of a female choosing retention as the proportion of females increase within this designator category while using the marginal effects of the other independent variables in the model. Staff Corps (Medical) has a critical mass between 45 percent and 50 percent.

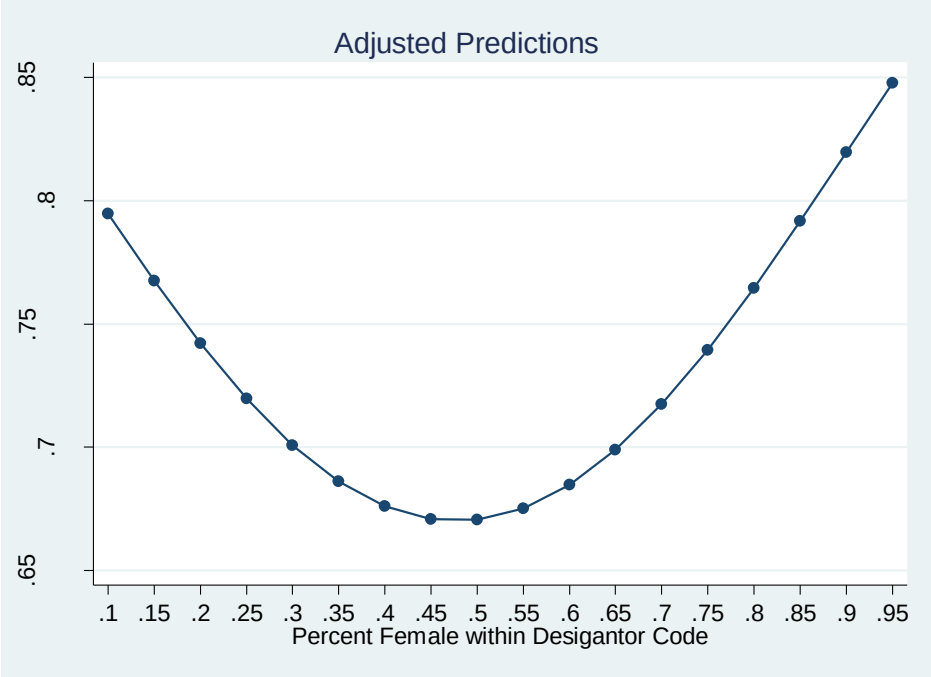

Figure 3. Critical Mass of Staff Corps (Medical)

An additional model logit model is performed that encompasses all Navy female officers for all four fiscal year cohorts and for all designator categories combined. The percent female within designator code variable is negative and significant at the 1 percent confidence level. Figure 4 displays the probabilities of a female choosing retention as the proportion of females increase within this category while evaluating the marginal effects at the mean for the other independent variables in the model. All designators combined has a critical mass of 45 percent.

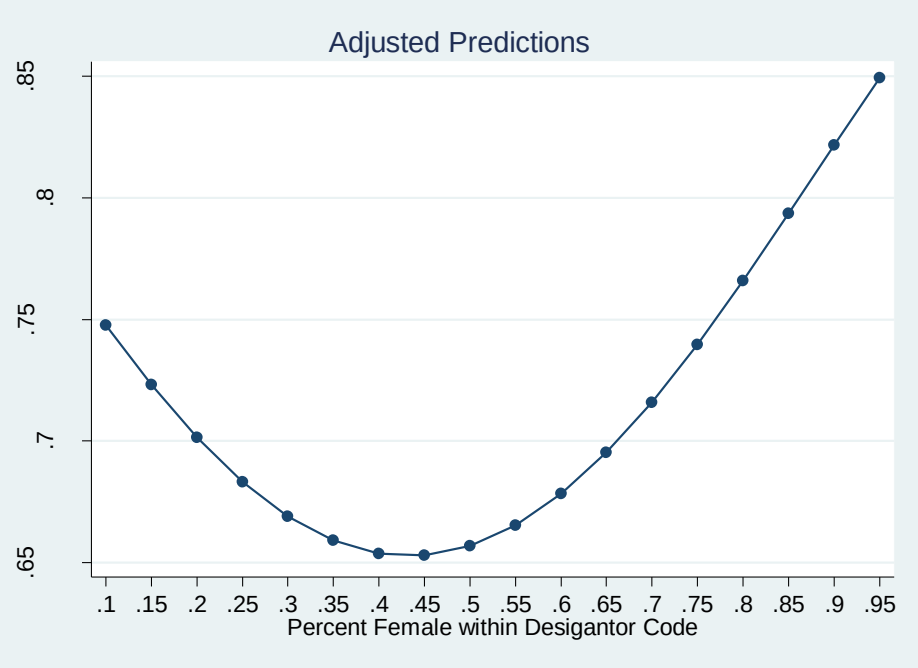

Figure 4. Critical Mass of All Designators Combined

b. Restricted Line (Engineering Duty)

The Restricted Line (Engineering Duty) designator category produces significant results but with limitations. In order to obtain a useable model, some of the independent variables are dropped primarily due to a lack of female observations and lack of variation. Additionally, it is noted that the logit model compares the 89 total women for all four cohort years with 83 percent choosing retention. With such a high retention rate and so few females within this designator category, the model is highly unstable until some variables are removed from the equation. The logit model perfectly predicts some of the outcomes for certain groups because there are so few observations.

After removing race/ethnicity and fiscal year variables, a statistically significant model is produced. The percent female within designator code variable is significant at the 10 percent confidence level. Figure 5 displays the probabilities of a female choosing retention as the proportion of females increase within this designator category while using the marginal effects of the other independent variables in the model. Restricted Line (Engineering Duty) has a critical mass of 10 percent.

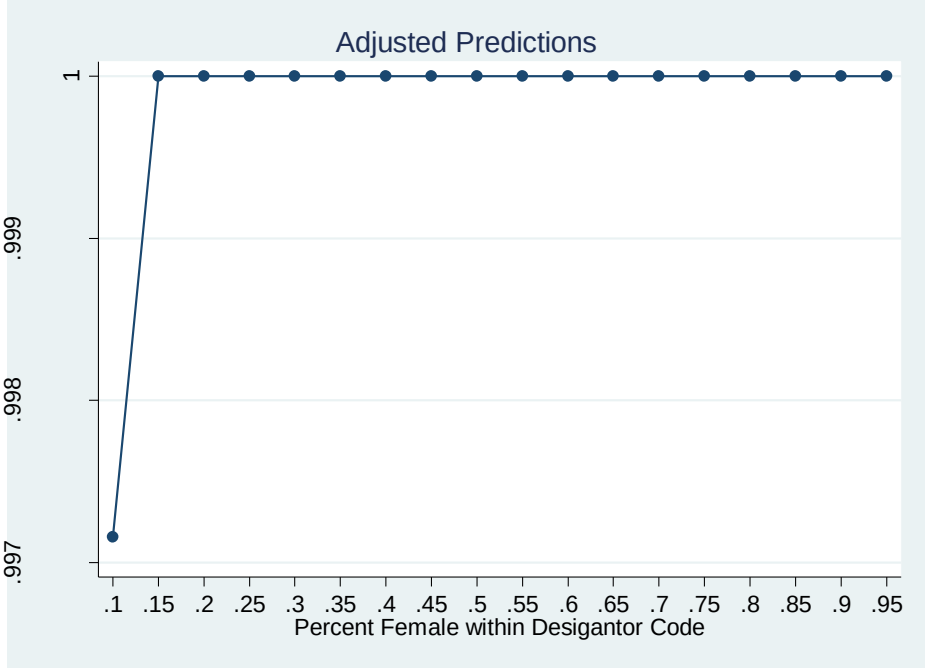

Figure 5. Critical Mass of Restricted Line (Engineering Duty)

2. Statistically Insignificant Results

After performing separate regressions for the remaining designator categories, it is determined that Human Resources & Permanent Military Professor, Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer), Restricted Line (Aerospace Engineering Duty), Restricted Line (Strategic Sealift, Public Affairs), Restricted Line (Information Dominance Corps), and Staff Corps (JAG, Supply, Chaplain, CEC) do not produce statistically significant results. The estimation results for these categories can be found in Appendix A.

Similar to the Restricted Line (Engineering Duty), four of the six designator categories lack the observations and variation needed to perform a logistical regression even after removing many of the independent variables. The percent female within designator code variable and its squared term within the Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer) and Staff Corps (Medical) categories are negative and positive respectively, which produces a critical mass model; however, both of the variables are insignificant. The percent female within designator code variable and

its squared term within the Staff Corps (JAG, Supply, Chaplain, CEC) designator category produces positive signs on each coefficient and are insignificant. The cause for this may be explained by the high percentage of the females in this category to choose retention regardless of the proportion of females.

B. SURVEY FINDINGS

During the week that our survey was active, we received responses from 877 Navy officers. These participants included 462 males and 361 females. These responses make up 53 percent and 41 percent of all participants, respectively. Fifty-four respondents, approximately six percent, did not disclose their gender. The following table displays the five occupational designator groupings that received the greatest number of female representation from the respondents:

Table 9. Representation of Female Respondents

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Numbers of Respondents	22	53	68	156	42
Approximate Percentages of Respondents	6%	15%	19%	43%	12%

The remaining five percent of female respondents that are not represented in Table 9 were spread out across various restricted line occupations and did not provide significant representation for their particular designator grouping. Because of this, we did not include them in this analysis.

Our survey was divided into five sections. They are as follows:

- Job Satisfaction
- Career Plateau

- Turnover Intention
- Occupational Fit
- Relational Demography

For each of these categories, several similarly worded statements were presented to our respondents to test for response validity and consistency. To avoid redundancy, we only present consistent findings of only one statement within each of the aforementioned categories.

1. Job Satisfaction

The following statement was posed, with various other similarly worded statements: *I like my job*. To this statement, we received the following responses.

Table 10. Job Satisfaction

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	77.28%	35.85%	77.94%	77.56%	69.05%
Neither Agree or Disagree	4.55%	15.09%	14.71%	15.38%	16.67%
Disagree or Strongly Disagree	18.18%	47.17%	7.35%	7.05%	14.28%
No Answer		1.89%			

Interestingly, female surface warfare officers had by far the lowest percentage of job satisfaction among our female respondents. This is not only considerably lower than the other fields represented in Table 10, but it is also notably lower than that of male surface warfare officers, where 58 percent of them agreed or strongly agreed with the statement: *I like my job*.

2. Structural and Content Career Plateau

To analyze career plateau, we compiled responses to female perceptions about structural plateauing and content career plateauing. For structural plateaus, the following statement was posed, with various other similarly worded statements: *I am unlikely to receive further promotions in my organization*.

Table 11. Structural Plateau

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	22.73%	20.76 %	19.12%	15.38%	7.14%
Neither Agree or Disagree	9.09%	13.21%	17.65%	14.74%	16.67%
Disagree or Strongly Disagree	68.18%	66.04%	63.24%	69.88%	76.19%

Staff corps officers least agreed with this statement when compared with the restricted and unrestricted line officers. Conversely, staff corps officers disagreed the most with this statement. These results may hint at some correlation between the responses and the proportion of women within these occupational groupings. The perception among female officers is that there is more room to progress in those occupations in which larger proportions of women work.

To test for Content Career Plateauing, we analyze the following statement, along with similarly worded statements: *My job responsibilities will increase significantly in the future*.

Table 12. Content Career Plateau

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	90.91%	81.13%	82.36%	88.39%	85.36%
Neither Agree or Disagree	4.55%	11.32%	13.24%	7.74%	9.76%
Disagree or Strongly Disagree	4.55%	7.55%	4.41%	3.88%	4.88%

In this case, the results from the unrestricted line occupations (SWO and aviation) lean slightly closer to one another than the staff corps occupations. At 91 percent, female information dominance officers felt most strongly that their job responsibilities would increase in the future. Although all occupations overwhelmingly agree or strongly agree with the statement regarding content career plateau, female SWO and aviators had the lowest percentages.

3. Turnover Intentions

In investigating turnover intention, we analyze the following statement, along with similarly worded statements: *I will leave this military as soon as I can*.

Table 13. Turnover Intention

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	18.18%	30.19%	30.89%	30.77%	14.28 %
Neither Agree or Disagree	13.64%	32.08%	33.82%	25.00 %	19.05 %
Disagree or Strongly Disagree	68.19%	37.73%	35.30%	44.23%	66.67%

The URL designator groupings (SWO and Aviation), both have a high number for percentages of agreeing. Especially interesting to our study on critical mass, is the consideration that both these two URL occupational designator groupings are fields in which women representation are lowest in the Navy (see Figure 1). Interestingly, despite the fact that the medical staff corps has the largest proportion of female officers, this group also has a high percentage of officers who agreed with the statement: *I will leave this military as soon as I can*.

4. Occupational Fit

Studying occupational fit helps us determine whether female navy officers believe that they are suited to their current line of work. For occupational fit we presented the following statement, along with similarly worded statements: *My line of work/ occupational field is an important part of who I am*.

Table 14. Occupational Fit

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	63.63%	69.81%	69.12%	88.31%	73.81%
Neither Agree or Disagree	13.64%	20.75%	22.06%	8.44%	16.67%
Disagree or Strongly Disagree	22.73%	9.43%	8.82%	3.25%	9.52%

The majority of all female respondents in these fields either agree or strongly agree that their line of work is important to who they are. If the majority of women in these occupational groupings feel that they are a good fit for the Navy, and that the Navy is a good fit for them, other factors such as the perception of career plateauing might be a better explanation for the lack of retention among female officers.

5. Relational Demography

For relational demography, we looked at two statements, along with similarly worded statements of each. The first statement, we wanted to assess whether the presence of female superiors was important to junior female officers. The second statement, we assessed whether the proportion of women in their designator grouping has an effect on their retention decision. The two statements were as follows:

1. *I would like to see more female superiors in my occupational field*. (See Table 15)
2. *If there were a greater proportion of female officers in my field, I would be more likely to stay in the Navy*. (See Tables 16)

For the first statement, we have the following responses:

Table 15. Relational Demography

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	68.18%	62.26%	64.18%	27.28%	57.14%
Neither Agree or Disagree	31.82%	32.08%	23.88%	40.26%	33.33%
Disagree or Strongly Disagree	0%	5.66%	11.95%	32.47%	9.52%

Information dominance officers, along with surface warfare officers and aviators most agreed with this statement. The medical staff corps, which has the largest proportion of women, least agreed. Considering that over 56 percent of all active and reserve female navy officers serve in the staff corps, medical or other, is notable (Office of Women's Policy, 2013).

As shown in Table 16, the SWO and aviation occupational designator groupings agreed the most with the statement: *If there were a greater proportion of female officers in my field, I would be more likely to stay in the Navy*.

Table 16. Relational Demography

Designator Categories	Information Dominance (RL)	SWO (URL)	Aviation (URL)	Medical (Staff Corps)	JAG, CEC, Supply, Chaplain (Staff Corps)
Agree or Strongly Agree	13.64%	15.38%	23.88%	8.5%	4.76%
Neither Agree or Disagree	22.73%	26.92%	25.37%	23.53%	28.57%
Disagree or Strongly Disagree	63.63%	57.70%	50.75%	67.97%	66.67%

6. Summary

In conclusion, the proportion of women in a given occupation contains a weak correlation with female officer responses with respect to job satisfaction, career plateau, turnover intention, and relational demography; however, results gathered from analyzing occupational fit seemed to not be influenced by the proportion of women within their occupational groupings. The concept of critical mass appears to be supported by the survey results. If the proportion of women within a given occupation is low, then the desire to leave the navy is higher, as seen from our turnover intention results. If more women from those occupational fields leave, then fewer women end up being promoted to senior officer ranks giving the perception of career plateauing. This, in turn, has created a greater desire among the less female-represented occupations to see more female superiors within their respective fields.

V. CONCLUSIONS

A. SUMMARY

The retention of female navy officers in today's navy is critical to the readiness of the navy. This study estimates Navy female officer retention probabilities and identifies individual-level attitudes and perceptions for particular designator categories with female representation in order to better understand the effects of occupation assignment and retention policies.

B. CONCLUSIONS

Using a multivariate logistic regression, we analyze the effect of different proportions of females within designator categories and the probability of retention at the five year and six month point.

We observe that critical mass or the point at which the probability of female remaining on active duty service is achievable for certain designator categories.

This analysis is important because it shows the Navy that for certain designator categories the ratio of men and women does have significant effects with respect to retention outcomes. Our results suggest that a critical does exist within the designator categories of SWO and other, staff corps (medical), restricted line (engineering duty), and all designators within our dataset combined. SWO and other reaches critical mass of 30 percent and the probability of a navy female officer choosing retention begin to increase. Staff corps (medical), restricted line (engineering duty), and all designators within our dataset combined, achieve critical mass between 45 percent and 50 percent, 10 percent, and 45 percent respectively.

Through survey analysis, we observe that the concept of critical mass appears to be supported by the results given. While the results gathered from analyzing occupational fit seemed to not be influenced by the proportion of women within their occupational groupings, the proportion of women in given occupations includes some correlation with female officer responses with respect to job satisfaction, career plateau, turnover

intention, and their particular navy occupation. The desire to leave the navy is higher among women in occupations where representation is lower. Because the turnover intention is higher among female officers where the proportion of women in their occupation is fewer, the representation of women in more senior positions is fewer giving junior female officers the perception of career plateauing.

C. RECOMMENDATIONS

While we believe that our study provides significant awareness into the concept of critical mass and its effects on retention probabilities, we encourage further investigation on this subject. The limitations in our study for both regression and survey analysis include not taking into account variables such as number of deployments, time spent at sea, and critical skills retention bonuses. These are important considerations because they may affect retention decisions. Having data that can control for these additional variables would enhance this study's ability to better analyze critical mass.

Another limitation for both regression analysis and our survey is the lack of observations for particular occupation designators. For the regression analysis, we recommend lengthening the scope of the time period in order to increase the number of female observations within those specific fields. For the survey, we recommend lengthening the time period for collecting the survey data, and to send follow up invitations to encourage participation.

Furthermore, additional key variables that we did not control for are for the performance and quality of individual female service members. This is important because we could not determine if the navy is retaining the highest performing navy female officers. Either one of these variables would have served as a proxy for ability.

Lastly, for our regression and survey analysis, we grouped together some occupational designators in order to increase the number of observations within those groups. We recommend furthering this study by examining individual designators. This could provide a more accurate finding with regards to determining critical mass.

APPENDIX A. STATISTICALLY INSIGNIFICANT LOGIT MODEL RESULTS

	Human Resources & Permanent Military Professor	Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer)	Restricted Line (Aerospace Engineering Duty)	Restricted Line (Strategic Sealift, Public Affairs)	Restricted Line (Information Dominance Corps)	Staff Corps (JAG, Supply, Chaplain, CEC)
VARIABLES	Retention at 5.5 yrs	Retention at 5.5 yrs	Retention at 5.5 yrs	Retention at 5.5 yrs	Retention at 5.5 yrs	Retention at 5.5 yrs
Percent Female within Designator Code	38.9253	-27.5904	449,334.1108	4,199.3654	-25.5505	2.7212
	(86.8144)	(79.7790)	(0.0000)	(11,254.5361)	(17.5280)	(5.3836)
Percent Female within Designator Code Squared	0.0000	106.1677	0.0000	0.0000	48.3461	3.5002
	(0.0000)	(206.3547)	(0.0000)	(0.0000)	(42.9858)	(13.3289)
Age	-0.0161	0.2446	2,412.7644	-3.0008**	-0.0832**	0.0611***
	(0.1158)	(0.3169)	(0.0000)	(1.2779)	(0.0338)	(0.0171)
Married	0.5038	2.6955*	-9,501.4624	0.1172	0.0461	-0.2319
	(0.7306)	(1.4914)	(0.0000)	(1.7389)	(0.2939)	(0.1739)
Joint Spouse Flag	1.4773	-2.5250	9,883.9081	-	-0.0151	0.4745**
	(1.0669)	(1.7570)	(0.0000)	-	(0.3266)	(0.2362)
Dependent Count	-0.5395*	-1.5430	-2,361.2826	-	-0.1476	-0.1808***
	(0.3047)	(1.1528)	(0.0000)	-	(0.1190)	(0.0684)
Years in Service	-0.4134**	0.0995	655.1060	2.6915*	0.1780***	-0.0355***
	(0.1636)	(0.2479)	(0.0000)	(1.4047)	(0.0426)	(0.0124)
Rank	0.0460	-0.0226	-14,275.7129	0.5907	0.1734	-0.0059
	(0.7067)	(0.8393)	(0.0000)	(1.9877)	(0.2206)	(0.1408)
White	15.7768	-	-	-	-1.0377*	-0.1370
	(1,363.0537)	-	-	-	(0.5472)	(0.3078)
Black	16.0386	-	-	-	-0.8402	-0.5478
	(1,363.0539)	-	-	-	(0.6291)	(0.3386)
Other	13.5740	-	-	-	-0.7911	-0.3470
	(1,363.0543)	-	-	-	(0.6118)	(0.3618)
Hispanic	16.4190	-	-	-	-0.4061	0.3612
	(1,363.0539)	-	-	-	(0.6096)	(0.5291)
Unknown Race/Ethnicity	-	-	-	-	-1.7843**	-0.0661
	-	-	-	-	(0.6998)	(0.3840)
No High School Diploma	-	-	101.0394	-	15.0551	-16.7958

	-	-	(0.0000)	-	(583.5190)	(1,035.3649)
High School Grad	-	-	-	-	-	-
	-	-	-	-	-	-
Associate Degree	-	-	-	-	14.5427	-13.3951
	-	-	-	-	(583.5193)	(1,035.3650)
Baccalaureate Degree	14.4935	19.8726	124.2004	-5.2757	16.1380	-15.6143
	(1,339.7420)	(2,618.2438)	(0.0000)	(3.5993)	(583.5191)	(1,035.3645)
Master's Degree	13.1885	21.0861	2,052.8442	-	15.5643	-15.9941
	(1,339.7424)	(2,618.2444)	(0.0000)	-	(583.5192)	(1,035.3645)
Post Master's Degree	-	-	-	-	-	-
	-	-	-	-	-	-
First Professional Degree	-	-	-	-	-	-
	-	-	-	-	-	-
Doctorate Degree	-	-	-	-	16.4693	-16.2459
	-	-	-	-	(583.5191)	(1,035.3645)
1.unkndeg	14.3607	20.6947	-	-	15.5122	-15.7479
	(1,339.7419)	(2,618.2438)	-	-	(583.5191)	(1,035.3645)
2003 Cohort	-1.3571	17.3113	-6,997.7740	-4.1829	-1.8577***	-1.2826***
	(1.2439)	(1,810.7652)	(0.0000)	(3.0031)	(0.3292)	(0.2197)
2004 Cohort	-2.4573**	16.3293	-	-	-0.3928	-0.1460
	(1.1288)	(1,810.7651)	-	-	(0.2791)	(0.2123)
2005 Cohort	-0.0769	16.7749	-	-	0.1445	0.4084**
	(1.0141)	(1,810.7648)	-	-	(0.2697)	(0.1861)
FY 2003	-9.3255*	-	-13,799.8606	-	-0.4788	-1.3043**
	(5.2289)	-	(0.0000)	-	(0.8145)	(0.5421)
FY 2004	-8.6187*	-	-18,832.8918	103.5148	-0.5802	-1.2837***
	(5.0590)	-	(0.0000)	(282.2073)	(0.7299)	(0.4625)
FY 2005	-7.9734*	-	-3,645.7128	90.1437	-0.7017	-1.2344***
	(4.5801)	-	(0.0000)	(250.0374)	(0.6619)	(0.3984)
FY 2006	-7.4219*	-	-4,254.6625	93.6094	-0.8451	-1.1629***
	(4.0607)	-	(0.0000)	(259.2370)	(0.5880)	(0.3647)
FY 2007	-7.7197	-	6,738.9288	105.6120	-1.0475**	-1.1912***
	(4.9088)	-	(0.0000)	(284.7091)	(0.5320)	(0.3376)
FY 2008	-7.6148*	-	6,296.0150	60.8511	-1.0993**	-1.0391***
	(4.4746)	-	(0.0000)	(171.7600)	(0.4790)	(0.3186)
FY 2009	-4.5511	-	3,753.5804	23.9013	-0.9655**	-0.8890***
	(3.0600)	-	(0.0000)	(73.6605)	(0.4633)	(0.3159)
FY 2010	-2.4484	-	350.8741	-3.9329	-0.5291	-0.4376
	(3.0628)	-	(0.0000)	(3.5847)	(0.4593)	(0.3272)

FY 2011	-	-	-	-	-0.3574	-0.2500
	-	-	-	-	(0.4671)	(0.3362)
Constant	-37.6149	-43.2311	73,311.650 7	-1,276.1412	-10.2131	16.0196
	(1,911.553 4)	(3,183.430 2)	(0.0000)	(3,604.829 3)	(583.5302)	(1,035.366 2)
Observations	192	112	36	46	1,096	1,671

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1this page intetnioanlly left blank

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APPENDIX B. FEMALE RETENTION SURVEY

Retention Survey
Thank you for taking the time to complete this survey.

By participating in this research survey, you are assisting us to better understand the retention decisions of officers within the United States Navy. We want to identify individual-level attitudes and perceptions that affect the decision to either exit or remain on active duty before or after one's initial end of active obligated service (EAOS).

This survey should take between 15-20 minutes to complete.

We value your opinions and time and need your help providing critical input to the Naval Postgraduate School to assist with policy and program decisions of the Navy.

PRIVACY ACT STATEMENT
Authority to request this information is granted under 5 U.S.C. 301, Departmental Regulations; 10 U.S.C. 5031 and 5032. License to administer this survey is granted per OPNAVINST 5300.8C under OPNAV Report Control Symbol: 5357-1 which expires 02/ 28/ 2015.

PURPOSE: This is a scientific survey to better understand retention decisions that cannot be observed through personnel data. From our survey sample, we would like to know why male and female officers make the decision to leave the Navy or to remain on active duty. We will use our results to provide insight into optimal staffing levels and investigate how low in the command structure critical mass is required to have an impact on retention.

ROUTINE USES: The information provided in this survey will be analyzed by the Graduate School of Business and Public Policy, Naval Postgraduate School. The data files will be maintained by the Naval Postgraduate School where they may be used for determining changing trends in the Navy.

CONFIDENTIALITY: All responses will be held in confidence by the Naval Postgraduate School. Information you provide will be statistically summarized with the responses of others and will not be attributable to any single individual.

PARTICIPATION: Completion of this questionnaire is entirely voluntary. Failure to respond to any of the questions will NOT result in any penalties except possible lack of representation of your views in the final results and outcomes.

There are 126 questions in this survey

Informed Consent

Thank you for participating in our research.

Your responses will be assigned a random ID #and all responses will remain completely anonymous. No SSNs, names, or addresses will be collected. There is no individual benefit or compensation for your participation, although results will be used to enhance our research and to help inform Navy policy.

This survey should take between 15-20 minutes to complete.

Your participation is voluntary. If you participate, you are free to skip any questions or stop the survey at any time without a penalty. Your responses to the survey will be used responsibly and protected from release to persons not part of the research; however, as with data collected from any research, there is a minor risk that data could be mismanaged. Responses collected will be stored securely on password protected computers at the Naval Postgraduate School.

If you have questions regarding the research or experience any injury or discomfort associated with the research, contact Dina Shatnawi, Ph.D. at dshatnaw@nps.edu, 831-656-2755. If you have any questions regarding your rights as a research subject, please contact the Naval Postgraduate School IRB Chair, Lawrence G. Shattuck, Ph.D. at lgshattu@nps.edu, 831-656-2473.

Many questions will appear very similar. This is necessary to accurately interpret your responses.

Please click “Yes” and “Next” to consent and continue. Thank you.

Please choose **only one** of the following:

- ○Yes
- ○No

Demographics

1. What is your gender?

Please choose **only one** of the following:

- ○Male
- ○Female

2. Which of the following best describes you?

Please choose **only one** of the following:

- ○Hispanic
- ○Latino
- ○American Indian or Alaska Native
- ○Asian

- ○ Black or African American
- ○ Native Hawaiian or Other Pacific Islander
- ○ White
- ○ Two or more races (Not Hispanic or Latino)

3. What is your age?
Please write your answer here:

4. Select the occupational field that most closely matches yours.
Please choose **only one** of the following:

- ○ Unrestricted Line (SWO)
- ○ Unrestricted Line Aviation (Pilot, NFO)
- ○ Unrestricted Line (Submarines, SEAL, EOD)
- ○ Restricted Line (HR, PMP)
- ○ Restricted Line (Nuclear Power School Instructor, Naval Reactors Engineer)
- ○ Restricted Line (Engineering Duty)
- ○ Restricted Line (Aerospace Engineering Duty)
- ○ Restricted Line (Strategic Sealift, Public Affairs)
- ○ Restricted Line (Fleet Support Officer)
- ○ Restricted Line (Foreign Area Officer)
- ○ Restricted Line (Information Dominance Corps)
- ○ Staff Corps (Medical)
- ○ Staff Corps (JAG, Supply, Chaplain, CEC)
- ○ Limited Duty Officer
- ○ Chief Warrant Officer
- ○ Other (Not Listed Above)

5. Please type in the 4 digit code of your current designator. (e.g. 1110, if SWO)
Please write your answer here:

6. Did you have a previous designator?
Please choose **only one** of the following:

- ○ Yes
- ○ No

7. If you had a previous designator, enter the 4 digit code of that designator (e.g. 1110, if SWO).
Please write your answer here:

8. If you had a previous designator, enter the year that you made the switch.
Please write your answer here:

9. What percentage of service members in your occupational field are female? Please take your best guess.
Please write your answer here:

10. What is your current paygrade
Please choose **only one** of the following:

- ○O1
- ○O2
- ○O3
- ○O4
- ○O5
- ○O6
- ○O1-E
- ○O2-E
- ○O3-E

11. How many years of service do you have in the Navy?
Please write your answer here:

12. Marital Status
Please choose **only one** of the following:

- ○Not Married/ Not Living With Partner
- ○Married/ Living With Partner

13. Total number of children 18 or under currently living with you:
Please write your answer here:

14. Is your spouse in the military?
Please choose **only one** of the following:

- ○Yes
- ○No

Individual Level
In this section, we are interested in your personality characteristics, i.e., how would you describe yourself. Indicate, on the scale below, how true of you these various characteristics are. Do not leave any characteristic unmarked.

15 – 24. Personality Characteristics
Please choose the appropriate response for each item:

	Never or almost true	Usually not true	Sometimes but infrequently true	Occasionally true	Often true	Usually true	Always true or almost always true
Affectionate	○	○	○	○	○	○	○
Sympathetic	○	○	○	○	○	○	○
Love children	○	○	○	○	○	○	○
Eager to soothe hurt	○	○	○	○	○	○	○

	Never or almost true	Usually not true	Sometimes but infrequently true	Occasionally true	Often true	Usually true	Always true or almost always true
feelings							
Compassionate	○	○	○	○	○	○	○
Understanding	○	○	○	○	○	○	○
Warm	○	○	○	○	○	○	○
Tender	○	○	○	○	○	○	○
Sensitive to needs of others	○	○	○	○	○	○	○
Gentle	○	○	○	○	○	○	○

25 – 29. Job Satisfaction

To what extent do you agree with the following statements using the scale below:
(Strongly Disagree, Disagree, Neither agree nor disagree, Agree, Strongly Agree)

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
I like my job.	○	○	○	○	○
All in all I am satisfied with my job.	○	○	○	○	○
In general, I DON'T like my job.	○	○	○	○	○
In general, I like working here.	○	○	○	○	○
I would prefer to work somewhere else.	○	○	○	○	○

WLP

To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

30. It is important to me that I am effective in many different parts of my life (e.g., family, friends, community, leisure activities, career).
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

31. Before making a career-related decision, I think about how the decision would affect many other parts of my life.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

32. I strive to be successful in many different parts of my life.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

33. It is important to me that I am satisfied with my experiences in many different parts of my life.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

34. I make work-related decisions based on the effects the decisions have on many other parts of my life.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

35. I participate in activities outside of work because they help me feel more fulfilled in life.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

PsyCap
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

36. I feel confident analyzing a long-term problem to find a solution.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

37. I feel confident helping to set targets/goals in my work area.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

38. I feel confident contacting people outside the company (e.g., suppliers, customers) to discuss problems.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

39. At the present time, I am energetically pursuing my work goals.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4

○5

40. There are lots of ways around any problem.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

41. When I have a setback at work, I have trouble recovering from it, moving on.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

42. I usually manage difficulties one way or another at work.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

43. I feel I can handle many things at a time at this job.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

44. When things are uncertain for me at work, I usually expect the best.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

45. If something can go wrong for me work-wise, it will.
Please choose **only one** of the following:
○1

○2
○3
○4
○5

46. In this job, things never work out the way I want them to.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

47. I approach this job as if "every cloud has a silver lining."
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Structural Career Plateau
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

48. My opportunities for upward movement are limited in my present organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

49. I have reached a point where I do not expect to move much higher in my organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

50. The likelihood that I will get ahead in my organization is limited.
Please choose **only one** of the following:

○1
○2
○3
○4
○5

51. I expect to advance to higher levels in my organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

52. I am unlikely to receive further promotions in my organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Content Career Plateau
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

53. I expect to be continually challenged in my job.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

54. I will learn and grow in my job.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

55. My job responsibilities will increase significantly in the future.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

56. My job will continually require me to expand my abilities and knowledge.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

57. My job will constantly challenge me.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

Turnover Intention
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

58. I intend to separate from the military once I am eligible.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

59. I plan to leave this organization at my next legal opportunity.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

60. I will quit this organization as soon as possible.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

61. I do NOT plan on leaving the military in the near future.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

62. I will leave this military as soon as I can.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

PCO

To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

63. I am responsible for expanding my career-related skills and knowledge.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

64. It is my responsibility to take the initiative to investigate my career options.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

65. I am responsible for my career development.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

66. My career is guided by the opportunity to achieve personally meaningful values.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

67. I judge my level of career success based on whether I achieve my own personal values and ideals.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

68. I am motivated in my career to achieve personal goals and values regardless of whether they coincide with those of my organization.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

69. I control the direction of my career.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

70. It is up to me to create opportunities for career progression.
Please choose **only one** of the following:

- ○1
- ○2

○3
○4
○5

71. I am personally accountable for how my career develops.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

72. It is important that my career helps me fulfill my life values.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

73. I derive career success from achieving the personal standards that I set for myself, not the standards set by my organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

74. My career is driven by my need to achieve my values.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Career/ Occupational Commitment and Fit
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

75. My line of work/ occupational field is an important part of who I am.
Please choose **only one** of the following:
○1

○2
○3
○4
○5

76. This line of work/ occupational field has a great deal of personal meaning to me.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

77. I do not feel "emotionally attached" to this line of work/ occupational field.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

78. I strongly identify with this line of work/occupational field.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Empowerment – Meaning and Competence
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

79. The work I do is very important to me
Please choose **only one** of the following:
○1
○2
○3
○4
○5

80. My job activities are personally meaningful to me
Please choose **only one** of the following:
○1

○2
○3
○4
○5

81. The work I do is meaningful to me
Please choose **only one** of the following:
○1
○2
○3
○4
○5

82. I am confident about my ability to do my job
Please choose **only one** of the following:
○1
○2
○3
○4
○5

83. I am self-assured about my capabilities to perform my work activities
Please choose **only one** of the following:
○1
○2
○3
○4
○5

84. I have mastered the skills necessary for my job
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Embeddeness
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

85. I feel attached to this organization.
Please choose **only one** of the following:
○1

○2
○3
○4
○5

86. It would be difficult for me to leave this organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

87. I'm too caught up in this organization to leave.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

88. I feel tied to this organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

89. I simply could not leave the organization that I work for.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

90. It would be easy for me to leave this organization.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

91. I am tightly connected to this organization.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

92. I feel like I am a good match for my organization.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

93. If I stay with this organization, I will achieve most of my goals.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

94. I would sacrifice a lot if I left this organization.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

Psychological Mobility
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

95. I could easily find comparable alternative employment.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

96. It would be difficult to acquire a new job that utilizes my skills and talents as well as this one.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

97. It would be difficult for me to acquire a new job that meets my needs and values as well as my current job does.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

98. I am confident I could find a new job that is as good as my current one.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

99. Working in a different organization would make me feel uneasy.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

100. I could perform effectively in a new job environment.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

101. I would have a difficult time adjusting to a new job in a different organization.
Please choose **only one** of the following:
- ○1
- ○2

○3
○4
○5

102. I could easily adapt to a new work setting.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Navy Occupational Field
To what extent do you agree with the following statements: Scale 1-5
(1= Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)

103. It matters to me how many female officers are in my occupational field.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

104. I do not feel there are enough female role models in my occupational field.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

105. I would like to see more female superiors in my occupational field.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

106. There are not enough female superiors in my occupational field.
Please choose **only one** of the following:
○1
○2

○3
○4
○5

107. The presence of female superiors in my field is influential to my decision to stay or leave the Navy.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

108. Having female superiors in my occupational field increases my likelihood of staying in the Navy.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

109. If there were a greater proportion of female officers in my field, I would be more likely to stay in the Navy.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

110. I would feel more confident about my future in the Navy if more of the superiors in my field were women.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Psych Safety Climate
To what extent do you agree with the following statements: Scale 1-5
(Strongly Disagree, Disagree, Neither agree nor Disagree, Strongly Agree)

In my occupational community:

111. Some employees are rejected for being different.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

112. When someone makes a mistake, it is often held against them.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

113. People deliberately act in a way that undermines others' efforts.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

114. It is difficult to ask others for help.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

115. People are free to take risks.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

116. People value others' unique skills and talents.
Please choose **only one** of the following:

- ○1
- ○2
- ○3

○4
○5

117. People are able to bring up problems and tough issues.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

Competitive Climate
To what extent do you agree with the following statements: Scale 1-5
(Strongly Disagree, Disagree, Neither agree nor Disagree, Strongly Agree)

In my occupational community:

118. Superiors frequently compare my performance with others in the community.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

119. The amount of recognition you get depends on how you perform compared to others.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

120. Everybody is concerned with being the top performer.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

121. My coworkers frequently compare their performance with mine.
Please choose **only one** of the following:
○1

○2
○3
○4
○5

Supervisory Support
To what extent do you agree with the following statements: Scale 1-5
(Strongly Disagree, Disagree, Neither agree nor Disagree, Strongly Agree)

In my occupational community:

122. Supervisors here are really good at understanding peoples' problems.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

123. Supervisors show that they have confidence in those they manage.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

124. Supervisors here are friendly and easy to approach.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

125. Supervisors can be relied upon to give good guidance to people.
Please choose **only one** of the following:
○1
○2
○3
○4
○5

126. Supervisors show an understanding of the people who work for them.

Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

Self-Expression
To what extent do you agree with the following statements: Scale 1-5
(Strongly Disagree, Disagree, Neither agree nor Disagree, Strongly Agree)

In my occupational community:

127. The feelings I express at work are my true feelings.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

128. I feel free to be completely myself at work.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

129. There are parts of myself that I am not free to express at work.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

130. It is okay to express my true feelings in this job.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

Contribution
To what extent do you agree with the following statements: Scale 1-5
(Strongly Disagree, Disagree, Neither agree nor Disagree, Strongly Agree)

In my occupational community:

131. I feel very useful in my job.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

132. Doing my job well really makes a difference.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

133. I feel like a key member of the organization.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

134. The work I do is very valuable.
Please choose **only one** of the following:
- ○1
- ○2
- ○3
- ○4
- ○5

Recognition
To what extent do you agree with the following statements: Scale 1-5
(Strongly Disagree, Disagree, Neither agree nor Disagree, Strongly Agree)

In my occupational community:

135. I rarely feel my work is taken for granted.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

136. My superiors generally appreciate the way I do my job.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

137. The organization recognizes the significance of the contributions I make.
Please choose **only one** of the following:

- ○1
- ○2
- ○3
- ○4
- ○5

138 – 147. Masculinity Climate
How well does each of the following describe the people in your occupational community?

Please choose the appropriate response for each item:

	Never or almost never true	Usually not true	Sometimes but infrequently true	Occasionally true	Often true	Usually true	Always true or almost always true
Defend their beliefs	○	○	○	○	○	○	○
Independent	○	○	○	○	○	○	○
Assertive	○	○	○	○	○	○	○
Strong personality	○	○	○	○	○	○	○
Forceful	○	○	○	○	○	○	○
Leadership oriented	○	○	○	○	○	○	○
Willing to take risks	○	○	○	○	○	○	○

	Never or almost never true	Usually not true	Sometimes but infrequently true	Occasionally true	Often true	Usually true	Always true or almost always true
Dominant	○	○	○	○	○	○	○
Willing to take a stand	○	○	○	○	○	○	○
Aggressive	○	○	○	○	○	○	○

Thank you for taking this survey! Your answers will help our research and will allow us to provide recommendations based on these findings. Have a fine Navy day!

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