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AN ANALYSIS OF THE EFFECTS OF MINORITY COMMAND LEADERSHIP ON THE RETENTION OF MINORITY SAILORS

by

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March 2019

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This thesis evaluates the effects of minority command leadership on the first-term reenlistment decisions of underrepresented junior enlisted sailors in the U.S. Navy. In this thesis, I build a data set for Navy enlisted personnel and officers observed from fiscal years 1995 to 2018. Using a linear probability model and an ordinary least squares regression analysis approach, I analyze the first-term retention rates for minority enlisted sailors based on different levels of exposure to minority naval command leadership. This thesis found statistically significant evidence that suggests that same-minority command leadership influences the reenlistment of minority sailors. The results also demonstrate that increased diversity leads to greater reenlistment rates among non-minorities. These findings on the influence on junior enlisted sailors suggest that the Navy could present more opportunities for minorities to assume senior leadership positions in hopes of increasing minority recruiting, retention, and diversity. Moreover, this research provides support to policy adjustments not only in the Navy, but throughout the military toward placing more underrepresented but qualified personnel in leadership positions to exploit role model effects on retention of entry-level rated enlisted personnel. In addition, insights gained from this thesis may help Navy decision-makers further develop and foster a culture of inclusion across all ranks, designators, rates, and ratings.

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ABSTRACT

This thesis evaluates the effects of minority command leadership on the first-term reenlistment decisions of underrepresented junior enlisted sailors in the U.S. Navy. In this thesis, I build a data set for Navy enlisted personnel and officers observed from fiscal years 1995 to 2018. Using a linear probability model and an ordinary least squares regression analysis approach, I analyze the first-term retention rates for minority enlisted sailors based on different levels of exposure to minority naval command leadership. This thesis found statistically significant evidence that suggests that same-minority command leadership influences the reenlistment of minority sailors. The results also demonstrate that increased diversity leads to greater reenlistment rates among non-minorities. These findings on the influence on junior enlisted sailors suggest that the Navy could present more opportunities for minorities to assume senior leadership positions in hopes of increasing minority recruiting, retention, and diversity. Moreover, this research provides support to policy adjustments not only in the Navy, but throughout the military toward placing more underrepresented but qualified personnel in leadership positions to exploit role model effects on retention of entry-level rated enlisted personnel. In addition, insights gained from this thesis may help Navy decision-makers further develop and foster a culture of inclusion across all ranks, designators, rates, and ratings.

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LIST OF ACRONYMS AND ABBREVIATIONS

9/11	September 11, 2001
ADBD	Active Duty Base Date
AFQT	Armed Forces Qualification Test
AMPHIB	Amphibious Warfare
CG	Cruiser
CI	Confidence Interval
CMC	Command-Master-Chief
CNO	Chief of Naval Operations
COC	Chain-of-Command
CO	Commanding Officer
CRUDES	Cruisers and Destroyers
DDG	Destroyer
DEP	Delayed Entry Program
DH	Department Head
DMDC	Defense Manpower Data Center
DOD	Department of Defense
DON	Department of the Navy
EAOS	End of Active Obligated Service
EDUC	Highest Level of Education
FCAT	Florida Comprehensive Assessment Test
FITREP	Fitness Report
FY	Fiscal Year
JO	Junior Officer
LCC	Amphibious Command Ships
LCS	Littoral Combat Ships
LHA	Landing Helicopter Assault
LHD	Landing Helicopter Dock
LOS	Length of Service
LPD	Amphibious Transport Dock
LPM	Linear Probability Model

LSD	Dock Landing Ships
MCM	Mine Countermeasures Ships
NCERDC	North Carolina Education Research Data Center
NEC	Navy Enlisted Classification
NELS:88	National Educational Longitudinal Study of 1988
NJROTC	Navy Junior Reserve Officers' Training Corps
NPS	Naval Postgraduate School
NRC	Navy Recruiting Command
NRD	Navy Recruiting District
NROTC	Navy Reserve Officers' Training Corps
OCCUP	Occupational Specialty
OCS	Officer Candidate School
OLS	Ordinary Least Squares
OPNAVN1D	Office of the Chief of Naval Operations Office of Inclusion & Diversity
OTHRACE	Other Race
OTHSEX	Other Sex
PC	Patrol Coastal Ship
P&PC	Personal and Professional Choices
PRD	Projected Rotation Date
SME	Subject Matter Expert
SOC	Source of Commissioning
STATA	Software for Statistics and Data Science
SWO	Surface Warfare Officer
TIR	Time-in-rate
TIS	Time-in-service
UIC	Unit Identification Code
USN	United States Navy
USNA	United States Naval Academy
XO	Executive Officer
YOS	Years of Service

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I. INTRODUCTION

A. AREA OF RESEARCH: DIVERSITY AND INCLUSION

The Department of Defense (DOD) Diversity and Inclusion Strategic Plan for 2012 to 2017 was developed to encourage and spread a culture of diversity and inclusion throughout the federal government. Although the strategic plan initially sought to address the civilian workforce, this human resource initiative also focuses on military service members. The Diversity and Inclusion Strategic Plan for 2012 to 2017 defines diversity as, "all the different characteristics and attributes of the DOD's total force, which are consistent with our core values, integral to overall readiness and mission accomplishment, and reflective of the nation we serve" (Department of Defense [DOD], 2012, p.3). This definition is intended to help the DOD to implement and sustain an inclusive atmosphere to encourage innovation, optimization, and problem-solving that can be used as a competitive advantage against adversaries. The U.S. population is widely diverse in background and experiences, and the make-up of the DOD workforce should reflect the diversity of the country. Because of this diversity, DOD personnel will be able to share their differing backgrounds and experiences to meet complex challenges, such as the changing global security environment.

The strategic plan provided three goals in order to successfully accomplish diversity and inclusion throughout the DOD:

> One, ensure leadership commitment to an accountable and sustained diversity effort; two, employ an aligned strategic outreach effort to identify, attract, and recruit from a broad talent pool reflective of the best of the nation we serve; and three, develop, mentor, and retain top talent from across the total force. (p. 4)

The first goal is a top-down approach that starts with the leadership and trickles down to the lowest of levels. According to this goal, commanding officers (COs) should be given the resources they need to improve diversity and inclusion at their commands. In addition, leaders should be communicating the importance of diversity and inclusion to their department heads or managers as well as their junior personnel. Finally, stakeholders should also be assessed based on the culture of their command, and checks and balances

should be in place to ensure that leaders are constantly updating diversity and inclusion policy. If they fail to meet these goals, they should be held accountable. The second goal is an attempt to recruit more effectively, across all demographics, to guarantee that the DOD is onboarding the most talented individuals available. The third goal calls for an effective mentorship program and adequate retention initiatives to retain top talent after the DOD successfully recruits the right personnel. In order to successfully accomplish the DOD 2012 to 2017 Diversity and Inclusion Strategic Plan, Lim, Haddad, & Daugherty (2013) recommended the establishment of a clear timeline of implementation milestones with annual status progress reports. As their analysis suggests, this is the best way to hold stakeholders accountable and the best way to actually track the state of diversity and inclusion across the DOD over time.

Parker (2017) wrote a 14-page document with similar goals describing a roadmap to improve diversity and inclusion. Victoria Bowens, director of Diversity and Inclusion Management for the Department of the Navy (DON), stated in a summary of the document:

> Our department's strength relies upon the diverse talents and perspectives of our sailors, marines and civilian personnel; our differences foster respect and trust, promote a free flow of ideas and enhance collaboration and cooperation between and within organizations. (United States Navy [USN], 2017a, para. 2)

The diversity and inclusion roadmap described three priority objectives: diversify recruiting across all demographics and multiple occupational fields or skill sets; encourage a sustainable culture of inclusion, innovation, and cooperation; and lastly, empower leaders to manage diversity while holding them accountable, assess and evaluate command climates, and continue to improve upon inclusive policy (USN, 2017a). These objectives, or strategic imperatives, were put in place to ensure that the DON is recruiting and retaining high-quality personnel, whether uniformed or civilian, to accomplish their respective services missions. In addition, in a "people-driven" organization such as the DON, the primary goal is to bring individuals together from different backgrounds, so they can share ideas and expertise to improve its workforce environment, operations, efficiency, and overall readiness. Parker (2017) explained that "to fully leverage the diversity of our workforce, we have to value the diversity of background, diversity of thought, diversity of

perspective, and diversity of experience" (p. 1). In closing, Bowens also said: "As we embark upon the uncertain and ambiguous security challenges for tomorrow, she added, our global readiness priorities rests upon our ability to lead and manage a multi-generational, multi-cultural workforce" (USN, 2017a, para. 8). Simply stated, the DON is more effective when the workforce is diversified, and an inclusive community is prevalent.

B. RESEARCH TOPIC

This thesis aims to provide a comprehensive examination of role-model effects for minority same-category Navy personnel, such as minority command leaders and minority junior sailors of the same race, same ethnicity, or same gender. This thesis will examine the influence that minority command leadership have on the retention of underrepresented enlisted sailors in the Navy. Specifically, the research consists of an analysis of role-model effects of minority command leadership, which will be classified as all E-6 to E-9 and all O-4 to O-6, on minority enlisted sailors' first-term reenlistment decisions. The primary research question assess whether racial/ethnic minority command leadership have an effect on the retention of racial/ethnic minority enlisted sailors. Similarly, the secondary research question assess whether female minority command leadership have an effect on the retention of female minority enlisted sailors. These questions will help to identify what minority groups, if any, encourage retention from the "top-down" compared to other minority groups.

A sailor might decide to reenlist for many reasons besides same-minority role-model effects: civilian market and economic conditions, Navy selective reenlistment bonuses, military pensions, or intrinsic values such as job security or a service member's desire to serve their country. To further investigate factors associated with a sailor's decision to reenlist, the 2018 Navy Personal and Professional Choices (P&PC) Survey asked sailors about their career intentions and retention influencers. The 2018 P&PC survey found: "The primary influencers to stay include job stability, loyalty to service, healthcare, education benefits, pay, and retirement benefits" (Chief of Naval Operations [CNO], 2018, p. 3). On the other hand, "The primary influencers to leave include: impact of your Navy career on your spouse, impact of your Navy career on ability to have a family,

work-life balance and unpredictable schedule" (CNO, 2018, p. 3). Whether a minority enlisted junior sailor decides to reenlist, on their first-term, due to same-category minority leadership role-model effects, or because of one or more of the reenlistment factors provided above, it is important for the U.S. Navy to understand in order to help improve inclusion and diversity across all enlisted rates and officer ranks.

As a minority, a Black officer, I believe from my personal experience, that same-category role-model effects exist, but I believe the effect is miniscule. I have had several Black role models, as well as several mentors of other races and ethnicities in leadership positions, and I do not think they are the reasons I want to continue service. My desire to continue service stems from job security, having the ability to comfortably support and provide for my family, and also leadership opportunities as I progress through the ranks. As far as the enlisted effect of same-minority role models in leadership positions, I am not sure if the effect is large or minimal, specifically to the point at which it can influence a junior enlisted sailor to retain.

C. SIGNIFICANCE

This thesis is potentially significant for military manpower and military personnel policy because the findings can be used by service leaders, policy makers, and stakeholders to better understand the benefits of same-category role models in order to leverage effective diversity and inclusion. This thesis provides a list of indicators and, significantly, contributing factors that are highly associated with Navy same-category role models. More importantly, the factors associated with same-category role models will assist in encouraging the Navy to achieve optimal readiness by further developing a diversified force. Ultimately, the thesis outcome is important because it can enhance inclusion and diversity within the Navy, while retaining top enlisted talent, and helping to improve manpower.

For decades, the Navy has experienced a year-to-year decline in personnel due to reduced requirements. From 2000 to 2016, the number of active duty members in the Navy decreased by 12.9% (DOD, 2016). Although the military has experienced a slight increase in women and minorities joining the force over the past few decades, the DOD active duty

force comprises only 15.9% of women, and less than 32% identify as racial minorities (DOD, 2016), compared to the United States total population of women and minorities at 51% and 39%, respectively (Kaiser Family Foundation 2019a, 2019b). These numbers reveal that the DOD needs to devise effective strategies to recruit and retain more women as well as more racial and ethnic minorities in an attempt to make the military more balanced and inclusive throughout, particularly, as used in this analysis, for enlisted personnel.

Demographic Variable	Active Duty
Members	
Total number	1,288,596
Ratio of enlisted members to officers	4.6 to 1
% women / % men	15.9% / 84.1%
% minorities	31.4%

Figure 1. Active Duty Summary Table. Source: DOD (2016).

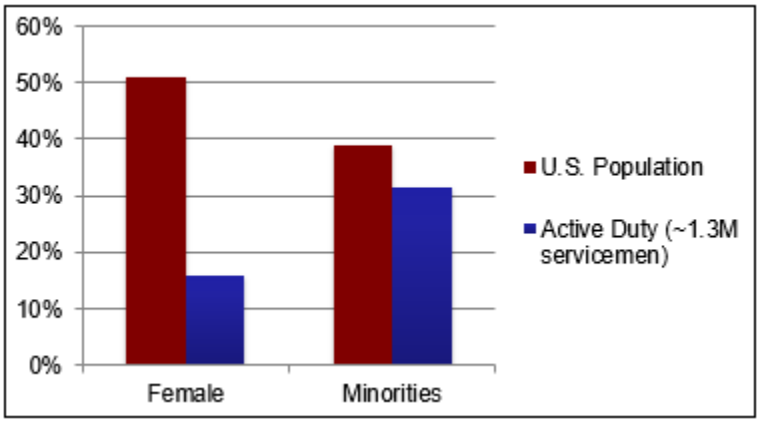

Figure 2. U.S. Population-Active Duty Military Diversity Comparison

Across all services in the DOD, enlisted personnel make up the bulk of the population. "The DOD active duty force is composed of 82.3% enlisted personnel and there are 4.6 enlisted personnel for every one officer; furthermore, the Navy has one officer for every 4.9 enlisted personnel" (DOD, 2016, p. iii). As there are far more enlisted personnel

compared to officers, it is assumed that the decline in Navy personnel has more negative implications for the enlisted force. The decline of enlisted personnel, especially in large amounts, is a major issue for the Navy because enlisted sailors are the backbone of the Navy, as they play a vital role in day-to-day operations. Moreover, retention of enlisted sailors is vital to the continued success of the Navy since they comprise much of the workforce; enlisted sailors serve in critical watchstations and hold critical Navy Enlisted Classifications (NECs). These enlisted sailors are being groomed to succeed current senior command leaders, and they are responsible for progressing the Navy forward in the future.

The U.S. military is constantly evaluating policies and promoting a culture of diversity to further develop an all-inclusive force among all branches of service. Office of the Chief of Naval Operations Office of Inclusion & Diversity (OPNAVN1D; 2019) states that the Navy mission is to: "Shape Navy policy, strategy, and program execution, strengthening Navy's inclusive and diverse culture; in addition, utilize best practices, collaboration, and data-driven decisions, ensuring all sailors have the opportunity to succeed and contribute to mission success" (para. 1). With OPNAVN1D's mission in mind, it is clear that the Navy is committed to further enhance and develop strategies to break down institutional barriers while maintaining the highest of standards for recruiting and retention of underrepresented demographics. These demographics include gender, ethnic, and racial minorities: females, Blacks, Hispanics, Asians, Mexicans, and Puerto Ricans. By improving diversity and inclusion, the Navy will be able to onboard a wider range of individuals from varying backgrounds, bringing differing experiences and perspectives that will improve the service as a whole. Also, achieving diversity and inclusion will help the military retain top talent within different minority groups by identifying what conditions lead to reenlistment.

D. THESIS RESEARCH QUESTIONS

The research questions in this thesis were designed to observe how same-demographic role-models, acting as service members who hold the highest positions among the enlisted rates, influence junior enlisted sailors of the same demographic to continue service with the Navy when faced with their first-term reenlistment decision.

Furthermore, the research questions seek to explain if same-demographic officers also influence retention for sailors who identify as the same demographic.

1. Primary Research Question

Does racial/ethnic minority command leadership have an effect on the retention of racial/ethnic minority enlisted sailors in the Navy surface warfare community?

2. Secondary Research Question

Does female minority command leadership have an effect on the retention of female minority enlisted sailors in the Navy surface warfare community?

E. SCOPE

The thesis will include the following:

1. An analysis of the current retention rates for minority enlisted naval sailors.
2. An in-depth examination of the effects of minority leadership on the retention of first-termers, using a linear probability model (LPM) and ordinary least squares (OLS) regression analysis.
3. Recommendations for adjusting current military retention-oriented practices, which focus on diversity and inclusion for minority enlisted personnel.

F. METHODOLOGY

The methodology used in this thesis research will consist of the following steps.

1. Conduct a thorough review of prior studies on minority enlisted sailors' retention and advancement and investigate the effects of same-category role models in various areas, such as teachers.

2. Conduct a regression analysis of retention for minority enlisted first-termers on minority command leadership.

3. Formulate recommendations for increasing the advancement of diverse naval enlisted sailors as well as the retention of diverse enlisted sailors.

G. ORGANIZATION OF STUDY

The remainder of the thesis comprises five chapters. Chapter II is a brief background chapter that describes relevant institutional details of the Navy to provide insight on the thesis data analysis. Chapter III references a study performed on reenlistment decisions and reviews several studies conducted on role-model effects. Chapter IV presents the analysis, which includes a data description, methodology, and econometric models. Chapter V discusses the results, and Chapter VI provides a conclusion and recommendation.

II. BACKGROUND

This chapter provides context to better understand the thesis data analysis. This chapter details operational or institutional aspects such as recruiting, accessions, placement, ratings, rates, ranks, and command structure associated with U.S. Navy enlisted personnel and officers in the surface warfare community.

A. NAVY RECRUITING AND ACCESSIONS

To understand the make-up of Navy personnel, the first step is to examine Navy recruiting—specifically, how the Navy Recruiting Command (NRC) achieve goals through their mission and vision. Navy Recruiting Command (NRC; 2017a) states that their mission is to "leverage an inspirational culture to inform, attract, influence and hire the highest quality candidates from America's diverse talent pool to allow America's Navy to assure mission success and establish the foundation for sailors to thrive in a life-changing experience" (para. 1). The vision of the NRC is to develop and sustain a "people-first" organization and lead the DOD in talent acquisition and management (NRC, 2017a). The NRC's mission statement and vision provides insight into the command's philosophy and strategy to find diverse, motivated, and skilled individuals to man the ever evolving, high-tech, and integrated Navy total force in both the U.S. and forward deployed.

Based in Millington, Tennessee, the NRC recruits' active duty and reserve candidates for both the enlisted rates and officer ranks. There are two Navy recruiting regions: Region East and Region West. Across both recruiting regions are 26 recruiting districts. The Navy Recruiting Districts (NRDs) enables the Navy to recruit across the entire country. Navy recruiters consider themselves the sole public face of the Navy because throughout the country they access both private and public high schools, two- and four-year colleges, the Navy Junior Reserve Officers' Training Corps (NJROTC), and the Navy Reserve Officers' Training Corps (NROTC) (Navy Recruiting Command [NRC], 2017b). Recruiters are looking for several characteristics in prospective recruits: level of education, AFQT scores, work experience, physical fitness, extracurricular activities, community service, and hobbies. In addition, recruiters observe demographics to ensure

that the Navy is diverse and inclusive across all rates, ratings, ranks, and designators. Before a candidate is accessed, he or she must meet eligibility screens or requirements: age, medical, mental health, citizenship, dependency, conduct, drug and alcohol.

The NRC's priority objective is to recruit the "best and brightest" qualified personnel to meet the mission demands of the Navy. To help accomplish this objective, the Navy uses advertising and outreach programs such as "Life Ops," which allows for current sailors to provide feedback on their career field and gives recruits and their families the opportunity to ask recruiters questions (NRC, 2017b). Another priority objective of the NRC is to ensure that recruits are placed in boot camp, which also includes effective management and oversight of the Delayed Entry Program (DEP) (NRC, 2017b). The DEP is a program that enlists recruits going into active duty service at the DEP station before starting boot camp. Although the leadership of the Navy lies within the officer ranks, the NRC recruiting goals for enlisted personnel is of great importance because it is the largest mission number overall (NRC, 2017b). NRC showed that the fiscal year (FY) 2017 Navy recruiting enlisted goal was 35,200, compared to the officer goal of 2,132. In FY 2017, Navy recruiting facts and statistics showed that active accessions for enlisted personnel matched their respective recruiting goals. Although the quality of the accessions are not shown here, these numbers illustrate that the NRC has been successful at reaching the manpower or end strength needs of the Navy.

Figure 3. Navy Recruiting Enlisted and Officer Active and Reserve FY17 Goals. Source: NRC (2017b).

Fiscal Year	Goal	Accessions	End Strength
2017	35,200	35,200	-
2016	30,986	30,986	323,792
2015	34,990	35,004	325,000
2014	33,740	33,765	325,000
2013	40,112	40,112	323,051
2012	36,275	36,329	324,209
2011	33,400	33,444	325,123
2010	34,140	34,180	329,629
2009	35,500	35,527	330,621
2008	38,419	38,485	332,436
2007	37,000	37,361	338,735

Figure 4. Navy Recruiting Enlisted Active FY07 to FY17 Goal/Accessions. Source: NRC (2017b).

B. NAVY ENLISTED PLACEMENT AND RATINGS

After an individual takes the oath of enlistment and is accessed into the Navy, he or she is held at the DEP station or sent immediately to boot camp in Great Lakes, Illinois. Enlisted jobs or occupational specialties in the Navy are referred to as ratings, and several factors determine a sailor's rating: AFQT score, physical profile, education level, demographics, and known languages. For example, a person with a high AFQT score has a higher probability of being in a more technical rating, while a person who scores high on the physical fitness test is more likely to be a member of a Navy special warfare team. During the recruiting process, some sailors are given a guaranteed rating, while others are classified as undesignated. Also, some recruits who are in special enlistment programs sign contracts knowing their job field, but not their specific rating. After successfully completing boot camp, sailors are sent to training known as Class A School to receive procedural training. The procedural training received at A school is specific to the sailors designated rating. The purpose of this school is to give sailors general familiarity of their first in-rating duty assignment. After graduating A school, majority of the sailors are assigned to their first permanent duty station, typically a surface warfare ship, while a select few sailors attend Class C School. C school is for advanced in-rating training. After completing C school, a sailor will proceed to their first command. Before arriving at their first command, sailors will sign their initial contract of service. In most cases, an initial contract will be for at least three years of service. As a sailor successfully approaches the end of their initial obligated service time, they will be faced with their first-term

reenlistment decision in which they will have the option to continue service for at least three more years.

C. NAVY ENLISTED RATE PROGRESSION TIMELINE

The Navy enlisted rank structure and organization is divided into rates, consisting of paygrades E-1 to E-9. Within these paygrades, rates are broken down into three classification levels: apprenticeships, which comprise E-1 to E-3; petty officers, which comprise E-4 to E-6; and chief petty officers, which comprise E-7 to E-9. As the lowest tier of classification, apprentices are required to take orders from their superiors and learn from petty officers to acquire experience. To advance from E-1 to E-2, a sailor must successfully complete six months of time-in-service (TIS) without any conduct or mishap issues (Military Advantage, 2019). Similarly, to advance from E-2 to E-3 a sailor must have 12 months TIS and nine months' time-in-rate (TIR) without any conduct or mishap issues. Going from apprentice to petty officer means that a sailor has earned the right and responsibility to lead their subordinates. Advancement from E-3 up to E-6 are based on several varying factors: TIS, TIR, awards, CO recommendations, advancement exams, rating qualifications, evaluations, leadership training, Navy wide in-rate competition, and needs of the Navy (Military Advantage, 2019). To advance from E-6 to E-7 requires all the factors stated above, plus a chief petty officer board and the chief indoctrination course. Chief petty officers are of vital importance to the Navy because they are responsible for not only leading junior enlisted sailors, but junior officers as well. Advancement from E-7 to E-8 and advancement from E-8 to E-9 is based heavily of the senior chief petty officer board and the master chief petty officer board, respectively. Senior chief petty officers, E-8, possess managerial expertise and serve as the technical in-rating subject matter experts (SMEs) at their commands. Master chief petty officers, E-9, are usually the highest rated enlisted personnel at a unit or command, and they typically hold the title of Command-Master-Chief (CMC).

D. NAVY COMMAND-MASTER-CHIEFS

The CMC is a part of the "Triad," alongside the two most senior officers onboard a ship, the CO and Executive Officer (XO). The CMC is the link between the CO and the

enlisted sailors. As the CMC, this position enables someone to advise the CO and help to formulate and implement Navy wide or command specific policy. Also, the CMC coordinates with the XO on a daily basis for command scheduling. The CMC is responsible for morale, job satisfaction, discipline, safety, training, cleanliness, and ensuring sailor welfare. Just like any other enlisted rate or officer rank in the Navy, CMCs are placed on ships or shore-based commands at random, based on the needs of the Navy. Typically, Navy detailers send out a slate of jobs, known as billets, that will be available at a sailors' projected rotation date (PRD) from their current command. Once received, the sailors rank preferences and send their slate back to their detailer. Once the slate is sent, sailors have no control over where they will be placed. Detailers assign individuals based on several factors: Navy wide in-rate competition, Navy wide in-rating competition, qualifications, CO recommendations, and geographic location. In most cases, the CMC holds the paygrade of E-9, but at some smaller units or commands, they may be an E-8 or even an E-7.

E. NAVY SURFACE WARFARE COMMUNITY

The surface warfare community is considered the most important community in the Navy. Surface warfare sailors support, maintain, and operate ships that have enabled the Navy to be the considered the best surface fleet throughout the entire world. As the "backbone of the Navy," without naval vessels on station in U.S. ports, forward deployed, or stationed abroad in foreign ports, the surface Navy will not be able to accomplish its mission to control the sea and project power ashore. The surface Navy prides itself on readiness, having global presence and ready to respond to any situation when needed. In addition to their mission of sea control and power projection, Navy surface ships provide humanitarian assistance and disaster response. Without the ships, or the crew that sustain and run these ships on a daily basis, the surface warfare community cannot function. Furthermore, if the surface warfare community cannot function, the Navy as a whole cannot sustain its title as the hegemon of the sea.

F. SURFACE WARFARE OFFICERS

The leaders of the surface warfare community are known as surface warfare officers (SWOs). SWOs are commissioned through many sources: The United States Naval

Academy (USNA), ROTC, Officer Candidate School (OCS), or enlisted-to-officer commissioning programs. Once commissioned as an Ensign (O-1), promotion up to Lieutenant (O-3) is essentially guaranteed after successfully earning surface warfare qualifications and not incurring any conduct or mishap issues. Traditionally, junior officers (JOs), from the paygrades of O-1 to O-3, are commissioned with an initial contract to serve four to five years. Surface warfare JOs are typically assigned sea duty for their first two tours followed by shore duty. After successfully completing shore duty and agreeing to continue service, JOs proceed to 27-week department head school. Most Department Heads (DHs) are promoted to Lieutenant Commander (0-4) during or around their second DH tour. Promotions at this point in an officer's career are based upon qualifications, fitness reports (FITREPs), and screening boards. After successfully completing two DH tours and advanced officer training, these officers go on to become XOs, then take command as COs. On most Navy surface platforms, the XO is a Commander (O-5) and the CO is a Captain (O-6). However, some platforms have "fleet-ups," a process in which an O-5 XO stays onboard the same platform and becomes the CO. The next step after becoming CO of a ship is assuming major command as a warfare commander.

G. NAVY SURFACE PLATFORMS AND UNIT IDENTIFICATION CODES

The Navy has several surface forces: aircraft carrier, amphibious warfare (AMPHIB), cruisers and destroyers (CRUDES), littoral combat, mine countermeasure, and patrol. Currently, there are 11 actively commissioned aircraft carriers in the Navy, and each carrier can hold more than 3,000 sailors (USN, 2017b). There are several types of AMPHIBs in the Navy: amphibious assault ships, amphibious transport dock (LPD) ships, amphibious command ships (LCC), and dock landing ships (LSD). Amphibious assault ships comprise landing helicopter assault (LHA) ships and landing helicopter dock (LHD) ships. Currently, there is one actively commissioned LHA, *USS America* (LHA 6), and a total of eight LHDs (USN, 2017c). Amphibious assault ships have a crew size of over 1,000 personnel (USN, 2017c). A total of nine LPDs are actively commissioned in the Navy (USN, 2017d). With ships company and embarked personnel, these ships can support a crew of 600 to 800 people (USN, 2017d). There are two amphibious command ships, *USS Blue Ridge* (LCC 19) and *USS Mount Whitney* (LCC 20), that each hold a capacity an

excess of 500 personnel (USN, 2017e). It is a total of 12 LSDs in the Navy, which carry a total of approximately 400 personnel. There is a total of 22 cruisers (CGs) and 68 destroyers (DDGs) that are actively commissioned in the Navy (USN 2017f, 2017g). Depending on the ship type and variant, CRUDES ships have a crew size from 180 to 330 sailors. Littoral combat ships (LCS) are fairly new to the fleet: several ships are still under construction and crew members are going through an extensive training pipeline. Both, mine countermeasures ships (MCMs) and patrol coastal ships (PCs) combined, have roughly 20 platforms. MCMs have approximately 81 crewmembers and PCs have approximately 28 personnel (USN 2017h, 2017i). Every DOD command or unit, including ships and shore commands, has a six-character alphanumeric code that distinctively identifies its command. This unique code is known as a unit identification code (UIC).

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III. LITERATURE REVIEW

A. INTRODUCTION

There are no academic papers or case studies regarding the effects of same-minority leadership on same-minority enlisted sailors' first-term reenlistment decision. Although this specific topic is under studied, several academic studies have examined Navy enlisted retention, observing various factors that influence reenlistment decisions: civilian unemployment rates, selective reenlistment bonuses, promotion status, and times of peace or war. Also, there are many academic papers regarding role-model effects, primarily in the civilian sector, such as same-race and same-gender teachers' effects on same-category minority students' academic performance. In this literature review, I will review one academic study concerning sailor's reenlistment decisions, as well as multiple studies examining role-model effects.

B. REENLISTMENT DECISIONS

The 2010 study by Golan, Greene, and Perloff titled "U.S. Navy Promotion and Retention by Race and Sex" provides the basis for a better understanding of promotion and retention for minority enlisted naval sailors. The study examines whether Navy retention rates differ across race and sex, and whether the Navy can change its promotion and other policies to improve the retention of sailors. Golan et al. utilize a two-step bivariate probit decision model, using two separate equations. The first model estimates the Navy's decision to promote a sailor based on the sailor's prior performance and needs of the Navy. The second model estimates a sailor's decision to reenlist or leave the Navy if he or she is offered the opportunity to promote to the next paygrade. The study found that promotion and retention rates depend on race, gender, war, peace, economic condition, and Navy policy.

The decision model data consists of annual cross sections from January 1997 to May 2008, capturing E-4 through E-7 sailors in the Navy in all rates or occupational specialties (Golan et al., 2010). The study used several predictor variables in both the promotion and retention regression models: Armed Forces Qualification Test (AFQT)

percentile score; two variables indicating the highest level of education completed—one for high school diploma and the other for post high school education (sailors with no high school diploma is the base group); sea duty or shore duty indicators; dummy variables for paygrade (E-3 is the base group); three dummy variables for race: Black, Hispanic, and other (White is the base group); a female dummy variable; and periods of peace and war. The variables used in the promotion equation for Golan et al. that do not appear in the retention equation are related to Navy policies that might affect sailor promotion probabilities. The study also states that: "The variables in the retention equation that do not appear in the promotion equation concern family considerations and economic conditions that affect the civilian labor and housing markets" (p. 10). In addition, the retention equation has a promotion dummy variable because a sailor is unable to reenlist without being eligible for advancement. As a result of some variables missing data, Golan et al. dropped approximately one-seventh of the observations, which did not change or alter the results of the study.

Golan et al.'s (2010) recursive bivariate probit model revealed that sailors with higher AFQT scores are more likely to promote and more likely to leave the Navy. Sailors with a high school diploma are more likely to continue service in the Navy, while sailors with some post-high school education are more likely to be advanced to the next paygrade (Golan et al., 2010). The study found that, "being on current sea duty increases the likelihood of staying in the Navy but does not significantly affect the probability of promotion" (p. 15). Regarding the analysis of paygrade for this study, compared to lower paygrades (E-3 and in some cases E-4), the probability of promotion for higher paygrades (E-4 through E-6) are low, and the probability of higher paygrades attrition is low as well (Golan et al., 2010). The paygrade findings come as no surprise as it is more difficult to advance as a sailor moves up in paygrade. Also, it is less likely for a sailor to leave service late in their career because they would be forfeiting their pension benefits.

To differentiate between times of peace and war and to report separate simulated probabilities for both periods, Golan et al. (2010) classify before September 11, 2001 (9/11) as the peace period, and after 9/11, as the war period. During the war period, it is evident that the probability of promotion decreases across all pay grades for each racial group.

"Whites are more likely to be promoted than are the other racial groups, and the probabilities of promotion within any pay grade or racial group fell substantially after 9/11" (Golan et al., 2010, p. 18). However, the decrease in promotion probabilities was not only a result of a period of conflict, but it was also related to the Navy's long-term draw-down starting in the 1990s and a sudden activation of reserves, which consequently decreased a sailor's opportunity to promote (Golan et al., 2010). Lastly, the study finds that promotion and retention rates also decrease for both male and females during the war period.

Unlike other academic papers on this topic, to portray a clear depiction of Navy enlisted promotion and reenlistment decisions, Golan et al. (2010) were able to simultaneously observe individual sailor characteristics, Navy policy factors, and civilian economic conditions. Although the Navy promotes a culture of fairness, inclusion, and diversity, the results in this study regarding promotion and retention, accounting for race and sex, contradicts the Navy's efforts with statistically significant positive estimates. Based on the analysis of this study, racial minorities, such as Blacks and Hispanics, are less likely to be promoted and more likely to stay in the Navy compared to Whites, among all occupations (Golan et al., 2010). Across race and sex, the study presented three hypotheses about how the annual probabilities of retention and promotion could differ:

> First, demographic groups could be treated differently by the Navy in the sense that people with the same characteristics, but who differ in terms of race or sex have different probabilities; second, these groups could have different mixes of observed characteristics such as education and experience; and third, there could be differences in unobserved characteristics across the demographic groups. (p. 26-27)

Based on the observed characteristics and the coefficient estimates, the decision model helps to explain or support the first two hypothesis. The third hypothesis is difficult to observe but based on the large number of variables within the bivariate probit model, it is likely that the analysis captured a majority, if not all, of the characteristics across demographic groups (Golan et al., 2010).

Golan et al. (2010) provided further insight concerning the advancement and retention gap for sailors of differing races and gender. The study revealed that White promotion probabilities increased slightly after 9/11, and promotion probability also

differed for gender across paygrades. Furthermore, males are more likely to advance to the next paygrade up to E-5, but E-6 women are more likely than men to promote, even during a time of peace or war (Golan et al., 2010). The study also states that, E-4 women are more likely to reenlist, but less likely to reenlist at the paygrades of E-5 and E-6 in comparison to men. Based on the findings of this study, it is clear that race and gender are significant factors to consider when observing retention and promotion in the Navy, and it is also evident that increased rates of promotion help to increase sailor retention. In addition, retention rates are high when there is a lack of opportunity in the civilian labor market, particularly for minorities (Golan et al., 2010). The study concludes with the following findings:

> Navy policies contribute much less to keeping sailors in the Navy than do civilian labor market conditions. Consequently, if the Navy remains small and has a low probability of promotion, it faces the risk that when civilian economic conditions improve, the Navy could lose many of its enlisted sailors upon the expiration of their tours of duty. To avoid that outcome, the Navy may have to raise the promotion rate, pay substantial re-enlistment bonuses, continue to increase the Navy's relative wage, or take other financially costly actions. (p. 28)

I chose to review Golan et al. (2010) because it is unlike any other study on enlisted promotion and retention. Many of the other studies, focusing on Navy enlisted personnel, look at one variable or factor that influences retention or promotion, while Golan et al. used two separate equations for promotion and retention, which incorporate many variables for observation. The approach and findings from Golan et al. help better understand how minorities, based on a sailor's race, sex, or a combination of both, are affected by Navy promotion and retention. For this thesis, insight gained from Golan et al. will be used to help explain what factors or characteristics influence a sailor to continue service, consistent or to the contrary of role-model effects.

C. ROLE-MODEL EFFECTS

1. Occupational Choice

Several studies have revealed that role models of the same gender or the same race/ethnicity have had positive effects on their subordinates in occupational choice,

leadership style, character intangibles, and career continuation. Of these studies, Kofoed and McGovney (2017) is the most similar to this thesis topic and will be the primary focus for the literature review. The 2017 study addressed a concern of the U.S. Army about the underrepresentation of racial minorities and women among the officer ranks, particularly in combat arms, infantry, and armor branches. It used a natural experiment that resulted in a random assignment of mentors, known as tactical action officers, at the U.S. Military Academy at West Point, allowing to observe same-minority role-model effects of cadets' occupational choice upon graduating and becoming commissioned in the Army. To validate the random assignment, Kofoed and McGovney estimated several regressions, such as "regressing the cadet's gender, race, and other characteristics on a dummy variable indicating whether the cadet had a female or minority tactical officer during their time at West Point" (p.12). The regressions showed no statistically significant results, which means no evidence exists to show that West Point assigned minority cadets to same-minority role models, supporting the claim of random assignment. In addition, to eliminate self-selection, West Point policy does not allow for cadets or tactical action officers to choose their companies.

The overall results of Kofoed and McGovney (2017) reveal that same-minority officers, in the capacity of a mentor, influence the occupational choices for women and racial minority cadets at West Point. The study found that female cadets who are assigned to a female officer are 4.6 percentage points more likely to choose their officer's occupational branch as their first preference, compared to being paired with a male officer. Furthermore, female cadets who are assigned to a female officer are 15.9 percentage points more likely to choose their officer's occupational branch as one of their top three preferences, compared to being paired with a male officer. In addition, Kofoed and McGovney found that Black cadets who are assigned to a Black officer are 6.1 percentage points more likely to choose their officer's occupational branch as their first preference, compared to being assigned a White officer. Although the study results do not show an effect for Hispanic cadets, the analysis reveals overall that a minority cadet of the same sex or same race as their assigned tactical action officer is most likely influenced by their

tactical action officer, with regard to selecting their branch assignment or occupational preference.

As previously stated, the cadets at West Point are supervised by tactical officers. Kofoed and McGovney (2017) describe a tactical officer as a person whose job is to, "serve as role models, counselors, and disciplinarians within their assigned cadet companies, exerting significant influence" (pp. 4-5). West Point has approximately 4,000 enrolled cadets, 1,000 cadets per class, and a total of 36 companies (Kofoed & McGovney, 2017). West Point randomly assigns incoming cadets to a company and each company is randomly assigned a tactical action officer (Kofoed & McGovney, 2017). In addition, after freshman year, West Point conducts a second round of random assignment to companies, which is known as "scrambling." Scrambling can occur between freshman and sophomore year or between a cadet's sophomore and junior year. In the Kofoed and McGovney analysis, "cadets on average work under 2.88 distinct tactical officers during their time at West Point" (p. 5). During a cadet's tenure at West Point, they are able to interact with their tactical action officer quite often (Kofoed & McGovney, 2017). This interaction enables the tactical action officer to not only mentor the cadets, but also to share their experience within their occupation field in the Army. This is important because through these shared experiences, cadets are, in many cases, influenced to select the occupation or branch of their tactical action officer.

During a cadet's senior year, they rank and submit branch preferences and are selected for each branch preference based upon their class ranks. This means the higher the cadet's rank, the higher chance of the cadet receiving their first occupational choice. Kofoed and McGovney (2017) found that "76.96% of cadets receive their first preference, 11.85% receive their second preference, and 4.43% receive their third preference" (p. 10). The cadets can choose from a total of 16 branches that are broken down into three groups: the first group is combat arms, which entails infantry, armor, field artillery, air defense artillery, aviation, and engineering; second, combat support, which comprises the branches of signal, military police, military intelligence, and the chemical corps; and the third group is called combat service support, which consists of the medical corps, ordnance, the adjutant general corps, quartermaster, transportation, and the finance corps. A majority of

the male cadets select combat arms branches, while most women prefer branches with an administrative focus or the medical service corps. White cadet's highest selected branch is infantry at 25%, Black cadet's highest selected branch is military intelligence at 11%, and Hispanic cadet's highest selected branch is infantry at nearly 20% (Kofoed & McGovney, 2017).

The data used for Kofoed and McGovney (2017) is from West Point's Office of Economic and Manpower Analysis and comprises a list of ranked occupational preferences for 6,254 cadets who graduated between 2010 and 2015. The variables used in this data are as follows: "the initial company (before scramble), the graduation company (after scramble), the cadet's sex, race, ethnicity, SAT scores, fitness score, leadership score, academic GPA, and whether a cadet is a recruited NCAA athlete" (Kofoed & McGovney, 2017, pp. 6-7). The study matched cadet data with the tactical action officer assigned as the cadet's mentor for a given academic year. The variables used for the tactical action officer data are the tactical action officer's gender, race, and occupational service branch. Kofoed and McGovney observe each cadet four times, once for every academic year, and "matches each year between the gender and race of the cadet and the assigned tactical officer" (p. 7). A cadet matched with a tactical action officer for a given year is the unit of analysis for this study. The dependent variable is established as a dichotomous variable for a cadet's number one or top three branch preferences that match the branch of their tactical action officer.

Much like the other service academies, women and racial minorities are extremely underrepresented throughout the brigade of students. In Kofoed and McGovney (2017) sample, the minority student breakdown is as follows: 15.6% female, 6.6% Black, and 8.9% Hispanic. In addition, less than 13% of the tactical action officers were female, less than seven percent were Black, and two percent were Hispanic (Kofoed & McGovney, 2017). Similar to the cadets, these percentages reveal that women and racial minorities are also underrepresented among the tactical action officers. When observing sex and race data matches of cadets and tactical action officers, the study showed that on average, in a given year, nearly 83.8% of male cadets are matched with male tactical action officers; 12.6% of the matches are when a female cadet works with a female officer; 83.3% of White-male

cadets work with a White tactical action officer; 6.9% of the matches occur when a Black-male cadet works with a Black officer; 1.5% of the matches is when a Hispanic-male cadet works with a Hispanic officer; Black-female cadets are only matched with Black-female tactical action officers in 1.2% of our yearly matches; and Hispanic-female cadets are never matched with a Hispanic-female tactical action officer for a given year. Cadet summary statistics by sex and race reveal that male cadets are more likely to select their tactical action officer's branch for their first occupational choice, as well as their top three choices compared to females (Kofoed & McGovney, 2017). Also, Whites, of both sexes, are more likely to select their tactical action officer's occupational branch than Blacks (Kofoed & McGovney, 2017).

Kofoed and McGovney (2017) use several econometric models for their study. The first model was designed to estimate the effect of a female cadet having a female tactical action officer as a role model. To counter the limitation of women not being allowed to select infantry and armor branches, the model includes fixed effects for combat arms; however, these fixed effects were not included for Blacks and Hispanics (Kofoed & McGovney, 2017). In addition, company year fixed effects were included in the first model, as well as several control variables including: "a cadet's cumulative grade point average when she made her branch selection, SAT math and verbal scores, the cadet's leadership and fitness cores, whole candidate score, and whether the cadet was a recruited NCAA athlete" (Kofoed & McGovney, 2017, p. 16). The second econometric model was designed to estimate the effect of multiple interactions of minority cadets with same-minority tactical action officers on a cadet's branch preference. Kofoed and McGovney collapsed their panel to create one observation per cadet, which means that if a female cadet had a female role model for multiple years it will only count for one year, increasing female variation. The second model of this study observed that

> 67.94% of cadets never have a female officer, 29.31% of cadet's work with one female officer, 2.75% of cadets are matched with two female officers, 83.18% of cadets never work with a Black officer, 15.94% work with one Black officer, only 0.88% work with two officers, and no cadets work with more than one Hispanic officer. (p. 17)

As a result of the lack of variation for Blacks and Hispanics, Kofoed and McGovney only estimate the model for female same-gender and same-race role-model effects.

When observing results for female and Black cadets' interaction with same-gender or same-race tactical action officers, company fixed effects, graduation year fixed effects, exogenous controls, and first choice as the dependent variable, Kofoed and McGovney (2017) find statistically significant evidence for a female or Black cadet working with same-gender or same-race tactical action officers. To explain further, female cadets are 4.6 percentage points more likely to select their role models branch as their first choice, given the role model is a female; and Black cadets are 6.1 percentage points more likely to select their role-models branch as their first choice, given the role model is Black (Kofoed & McGovney, 2017). Using the same conditions but top three branch preferences as the dependent variable and given the tactical action officer is a female, statistically significant results show that female cadets are 15.9 percentage points more likely to select their role-models branch within their top three choices (Kofoed & McGovney, 2017). Hispanic results for this study show that Hispanic cadets are 0.8 percentage points more likely to select their Hispanic role-models occupational branch as their first choice and 2.2 percentage points more likely to select their Hispanic role-models occupational branch within their top three branch preferences, but the results are not statistically significant. The differing results for Hispanics, compared to Females and Blacks, is most likely a result of a lack of observations for Hispanic tactical action officers, because "a small number of observations could mean that there is insufficient statistical power to use the model for Hispanic cadets" (Kofoed and McGovney, 2017, p. 20).

Kofoed and McGovney (2017) created a regression model to estimate the effects of female cadets assigned to a fraction of female tactical action officer matches to see if "multiple interactions with same-gender mentors increases the effect of if the effect is only being driven by ever being exposed to a mentor" (p. 21). Including cadet company fixed effects, graduation year fixed effects, and exogenous demographic controls, the study results show that when a fraction of a female cadet's officers are female, the cadet is 15.3 percentage points more likely to select any of her tactical officers' branches as her top choice. Regarding a female cadets top three choices, a cadet is 30.0 percentage points more

likely to select any of her tactical officers' branches, when a fraction of the female cadet's officers are female. Ultimately, these results "show that not only does having one same gender mentor influence occupation choices of female cadets, but multiple interactions can reinforce the effect" (Kofoed & McGovney, 2017, p. 22).

Robustness checks for policy excluding women from combat arms branches, timing of cadet-tactical action officer interactions, and confounding covariates influencing results were used to increase the validity of the Kofoed and McGovney (2017) study. First, the restriction for females selecting infantry and armor branches could bias the coefficients estimate results. Kofoed and McGovney use infantry and armor fixed effects to counter this issue in previous models, but for the robustness checks, to validate the effectiveness of the fixed effects, the study excludes combat arms tactical action officers from the sample; therefore, only observing all-inclusive branches, which are eligible for both men and women cadets. "We find that a female cadet who is matched with a female officer is 5.0 percentage points more likely to select their officer's branch as her top choice and 16.1 percentage points more likely to select the officer's branch in her top three preferences" (Kofoed & McGovney, 2017, p. 24).

The second robustness check concerns the timing of cadet-tactical action officer interaction. The assumption is that the first three academic years are the primary years that should be observed for role-model effects because cadets input their branch preferences at the beginning of their senior years. That being said, the purpose of the robustness check is to ensure that the senior year cadet-tactical action officer interactions are not driving the results. For the time robustness check, Kofoed and McGovney (2017) revealed that a female cadet having a female role model during her senior year did not influence the cadet's occupational choice differently than her freshman to junior year.

The final robustness check is to isolate the gender effect and the racial effect by running several regressions: first, the effect of having a same gender role model independent of race; second, isolating the effect for Black cadets independent of gender; and finally, the effect of excluding female and Black cadets from the sample (Kofoed & McGovney, 2017). The results from all three of these separate regressions mirror the results of previous regressions from earlier in the study. In addition, to isolate the effect of being

both female and Black, Kofoed and McGovney estimate a triple difference model, which included fixed effects for combat arms and the interaction among infantry and armor branch fixed effects and the cadet's gender. The triple difference model included cadet company fixed effects, graduation year fixed effects, and exogenous controls, and the results show that female and Black cadet-tactical action officer matches are robust. However, the results are underestimated due to the lack of observations for Black-female cadets and Black-female role-models, meaning the low number of Black-female matches for the specification did not have enough "statistical power" (Kofoed & McGovney, 2017).

In conclusion, Kofoed and McGovney (2017) was successful at showcasing how gender and race matches of cadets and tactical action officers, acting as role-models, at West Point can positively influence a cadet's occupational choice. Because the Army is concerned with underrepresentation of racial minorities and gender inequality, their study proves to be very useful because if policy is put in place to increase the existence of minority tactical action officers in certain branches and minority cadets at West Point, the Army will be able to generate more same-minority cadet-tactical action officer matches; thus, increasing diversity among their occupational branches. For women, the Army must eliminate the policy of male-only infantry and armor branches and develop female tactical action officers. By doing so, female tactical action officers can mentor female cadets and increase the likelihood of female cadets selecting combat arms branches not only in their top three preferences, but their first choice. Similarly, if the Army wants to increase the inclusion of Blacks in combat arms type branches or other branches in which they have been underrepresented, they must select more Black tactical action officers in those branches and use role-model effects to their advantage to encourage more selection from Black cadets. Although these role-model effects are specific to West Point, evidence from Kofoed and McGovney show that mentee-mentor same-demographic matches can explain the gender and race disparities across many professions. To test this notion, this thesis will investigate role-model effects in a different occupational setting.

2. Academic Achievement

The final three studies for the literature review focus on same-race and same-gender teachers' effects on academic performance for students who identify as the same-minority status. First, Dee (2005) finds that race, ethnicity, and gender differences have a large effect on teachers' perceptions of student performance; furthermore, teacher opinions impact a student's opportunity and ability to learn as well as the learning environment or classroom setting, which ultimately helps or hurts academic performance. To eliminate the unintended consequence of hurting a student's academic performance if that student does not share their teacher's demographic traits, Dee suggested that efforts be put in place to recruit more minority teachers.

Like Kofoed and McGovney (2017), Dee (2005) seeks to further understand and explain the disparity between minority and non-minority groups. Rather than examining how same-minority tactical action officers influence a cadet's occupational branch choice at West point, Dee examines how same-minority teachers affect a student's academic achievement. This study provides new insight to this topic by assessing if the placement of same-demographic teachers have an effect on the teacher's personal assessment of student conduct and academic output. Prior to Dee, most relevant studies on this topic focused on same-race and same-gender student-teacher matches to observe teacher behavior and student expectations, as opposed to uncommonly used subjective outcomes in education, which is used for this study. This study is important and a useful addition to previous studies because it is assumed that teacher expectations and perceptions explicitly affect a student's motivation, class environment, and academic performance.

When observing and evaluation student-teacher interactions that influence educational outcomes, Dee (2005) identifies a term known as "passive teacher effects," which are due to a teacher's gender, race, or ethnicity, and not by teacher behaviors. Passive teacher effects include "role-model" effects, when a same-race or same-gender teacher increases a student's academic motivation and expectations, and "stereotype threat," "where students perceive stereotypes might attach (e.g., Black students with White teachers, female students with male teachers), they experience an apprehension that retards their academic identification and subsequent achievement" (Dee, 2005, p. 3). In contrast

with passive teacher effects, “active” teacher effects are unintended preconceptions of a teacher’s expectations for students who are of a different race, gender, or ethnicity (Dee, 2005). Furthermore, “active” teacher effects are inadvertent biases in a teacher’s interaction or relations with students who identify with differing demographics.

Dee (2005) uses data gathered from the National Education Longitudinal Study of 1988 (NELS:88) and specifically focuses on survey responses from 8th graders. NELS:88 sample comprised 24,599 students from 1,052 public and private schools. Also, NELS:88 surveyed teachers about students they taught in two out of four academic subjects, math, science, reading, and social studies; therefore, the student-teacher pairing resulted in a final data set of over 40,000 observations (Dee, 2005). The teacher surveys focused on three student behaviors based on a teacher’s subjective perception or assessment: one, if the student was disruptive; two, if the student was inattentive; and three, if the student rarely completed homework assignments. These teacher assessments seem to be concerning because it is difficult to correlate the student behaviors mentioned above with academic achievement, and it is also complicated, raising skepticism, because it is hard to determine if a student is acting in a certain way, specific to a certain teacher. However, Dee suggests that the student behaviors and teacher assessments are relevant to academic performance. Students who are perceived by teachers as disruptive and inattentive, as well as students that do not turn in their homework, all “clearly have much lower levels of contemporaneous and subsequent achievement” (Dee, 2005, p. 6). Another potential issue with the observed student behaviors and subjective teacher assessments are biases such as role-model effects, stereotype threat, and teacher behavior. This means that these biases will be understated because it is assumed that teachers of a different demographic than their student will have a more negative assessment and lower expectations compared to a demographic student match.

To observe the effects of same-demographic student-teacher matches, students and teachers identified with the following race and ethnic groups: White (non-Hispanic), Black (non-Hispanic), Hispanic, or other. Other race (OTHRACE) and other sex (OTHSEX) were dichotomous variables that indicated if a student did not have the same race, ethnicity, or gender as the evaluating teacher. Dee (2005) showed that six percent of White student

observations were with teachers of a different race; however, the percentage for Black and Hispanic students' observations that were with teachers of a different race was 67% and 89%, respectively. The study included fixed-effects to control for teacher highest level of education as it relates to the academic subject they are teaching, teacher years of experience, and class size. To estimate results, Dee used odds ratios from fixed-effects logit models, which included both student-teacher paring fixed-effects and teacher-class controls.

Using disruptive, inattentive, and a student who frequently failed to turn in homework as the dependent variables, and OTHRACE and OTHSEX as the independent variables, Dee (2005) found statistically significant results: The odds of a teacher evaluating a student as disruptive are 1.36 times greater when the student and the teacher do not share the same race. Similarly, the odds of a student who is perceived as being inattentive by a teacher and a student that rarely completes homework assignments are respectively 1.33 and 1.22 times as large when the teacher does not share the same race and ethnicity demographics as the evaluated student. When observing teachers who do not share the student's gender, Dee found that the odds of a teacher evaluating a student as an individual that rarely completes homework is 15% higher, inattentive is 19% higher, and disruptive is 38% higher.

To test the reliability of student fixed effects, Dee (2005) conducted Hausman tests to compare the conventional logit models with the fixed-effects logit models. Because the Hausman tests showed statistically significant differences, the results imply that unobserved student fixed effects are reliable, and they should be included in the logit models (Dee, 2005). To test whether race, ethnicity, and gender differences between students and teachers are biased, Dee simply observed how the estimates of other race and other sex changed after the teacher-class controls were added. Being that the controls barely changed the estimated effects or did not change the estimated effects at all, indicates that the "racial, gender and ethnic dynamics between students and teachers and are not biased by any demographic patterns in unobserved teacher quality" (Dee, 2005, p. 10).

Dee (2005) also observed students perceived as inattentive and disruptive by their teachers on other race and other sex based upon samples or variables of student

characteristics (White non-Hispanic, Black and Hispanic, low-socioeconomic status, high-socioeconomic status) and United States regions (Northeast, North Central, South, West). The study revealed that White non-Hispanic, Black non-Hispanic, and Hispanic students all experience negative assessments from teachers that identify as a different race or ethnicity; however, Black non-Hispanic and Hispanic students are more likely to be perceived as inattentive by teachers that do not share their race, compared to White non-Hispanic students in similar situations. "Among students with low socioeconomic status, the odds of being seen negatively are 35 to 57% higher when evaluated by an OTHRACE teacher" (Dee, 2005, p. 10). Yet, when observing high socioeconomic status, the results are much lower than low socioeconomic status and statistically insignificant (Dee, 2005). The study odds ratios for other sex are similar to other race across student characteristics but differ among United States regions. Across all regions, Dee showed statistically significant evidence that teachers who did not share the same gender as the evaluated students, were more likely to perceive the students as being inattentive and disruptive than teachers with a differing racial demographic. The South region was the only region in which other sex was statistically significant for students that rarely turned in homework. In contrast, other race showed large statistical significance only in the South region for all teacher perceptions: inattentive, disruptive, and students that rarely turn in homework. Dee showed that other race increased the odds that a teacher will evaluate a student as disruptive by 83% and increased the odds that a teacher will evaluate a student as inattentive by 60%.

One of the biggest problems in the United States is the vast academic achievement gaps between minority and non-minority students. It is evident from Dee (2005) that student-teacher race, ethnicity, and gender matches all influence if a teacher perceives a student to be disruptive, inattentive, or an individual who rarely turns in homework, all of which having an effect on a student's academic performance. In addition, the class environment and culture, as well as opportunities to learn also play a role in observed demographic gaps in student achievement (Dee, 2005). For example, in the South region of the United States, race, ethnicity, and students from low socioeconomic conditions had large statistically significant estimates. To eliminate the demographic gaps in academic achievement, policy such as recruiting minority teachers, developing adequate teacher

training, incorporating incentives as well as negative consequences for teacher performance, promoting programs to increase inclusion and diversity among students and teachers, and also sponsoring programs to encourage gender and race equality of student-teacher relationships needs to be adopted to encourage equality across students, in hopes of increasing educational performance or outcomes.

In another study, Winters, Haight, Swaim, and Pickering (2013) observe standardized test scores for five years in Florida public schools in grades three through ten to evaluate how same-sex student-teacher interactions influence a student's academic performance. The study uses a first-difference estimator to hold constant factors associated with student-teacher academic outcomes and observe how a student's academic performance changes as the gender of their teacher changes overtime. In addition, comparative academic performance of students in the same classroom or comparative academic performance of students with the same teachers are evaluated based on the gender of the teacher (Winters et al., 2013). The study stated:

> We find no statistically distinguishable relationship between same-gender teacher assignments and student math or reading achievement in elementary school, but a statistically significant relationship exists between being assigned to a female teacher and student achievement in middle and high school, however the magnitude of the effect is small. (p. 69)

Winters et al. is unique because unlike other studies that focus on race and gender differences among students and teachers, it exclusively focuses on the sex of a teacher to observe a student's academic performance. The study analysis helps to "expand on prior research by estimating the effect of teacher gender on the reading and math achievement of male and female students" (p. 70).

In elementary and secondary schools in the United States, female and male students have considerable differences in academic performance; female students typically do better than males in both reading and writing, while male students outperform females in math and science (Winters et al., 2013). The academic achievement disparity between male and female students is commonly known as the "gender gap," and widely suggested policy to counter the gender gap is to encourage same-sex schools and teachers (Winters et al., 2013). It is commonly assumed that teachers will be more easily relatable to students of

the same gender, enabling them to act as better role models and mentors. Furthermore, it is assumed that a teacher having the same gender of their students will have higher achievement expectations, thus increasing their student's academic performance.

Winters et al. (2013) collected data from the Florida Department of Education consisting of observable characteristics for students and teachers from the years of 2000 to 2005. The dataset had an excess of 1.7 million students, 13,000 teachers, and represented more than 3,000 schools (Winters et al., 2013). The data included each student's demographic characteristics, and the dataset tracked student's individual reading and math scores from a Florida standardized test known as the Florida Comprehensive Assessment Test (FCAT) overtime. In addition, the study dataset included identifiers for teachers, specific classes, and course numbers, which helped to recognize student-teacher matches for different academic subjects. Winters et al. aimed to capture one student-year observation matched with a single teacher. To do so, the study created several screens to eliminate multiple student-teacher-year match observations, such as using a student's general class or excluding student observations in which students were assigned to part-time teachers. If these screens were not successful observations were randomly matched; nevertheless, the screens were able to match a student's math and reading scores with a single teacher for both elementary, middle, and high school over 93% of the time before resorting to a random match (Winters et al., 2013). Based on the summary statistics, most of the students are minorities, either Hispanic or African-American; majority of all the students were assigned to teachers who have more than four years of teaching experience; and majority of the teachers are women.

The regression model used in the Winters et al. (2013) was designed to estimate the effect on same-gender teachers on a student's academic performance. The dependent variable is student test scores, and independent variables include student characteristics, teacher gender, the teacher's years of experience, school year and student fixed effects. The results show positive statistical significance across all grade levels for both male and female students who are taught by a female teacher (Winters et al., 2013). Although elementary grade levels had a statistical insignificant relationship between teacher gender and student test scores, more mature students in grade levels six through ten did have a

statistically significant relationship as they performed better academically with female teachers (Winters et al., 2013). Similarly, both female and male older students in middle school and high school, compared to elementary school students, perform better in the subject of reading when they have a female teacher (Winters et al., 2013). While performance on reading assessments are similar for both male and female students, in math, female students have slightly higher performance than males when the instructor is female (Winters et al., 2013). The study stated that "though statistically significant, the magnitude for the effect of having a female teacher appears to be quite mild" (p. 73).

The gender gap between student performance is prevalent in the United States, but policy implementation of same-gender teachers could potentially eliminate this issue. "Teachers of the same gender could theoretically improve a student's achievement by serving as high-quality role models or because they are more inclined to think positively about the student's potential" (Winters et al., 2013, p. 74). Unlike any other study on student-teacher role-model effects for academic performance, this study focuses exclusively on how the gender of a teacher effects a student testing proficiency in math and reading. Winters et al. seek to inform the education community about "gender role-modeling" as it relates to student academic performance in hopes of encouraging stakeholders to consider their results when making decisions about student-teacher relationships and teacher development. This study gives insight on how organizations, not just grade schools, can assign instructors, trainers, mentors, and role models based on gender matches within their institution to increase performance, productivity, and efficiency.

The third study by Gershenson, Hart, Lindsay, and Papageorge (2017) study is different from the other literature review studies because it concentrates on long-run educational outcomes, while other student-teacher demographic matching literature only focuses on short-term educational achievement. The study is unique because it provides insight on how same-race teachers can influence a student to stay in grade school and encourage students to obtain higher education. In addition, Gershenson et al. evaluate and account for the educational attainment gap among students due to disadvantaged

socioeconomic conditions (students living in low-income households), which is determined by observing students that persistently received free or reduced lunch.

Gershenson et al. (2017) use data provided by the North Carolina Education Research Data Center (NCERDC). The data is from public schools in North Carolina that tracks students from the time they enter the third grade between the years of 2001 to 2005 until these students reach the 12th grade. To account for variation across schools over time and differing characteristics of teachers, the study uses instrumental variables. Gershenson et al. exclude the following samples: students missing from public school data by eight grade; students who are still listed in the public-school system by eight grade, but are also listed as a student that has exited the public school system; students who had elementary school teachers' with an unrecorded race; and students with unknown graduation results. The study specifically focus on Black students because in North Carolina and across the United States, "Black students have higher average high school drop-out rates and lower college attendance rates compared to non-Blacks" (p. 8).

Gershenson et al. (2017) show that: "Black students who are as good as randomly assigned to a Black teacher at least once in the third, fourth, or fifth grades are more likely to aspire to college and less likely to drop out of high school" (p. 2). The study found that low-income Black-male students that have at least one Black teacher in third through fifth grade is less likely to drop out of high school by seven percentage points, or 39%. Also, for low-income Black students of either gender, having at least one Black teacher in third through fifth grade increases the chance of having a desire to attend college by six percentage points, or approximately 19% (Gershenson et al., 2017). It is fairly uncommon to have more than one Black teacher from third through fifth grade; nevertheless, because the effect of the assignment of multiple Black teachers was miniscule and statistically insignificant, a Black student's exposure to one Black teacher is sufficient to increase educational attainment and achievement.

In conclusion, Gershenson et al. (2017) revealed that Black elementary school teachers increase long-run educational attainment, lower high school dropout rates, and raise the possibility of going to college for Black male students, particularly those from low-income families. The study findings also suggest, "a straightforward policy lever,

assignment of Black male students to Black teachers, can help to close frustratingly persistent achievement gaps" (p. 36). As previous studies reveal the importance of same-category role models, the DOD could consider these findings and investigate how they can apply specifically to the military.

D. CONCLUSION

This chapter described factors associated with reenlistment decisions for service members in the Navy as well as the effects of same-category role models in various areas, such as tactical action officers and teachers. This thesis will attempt to explore whether similar effects exist throughout the surface Navy. If a statistically significant same-category role model effect is revealed throughout this thesis analysis, the results could then be used by Navy policy makers to develop and create strategies, initiatives, and policies to increase opportunities for minority command leadership in an attempt to retain more minority enlisted sailors, and to also further enhance recruiting, inclusion, and diversity.

IV. DATA AND METHODOLOGY

This research defines junior enlisted sailors as sailors with paygrades between E-1 and E-5 and a maximum of seven years of service (YOS). This definition of junior enlisted sailors is set to ensure that the study is capturing the sailors' first-term reenlistment decisions. Senior enlisted command leadership is defined as all E-6 to E-9 and senior officer command leadership is defined as all O-4 to O-6. The study uses data on sailors from only three Navy platforms: CGs, DDGs, and LSDs. These platforms were chosen due to the crew size, which all have a sufficient sample size to observe role-model effects between junior enlisted sailors and their leadership. Also, it is assumed that onboard these platforms, a sufficient amount of interaction is taking place between junior enlisted sailors and senior command leadership. For a better illustration, smaller platforms, such as PCs, are not likely to have a large enough crew size to observe an effect, and larger ships, such as aircraft carriers, have too many personnel, which lessens the chance of interaction across junior enlisted sailors and personnel higher up their chain-of-command (COC). There is a total of 102 UICs for the three chosen platforms.

Once again, the paygrades of E-6 to E-9 are considered to be enlisted command leadership and the paygrades of O-4 to O-6 are considered to be officer command leadership. To identify all E-6 to E-9 and officers O-4 to O-6, the study observes only enlisted sailors who are petty officer first class (E-6) and above and officers who are DH's, XO's, or CO's, onboard each UIC, for every month, throughout each year of the treatment data. The percent of all E-6 to E-9 and O-4 to O-6 leadership's demographics on a given UIC, for a given year-month, were matched to each junior enlisted sailor who was onboard the same UIC, during the same year-month, to determine if a sailor experienced same-minority "role-model" effects. Originally, this thesis sought to examine the CMC and COs influence on a junior sailors first-term reenlistment decisions; however, due to multiple personnel holding the same highest rate and rank, onboard the same UIC, during the same year-month, it was difficult to specifically determine who held the position of CMC or CO. That being said, to avoid measurement error, this analysis will only examine the effects of

minority leadership, E-6 to E-9 and O-4 to O-6, influence on a sailor of the same minority reenlistment decision.

The outcome variable for this analysis is a sailor's decision to reenlist. The treatment variable is the average percentage same-minority leadership (as defined as an average percent of E-6 to E-9 and O-4 to O-6 onboard who are of the same minority status) during the time a sailor spends at their first UIC. This thesis will test whether minority (race, ethnicity, and gender) leadership affects the probability of reenlistment for same-minority enlisted sailors relative to other sailors who are not of the observed minority. For example, the analysis examines whether Black command leadership affects the probability of reenlistment for Black enlisted sailors relative to non-Black sailors. This analysis includes year controls to account for year-to-year changes, such as a downturn in the economy or global conflict. Furthermore, controls for UIC-effects are used in this analysis to account for the variation across differing platforms or commands.

A. DATA DESCRIPTION

1. Enlisted Data

This thesis analyzes the effect of same-minority leadership on same-minority enlisted sailors' first-term reenlistment decision. To that end, the data used in this thesis consists of personnel file data on individual sailors who accessed between 1995 and 2012, followed monthly and with quarterly snapshots until 2018, or until separation. The original data was provided by the Defense Manpower Data Center (DMDC) in two separate files: Enlisted File 1, the outcome file; and Enlisted File 2, the treatment file. Enlisted File 1 had approximately 17,400,000 person-year-quarter records with the following data elements: ID, paygrade, race, ethnicity, year-month, age, highest level of education (EDUC), gender, active duty base (ADBD), end of active obligated service (EAOS), length of service (LOS), occupational specialty (OCCUP), and UIC. Enlisted File 2 had approximately 3,100,000 person-year-month records with the same data elements as Enlisted File 1. Across both DMDC enlisted files, the data was reduced to a total of 1,943,276 person-year month and quarter observations: 894,701 for the outcome data and 1,048,575 for the treatment data. This was a result of dropping sailors that did not serve at one of the 102 observed UICs, as

well as dropping sailors with more than 42 months of service since their ADBD from the outcome file. Similar to the set parameters of E-5 and below with no more than 7 YOS to define a junior enlisted sailor, the maximum of 42 months of service from ADBD is also set to make sure the analysis is examining a sailors first-term reenlistment decision. Furthermore, the data reduction was a result of dropping all E-5 and below sailors from the treatment file. All the original independent variables remained in the dataset after the reduction. As previously stated, the dependent variable is a junior enlisted sailors' first-term reenlistment decision. Among racial/ethnic minorities, this thesis only observes Black and Hispanic because other race/ethnicity minorities, such as Puerto Rican, Mexican, and Asian, do not have enough variability to observe an effect.

The junior enlisted working dataset includes only service members who accessed on or before September 30, 2012, to ensure they can be observed for at least six YOS before the end of FY 2018. With the focus of this analysis on the effects of same-minority leadership on same-minority enlisted sailors' first-term reenlistment decision, the non-Hispanic White males are excluded from the working data set. Further, given that this thesis focuses on only three Navy platforms, the working sample includes only sailors who were at one of the considered 102 UICs, for their first UIC, and observed for at least eight consecutive quarters or 24 consecutive months. As previously stated, by observing ADBD and LOS, this file dropped a LOS greater than 42 months because it is assumed that a sailor is at their first UIC within this timeframe.

The second data file received from the DMDC is used to capture each junior sailor's exposure to minority leadership. To identify the enlisted command leadership, which is the percentage of all sailors E-6 to E-9, the second file keeps all observations because E-5 and below observations were previously dropped. The senior enlisted personnel, E-6 to E-9, working file is then merged with data on the junior enlisted working data set to be able to analyze the effects of same-minority leadership on same-minority enlisted sailors' first-term reenlistment decision. "Treatment" shows a sailor's average exposure to minority leadership.

2. Officer Data

In addition to observing enlisted command leadership, this thesis merged officer treatment data from the same timeframe, for the same UICs, to determine if a role-model effect exists for all officers O-4 to O-6 for the three observed platforms. The data was also provided by DMDC and contained personnel file data on O-4 and above officers who commissioned between 1995 and 2012, followed monthly until 2018, or until separation. This dataset had approximately 71,757 person-year-month records with the following variables: ID, race, ethnicity, year-month, year, month, age, EDUC, gender, ADBD, EAOS, OCCUP, source of commissioning (SOC), and UIC. Aligned with enlisted classification, Blacks and Hispanics are the only observed racial/ethnic minorities because other racial/ethnic minorities, such as Puerto Rican, Mexican, and Asian, do not have enough variability to observe an effect.

A leadership file was created to identify officers O-4 to O-6. This officer leadership file merged with the E-6 to E-9 leadership file to create a master leadership file. Next, the average percent of O-4 to O-6 leadership variable was collapsed with the enlisted "treatment" to create a master treatment file. Finally, the master treatment file merged with the enlisted outcome file to observe the average E-6 to E-9 leadership and O-4 to O-6 leadership role-model effects on the dependent variable, sailor first-term reenlistment.

B. VARIABLE DEFINITIONS AND SUMMARY STATISTICS

1. Dependent Variable

The dependent variable for this analysis is a minority junior enlisted sailor's first-term reenlistment decision, defined by comparing the initial EAOS to the highest EAOS. A difference between the initial and highest EAOS greater than or equal to 25 months indicated that the sailor reenlisted.

2. Explanatory Variables

The key explanatory variables for this analysis is the interaction between minority junior enlisted sailors with the average percentage of enlisted command leaders (defined as all E-6 to E-9) and the average percentage of officer command leaders (defined as all O-

4 to O-6) of the same minority. The percentage of minorities in leadership was averaged over the quarterly snapshots in which a junior enlisted sailor was observed at a given UIC. Each variable having the average percentage of command leadership was multiplied by 100 to observe percentage points rather than proportions. In addition, the estimates are interpreted by observing a ten percent increase in the exposure of the key explanatory variable, instead of going from 0-100%. This means that an increase in ten percentage points in the "treatment" is associated with the estimated percentage point increase in the probability of retention. This is because ten percentage points is the central number of standard deviations for the treatment variables.

Table 1. Definition of Explanatory Variables

Explanatory Variables	Variable Definition
X1: Avg. % of E6-E9 who are Minorities	Average percent of race, ethnicity, and/or gender minority E6-E9
X2: Avg. % of O4-O6 who are Minorities	Average percent of race, ethnicity, and/or gender minority O4-O6
X3: Minority Sailor	Junior sailor who identifies as one of the observed race, ethnicity, and/or gender minorities
X4: Minority Sailor* Avg. % of E6-E9 who are Minorities	X1*X3
X5: Minority Sailor* Avg. % of O4-O6 who are Minorities	X2*X3

Table 2. Summary Statistics

	Total Sample (n = 49,027)		Black Sample (n = 10,386)		Hispanic Sample (n = 6,844)		Female Sample (n = 6,097)	
Variable	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Reenlist	0.34	0.47	0.39	0.49	0.34	0.47	0.31	0.46
Avg. % of E6-E9 who are Black	21.17	7.92	22.34	7.93				
Avg. % of E6-E9 who are Hispanic	8.94	5.52			10.03	5.95		
Avg. % of E6-E9 who are Female	7.17	6.16					11.24	4.92
Avg. % of O4-O6 who are Black	7.49	12.00	7.86	12.17				
Avg. % of O4-O6 who are Hispanic	4.43	9.12			4.94	9.77		
Avg. % of O4-O6 who are Female	4.35	8.96					5.54	10.38
Black Sailor*Avg. % of E6-E9 who are Black	4.77	9.84	22.34	7.93				
Hispanic Sailor*Avg. % of E6-E9 who are Hispanic	1.56	4.26			10.03	5.95		
Female Sailor*Avg. % of E6-E9 who are Female	1.40	4.10					11.24	4.92
Black Sailor*Avg. % of O4-O6 who are Black	1.68	6.47	7.86	12.17				
Hispanic Sailor*Avg. % of O4-O6 who are Hispanic	0.77	4.16			4.94	9.77		
Female Sailor*Avg. % of O4-O6 who are Female	0.69	4.10					5.54	10.38
Black Sailor	0.21	0.41	1.00	0.00				
Hispanic Sailor	0.15	0.36			1.00	0.00		
Female Sailor	0.12	0.33					1.00	0.00

C. DIFFERENCE-IN-DIFFERENCE: DISCRIMINATION AS A SELF-FULFILLING PROPHECY

This subsection presents insight on the thesis modeling approach. This thesis follows the approach and findings from a 2017 study from the *Quarterly Journal of Economics* by Glover, Pallais, & Pariente titled "Discrimination as a Self-Fulfilling Prophecy: Evidence from French Grocery Stores". The study found that minority cashiers perform worse when overseen by racially biased managers, having a lower productivity level (e.g., assisting fewer customers, scanning items more slowly, missing work more often, working shorter days, or working less overtime), than non-minority cashiers when they are overseen by the same biased managers. Glover et al. reveal that the underperformance in minority workers is a result of the discrimination from biased managers. This is because the interaction, or the lack thereof, of biased managers and minority cashiers have negative self-reinforcing effects. To explain further, Glover et al. find that the more biased a manger is, the less interaction the manager has with minorities. To avoid the perception of bias and discrimination, managers avoid interaction with their cashiers, and these managers are also less likely to task their cashiers with cleaning duties or ask them to stay late (Glover et al., 2017). Therefore, less interaction by managers leads to less oversight, which puts less pressure on a worker to put forth more effort to be more productive. Results from Glover et al. imply that worker-manager interaction leads to better worker performance. The study states: "The findings are consistent with statistical discrimination in hiring whereby because minorities underperform when assigned to biased managers, the firm sets a higher hiring standard for minorities to get similar average performance from minority and non-minority workers" (p. 1219). Effectively controlling for minority with cashier fixed effects, the analysis used by Glover et al. can be thought of as a difference-in-difference model because it observes the effects of how minority workers respond to higher manager bias against minorities relative to how non-minority workers respond to the same higher bias against minorities. The study used difference-in-difference model with all cashiers, rather than just using a sample of only minority cashiers because it is a possibility that managers with higher bias cause worse productivity for all workers, not just minorities. Glover et al. is important because the difference-in-difference

methodology and framework used to establish its estimating regression equations were used to help construct the econometric models for this thesis.

D. ECONOMETRIC MODEL

To determine the role-model effect of minority command leadership on a same-minority enlisted sailor's first-term reenlistment decision, this thesis estimates the following equations:

(1) $Y_{ist} = \beta_0 + \beta_1(\text{average percent minority leadership})_{ist} + \delta_s + \alpha_t + \varepsilon_{ist}$ (for the given minority group)

(2) $Y_{ist} = \beta_0 + \beta_1(\text{minority sailor} \times \text{average percent minority leadership})_{ist} + \beta_2(\text{minority sailor})_{ist} + \beta_3(\text{average percent minority leadership})_{ist} + \delta_s + \alpha_t + \varepsilon_{ist}$

Here, Y_{ist} is the reenlistment decision for sailor i stationed at UIC s on year-month t. Based upon UIC-year-month, "minority sailor" indicates whether a sailor is a minority: Black, Hispanic, or female. "Average percent minority leadership" is the percentage at which a given minority holds a leadership position, either all E-6 to E-9 or all O-4 to O-6, at a UIC for a specific year-month. "Minority sailor × average percent minority leadership" is the interaction of the two previous variables. The regression controls for FY fixed effects, δ, and UIC α. The coefficient of interest, β_1, measures how minorities' decision to reenlist changes with differing command leaders, relative to the change in all demographics reenlist decisions, when they are assigned to the same command leaders. The random error term ε measures the true relationship between the independent variables and the outcome—i.e., a sailor's decision to reenlist. Model (1) is used to observe specific minority sailors, which means that the "average percent minority leadership" serves as the key explanatory variable (the causal effect or "predictive power" independent variable). Contrarily, model (2) observes sailors who do not identify as the observed sample minority and the key explanatory variable is the interaction term: "minority sailor × average percent minority leadership." Like Glover et al., both models are used because it is possible that minority command leadership has an influence on first-term reenlistment for all sailors, not just sailors who share the same minority. Furthermore, the difference-in-difference

methodology examines how minority command leadership affects sailor reenlistment decisions for minority matches relative to how they affect reenlistment decisions for non-minorities.

E. MODEL ASSESSMENT

The strength of this model analysis is randomization with regard to leadership assignment to enlisted personnel. Many junior enlisted sailors are not allowed to choose either their command or occupation, nor do they have prior knowledge of their leadership's characteristics. Therefore, self-selection bias is mitigated and negligible. Next, reverse causality is not likely because majority of the command leaders have at least eight YOS, served at multiple commands, and have overseen and mentored thousands of sailors across several demographics. Therefore, it is unlikely that the command leaders will be affected by a junior enlisted sailor, despite their demographics.

Based on the DMDC data, it was difficult to accurately and definitively identify and determine who held the position of CMC and CO, making these leadership variables an imprecise measure. For this reason, the weakness of this model is the inability to individually examine CMC and CO role-model effects on reenlistment due to measurement error.

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V. RESULTS

This chapter discusses results, findings, and limitations from fixed effects LPMs and OLS regression analysis for estimating the role-model effects of same-minority command leadership on a minority sailor's first-term reenlistment decision. These models will effectively test whether minority (Black, Hispanic, or female) enlisted command leadership affects the probability of reenlistment for enlisted sailors of the same minority demographics relative to sailors that identify as a minority race/ethnicity or gender other than those observed.

In the tables that follow, model (1) presents estimates within the minority group while model (2) estimates how the minority group is affected relative to the non-minority group. As previously stated in the Data and Methodology chapter, this analysis includes controls for UIC-effects, which serves as an indicator for each observed ship, and FY controls to account for year-to-year changes. Because the central number of standard deviations for the treatment variables is about ten percentage points, estimates will be interpreted as such: an increase in ten percentage points in the "treatment" is associated with the estimated percentage point increase in the probability of retention.

As previously stated, Tables 3, 4, and 5 show the results for minority racial/ethnic and gender and minority command leadership who share the same demographic. Model (1) uses a sample of all minority sailors, while model (2) uses the sample with all sailors. Once again, these results are generated using LPMs and OLS regression analysis with UIC and FY fixed effects. They examine the effect of senior leadership, who identify as a minority on junior enlisted sailor's reenlistment decisions. The outcome, whether the first-term sailor reenlisted, is observed for both minority sailors and non-minority sailors. The model estimates the effect of greater exposure to minority leadership on the probability that a minority sailor will reenlist.

For the effects of Black leadership, when observing Black sailors only, the estimate for the effect of the average percent of Black enlisted command leadership E-6 to E-9 was statistically significant while the average percent of Black officer command leadership O-

4 to O-6 was not statistically significant. This means that a ten-percentage point increase in the average percent of Black enlisted command leadership E-6 to E-9 is estimated to improve the probability of reenlistment for Black sailors by an estimated 2.3 percentage points. For Table 3 model (2), all sailors, the estimated effects of an increase in the percentage of Blacks among E-6 to E-9 and O-4 to O-6 on the reenlistment propensity for Black sailors, compared to non-Black sailors, is statistically insignificant. Lastly, when observing the effect of Black enlisted command leadership E-6 to E-9 on non-Black sailors, Table 3 shows that an increase in ten percentage points is associated with an estimated 0.9 percentage point increase in the probability of reenlistment. The effect is statistically significant at the ten percent level. These results show that a Black sailors and non-Black sailors who are exposed to a higher percentage of Black enlisted command leadership E-6 to E-9 may be positively influenced to reenlist during their first-term. Therefore, providing sailors with Black leadership who are E-6 to E-9 may encourage sailors to reenlist.

Next, results from Table 4 find statistically insignificant results for the average percent of Hispanic enlisted command leadership E-6 to E-9 on the probability of reenlistment for Hispanic sailors only. However, compared to a non-Hispanic sailor, a Hispanic sailor who is exposed to the same enlisted command leadership is an estimated 1.9 percentage points more likely to reenlist. These results are statistically significant. The insignificant results for the average percent of Hispanic enlisted command leadership E-6 to E-9 on the probability of reenlistment for Hispanic sailors is surprising because there is statistically significant evidence that shows a ten-percentage point increase in the average percent of E-6 to E-9 who are Hispanic improves the probability of reenlistment for non-Hispanic sailors by an estimated 2.8 percentage points. This means that increased instances of Hispanic leadership E-6 to E-9 can help improve reenlistment for sailors outside of their ethnicity. In Row 2 of Table 5, an increase in ten percentage points in the average percent of Hispanic officer command leadership O-4 to O-6 is associated with an estimated 1.4 percentage point increase in the probability of reenlistment for Hispanic sailors. This effect is statistically significant. Similarly, when observing the effect of Hispanic officer command leadership O-4 to O-6 on Hispanic sailors, Table 4 shows that an increase in ten percentage points is associated with the same 1.4 percentage point increase in the

probability of reenlistment, relative to non-Hispanic sailors. This effect is also statistically significant. Overall, these results show evidence for a role model effect and that Hispanic sailors do seem to respond to Hispanic leadership by reenlisting at their first-term decision point. These results also indicate that if the surface warfare community wants to encourage more Hispanic sailors to reenlist where Hispanics are underrepresented, then the surface Navy may want to present more opportunities for more Hispanics to assume leadership positions to lead Hispanic sailors. If not, the lack of Hispanic leaders in the surface fleet may continue to add to low instances of junior Hispanic sailors reenlisting.

Lastly, this thesis examines the results for female command leadership. Results from Table 5 show that the estimated effect of the average percent of female enlisted command leadership E-6 to E-9 on the probability of reenlistment for female sailors is statistically insignificant. The previous results differ from the results for males. Furthermore, a ten-percentage point increase in the average percent of female enlisted command leadership E-6 to E-9 improves the probability of reenlistment by an estimated 6.2 percentage points for males. This effect is statistically significant. This essentially means that female enlisted leadership E-6 to E-9 encourage male sailors to continue service. One strange result is that the estimated effect of an increase of ten percentage points in the average percent of female E-6 to E-9 enlisted command leadership has an estimated 5.2 percentage points smaller effect for females than for males. However, this could be due to the estimated positive effect of female leadership on male reenlistment rates, as noted above. When observing the average percent of female officer command leadership O-4 to O-6 on sailors in both model (1) and model (2) of Table 5, the estimated effects are statistically insignificant. In closing, compared to male sailors, a higher percentage of exposure to female enlisted command leadership E-6 to E-9 may negatively affect the probability of reenlistment for female enlisted sailors. Thus, it is evidence to support that negative role model effects potentially exists between female enlisted command leadership E-6 to E-9 and female sailors, in regard to a sailor's decision to reenlist. However, perhaps, an increase in female enlisted command leadership can improve upon retention for men.

While this thesis intended to observe role-model effects for same-race/ethnicity and same-gender minority command leadership on the reenlistment of same-minority junior sailors, some of the most interesting results were diversity effects for non-minorities (e.g., the average percent female effects on males). In Tables 3, 4, and 5, Row 1 under model (2) shows that the average percent of minority leadership E-6 to E-9 increases retention for non-minorities. In other words, enlisted command leadership, across all minorities, show estimating results for improving the probability of reenlistment for sailors outside of their respective minority demographic. Although I believe that these results show that diversity actually increases reenlistment among non-minorities, this could also be a result of these minorities being better leaders in terms of fostering reenlistment.

Table 3. Estimated Effects of Black Command Leadership

	Dependent Variable = Reenlist	
	(1) Black Sailors	(2) All Sailors
Avg. % of E6-E9 who are Black	0.0023**	0.0009*
	(0.0010)	(0.0005)
Avg. % of O4-O6 who are Black	0.0001	0.0002
	(0.0004)	(0.0002)
Black Sailor*Avg. % of E6-E9 who are Black		0.0009
		(0.0007)
Black Sailor*Avg. % of O4-O6 who are Black		-0.0002
		(0.0004)
Black Sailor		0.0451***
		(0.0154)
Observations	10,386	49,027
R-squared	0.0446	0.0304
UIC FE	YES	YES
FY FE	YES	YES
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

Table 4. Estimated Effects of Hispanic Command Leadership

	Dependent Variable = Reenlist	
	(1) Hispanic Sailors	(2) All Sailors
Avg. % of E6-E9 who are Hispanic	0.0020	0.0028***
	(0.0017)	(0.0007)
Avg. % of O4-O6 who are Hispanic	0.0014**	0.0004
	(0.0007)	(0.0003)
Hispanic Sailor*Avg. % of E6-E9 who are Hispanic		0.0019*
		(0.0010)
Hispanic Sailor*Avg. % of O4-O6 who are Hispanic		0.0014**
		(0.0006)
Hispanic Sailor		-0.0239**
		(0.0118)
Observations	6,844	49,027
R-squared	0.0440	0.0280
UIC FE	YES	YES
FY FE	YES	YES

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

Table 5. Estimated Effects of Female Command Leadership

	Dependent Variable = Reenlist	
	(1) Female Sailors	(2) All Sailors
Avg. % of E6-E9 who are Female	-0.0002	0.0062***
	(0.0018)	(0.0007)
Avg. % of O4-O6 who are Female	-0.0005	0.0004
	(0.0007)	(0.0003)
Female Sailor*Avg. % of E6-E9 who are Female		-0.0052***
		(0.0013)
Female Sailor*Avg. % of O4-O6 who are Female		-0.0005
		(0.0006)
Female Sailor		0.0221
		(0.0164)
Observations	6,097	49,027
R-squared	0.0444	0.0295
UIC FE	YES	YES
FY FE	YES	YES
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		

For models (1) and (2), Figures 5, 6, and 7 show the estimated diversity effects and 95% confidence interval (CI) for same-minority sailors and command leadership. The 95% CI is a useful illustration because it can be used to evaluate the precision of the estimates. To explain further, if a CI is large, the estimate is less precise. Conversely, if the CI is small, the estimate is more precise. In the figures below, the black line, or baseline, is used to show if a statistic is significantly different from zero at the 0.05 level. The baseline is a helpful illustration because if it does not overlap or contain the 95% CI, the estimate is statistically significant. For example, in Figure 5, which observes Black leadership, we can see that the 95% CI does not include the baseline for average percent E-6 to E-9 for model (1). This means that the estimated 2.3 percentage point increase in the probability of reenlistment for Black sailors is statistically significant. The remaining three estimates in Figure 5 are not significant and this is shown by their 95% CI overlapping the baseline.

The lack of significance in these estimates may be a result of low variation of Blacks holding leadership positions, which could be the basis for further research. Like Figure 5, Figures 6 and 7 are should be described and interpreted similarly.

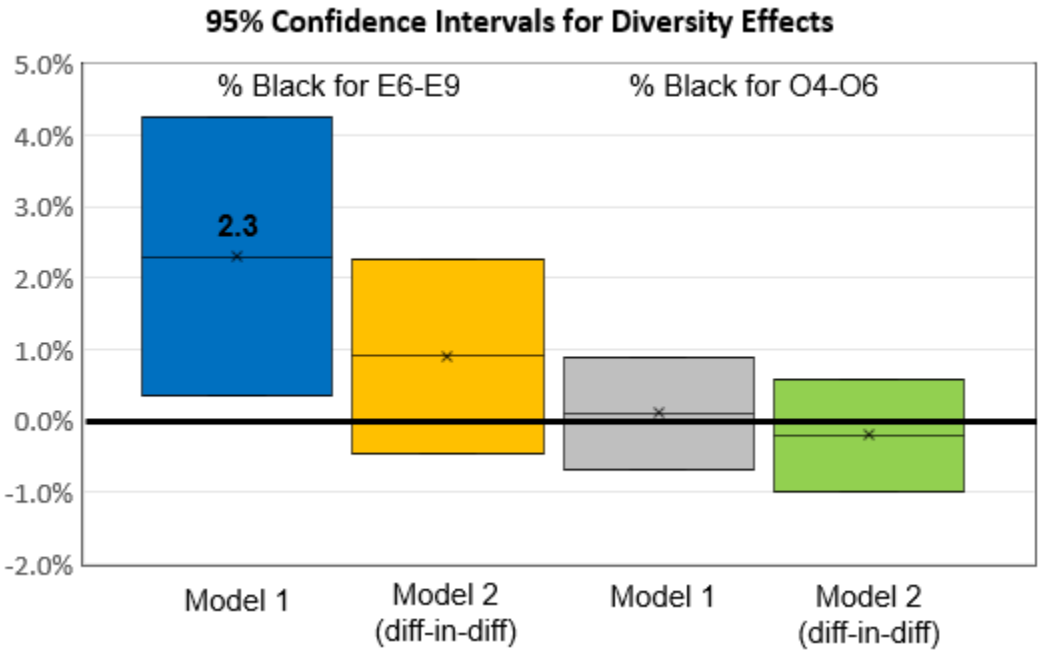

Figure 5. Estimated Effects of a Ten-Percentage-Point Increase in Black Leadership

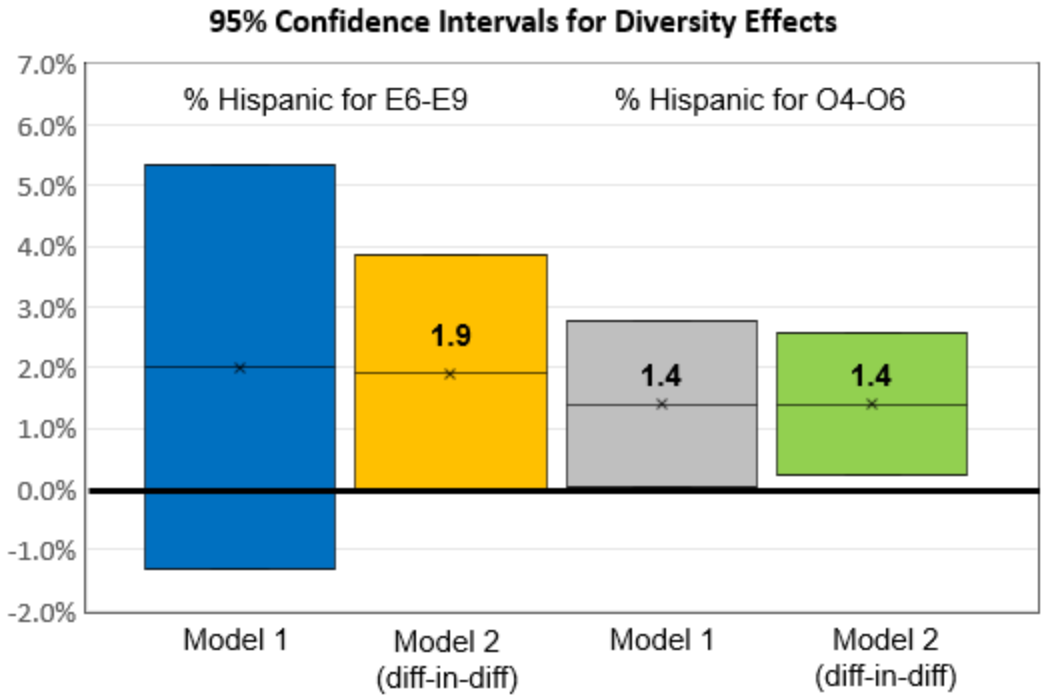

Figure 6. Estimated Effects of a Ten-Percentage-Point Increase in Hispanic Leadership

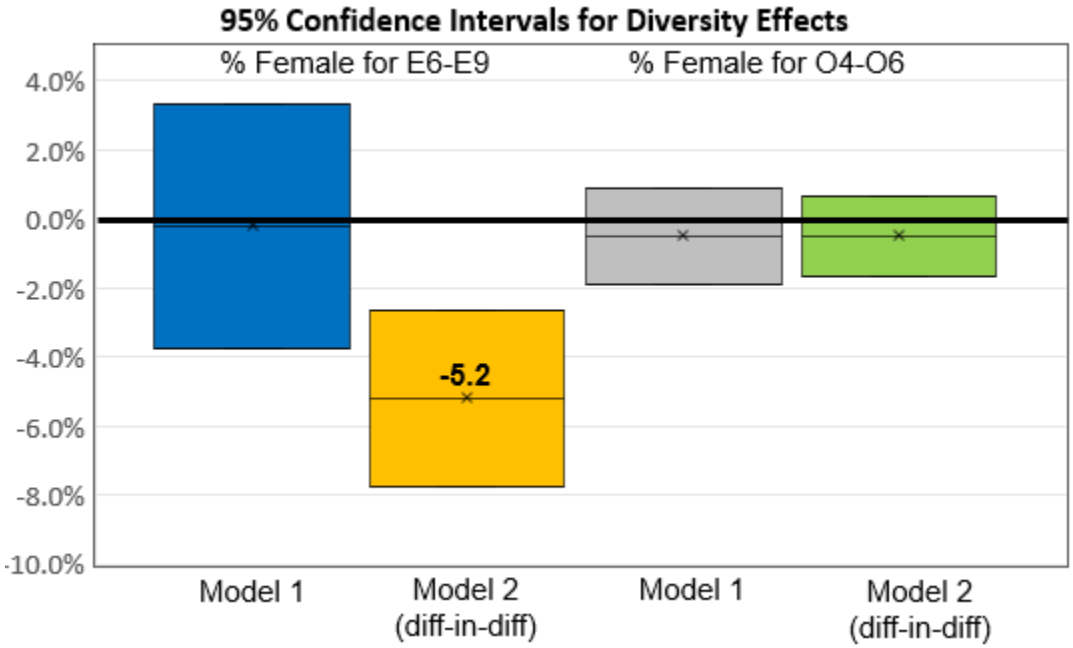

Figure 7. Estimated Effects of a Ten-Percentage-Point Increase in Female Leadership

VI. CONCLUSION AND RECOMMENDATIONS

The primary focus of this thesis was to analyze the effect of minority command leadership on the first-term reenlistment decisions of underrepresented junior enlisted sailors in the U.S. Navy. The results suggest that same-minority command leadership does influence the reenlistment of minority sailors. In addition, the results revealed that increased diversity leads to greater reenlistment rates among non-minorities.

A. CONCLUSION

This thesis found statistically significant evidence that supports the notion of same-minority sailor-command leadership matches helping to increase the probability of reenlistment for minority juniors' sailors during their first-term. Specifically, for the average percent Black among E-6 to E-9 leadership, and the average percent Hispanic among both E-6 to E-9 and O-4 to O-6 leadership. This thesis also found statistically significant evidence that minority leadership improves retention for non-minority enlisted sailors: average percent Black among E-6 to E-9 leadership on non-Blacks, average percent Hispanic among E-6 to E-9 leadership on non-Hispanics, and average percent female among E-6 to E-9 leadership on males. Before making recommendations, the primary and secondary research questions are revisited and answered by restating analysis findings from Chapter V.

1. Primary Research Question

> Does racial/ethnic minority command leadership have an effect on the retention of racial/ethnic minority enlisted sailors in the Navy surface warfare community?

This thesis finds that a ten-percentage point increase in the average of Black enlisted command leadership E-6 to E-9 improves the probability of reenlistment for Black sailors by an estimated 2.3 percentage points. For the effects of Hispanic leadership on Hispanic sailors only, results show that an increase in ten percentage points in the average percent of Hispanic officer command leadership O-4 to O-6 is associated with an estimated 1.4 percentage point increase in the probability of reenlistment. Next, this thesis finds that

if a Hispanic sailor is exposed to an increase of ten percentage points in the average percent of Hispanic E-6 to E-9 enlisted command leadership then the sailor is an estimated 1.9 percentage points more likely to reenlist than a non-Hispanic sailor who is exposed to the same leadership. Lastly, results show that an increase in ten percentage points in the average percent of Hispanic O-4 to O-6 officer command leadership is associated with an estimated 1.4 percentage point increase in the probability of reenlistment, relative to non-Hispanic sailors.

2. Secondary Research Question

Does female minority command leadership have an effect on the retention of female minority enlisted sailors in the Navy surface warfare community?

This thesis finds that if a female sailor is exposed to an increase of ten percentage points in the average percent of female E-6 to E-9 enlisted command leadership, the sailor is an estimated 5.2 percentage points less likely to reenlist than a male sailor who is exposed to the same leadership.

These thesis findings show that command leadership may play a role in explaining gender and racial disparities regarding a junior sailors first-term reenlistment decision. Although this analysis showed statistically significant results for minority command leadership influence on a junior enlisted sailor's (who shares the same minority group as their leadership) first-term reenlistment decision, even if a role-model effect did not exist, this study still revealed very few instances of both minority junior enlisted sailors and minority command leadership. As discussed in Chapter IV, in this thesis, racial/ethnic minority was defined as Black and Hispanic due to low variation for Mexicans, Puerto Ricans, and Asians. Nevertheless, although sufficient to observe an effect for this analysis, summary statistics from Chapter IV showed low variation for Blacks and Hispanics, as well as women. That being said, the Navy should focus on further improvement of diversity across the surface fleet.

B. RECOMMENDATIONS

A concern faced by not only the surface warfare community, but also the entire DON and DOD, is the underrepresentation of racial/ethnic and gender minorities among

all services, rates, ranks, occupational specialties, and designators. A potential reason for these gender and racial disparities is the lack of senior command leadership for these minority groups. The findings in this thesis indicate that if the surface Navy would like to increase gender or racial inclusion and diversity among their personnel, presenting more leadership opportunities for qualified Blacks, Hispanics, and women may prove effective. This is because more minorities holding senior command leadership positions may improve the likelihood that a minority junior sailor will reenlist. Also, more minorities in senior leadership positions could help increase minority recruiting: prospective recruits could be encouraged to join the Navy after seeing senior leaders who resemble their demographics. Finally, based on the results of this thesis, current Navy retention-oriented practices and policy should be adjusted to focus on inclusion and improved representation for minority personnel.

These policy changes could start with increased and consistent data collection for each unit or command to examine the demographic make-up. By doing so, the Navy will be able to identify which commands lack diversity; therefore, corrective action can be implemented. Next, command climate surveys should include in-depth questions regarding the unit's diversity to identify any shortfalls in inclusion. Also, command leadership should be responsible for developing a strategic plan to promote a diverse and inclusive work environment. Like Lim, Cho, and Curry (2008), these initiatives should be established and overseen by an all-inclusive DON or DOD committee. Furthermore, an accountability system, which includes rewards and consequences, should be developed to ensure that senior leaders and their commands are meeting the committee's diversity requirements (Lim et al.). Another recommendation is for Navy personnel command to make diversity a consideration among detailers to ensure leadership at various commands have minority representation. These efforts should help level the playing field for more racial/ethnic and gender minorities and enhance diversity and inclusion in the Navy.

For further research on this topic, improved data on identifying leadership such as the CMC and CO could substantiate the findings of this thesis and help to achieve more precise estimates. Although the CMC and CO are captured in the "treatment" (enlisted command leadership E-6 to E-9 and officer command leadership O-4 to O-6, respectively),

these senior command leaders were not observed individually due to measurement error. If an identifier such as a NEC had been included in the data, the analysis could have precisely examined the estimating effects of minority CMCs and COs on the reenlistment decision of a junior enlisted sailor who identified with the same minority. Future research should also include other races and ethnicities: Mexican, Hispanic, and Asian. Yet, to observe the true effect of these unobserved race/ethnicity groups, as well as Blacks and Hispanics, more instances of minority leadership must exist in the surface fleet by improving upon diversity and inclusion.

APPENDIX. ENLISTED DATA FILE MERGING

Based on the original DMDC data, Enlisted Files 1 and 2, coding was conducted to create several files for merging.

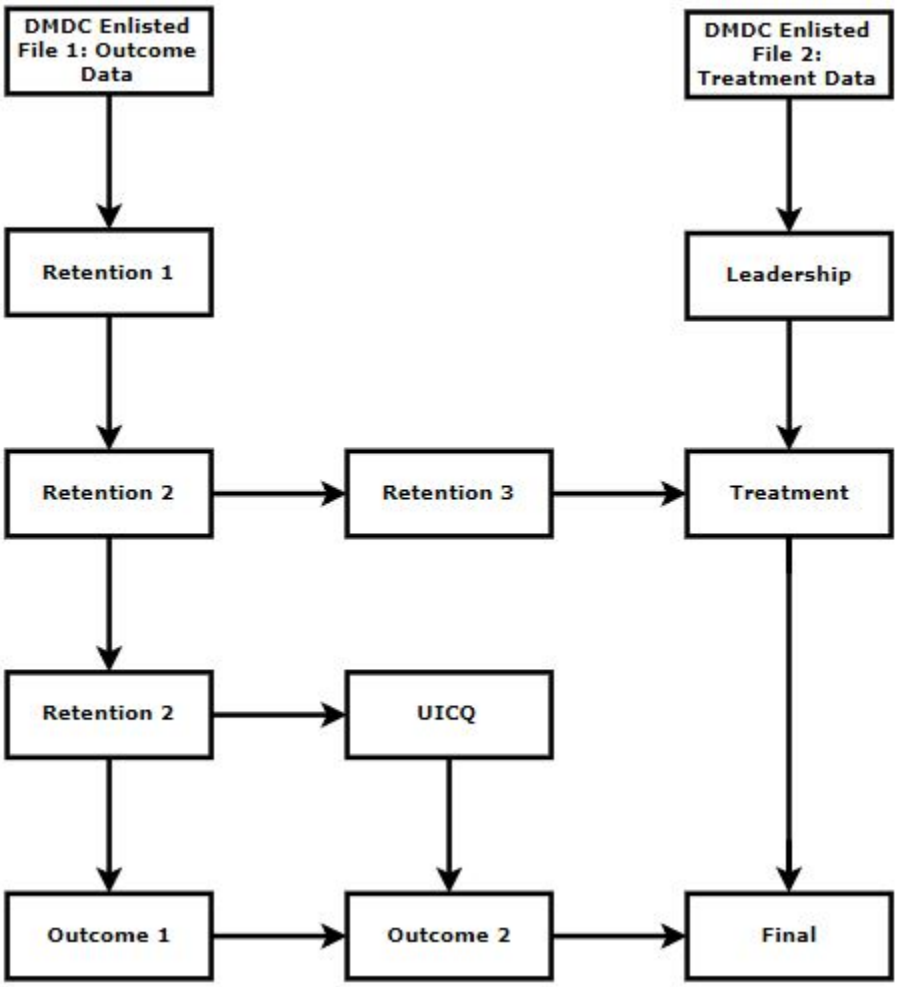

Figure 8. Enlisted Data File Merging

Retention 1: The data file "Retention 1" was developed to show retention background comparisons. The purpose of this file was to compare retention outcomes by FY, race, ethnicity, gender, and various interaction terms. The sample includes only

enlisted service members who accessed on or before September 30, 2012, to ensure they can be observed for at least six YOS before the end of FY 2018.

Retention 2: The "Retention 2" file is a subsample generated from "Retention 1." The sample includes sailors who accessed on or before September 30, 2012, and who are non-Hispanic White males, with one UIC, and with all observations per person at the given UIC. The "Retention 2" file was used to create both the "Outcome 1" and "UICQ" files. By observing ADBD and LOS, this file dropped a LOS greater than 42 months from the ADBD because it is assumed that a sailor is at their first UIC within this timeframe.

Retention 3: The "Retention 3" file amends "Retention 2" by capturing just the matching observations from a sailors' first UIC. Based on UIC and year-month, "Retention 3" was merged with the "Leadership" file to create the "Treatment" file.

Outcome 1: "Outcome 1" is the retention outcome file and its purpose is to serve as the main analysis. The sample has one observation per person from "Retention 2." Variables for this file included retention outcomes and all control variables, other than treatment variables. The outcome, a sailor's decision to reenlist, was determined by comparing the initial EAOS to the highest EAOS. A difference between the initial and highest EAOS greater than or equal to 25 months indicated that the sailor reenlisted (reenlist = 1, otherwise = 0). Finally, the Software for Statistics and Data Science (STATA) collapse function was used to obtain one observation per person.

UICQ: "UICQ" is the UIC sample qualification file to determine who qualifies for the sample. The sample is "Retention 2," which contains one observation per person. The key variable in this file is UICQ = 1, which means that an individual was at one of the 102 UICs for at least 8 quarters. The STATA egen function was used to count the number of observations at the UIC, and the UICQ indicator variable was created for qualification of at least eight observations. Lastly, the file only kept variables ID and UICQ.

Outcome 2: The "Outcome 2" file merged "UICQ" and "Outcome 1" by ID. This file used one observation per person and kept observations with UICQ = 1.

Leadership: The purpose of the "Leadership" file is to show a junior sailor's exposure to minority leadership. This file has one observation per UIC-year-month.

Variables in this file include UIC, year-month, indicator variables for each race, ethnicity, and gender minority category holding a leadership position (defined by all E-6 to E-9 at a UIC for a given year-month). All individuals are kept in the file because all E-5 and below were previously dropped. To take the average of all minority leadership variables, the data is collapsed at UIC-year-month.

Treatment: The "Treatment" file merges "Leadership" and "Retention 2." This file had multiple observations per person, but it was collapsed to create one observation per person. "Treatment" shows a sailor's average exposure to minority leadership.

Final: The "Final" file merges "Outcome 2" and "Treatment" by ID. This file has one observation per person.

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