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MANPOWER IMPLICATIONS OF EXPANDED PARENTAL LEAVE FOR ACTIVE DUTY U.S. NAVY SERVICEMEMBERS

by

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September 2023

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In the fiscal year 2022 National Defense Authorization Act, U.S. Congress significantly increased the parental leave allowance for all active-duty servicemembers. However, Congress conferred no additional funding or manpower resources to accommodate the benefit. Increasing parental leave without resourcing has a high potential to disrupt the manpower system and induce disparities at the operational level of execution. This study uses historical data and uptake patterns from the Navy Standard Integrated Personnel System, the electronic leave tracking system, to model parental leave uptake under the new policy. The study's findings show that, in general, sailors utilized a majority of new parental leave authorized. Post-policy, the model suggests parental leave usage will triple compared to the immediate pre-policy period, approximating the manpower equivalent of 3,000 servicemembers a year. The thesis offers suggestions for mitigation measures, further research, and policy recommendations to address the workforce gap generated by the new policy.

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MANPOWER IMPLICATIONS OF EXPANDED PARENTAL LEAVE FOR ACTIVE DUTY U.S. NAVY SERVICEMEMBERS

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In the fiscal year 2022 National Defense Authorization Act, U.S. Congress significantly increased the parental leave allowance for all active-duty servicemembers. However, Congress conferred no additional funding or manpower resources to accommodate the benefit. Increasing parental leave without resourcing has a high potential to disrupt the manpower system and induce disparities at the operational level of execution. This study uses historical data and uptake patterns from the Navy Standard Integrated Personnel System, the electronic leave tracking system, to model parental leave uptake under the new policy. The study's findings show that, in general, sailors utilized a majority of new parental leave authorized. Post-policy, the model suggests parental leave usage will triple compared to the immediate pre-policy period, approximating the manpower equivalent of 3,000 servicemembers a year. The thesis offers suggestions for mitigation measures, further research, and policy recommendations to address the workforce gap generated by the new policy.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADSM	Active-duty Servicemember
AFQT	Armed Forces Qualification Test
AT	Annual Training
DOD	Department of Defense
FMLA	Family Medical Leave Act
FY	Fiscal Year
IA	Individuals Account
ILO	International Labour Organization
LDO	Limited Duty Officer
MCL	Maternity Convalescent Leave
MPT&E	Manpower, Personnel, Training, & Education
MSC	Medical Service Corps
NDAA	National Defense Authorization Act
NEC	Navy Enlisted Classification
NMS	Navy Manpower System
NPC	Navy Personnel Command
NSIPS	Navy Standard Integrated Personnel System
OPNAV	Office of the Chief of Naval Operations
OSD	Office of the Secretary of Defense
PC	Primary Caregiver
PCL	Primary Caregiver Leave
PE	Program Element
PPH	Patients, Prisoners, and Holdees
QBE	Qualifying Birth Event
RL	Restricted Line
SC	Secondary Caregiver
TPPH	Transients, Patients, Prisoners, and Holdees

UL	Unrestricted Line
USMC	United States Marine Corps
WO	Warrant Officer

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I. INTRODUCTION

The Fiscal Year (FY) 2022 National Defense Authorization Act (NDAA) mandated sweeping changes to the parental leave structure and allowance for all active-duty servicemembers (ADSMs) in the Department of Defense (DOD) (Kamarck & Donovan, 2021). This legislation emphasized Congress's focus and support of military family readiness and servicemember quality of life while standardizing paid parental leave across the service components and addressing gender inequities. The law also equalized the paid parental leave between civilian government workers and many civilian employers. However, the generous increase was not funded or resourced in any way. Each service component must accommodate the new policy without additional personnel, creating a potentially significant resource gap. No published reports or literature examined the operational impact of the more generous paid parental leave policy. Military leaders may be forced to ration out the benefit, generating a potential for deteriorating morale and equity disputes. Opportunities exist to mitigate the potential impact, but the policy's effect must be quantified.

In the first chapter, my thesis explores the historical background of paid parental leave, including the global, United States, and U.S. government context and its documented health and economic benefits. In the literature review chapter, I focus on how parental leave policy changes influence subsequent uptake patterns. The structure of the Navy Manpower System (NMS) is then discussed in Chapter III, emphasizing how parental expansion affects operational manning levels. Chapters IV and V discuss and analyze the data sources, focusing on the historical leave data from ADSMs in the Department of the Navy (DON). In Chapter VI, I combine the parental leave data with evidence from the literature review to build an array of estimation models. My model predicts, on average, parental leave usage will triple, approximating the manpower equivalent of 3,000 servicemembers a year. This manpower loss is between 21 and 30 percent of the planned "friction" in the NMS and represents a significant additional human resource burden. The remainder of my thesis examines the limitations of my model and methods and provides recommendations for Navy leadership, policymakers, and future analysts.

A. HISTORY OF PARENTAL LEAVE

The United States has no national policy or mandate for paid parental leave—either maternal or paternal; the lack of paid maternal leave singles the country out as an outlier among all other developed nations (Stovall et al., 2020). Internationally, however, legislation protecting childbearing women in the workforce began over a hundred years ago with the Maternity Protection Convention in 1919 by the International Labor Convention (International Labour Organization, 1998). The same year, The International Labour Organization (ILO) was founded and eventually became the first specialized agency within the United Nations (International Labour Organization, 2015). The ILO began as a social justice and human and labor rights advocacy group and remains one today. Moreover, it is widely recognized as the global authority on fair labor practices (International Labour Organization, 2015). Today, the ILO remains the standard-bearer regarding parental leave labor legislation. The most recent iteration of ILO's parental leave standards, the Maternity Protection Convention, was published in 2000 and requires a minimum of 14 weeks of maternal leave and suggests the optimum number of weeks is 18 (2000).

Furthermore, the ILO codifies maternity protection provisions to include financial coverage (paid maternity leave) of at least two-thirds of earnings (International Labour Organization, 2015). Unfortunately, ILO has not yet established standards for paternal leave but calls for governments to develop policies that balance family responsibilities across genders. The ILO advocates that these policies should include paternal or parental leave and incentive schemes to encourage male take-up (Addati et al., 2014).

Over 184 of the 190 countries profiled by the World Bank have some form of paid maternity leave as of 2021 (Magarino & Shen, 2022). However, Magarino and Shen found only 118 meet the ILO benchmark of 14 weeks. The same authors note the number of countries providing paid paternal leave is almost the same—114, with 37 countries adding the benefit in the last ten years. The same comprehensive report found that the average number of paid paternal leave dates has increased from 3.2 to 7.0 days, a small fraction of the ILO standard for mothers. In addition, Margarino and Shen describe how some countries offer new parents a bank of shared parental leave. Depending on the individual

country's scheme, some "parental leave days" are reserved for fathers only. Their analysis found that, on average, this type of parental-paternal leave has grown from 8.7 to 13.7 days over the last ten years.

B. HEALTH AND ECONOMIC EFFECTS OF PAID PARENTAL LEAVE

Comprehensive research examining the health and economic outcomes of parental leave policies finds that labor force participation, employment, and job retention for women all improve with paid leave policies (Nandi et al., 2018). However, in their systemic literature review, Nandi et al. did not find the same economic benefits conferred when parental leave is unpaid; furthermore, they found that the benefits may diminish at approximately 28 weeks of fully-compensated leave.

Paid parental leave was also associated with improved infant and child health, measured by lower mortality rates, increased breastfeeding rates, increased breastfeeding duration, increased birth weights, and increased rates of well-baby care and vaccinations (Baker & Milligan, 2008; Gault et al., 2014; Nandi et al., 2018). Evidence also indicates that social bonds between the infant and parents are stronger with extended paid parental leave (Gault et al., 2014). Additionally, Gault found that extended leave periods seem protective in preventing maternal depressive symptoms, severe depression, stress, and self-reported poor health.

C. UNITED STATES

The 1993 Family and Medical Leave Act (FMLA) represents the only national policy requiring unpaid leave for new parents in the United States. In brief, FMLA requires companies with over 50 employees to grant eligible employees up to 12 weeks of unpaid, job-protected leave annually; it makes no gender distinctions (United States Department of Labor, 2023). These requirements are strict, covering less than sixty percent of the labor market, and disproportionately limit coverage to socioeconomically disadvantaged employees (Bergmann, 2021). However, Bacolod et al. (2022) note that eight states have paid family leave of varying lengths, with the benefit being a proportion of prior earnings; California led the nation by offering a paid family leave law in 2004. These authors note

Massachusetts' policy provides the most generous benefit with 12 weeks of coverage; Rhode Island allocates just four weeks.

Some private companies offer paid maternity or paternity leave, though it is the exception rather than the norm (Bergmann, 2021). Bergmann, an industry expert, estimated that 80 percent of employees have no access to paid parental leave. Furthermore, he states a third of men have no option for a paid or unpaid paternal leave period.

D. U.S. GOVERNMENT

As of 2020, the U.S. government, the country's largest employer, authorized eligible federal government civilian employees twelve weeks of paid parental leave for any qualifying event—birth, adoption, or long-term foster placement (Bergmann, 2021). Previously, government civilians only had access to unpaid leave under the FMLA policy (Yoder, 2020).

Active-duty birthing parents in the DON have had at least 42 days (or six weeks) of maternity leave since 1989, though it was typically classified as convalescent leave (Thomas et al., 1991). Between 1989 and 2015, the U.S. Navy made no changes to the length of maternity (convalescent) leave; it was standardized among all services to be six weeks (fully compensated) (Bacolod et al., 2022). In contrast, the NDAA first codified paternity leave in its FY 2009 budgetary law (Kamarck, 2016). First, the law authorized ten days for married fathers, contingent on approval from the commanding officer (Keefe, 2016). Then, in mid-2015, the DON (which governs over-arching policy for both the Navy and the United States Marine Corps [USMC]) approved 18 weeks of maternity leave for sailors and marines (Myers, 2015).

The following year, the Secretary of Defense standardized maternal leave policies across all the service components (Army, Navy, Air Force, USMC), authorizing 12 weeks of leave to all birthing parents (Carter, 2016). This change effectively doubled the Army and Air Force's allotment (increasing maternity leave from six weeks to twelve weeks) and cut the authorized amount for sailors and marines by six weeks (reducing leave from 18 weeks to 12 weeks). Again, the policy dictated no changes to paternity leave.

In June 2018, the Navy released its new Parental Leave Program, which consolidated all previous parental leave instructions (adoption, paternity, and maternity) into a comprehensive policy (Office of the Chief of Naval Operations, 2018). This Office of the Chief of Naval Operations (OPNAV) policy delineated three types of leave: maternity convalescent leave (MCL) for birthing parents (six weeks, only available to the birthparent), primary caregiver leave (PCL) (six weeks), and secondary caregiver leave (SCL) (two weeks). In addition, the policy was retroactively applicable to all sailors with a documented Qualifying Birth Event (QBE), defined as a "live birth," on or after December 23, 2016. Further clarifying definitions in the OPNAV policy include: "Birthparent. The parent who physically gives birth"; "Qualifying Birth Event (QBE). Any live birth to a Service member or member's spouse or partner. Multiple births within the same 72-hour period will be treated as a single QBE"; "Primary Caregiver (PC). Parent designated with the primary responsibility of caring for a child, normally the birthparent"; and "Secondary Caregiver (SC). The parent not designated as the PC" (2018, p. 2).

Dual-military couples could designate either parent as the PC or SC In these cases, the parental leave could effectively be "split" between the pair—the birthing parent receiving six weeks of MCL and two weeks of SC leave and the non-birthing parent receiving the six weeks of PCL. Traditionally, the female or birthing parent retained the primary caregiver role, and the spouse (predominantly male) became the SC. Birthparents married to civilian spouses or partners would receive the MCL and PCL, totaling 12 weeks. Active-duty non-birth parents with civilian spouses or partners were usually designated secondary caregivers unless they had extenuating circumstances justifying a need to be the PC. This PC and SC usage pattern effectively increased parental leave for active-duty SCs (predominantly males) from ten to 14 days. Before the more liberal FY 2022 NDAA parental leave expansion, the Secretary of the Navy increased this SC leave from 14 to 21 days in February of 2022 (Watkins, 2022).

U.S. Congress increased total parental leave for active-duty servicemembers in the DOD—matching the current provision for civilian federal workers—with their approval of the FY 2022 National Defense Authorization Act (Kamarck & Donovan, 2021). In Kamarck and Donovan's summary of the law, they note that it removes the primary and

secondary caregiver designation; instead, it authorizes every service member twelve weeks of parental leave while allowing the birthing parent an additional period of convalescence, customarily six weeks. The Under Secretary of Defense officially promulgated the new parental leave scheme on January 4, 2023 (Cisneros, 2023). His directive not only provides 12 weeks of parental leave to all ADSMs but also departs from the previous one in another critical aspect—sailors do not have to take it in one continuous block; instead, they can divide it into seven-day increments. The directive dictates parental leave must be used within one year of the birth event, with an extension waiver process for specific circumstances. Some waivable cases include deployments, lengthy temporary (travel) assignments, and in-residence professional military training. Figure 1 provides an overview of the policy evolution over the last decade, grouping males with non-birthing parent and secondary caregiver designation for ease of interpretation.

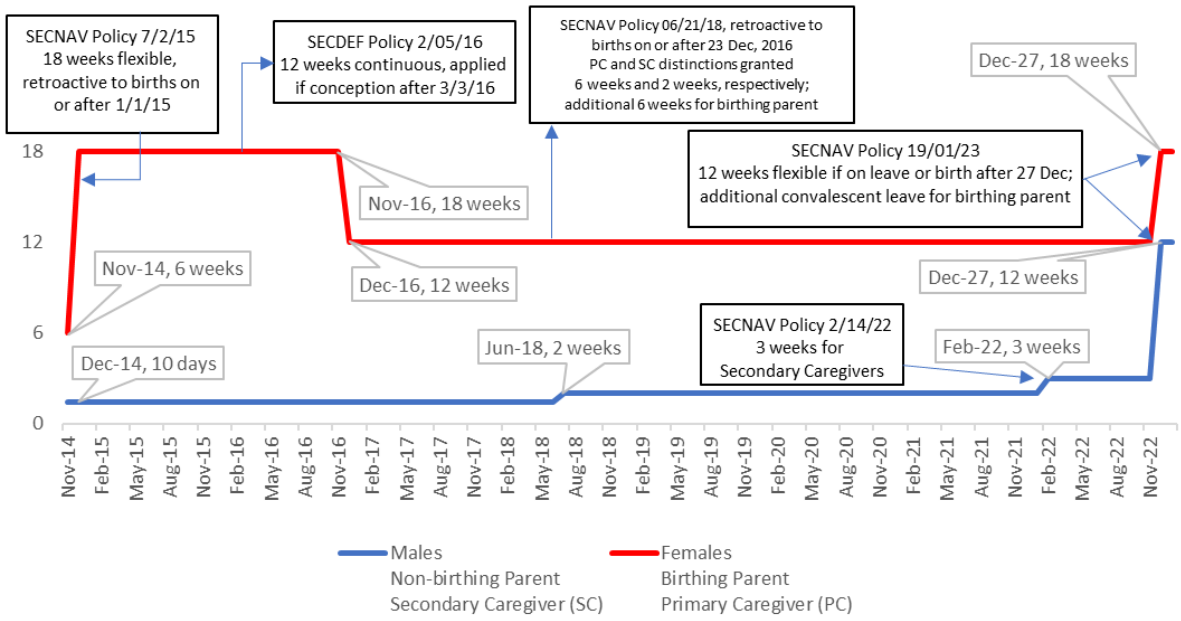

Figure 1. Policy Changes Over Time. Adapted from Bacolod et al. (2022)

II. LITERATURE REVIEW

Parental leave uptake patterns are influenced by a variety of factors, including cultural norms, economic considerations, and policy changes. When policy changes related to parental leave are implemented, they can have a significant impact on how individuals and families make decisions about taking advantage of these benefits. In this chapter, I review the established literature, first focusing on gender-specific uptake patterns and then examining patterns in a military context that emerge after parental leave policy changes.

A. MATERNAL

Robust policy development and research have traditionally focused on maternal leave policies and their effects. Studies examining the factors influencing maternity leave take-up exist in civilian and military contexts. A few examples of the many civilian-centric studies include 1) a comprehensive RAND Corporation report published in 2016 examining the trade-offs between health benefits and labor market demands for women in Europe (Strang & Broeks, 2016), 2) a systemic literature review of maternal leave access and health (Andres et al., 2016) and 3) maternity leave up-take implications in academia (Troeger et al., 2020). Another study found limited knowledge about available maternal leave benefits dampened the potential uptake pattern of women in San Francisco's Paid Parental Leave Ordinance (Goodman et al., 2020).

Legislative and policy factors play a crucial role in shaping maternal leave uptake patterns, with supportive legal frameworks, extended leave duration, and access to paid leave positively affecting uptake rates. Workplace factors, including organizational support, flexible policies, and favorable job characteristics, are essential facilitators for maternity leave uptake. Individual factors, such as socioeconomic status, education, personal values, and health considerations, also impact women's decisions. I will separately review studies concerning maternal leave uptake in the military context.

B. PATERNAL

Unfortunately, research examining these patterns for paternity leave is lacking, especially concerning the U.S. population (Birkett & Forbes, 2019). This dearth of research is likely related to the relatively newer and fewer organizations offering paid or unpaid paternal leave. Furthermore, drawing general conclusions about potential patterns of paternity leave take-up is difficult due to the sheer diversity of leave schemes. For example, countries often have some mixture of maternal, paternal, and shared leave policies, with varying levels of compensation.

The research on paternal leave that does exist is almost exclusively international—with most of its focus on countries within the European Union. Furthermore, much of the research focuses on the societal, family, and health benefits of paternal leave; few studies try to document and identify the take-up patterns. One recent study examined take-up in Finland, the first country to introduce paid paternity leave in 1978 (Eerola et al., 2019). Using individual data from October 2014 to September 2015, Eerola et al. found approximately 20 percent of men took no paid paternal leave and that the father's workplace culture was the most significant barrier to increased take-up. In the first year of the United Kingdom's Additional Paternity Leave policy (which does not provide total compensation), less than one percent of those eligible utilized the benefit (Kaufman, 2018). Moreover, Kaufman found that "perceived workplace resistance" significantly affected nonuse. Birkett and Forbes (2019) also explored the low take-up in the United Kingdom, with workplace culture as the driving element.

Studies have shown mixed results on paternal leave take-up when controlling for the fathers' or mothers' education, but workplace culture and occupation consistently affect fathers' leave use (Geisler & Kreyenfeld, 2019). For example, in Sweden, Duvander and Johansson found that the initial introduction of paternity leave had a more significant effect on take-up than the subsequent extension (2012). Again, in Sweden, Bygren and Duvander (2006) found paternal leave take-up was lower among private sector employees and those in more male-dominated occupations, among other factors, to decrease paternal leave take-up. In one U.S.-centric study, Bartel et al. (2015) exploited a quasi-natural experiment using a difference-in-difference design to study the effects of California's Paid Family

Leave program. They found the paid leave policy increased male leave take-up by 46 percent; the take-up pattern was significantly affected by dual-parent employment if the child was male or first-born and if the male was in a female-dominated occupation.

These patterns of paternal leave take-up in the civilian context have essential implications for anticipating how the expansion of parental leave will affect the human resources gap in the Navy. Specifically, workplace cultures, if an occupation is male or female-dominated, and if the service member is part of a dual-military or dual-parent employment couple will influence which sectors of the Navy will face the most substantial manpower resource burden due to the policy expansion.

C. MILITARY

The literature on the take-up of expanded parental leave within the military is small and limited to active-duty service members serving in the United States Marine Corps. Exploiting the changes in primary caregiver leave between 2016 and 2018, when primary caregiver leave was expanded from six weeks to 18 and then restricted back to twelve, Bacolod et al. (2022) found uptake was not homogenous. Instead, they found less advantaged mothers (single, lower enlisted, and first-time mothers) took more available leave. In the same study, Bacolod et al. found mothers had been supplementing maternal leave with annual (regular) under the most restrictive policy. Unfortunately, the subjects of the study—active-duty female marines—are a unique demographic, and it is unclear if these same patterns will hold when applied universally to active-duty sailors, especially males.

In their thesis research, Laurita and Molloy (2019) exploited the same policy change. They found that though the expanded leave policy only applied to birthing parents, there was an associated increase in leave-taking in non-birthing parents. This finding supports their idea "that maternity leave policy implementations led to a shift in workplace attitudes towards parental leave for mothers *and fathers*, within the Marine Corps" (p. 69).

The newest DOD leave expansion represents a seismic shift in authorized parental leave. For those previously designated as "secondary caregivers"—typically the father—the 2022 NDAA increases it from 21 days to 12 weeks, effectively quadrupling the amount

of available. At the same time, birthing parents—those commonly identified as "primary caregivers"—were given the same 12 weeks *and* a period of postpartum convalescence, which has historically been six weeks, allowing up to 18 weeks total. For birthing parents, this allotment now equals the maternity leave granted under the temporary DON policy in 2015–2016. As all previous paternal leave expansions within the DON have been limited (four to seven days at a time), the manpower implications of such a significant increase have not been studied. My thesis develops an array of potential uptake models for manpower analysts studying leave in the military. Using previously published literature to guide my assumptions and model development, I analyze historic leave data for active-duty sailors and project the unresourced manpower impact of the new policy.

III. BACKGROUND

A basic primer of the complex Navy Manpower System is required to understand how the 2022 NDAA parental leave expansion policy affects the Navy's unit-level manning. Even manpower analysts describe the manpower planning process as "rich and complex," requiring "a large body of institutional knowledge…and prior research" with "many complicated and long-standing problems" (Rodney, 2017, p. 1). The same expert further notes, "Gaining an understanding of Navy manpower planning is not easy: there's a lot to learn and no standard texts. Moreover, knowledge is diffuse and not captured in one place" (p. 1). Regardless of these challenges, I provide a simplified framework for understanding the NMS with a focus on policies and regulations influenced by the increased parental leave allowance.

A. NAVY MANPOWER SYSTEM

The manpower system contains four main steps: 1) determining the manpower requirements (for example, the number of billets needed to man a destroyer); 2) obtaining the funding; 3) planning the recruiting and training or professional development for the personnel; and 4) matching the qualified personnel with the billets (Rodney, 2017). This process may seem straightforward, but the closed labor market of military personnel and the long time horizon to develop military professionals significantly complicates it. The first step, determining manpower requirements, is most relevant to understanding the parental leave policy expansion. I describe this step in detail as follows.

Three categories of manpower requirements exist in the U.S. Navy: afloat (sometimes called "sea"), shore, and the Individuals Account (IA). Afloat or sea requirements encompass all billets (jobs) for operational units—ships, submarines, squadrons, etc. Shore requirements include all supporting billets—staffs, schools, logistical commands, military treatment facilities, etc. These two combined represent the bulk of the service's "work" or mission. These two categories contain personnel available for distribution into the fleet and are sometimes called the "base force" component (Scott & Dickason, 2004). The Defense Manpower Requirements Report for the fiscal year 2018

calculates the total base force as approximately 85 percent of the Navy's total end-strength (total manning) in 2016; the report estimates that the proportion will remain within one percent of 85 for the following two fiscal years (Office of the Assistant Secretary of Defense for Manpower & Reserve Affairs, 2017).

The third category—the Individuals Account—is the buffer for the known friction in the manpower system. These are "non-distributable" personnel who are unavailable for assignment to an authorized billet (Scott & Dickason, 2004). Scott and Dickason, in a comprehensive report for Navy Personnel Command (NPC) in 2004, further describe this category as sailors who are not always active in a shore or afloat billet; for example, they may be transitioning to another duty station, in a training status, sick, or in the brig. These are sailors who are unavailable to fulfill a billet or job requirement. The Navy needs a plan for this friction, so it budgets manpower overhead into this IA. The NPC report further divides the IA contingent into two main categories: 1) transients, patients, prisoners, and holdees (TPPH) and 2) students (which includes both students and trainees). The former category is further divided into 1) transients and 2) patients, prisoners, and holdees (PPH).

The governing instructions further define transients: "This category contains only the transient PE [program element] and consists of active duty military personnel in travel, leave in route, or temporary duty status (except for training) while on permanent change of station orders" (Office of the Chief of Naval Operations, 2022, p. 119). I hypothesize that the sub-category of transient personnel most closely matches the person-hours lost to commands by the parental leave expansion. They both represent a short-term loss of person-hours to a distributable billet. Though dated, Figure 2 is available for public release and visually represents the sorting IA personnel into student/trainees, transient, PPH personnel, and midshipmen in 2000.

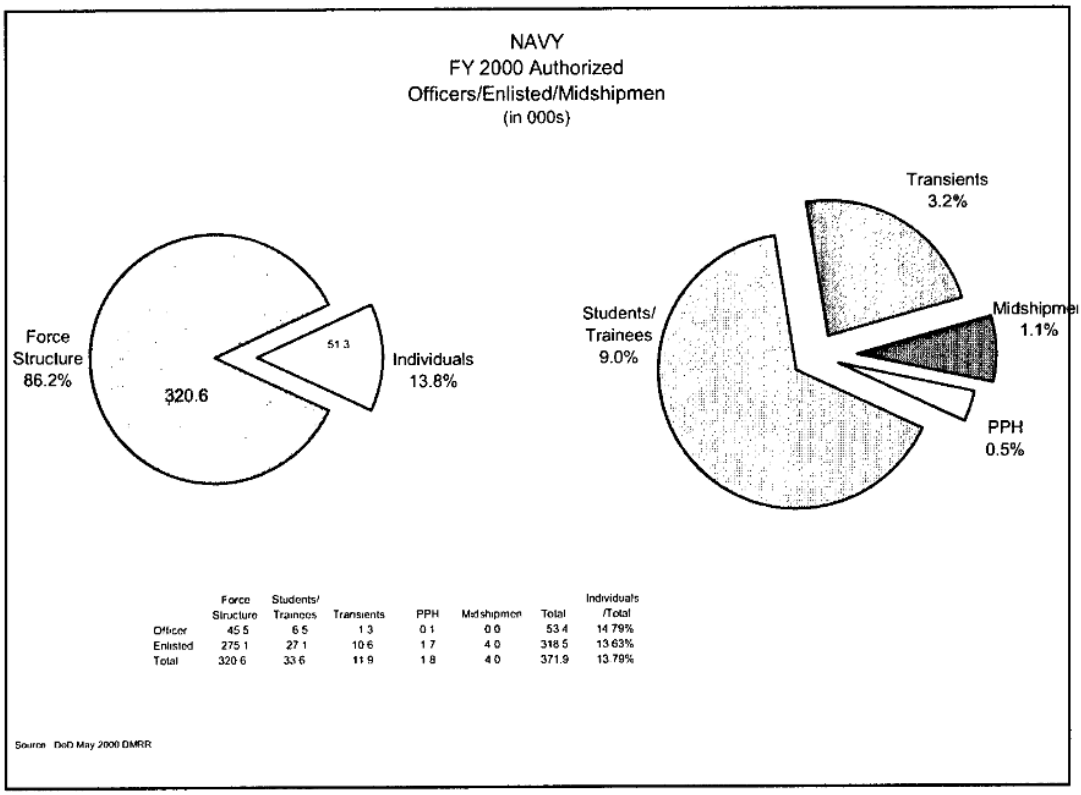

Figure 2. Navy Individuals Account, 2000. Source: Scott and Dickason (2004).

Historical trends, statistical analysis, and the overall force structure determine the planned size of the Individuals Account (Rodney, 2017). Notably, Rodney further describes the process in report from the Center for Naval Analyses states, "Execution of the [individuals] account, however, has been an almost constant problem with Navy MPT&E [Manning, Programming, Training, & Execution]…largely because of the unwillingness on the part of the Navy, OSD [Office of the Secretary of Defense], and Congress to properly fund the individuals account" (p. 19). In short, the number of sailors that fall into this "friction" category each year routinely exceeds the planned quantity.

B. PREGNANCY AND THE NAVY MANPOWER SYSTEM

Section 1300–1306 of the Navy's Military Personnel Manual prescribes the assignment and accountability of pregnant sailors. Specifically, it notes:

> pregnant Service members are fully participating members of the Navy team. Pregnancy is a *natural event that can occur in the lives* [emphasis added] of Service members and is not a presumption of medical incapability. Pregnancy could, however, affect a command's operational readiness by temporarily limiting a Service member's ability and availability to perform all assigned tasks. (Naval Personnel Command, 2018, p. 10)

The Navy's personnel manual instructs that pregnant sailors are authorized to have a 12-month operational deferment from the delivery date. If a sailor is due to rotate to an operational command during the pregnancy or within a year following the delivery, the projected rotation date usually adjusts to 12 months post-delivery. A sailor can also choose to defer this accommodation. For example, some sailors might forgo the operational deferment for a coveted operational opportunity or desired location transfer. Sailors on afloat tours transfer to shore billets on or before the 20-week gestational period. However, a waiver process exists for pregnant sailors who want to remain in afloat (operational) billets. Little disruption in the manning system arises with pregnancies occurring during shore duty tours. Duty extensions are coordinated between the sailor, command, and detailer to support continuity of care during pregnancy, convalescence, and parental leave postpartum.

Pregnant sailors are not categorized as medically restricted but are dispositioned similarly to those with medical limitations. They are usually accommodated by remaining on shore duty or transferring from an afloat or operational tour to a shore billet. Administratively, they are not fully deployable. Still, these sailors stay in the workforce inventory, filling an active billet requirement throughout their pregnancies and parental leave periods. Unless extenuating medical circumstances exist, pregnant sailors are authorized and expected to continue working regular hours, with some minor limitations after 28 weeks of pregnancy: 20 minutes of rest every 4 hours and no more than 40 hours per workweek (Office of the Department of the Navy, 2019). Because these sailors remain in active afloat or ashore billets, the effect on manning throughout the pregnancy until delivery is minimal.

In contrast, parental leave authorized for the sailor postpartum directly impacts the command's available person-hours; the billet remains fully occupied by the sailor

administratively, but the service member is on extended leave—for a maximum of 18 weeks during the year following birth. The manpower system does not consider sailors' workplace absence due to convalescence or parental leave. On paper, these sailors are fully present and filling a required billet, usually at a shore command. This accounting differs from how the NMS handles other sources of "friction" as discussed earlier—the Individuals Account.

Currently, the gender demographics in the Navy are approximately 20 percent female and 80 percent male (Council on Foreign Relations, 2020). Thus, immediately before the parental leave expansion provided by the FY 2022 NDAA, the maximum amount of time a non-birthing parent—80 percent of the force—would be authorized is 21 days (three weeks). For the birthing parent—20 percent of the force—the maximum was 84 days (twelve weeks). Post policy, the allotted leave for non-birthing parents quadrupled to 84 days, and birthing parents gained an additional 42 days. No resources or funding were conferred to the manpower system to support this leave expansion. To help unpack the implications of these changes on manning requestions, my thesis analyzes historical leave uptake patterns among PCL-takers (primarily females) and SCL-takers (mostly males) to identify the potential unresourced burden placed on the NMS by the FY 2022 parental leave expansion.

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IV. DATA

To study the historical pattern of parental leave uptake, I obtained a comprehensive file of all unique parental leave occurrences granted to active-duty sailors from June 2018 through April 2023, which spanned the three most recent policy updates. No valuable data was available before 2018 as adoption leave was the only type of parental leave annotated electronically; the 2018 leave system update corresponded to Naval Administrative Message 151/18 first establishing the primary and secondary caregiver roles and leave periods (L. Partain, email to author, April 26, 2023). I also obtained publicly available data regarding the yearly budgeted Individuals Account from the Defense Manpower Profile Reports in FYs 2018, 2020, and 2023. The IA data was used to compare the budgeted friction on the NMS to the predicted new unbudgeted friction exacted by the FY 2022 NDAA parental leave expansion.

A. LEAVE DATA

1. Outcome of Interest

I obtained Navy electronic leave (e-leave) from Naval Support Activity Mid-South, the Navy's Human Resources Center of Excellence. Leave tracking and documentation for active-duty sailors is captured in the Navy Standard Integrated Personnel System (NSIPS), which replaced hardcopy, paper requests starting in 2010 (Howard, 2010). The independent variable was all unique instances of parental leave specific to this study: Primary Caregiver Leave, Secondary Caregiver Leave, Maternal Convalescent Leave, Convalescent Childbirth, and Birth Leave. Parent Leave–Adoption and Parental Leave–Long Term Foster leave occurrences were also provided. PCL, SCL, and MCL observations range from September 2018 to January 2023; Convalescent Childbirth and Parental Leave–Birth span from February 2023 to April 2023, correlating with the respective parental leave policy in place. The data did not capture sailors who had a QBE but took no parental leave.

The leave data identifies leave type, first and last day of leave charged, and the total number of leave days. It also includes similar demographic variables as the birth record data: an identifier for each unique leave period, Armed Forces Qualification Test (AFQT)

score (for enlisted personnel), birthdate, citizenship, education, marital status, military spouse indicator, service component of military spouse (Army, Navy, Air Force, etc., and active or reserve status), gender, race, paygrade, service occupation, officer or enlisted indicator, sea or shore duty indicator, and duty assignment location.

The leave data obtained duplicated observations for each service member's associated dependents. Duplicates were dropped, with a preference for sparing spousal observation as it contained pertinent information-military or civilian status of the spouse and spouse's service component. As they were not of interest, I dropped Parent Leave–Adoption and Parental Leave–Long-Term Foster. I also discarded Parental Leave–Birth and Convalescent Childbirth, the terminology for the leave types granted under the new policy. Use of Parental Leave–Birth began in February 2023; servicemembers have up to one full year to use it, leaving an incomplete picture of the uptake pattern at the time of the data pull. I dropped observations missing the leave dates.

2. Policy Changes Details

The Navy released its policy addressing the NDAA FY 2022 expansion to 12 weeks for all servicemembers on January 4, 2023; it applied to anyone who had not yet utilized all of their available SCL or PCL leave or to anyone with a QBE on or after December 27, 2022 (Office of the Chief of Naval Operations, 2023b). To ensure no contamination of the effects of the previous SCL policy change, I dropped all observations with a "last day charged" on or after December 26, 2022. Similarly, I discarded all observations with a "first day charged" in the calendar year 2018, as these were the immediate months after the establishment of the MCL, PCL, and SCL, and most susceptible to administrative entry errors.

I added an indicator variable to differentiate the leave policy under which different observations fell. The only cohort that saw a change in the allowed leave during my selected observation period were the sailors who utilized SCL. PCL and MCL authorizations did not change. The extension of SCL from 14 to 21 days was authorized on February 11, 2022, and included those currently executing SCL (Office of the Chief of Naval Personnel, 2022). Thus, if the last day charged was February 10 or sooner, I assigned

observation to the 14-day policy. If the final day recorded was February 11, 2022, or later, the observation was assumed to be under the 21-day policy.

I added quarterly, monthly, and yearly variables utilizing the last day of charged leave as the grouping mechanism. I chose the last day of leave charged instead of the first day to ensure the observation aligned with the corresponding leave policy.

3. Data Cleaning

In the electronic leave system, no barriers exist to entering incorrect leave types or number of leave days. System administrators and those approving the leave type and number of days (supervisors) are held responsible for accuracy. For example, Maternity Convalescent Leave has never changed—it was always held at 42 days as a maximum during the data observation period. Ten observations recorded between 43 and 84 total days of MCL. Various theories for these aberrations were considered: 1) the 42nd day was on a Saturday (or another non-work day), and the person returned to work on the following Monday (or working day); 2) the sailor requested to use additional annual (regular) leave after the termination of convalescent leave, and incorrectly labeled it as MCL; and, 3) in the instances of the MCL being 84, the amount of PCL taken was added to the MCL instead of being recorded as two different leave occurrences (42 days of each type—MCL and PCL). I found similar irregularities in all leave types. For my analysis, if an observation had a total number of leave days exceeding the allowed amount, I adjusted the leave number variable to 100 percent of the permitted leave.

Additionally, leave policy instructions are often promulgated before the administrative preparation of the data collection system (NSIPS). For example, the instruction authorizing PC and SC leave in 2018 directs:

> MCL, PCL, and SCL must be requested through e-Leave in Navy Standard Integrated Personnel System (NSIPS). Until NSIPS is fully updated to include the MCL [maternity convalescent], PCL [primary caregiver leave], and SCL [secondary caregiver leave] options, requests should be selected as 'Convalescent' with full annotation in the 'comment' section clarifying purpose for leave either MCL, PCL, or SCL. Leave approvers will be responsible for ensuring properly authorized days of MCL, PCL, and SCL outlined in this article are not exceeded. Commands not on e-Leave with

> NSIPS will manually track MCL, PCL, and SCL until the command begins utilizing e-Leave (Office of the Chief of Naval Operations, 2018).

Before this 2018 policy change, maternity leave was captured under a more general "convalescent" category, preventing actual distinction between other types of medical leave. Paternity leave was not codified separately before the 2018 policy. At the most, it was ten days, so commands would often track paternity leave without using the official e-leave system or document it as a Temporary Additional Duty—an administrative duty status. Unfortunately, the irregularities in tracking parental leave before the June 2018 consolidating policy and the subsequent required administrative updates restrict the useful dataset to after September 2018.

Some MCL observations had a male gender marker with the average amount of leave equal to 11.74 days. Maternity convalescent leave is only available to birthing parents and has a high uptake pattern—approximately 98% of MCL observations used between 40 and 42 days. The mean of these male-gendered observations is more aligned with the authorized number of SCL days (either 14 or 21, depending on the governing policy). Though a birthing parent may have a male gender marker, most likely, the leave type was incorrectly recorded. Thus, I substituted the leave type in these 230 observations, changing it from MCL to SCL.

I found that about 80 percent of males taking PCL could have used SCL to categorize their leave; they took either the maximum or less under the respective SCL policy (14 or 21 days). Since this is likely measurement error with male sailors incorrectly coding their parental leave, I transformed the leave type from PCL to SCL for my analysis.

4. Additional Variables

The parent data set provided occupational category as a code corresponding to the sailor's Rating Career Field Navy Enlisted Classification (NEC) awarded to enlisted sailors after completing their job-specific school or training. The NEC also indicates specialty career fields, entry servicemembers, and unique qualifications. Additionally, the entire classification system undergoes annual updates and periodic overhauls, the most recent of which happened in 2017 (Faram, 2017). Due to the complexity, nuances, and dynamic

nature of the NEC system, some observations had primary occupation variable codes that were unable to be interpreted or categorized into one of the twelve recognized enlisted occupational communities: Aviation, Executive Support, Information Warfare, Medical, Nuclear, Seabees, Security, Special Operations, Special Warfare, Submarine, Supply, and Surface (Office of the Chief of Naval Operations, 2023). Newly enlisted generalists were categorized as "Surface" sailors as they often complete their initial tours of duty on a ship.

The officer designator number provides a similar function for officers as the Rating Career Field NEC does for enlisted sailors. It also presents similar challenges. The officer occupational data underwent a similar scrub, grouping all officers first into Unrestricted Line (UL), Restricted Line (RL), Staff Corps, Warrant Officer (WO), or Limited Duty Officer (LDO). Unrestricted Line officers are generally considered "warfighting" occupations; they have no restrictions in performing their duties, including commanding ships or submarines, ground combat units, aviation squadrons, and fleets or shore bases. Due to the high proportion of aviators in this community, I divided the UL category into aviators and non-aviators.

Restricted Line officers have the professional expertise to support specific technical fields but do not primarily focus on combat-related or operational roles in contrast to the UL communities. Some examples of RL communities include aerospace engineering, human resources, oceanography, and intelligence. The RL specialties are all grouped.

Staff Corps officers primarily serve in staff or support positions in medicine, law, supply, and communications. Navy Medicine officer designators (Medical Corps, Nurse Corps, Medical Service Corps [MSC], and Dental Corps) were broken out by corps as a portion of this thesis will focus on the impact of the parental leave expansion to Navy Medicine specifically. Medical Service Corps contains all Navy Medicine officers who are not physicians, nurses, or dentists. This corps includes other clinicians like optometrists, physician assistants, pharmacists, audiologists, and support staff like health care administrators. I grouped all other Staff Corps designators and labeled them "miscellaneous."

Limited Duty Officers (LDOs) and Warrant Officers (WOs) are unique commissioned officer programs for senior enlisted personnel. LDOs and WOs are two distinct pathways but are similar in that they are selected for commission based on leadership and technical expertise; I grouped them.

B. INDIVIDUALS ACCOUNT DATA

I obtained Individuals Account data from the Defense Manpower Profile Report-Fiscal Year 2018, 2020, and 2023, all publicly available. These manpower reports are produced annually by the Department of Defense following that year's Presidential Budget. The reports document the number of individuals in sea or shore billets ("In Units") and those in the Individuals Account. The report further classifies those in the Individuals Account as Transients, Trainees/Students, Cadets (military academies), and Patients/ Prisoners/Holdees. The Transient portion of the Individuals category is ideal for comparison to the manpower burden exacted by the parental leave expansion.

V. DATA ANALYSIS

Using the parental leave data, I analyzed the patterns of uptake. Specifically, I analyzed the baseline percentage of leave uptake for the different leave types (MCL, PCL, SCL) by demographics such as age, gender, race, education and marital status. Furthermore, I examined personnel behavior and rate of uptake immediately after the SCL policy increased from 14 to 21 days in February 2022. This seven-day increase is the only empirical opportunity to develop a forecasting model for the more expansive leave policy under the FY 2022 NDAA policy change.

I show demographics by leave type in Tables 1 and 2. General characteristics are presented first in Table 1, followed by military-specific traits in Table 2.

Table 1. Demographics Personnel at the Time of Parental Leave, by Leave Type, January 2019–December 26, 2022.

	MCL	PCL	SCL Total	SCL A 14-days	SCL B 21-days
Age (in years)	30.59	30.82	32.83	33.28	31.43
Female	100.0%	97.7%	0.7%	0.7%	0.6%
American Indian or Alaskan Native	2.2%	2.3%	2.3%	2.4%	1.9%
Asian	5.1%	4.7%	5.1%	5.0%	5.4%
Black	26.6%	25.8%	17.1%	17.0%	17.3%
Hawaiian or Pacific Islander	1.5%	1.4%	1.4%	1.5%	1.2%
White	50.4%	51.6%	61.6%	61.4%	62.3%
Mixed/Declined to Respond	14.2%	14.3%	12.4%	12.6%	11.9%
Some College	12.7%	12.4%	8.9%	9.2%	8.1%
College	11.9%	12.3%	9.9%	10.3%	8.9%
Married or Widowed	77.7%	78.2%	95.6%	95.7%	95.4%
Observations	10,138	8,784	37,206	28,525	8,954

Mean values reported. College is defined as obtaining a bachelor's degree; some college is defined as more than 15 credits but no 4-year degree; it includes those with an associate degree.

One hundred percent of MCL observations are female; this result is a forced function from the data cleaning (conversion of the leave type from MCL to SCL for ten observations with a gender of male and an average number of leave days less than 12). About 2.3 percent of those taking PCL were male. I estimate the majority of the 203 male PCL-takers represent dual-military couples who elected to have the birthing parent utilize MCL and SCL (instead of the normative PCL); the non-birthing parent (usually a male) used the PCL. Other examples of males taking PCL would be if a male sailor needed to undertake primary caretaking responsibilities for a new infant due to severe illness or prolonged hospitalization of the birth parent. Only 0.7 % (248) of those taking SCL are female, which closely matches the above interpretation of dual-military couples' parental leave-taking pattern.

Understanding that all those utilizing MCL are women and that most of those electing PCL are also women highlights some gender-specific racial disparities that are well-documented in the service. Relative to the civilian labor force, black females are more represented in the Navy than black males; white males are more represented than white females (Council on Foreign Relations, 2020). Additionally, the 18-percentage point difference between MCL and SCL in the "Married or Widowed" variable reveals that relatively more single women have children than single men.

Lastly, the number of MCL and PCL observations diverges. Exactly 8,581 of the PCL observations are female; this leaves a total delta between MCL-takers (birthing parents who are all female-gendered) and female PCL-takers of 1,557 (10,138–8,581). The data reveals that 248 could be considered SCL-takers (SCL-takers who are female). Thus, 12.9 percent of women (1,309 observations) taking MCL appear to forgo any additional parental leave (PCL or SCL). One explanation for this discrepancy is again administrative: women have documented and correctly accounted for the MCL absence and continued with the additional six weeks of authorized PCL without administratively recording it.

Table 2. Military Characteristics at the Time of Parental Leave, by Leave Type, January 2019–December 26, 2022.

	MCL	PCL	SCL Total	SCL A 14-days	SCL B 21-days
Number of Leave Days	41.54	41.04		13.19	19.46
Military Spouse	39.6%	38.8%	9.2%	8.6%	11.1%
Navy Military Spouse	36.2%	35.6%	8.5%	7.9%	10.6%
Officer	15.6%	16.7%	19.2%	19.7%	17.7%
Enlisted	84.4%	83.3%	80.8%	80.3%	82.3%
Overseas Duty	4.4%	4.2%	8.1%	8.1%	8.0%
Sea Duty	21.4%	21.7%	44.8%	44.2%	46.9%
Shore Duty	78.6%	78.3%	55.2%	55.8%	53.1%
Percent of MCL Available Taken	98.9%				
Percent of PCL Available Taken		97.7%			
Percent of SCL Available Taken			93.8%		
Percent of 14-Day SCL Available Taken				94.2%	
Percent of 21-Day SCL Available Taken					92.7%
Observations	10,138	8,784	37,206	28,252	8,954

Mean values reported. The average number of leave days taken for all SCL leave occurrences was omitted as the authorized amount changed over the observation period.

Overall, most people take the majority of their available leave. The average uptake between the various leave types and policies ranges from 92.8 (SCL, 21-day policy) to 98.9 (MCL) percent. Even with only ten months of records after the SCL leave increase, uptake is only 1.5 percentage points lower under the 21-day policy than the 14-day policy (92.7 percent compared to 94.2 percent), which translates to 6.27 additional days taken. These patterns indicate a relatively quick acceptance of the new threshold. The 6.27 difference between these two calculations represents the additional

manpower loss, in days, for each authorized under the 21-day policy compared to the 14-day policy.

Over 39 percent of MCL-takers are half of a dual-military couple, most of whom are Navy-Navy pairings. This relationship translates to a potential maximum of 30 weeks (a combination of 18 and 12 weeks allotted) of unresourced workforce loss for the 3,671 Navy-Navy MCLs observed.

Surprisingly, 21.4 percent of MCL-takers (women) are on sea duty orders. This figure is significantly higher than anticipated. Only in exceptional circumstances would one transition from a shore billet to a sea billet after giving birth before executing the MCL. Navy policy only allows pregnant sailors to remain on sea duty through a waiver process; it is the exception rather than the rule (Naval Personnel Command, 2018). Furthermore, the Navy defers postpartum sailors from sea duty for a year following the birth (Naval Personnel Command, 2018). Due to the aforementioned administrative issues, I hypothesize that the sea-shore variable in the leave data set is inaccurate.

A. MATERNITY CONVALESCENT LEAVE

As noted, sailors take 98.9 percent of authorized MCL; the high uptake rate limited differentiation amongst different sub-groups. Figure 3 displays key patterns of groups of interest. All MCL-takers are female.

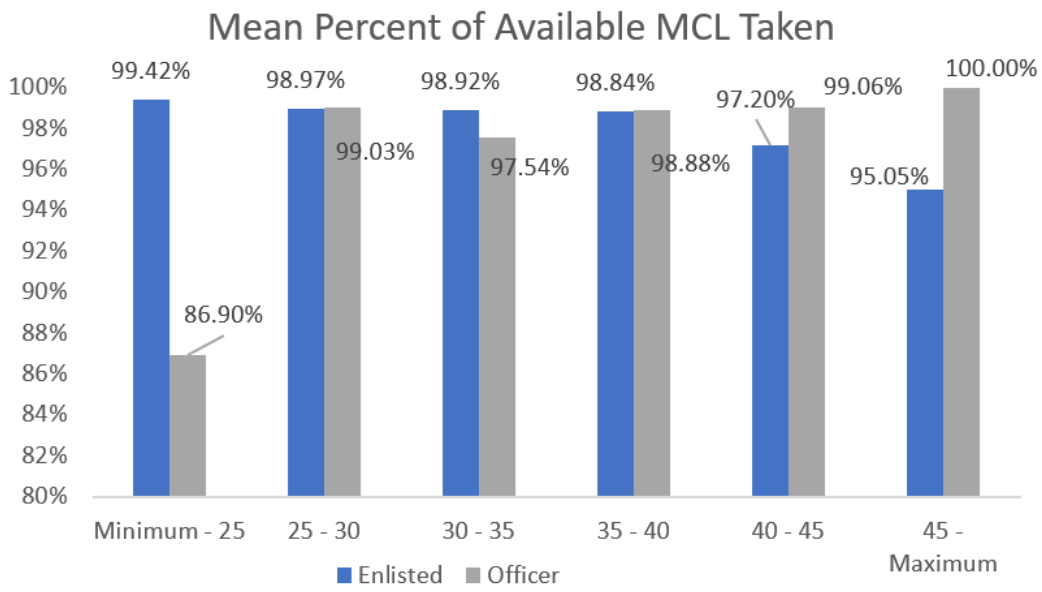


Figure 3. Age of Officers and Enlisted Sailors at the Time of MCL Execution, January 2019–December 26, 2022.

Young officers and older enlisted sailors are outliers; both cohorts have a low total number of observations (4 and 13, respectively). Ignoring the cohorts with a low number of observations, all groups take over 97.5 percent of offered MCL.

The average MCL uptake among officer designators varies little, with Dental Corps officers taking the least at 95.57 percent and miscellaneous Staff Corps officers taking the most at 99.97 percent. The enlisted communities' uptake patterns are even more homogenous than the officers, with a range of approximately 1.5 percentage points. No Special Warfare (Navy Seals or Special Warfare Combatant Craft Crewmen) took MCL during the observation period.

B. PRIMARY CAREGIVER LEAVE

PCL-takers are overwhelming females as we would expect. Of the 8,784 total, only 2.31 percent were male; they drive most of the uptake differentiation amongst the PCL-takers. Figure 4 presents the same demographics of interest as the MCL graph.

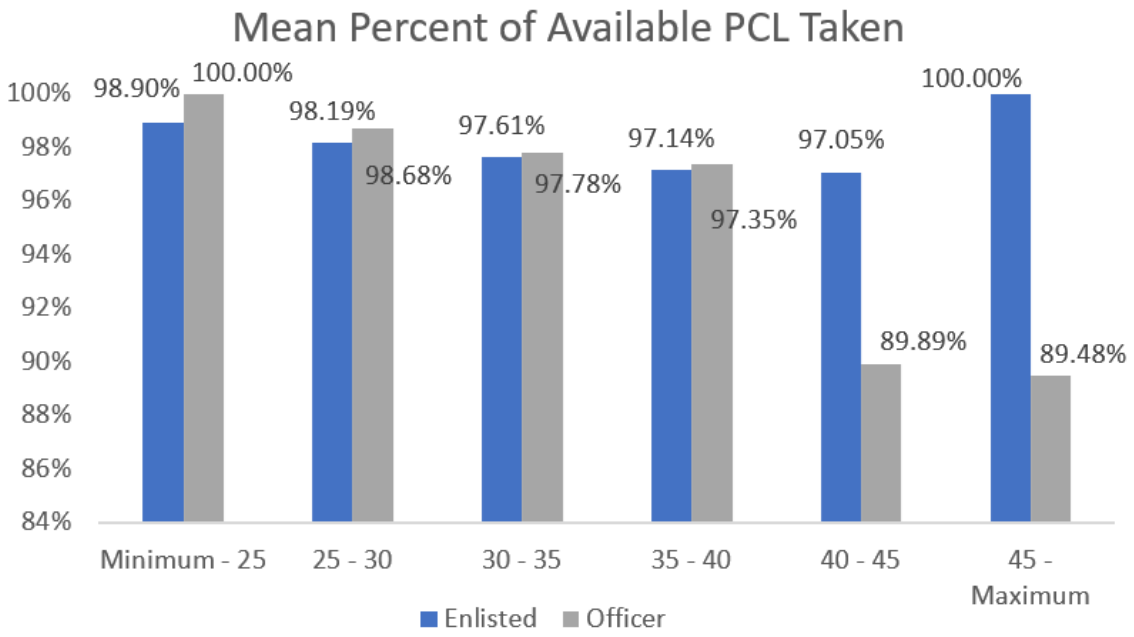


Figure 4. Age of Officers and Enlisted Sailors at the Time of PCL Execution, January 2019–December 26, 2022.

Differentiation in PCL uptake varies less than three percentage points except within the two eldest officer categories. These cohorts highly correlate with senior ranking officers, which may give insight into workplace culture expectations around parental leave amongst senior personnel.

Other cohorts of interest amongst PCL-takers include spousal status and occupational community. On average, females took the same amount of PCL regardless of if they were married to another active-duty Navy servicemember; in contrast, males married to Navy personnel took approximately ten percentage points more PCL.

I found mixed PCL utilization rates between junior and senior officers in different designators. I defined senior officers as O4 through O6; junior officers are O1–O3. Senior officers took relatively more if they were LDO/WO's, Dentists, Unrestricted Line (Aviation), or miscellaneous Staff designators; junior officers took more in the Restricted Line, Nurse Corps, Unrestricted Line, Medical Corps, and Medical Service Corps. The

officer corps with the most significant difference among seniority groups was the Medical Service Corps: junior officers took 12.5 percentage points more PCL than senior officers.

For the enlisted community analysis, I define junior enlisted as E1 through E6 and senior enlisted personnel as E7 through E9. On average, PCL uptake was higher in enlisted communities than officers and most enlisted communities saw higher uptake patterns among junior personnel. Only in the Nuclear and Surface communities did senior personnel utilize more PCL than junior personnel. Of note, the observation count for the Special Operations and Special Warfare communities, regardless of rank category, is small: only two in each.

C. SECONDARY CAREGIVER LEAVE

SCL-takers are overwhelmingly males; only 0.7 percent of the 37,203 SCL-takers are female. Overall, SCL leave uptake among cohorts of interest is the most varied of all the leave types. Figures 5 through 7 give an overall impression of the rate of SCL uptake averaged across both the 14- and 21-day policies. Figures 9 through 12 provide the reader with comparison graphs of uptake patterns between the two policies. Chosen graphs present demographics of interest: age, occupational community by relative rank, or officer status.

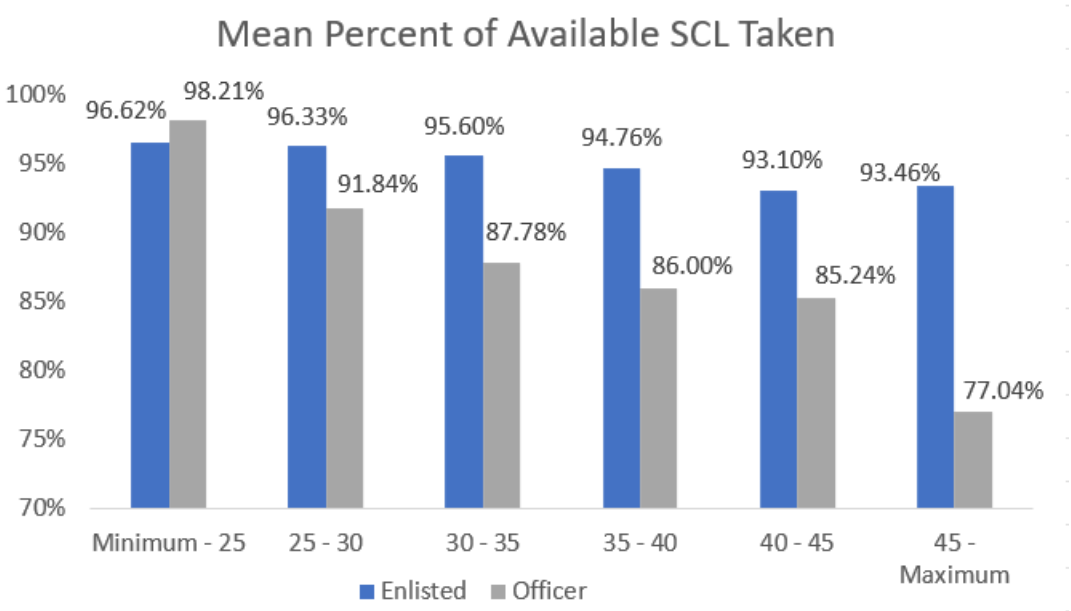
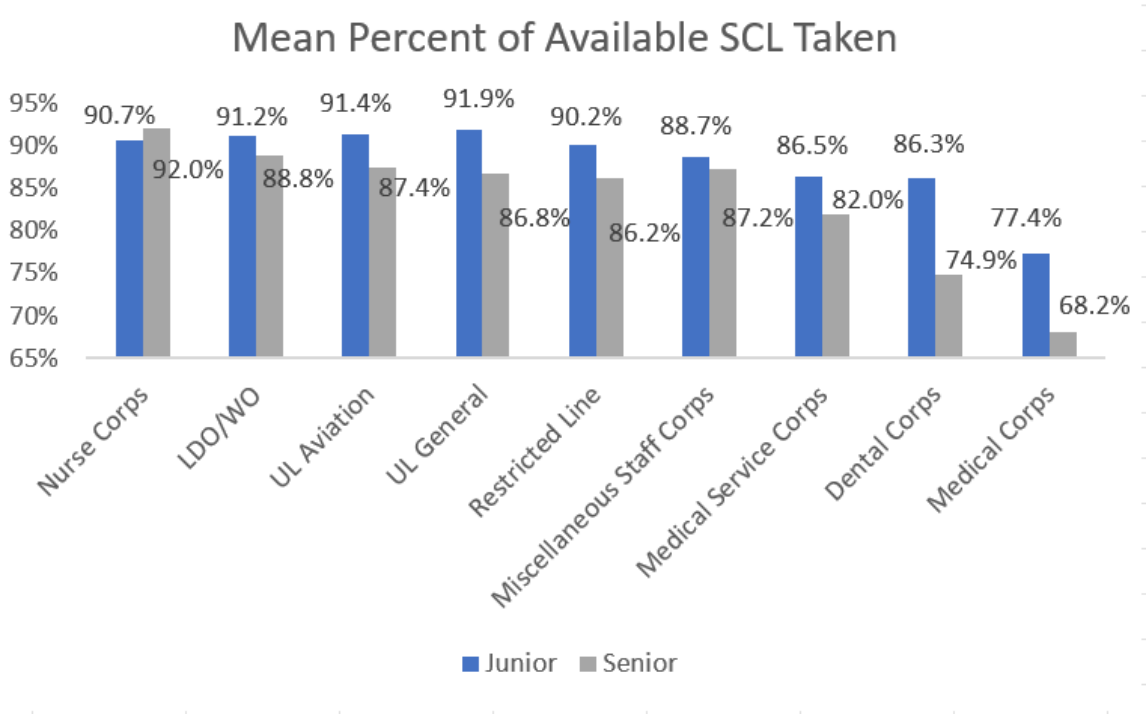


Figure 5. Age of Officers and Enlisted Sailors at Time of SCL Execution, Average of Combined Policies, January 2019–December 26, 2022.

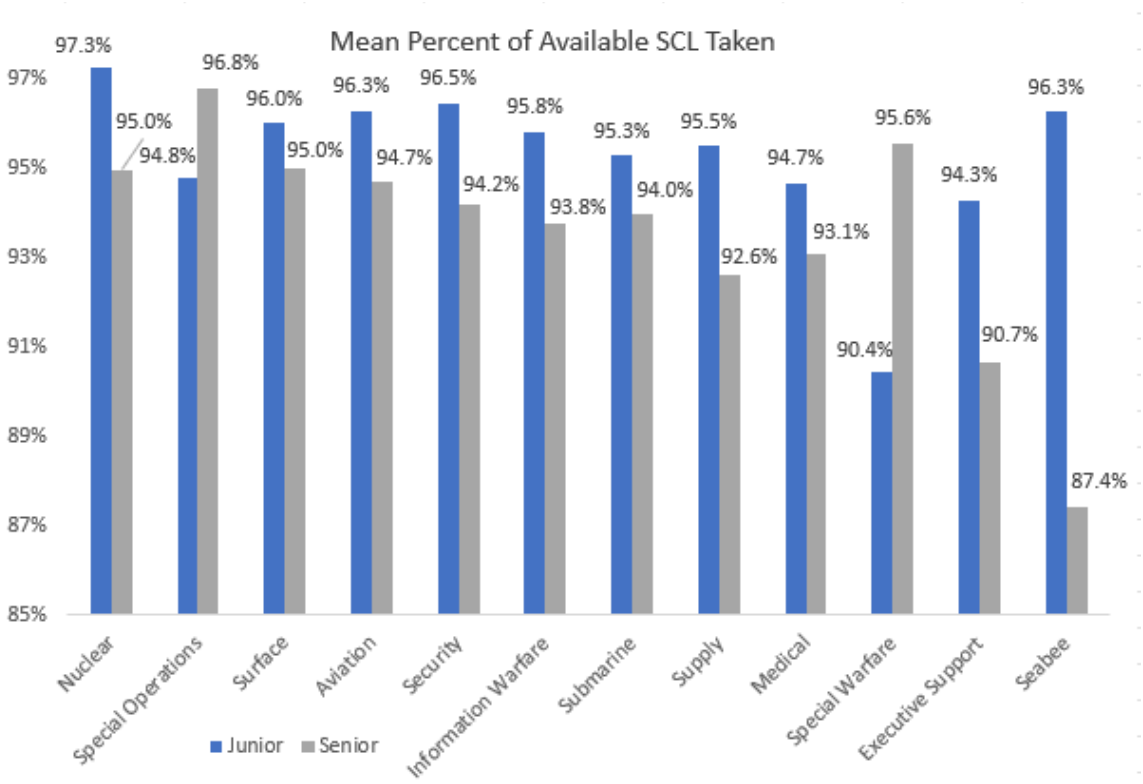
As shown in Figure 5, enlisted personnel take more SCL than officers; SCL rates generally decrease with increasing age. Enlisted personnel take between 93.1 and 96.6 percent of their SCL. In contrast, officers take between 77.0 and 98.2 percent of SCL with those above age 45 taking the least.



Junior officers are defined as O1–O3; senior officers are defined as O4–O6

Figure 6. Rank Group and Officer Corps at Time of SCL Execution, Average of Combined Policies, January 2019–December 26, 2022.

Of the officer communities, nurses have the highest uptake rate at 90.7 and 92.0 percent for junior and senior personnel, respectively; all the other medical communities range between 86.5 and 68.2 percent, the lowest of all the officer corps. I hypothesize workplace culture and the inherent nature of scheduling providers (physicians, dentists, and some MSC officers [audiologists, optometrists, for example]) versus nurses (shift work or office hours) contributes to the wide disparity in update patterns amongst the medical professionals. Additionally, Medical and Dental Corps officers often have long training pipelines (up to seven years for some residences or sub-specialties), which externally limit the amount of leave they can take. In all cases except the Nurse Corps, junior personnel utilize more SCL than seniors within the same profession, likely due to differing workplace expectations among mid- and senior-level officers.

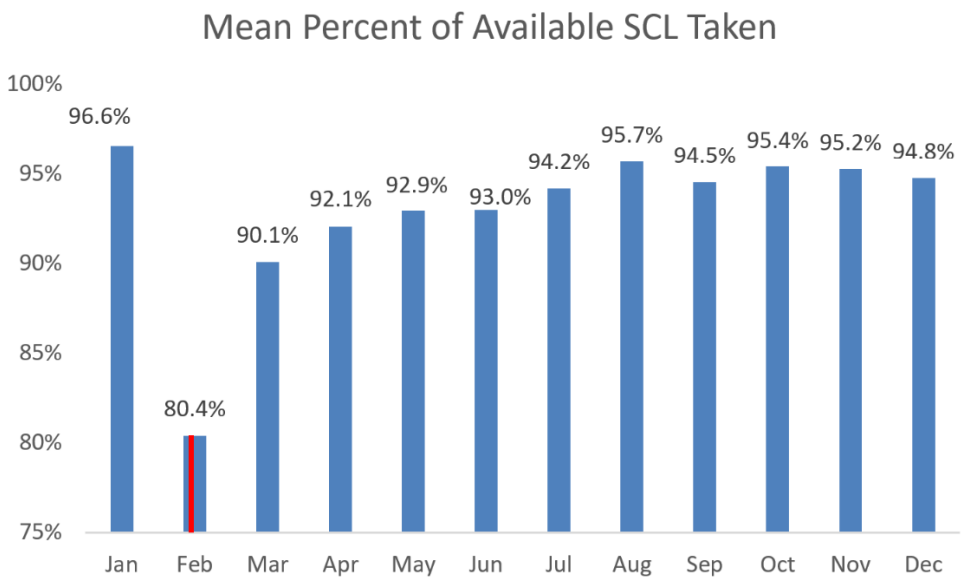


Junior enlisted are defined as E1–E6; senior enlisted are defined as E7–E9.

Figure 7. Rank Group and Enlisted Community at Time of SCL Execution, Average of Combined Policies, January 2019–December 26, 2022.

Enlisted communities (over 80 percent of the force) take more SCL than officers; additionally, I find less variation in uptake across occupations and between junior and senior personnel than officers.

The following four graphs, Figures 8 through 11, highlight the relative uptake patterns between the two SCL policies:1) 14 days maximum from January 2019 to February 10, 2022, and 2) 21 days maximum from February 11, 2022 to December 26, 2022. I exploit this policy increase in SCL to model the expected uptake pattern for the newest expansions of parental leave discussed in the following chapter.



The red line indicates a policy change from 14 days to 21 days of authorized SCL.

Figure 8. Mean Percent of Available SCL Taken, January 2022–December 26, 2022.

Expectedly, the SCL utilization rate dips during the month of policy roll-out; post-policy implementation, SCL usage increases each month, leveling off at about month six post-policy. In the final three months of observation, average SCL uptake is within 1.4 percentage points of previous levels.

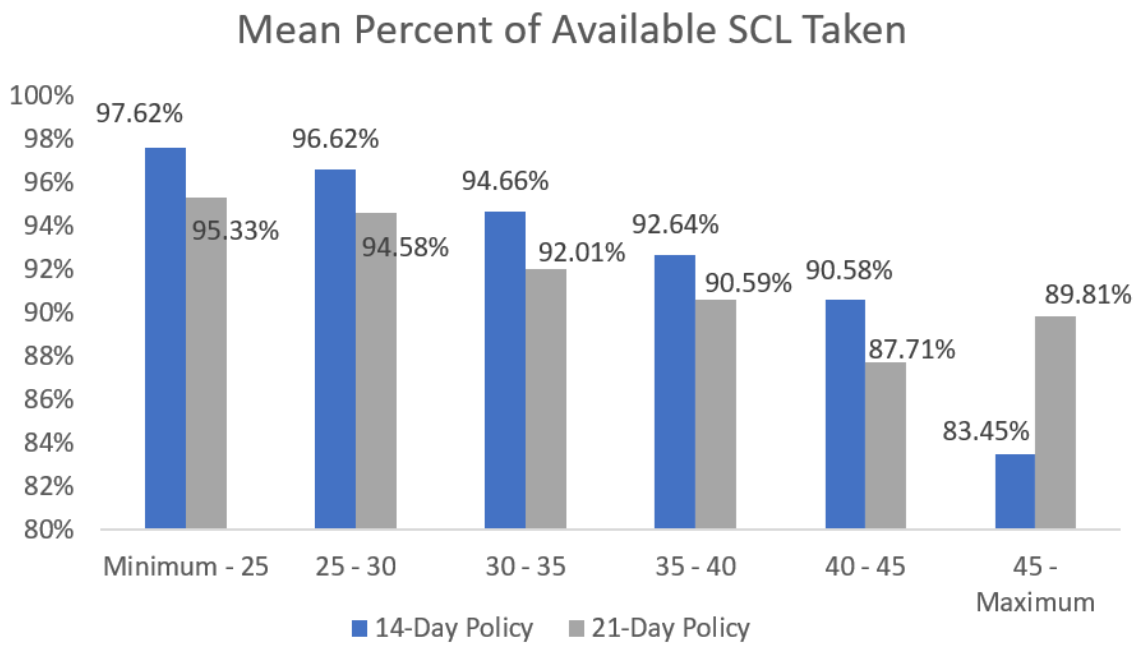


Figure 9. Age Group and SCL Policy Indicator at Time of SCL Execution, January 2019–December 26, 2022.

Interestingly, the oldest cohort (n=621) took a greater percentage of available SCL under the more liberal policy; all others took less, but only by two to three percentage points. When granted additional leave, SCL-takers approached the previous uptake levels within the first nine months of the policy. The pattern translates to a significantly increased absolute loss of person-days: the average number of SCL days used under the first policy was 13.19 compared to 19.47 under the 21-day policy.

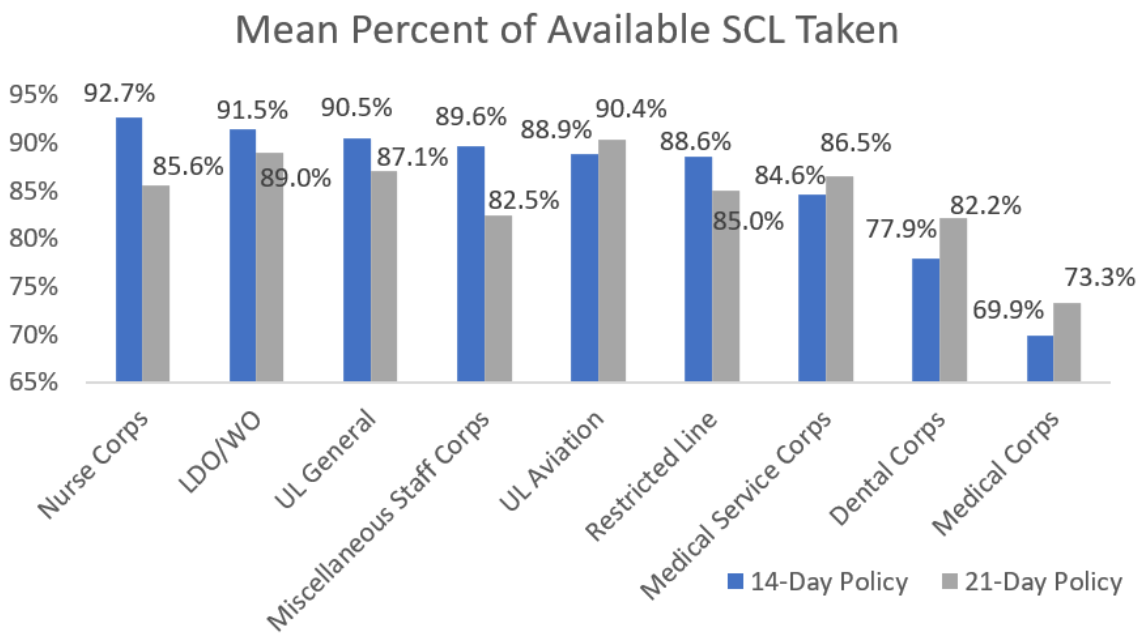


Figure 10. Officer Corps and SCL Policy Indicator at Time of SCL Execution, January 2019–December 26, 2022.

An interesting pattern emerged when comparing officer corps: those with the highest uptake levels (Nurse Corps, LDO/WO, Unrestricted Line, miscellaneous Staff Corps) took less percentage-wise under the 21-day policy; those with lower initial uptake levels (Restricted Line, MSC, Dental Corps, and Medical Corps), increased their uptake. Thus, increasing the total allowance of SCL had an equalizing effect amongst officer corps.

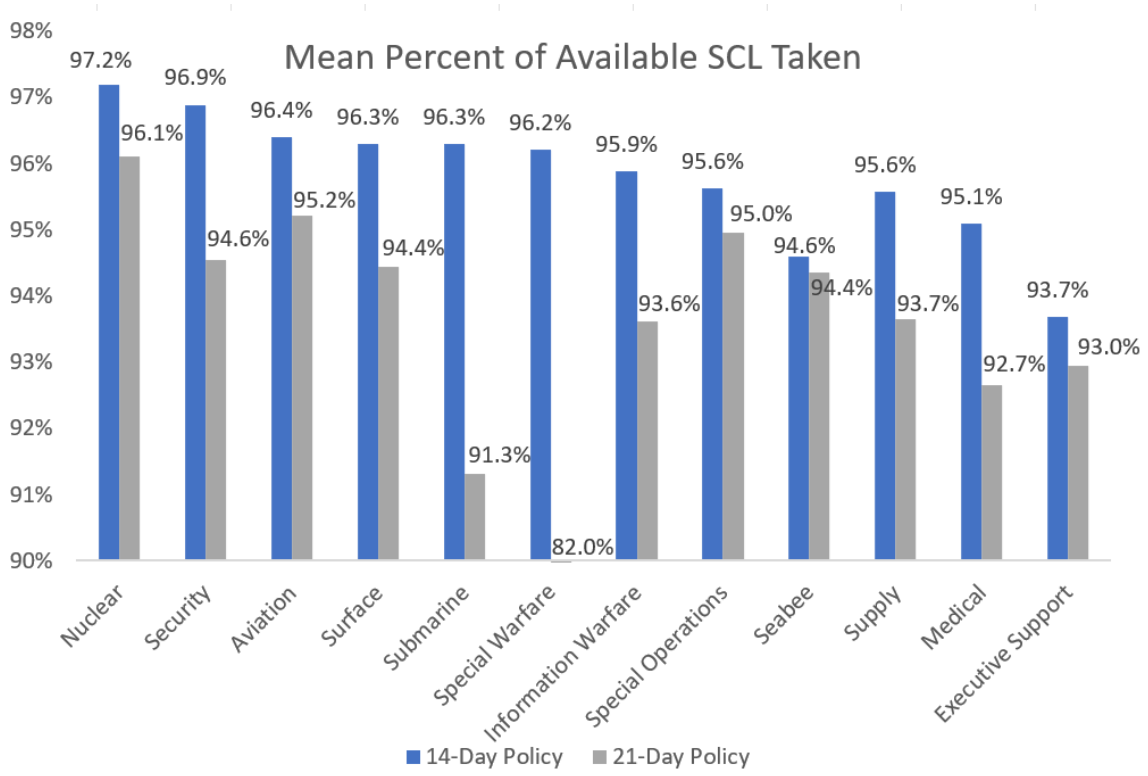


Figure 11. Enlisted Community and SCL Policy Indicator at Time of SCL Execution, January 2019–December 26, 2022.

Enlisted communities rebounded to near previous uptake levels within the nine-month observation period. Special Warfare is an outlier (n=71 under the 21-day policy).

As shown in this chapter, minimal differentiation in parental leave uptake rates exists across groups of interest for MCL and PCL-takers. Further, both groups come close to full utilization of the benefit (98.9 and 97.7 average percent utilization, respectively). More variation is noted amongst SCL-takers, though average utilization was still relatively high at 93.8 percent. SCL-takers were the only group which experienced a policy change; post-policy, the rate of uptake quickly rebounded to near previous levels. In the next chapter, I use the baseline insights and patterns gathered from this analysis to inform and develop my model and estimate the effect of further parental leave expansion.

VI. MODEL, ESTIMATION, AND LIMITATIONS

A. MODEL

I model the impact of the FY2022 NDAA Parental Leave Policy on the Navy Manpower System from the policy change captured in the leave dataset. For the model, I assumed: 1) all PCL-takers are provided six additional weeks (42 days), 2) SCL-takers are allotted either nine (63 days) or ten additional weeks (70 days) based on which SCL policy (14- or 21-days) presided, and 3) those who took no leave under the previous policies would also take no leave under the newest policy. I also assume no changes to the current uptake rate of MCL usage.

The leave data contains only one policy change: increasing SCL from 14 to 21 days, which affects SCs only. Exploiting this policy change allows me to infer uptake patterns for SCL-takers under another leave policy expansion. No similar opportunity exists for PC analysis. However, based on the literature review, I assume PCL-takers' (overwhelming females) uptake of the full quota of leave expansion would happen more quickly and completely than their male counterparts. Thus, applying the SCL uptake rates to PCL-takers represents a conservative estimate. Using the SC post-policy behavior, I calculate low, medium, and high uptake ranges per parental leave instance.

Using the model, I forecast the policy's increased manpower burden if it had been in place during the observation period: January 2019 through December 26, 2022. I offer low, medium, and high estimations. Finally, I compare this burden to the most recent allocation of manpower to the Individuals Account, highlighting the delta between the planned and the policy's newly exacted unplanned friction on the NMS.

Figure 8 provides a visual reference of the relatively quick uptake of parental leave under the 21-day policy. I use an average of the last three months of data (October through December) for the model (months eight through ten post-policy implementation). I used the new allotment's 10th percentile, mean, and complete uptake to establish low, medium, and high estimations. Table 3 summarizes the SCL uptake averages under the 21-day

policy from October through December 26, 2022. Of note, SCL-takers at the 25th percentile took the full allotment (2,173 of the 2,514 observations).

Table 3. Percentile Range of SCL Uptake, October 2022–December 2022, 21-Day Policy.

Percentiles	Proportion of SCL uptake	
1st%	0.190	
5th %	0.571	
10th %	**0.905**	
25th %	1.000	
Mean	**0.951**	**(0.158)**
Observations	2,514	

Standard deviation is provided in parentheses for the mean.

When granted additional fully-compensated parental leave, SCL-takers used what was available. Over 86 percent of them used all additional days. Even at the tenth percentile of uptake, SCL-takers took over 90 percent of the new allotment (6.34 days).

1. Low Uptake Model

Using the 10th percentile uptake proportion from Table 3, the increase in leave for PCL-takers is .905 * 42 days or 38.01 days per leave instance. The SCL-taker model varies depending on if the leave instance was under the 14- or 21-day policy. Those under the older, 14-day policy see a 70-day allotment increase. Those under the later policy see a 63-day increase. For the former, the rise in leave is .905 * 70 days or 63.35 days per leave instance; for the latter, it is .905 * 63 days or 57.02 days per leave occurrence.

2. Medium Uptake Model

Using the mean uptake proportion from Table 3, the increase in leave for PCL-takers is .951 * 42 days or 39.94 days per leave instance. The model for SCL-takers by the respective policy is .951 * 70 days or 66.57 days per leave instance and .951 * 63 days or 59.91 days per leave instance.

3. High Uptake Model

The high uptake model predicts full utilization of increased leave. This means all PCL-takers will take an additional 42 days. All SCL-takers under the 14-day policy will receive 70 days; all those under the 21-day policy take 63 days.

B. ESTIMATION

According to the model described previously, I created three new variables for each leave observation in my dataset corresponding with the absolute number of leave days taken for both PCL-takers and SCL-takers under each uptake projection-low, medium, and high. Table 4 provides a brief reference of the formula of these new variables (Low, Medium, and High) by leave type.

Table 4. Formulas for Models

			Low	Medium	High
PCL Model–42 Days	**Number of Leave Days Taken in Original Dataset**	+	38.01	39.94	42.00
SCL Model–14 Days		+	63.35	66.57	70.00
SCL Model–21 Days		+	57.02	59.91	63.00

The units for the low, medium, and high models are days.

Due to this high utilization rate, the low and high estimates only differ by approximately ten percent. Figures 12 and 13 display the average number of leave days utilized by leave type with the original data in grey and three forecasted models in blue.

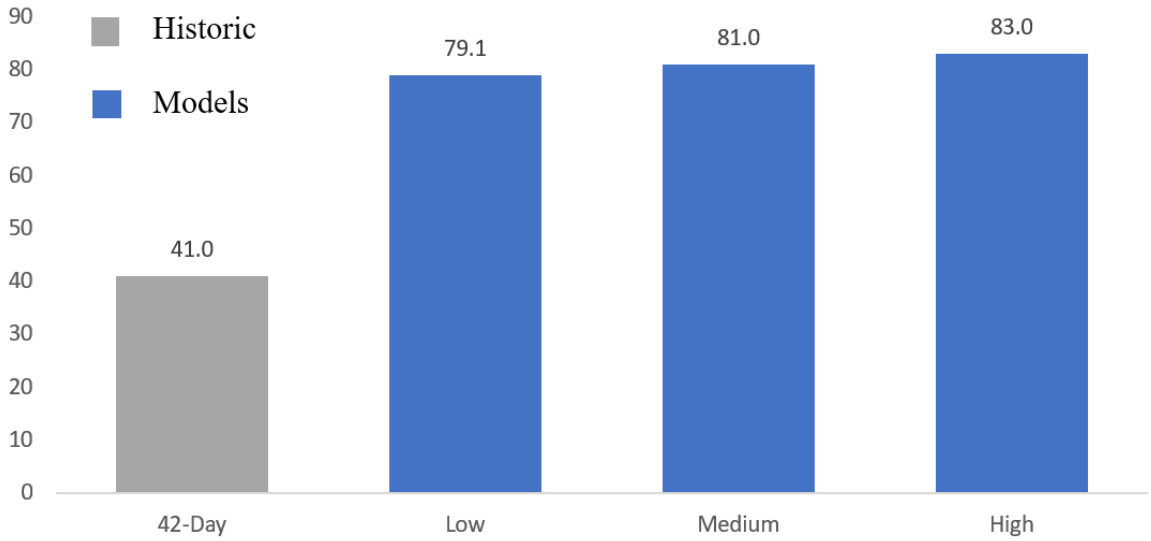


Figure 12. Mean PCL Days Used Per Leave Instance, Historic and Models-Low, Medium, and High.

PCL uptake basically doubles under all model estimates; even the low uptake model predicts an additional 38 days taken per PCL occurrence.

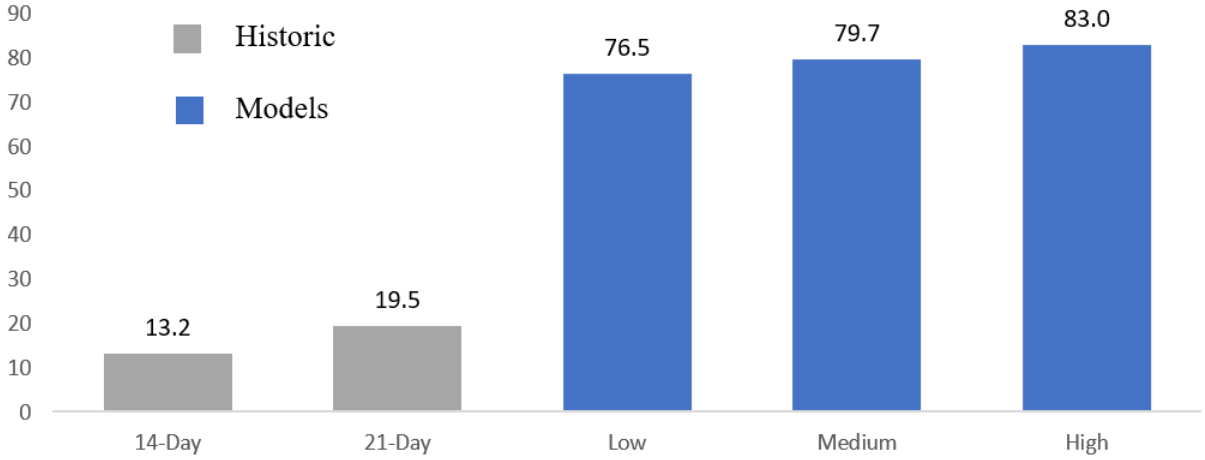


Figure 13. Mean SCL Days Used Per Leave Instance, Historic and Models-Low, Medium, and High.

Additional parental leave taken by SCL-takers increases four- or five-fold, depending on the baseline policy considered.

Tables 5 and 6 show the mean number of days taken per leave instance (PCL and SCL combined) by occupation compared to the medium-level uptake model. Over 80 percent of these observations are SCL-takers, so the historical averages skew towards those policy allotments (14 or 21 days). Combining both types of leave for the historical average columns highlights the impact of the FY 2022 NDAA parental expansion. The boost for previous SCL-takers is significant.

Table 5. Mean Number of Parental Leave Days Used by Officer Corps, Historic and Medium-Uptake Model Comparison.

	Historic	Medium-Uptake Model	Increase
Nurse Corps	30.2	80.3	50.1
Medical Service Corps	20.6	78.7	58.1
Dental Corps	18.7	78.2	59.5
Restricted Line	18.4	79.2	60.8
Miscellaneous Staff Corps	18.1	78.8	60.7
UL General	17.7	79.1	61.4
Medical Corps	16.8	76.8	60.0
LDO/WO	16.0	79.3	63.3
UL Aviation	15.3	79.0	63.7

The increase in leave per occurrence varies between 50.1 and 63.7 additional days amongst officer corps. Nurse Corps officers see the smallest boost by an eight-day margin; they were the highest utilizers under the historical policies. Unrestricted Line (Aviation) and LDO/WOs see the most considerable boost.

Table 6. Mean Number of Parental Leave Days Used by Enlisted Community, Historic and Medium-Uptake Model Comparison.

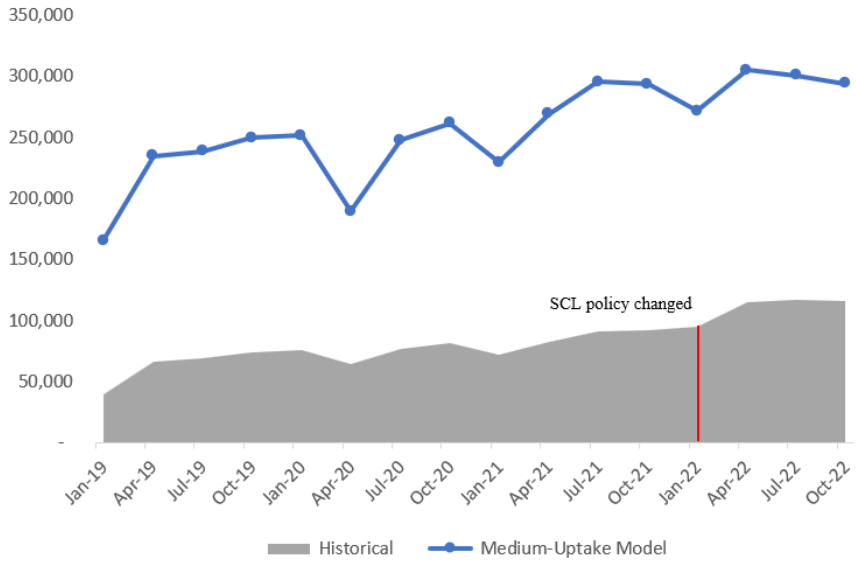
	Historic	Medium-Uptake Model	Increase
Executive Support	24.4	80.2	55.8
Supply	22.7	80.3	57.6
Medical	21.5	80.0	58.5
Surface	20.2	80.2	60.0
Information Warfare	20.1	80.1	60.0
Security	19.5	80.2	60.7
Aviation	19.5	80.3	60.8
Seabee	17.6	79.9	62.4
Nuclear	17.1	80.2	63.1
Submarine	15.8	79.8	64.0
Special Operations	15.0	80.0	65.0
Special Warfare	14.6	79.0	64.5

Overall, the delta between historical and medium-uptake projection is greater for enlisted sailors; they see increases between 55.8 and 64.5 days, depending on their respective communities.

Using historic uptake patterns, my models predict a significant unresourced burden to Navy manpower under the FY2022 NDAA parental leave expansion. Even the most conservative model estimates an extra 38.1 days for previous PCL-takers and 57 days for previous SLC-takers (using the 21-day policy as the SCL baseline). Again, these days are in addition to the previous MCL, PCL, & SCL allotments for parental leave (also unresourced).

My final figure presents the total burden to the NMS applied by the FY2022 NDAA parental leave policy compared to the previous guidelines. I impose my Medium-Uptake model on the January 2019–December 26, 2022 data. Figure 14 shows the total number of parental leave days taken according to the actual NSIPS data (including MCL) and the model estimate with the FY 2022 NDAA policy. MCL is included as part of the historical

and projected data, unchanged. These figures allow analysts and decision-makers to frame the new burden in the context of the previous strain already inherent in the NMS.



The red line indicates SCL policy change from 14 to 21 days.

Figure 14. The Sum of Parental Leave Days Utilized by Quarter, Historical and Medium-Uptake Model, January 2019–December 26, 2022

Historical parental leave days (grey area) increased markedly after the SCL policy change in February 2022. However, it appears to be growing even before that point. I considered a rise in end-strength (total number of ADSMs) or QBEs driving this trend. Unfortunately, I did not have access to birth records for this same period for a QBE analysis. However, official Navy end-strength by fiscal year is readily available from public sources: 336,985 in FY2019, 346,520 in FY2020, 348,359 in FY2021, and 346,920 in 2022 (Department of the Navy, 2021, 2023a). Total end-strength fluctuations do not correlate with the historical parental leave usage amounts. I hypothesize one of the driving factors in the upward trend of parental leave is that the documentation process becomes more complete and more accurate moving forward in time. Options for MCL, PCL, and SCL documentation first became available in September 2018, as noted in Chapter Three, but with limited administrative guardrails. The sharp increase noted in the first two quarters reinforces this hypothesis.

Regardless, the historical and projected models describe a meaningful, unfunded, NMS requirement. In the historical data's latest months, sailors utilize over 100,000 days of parental leave per quarter. The model predicts this amount will almost triple. Considerations for how this additional burden is absorbed are overdue. The following section will revisit the Individuals Account data and examine how my model's projection may impact the current NMS.

C. COMPARISON OF PARENTAL LEAVE AND INDIVIDUALS ACCOUNT

As described in previous chapters, the Navy Manpower System considers known friction within its framework. Notably, the Individuals Account captures active-duty sailors not occupying an afloat or shore billet (Rodney, 2017). The IA "transient" category is most akin to when sailors take parental leave. Table 7 shows the actual and estimated personnel in the IA account by type. I also include total end-strength.

Table 7. Active Military Manpower by Fiscal Year, 2018–2023.

Active Military Manpower in Units and Individuals Account			
Account	**FY18 Actual**	**FY19 Estimate**	**FY20 Estimate**
In Units (Afloat or Shore)	284,300	286,900	290,700
Transients	**9,900**	**11,200**	**10,800**
Trainees/Students	29,500	34,600	33,000
Patients/Prisoners/Holdees	1,600	1,700	1,600
Total End Strength	325,300	334,400	336,100
Account	**FY21 Actual**	**FY22 Estimate**	**FY23 Estimate**
In Units (Afloat or Shore)	297,913	297,526	295,931
Transients	**10,483**	**10,671**	**10,615**
Trainees/Students	33,477	33,318	33,828
Patients/Prisoners/Holdees	1,568	1,576	1,576
Total End Strength	343,441	343,091	341,950

Adapted from Defense Manpower Requirements Report Fiscal Year 2018 (2017), Defense Manpower Requirements Report Fiscal Year 2020 (2019), and Defense Manpower Profile Report Fiscal Year 2023 (2022). Reported numbers in fiscal years 2018 through 2020 were rounded to the nearest hundred.

Note that fiscal years 2018 and 2021 are actual data; the remaining years are projections based on the data available at the time of report publication. Table 7 shows in recent years, the Navy has budgeted for between 9,900 and 10,800 transient personnel; when viewed as a percentage of end-strength, this range is from 3.04 to 3.35.

To compare the budgeted transient amount to the unresourced parental leave projected, I had to convert parental leave into end-strength (man-years). I transformed parental leave days into end-strength by dividing it by 365.25. Figures 15 and 16 compare the medium-uptake parental leave model to the budget for transient personnel in absolute terms and as a percentage of total end-strength. Due to data constraints, I report parental leave over the calendar year (CY) and transient personnel by fiscal year (FY).

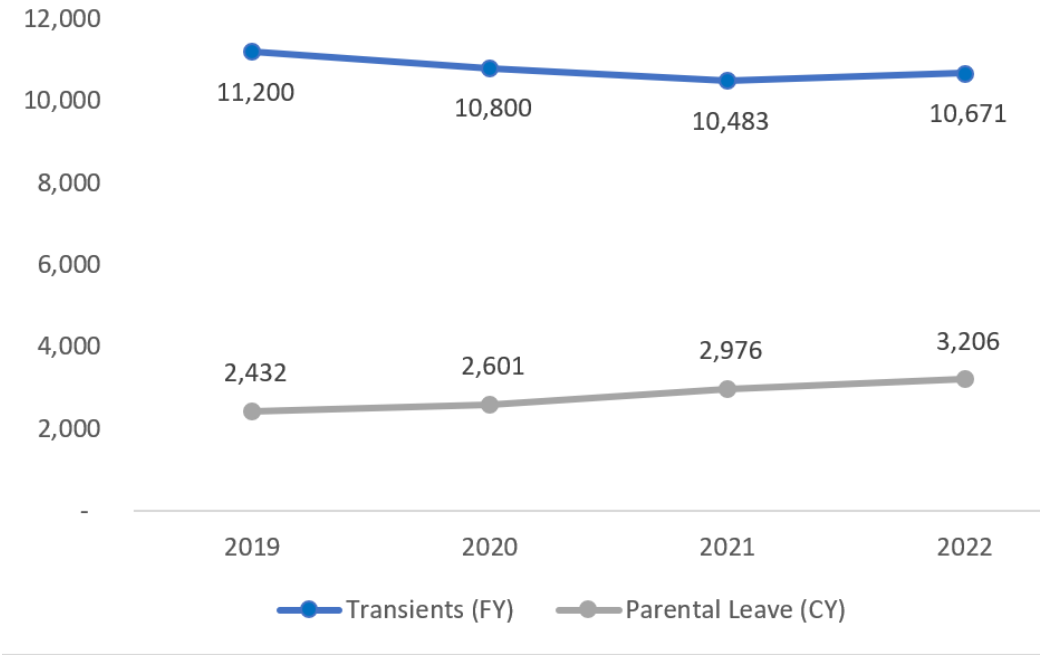


Figure 15. Comparison of Budgeted Transient Personnel and Medium-Uptake Parental Leave Model.

When compared to the NMS's budget for transient IA personnel, it becomes clear that the projected amount of parental leave under the NDAA FY 2022 mandate is not trivial. The parental leave burden is between 21 and 30 percent of the transient budget. An

additional 3,000 sailors (end-strength equivalents) could decrease the unfilled afloat billets by one-third (Mongilio, 2022).

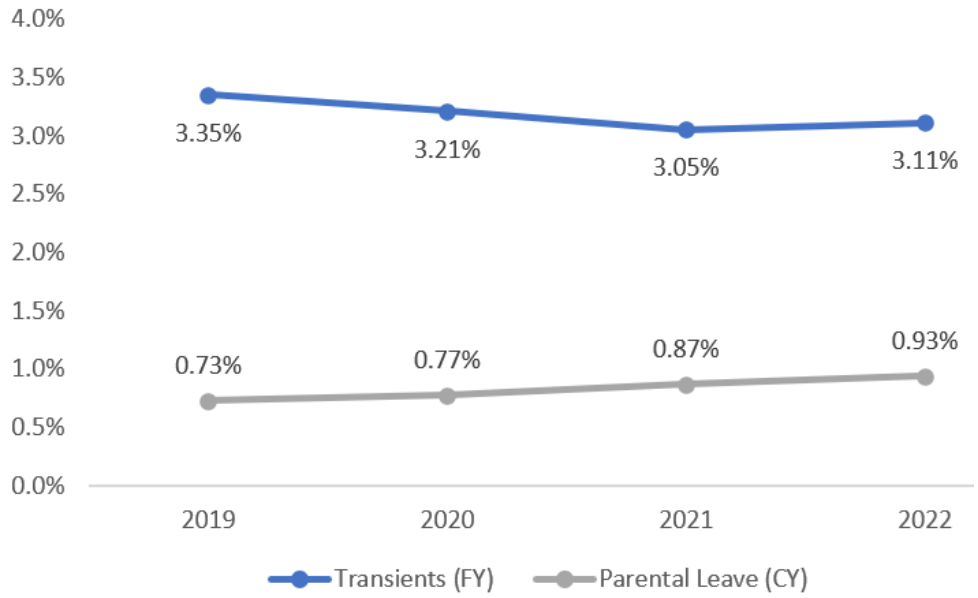


Figure 16. Comparison of Budgeted Transient Personnel and Medium-Uptake Parental Leave Model as a Percentage of Total End-Strength

When transient IA budget and modeled parental leave amounts are viewed as a percentage of end-strength, they are both relatively small. However, the current system acknowledges the importance of investing and funding the IA transient friction, even when representing only about three percent of total end-strength. My model predicts the new parental leave will approach a third of that amount.

D. LIMITATIONS

One of the most significant limitations of my research is the inability to ascertain and model those who did not take any parental leave. They are not captured in my leave dataset. Thus, my model treats these sailors as if they would also choose to take no parental leave. However, I believe their leave uptake pattern would change as the policy quadruples the absolute number of days available for over 80 percent of the force (previously SCL-takers) and, most importantly, increases the flexibility (the new policy allows leave to be

taken in one-week increments instead of one block and integrates a waiver process for extenuating circumstance). I anticipate these limitations cause the model to underrepresent the manpower burden.

Additionally, the lack of administrative guardrails on data entry for the data forced many assumptions in the analysis. For example, some observations documented 200 percent of the maximum available leave per regulation, males using MCL (reserved for birthing parents only), and several males using PCL even though the number of leave days utilized more closely aligned with the SCL-type leave. Additionally, in my prediction model, I assume 1) that all MCL- and PCL-takers are female and birthparents; 2) all SCL-takers are non-birthparents. Dual-military couples, male military members married with extraordinary QBE circumstances (severe medical issues for their partner or new infant), and birthing parents with a male gender marker defy these conventions. However, they represent tiny percentages of my studied population based on demographic characteristics. I also have concerns that the data underreported the actual burden of parental leave, especially at the beginning of the dataset, as sailors and administrators familiarized themselves with the 2018 policy change. Qualifying parental leave as convalescent leave or just simply not formally capturing it in NSIPS are the most likely lapses.

The change I observe in my data, SCL allotment increasing seven days, is relatively small compared to the new policy's expansion. Uptake patterns for this more expansive policy (42 and 63 days for SC and PC, respectively) may be more or less than my estimation, which I built on the more minor, incremental change.

I overlay my model on a historical dataset to estimate a policy impact. However, the Navy's manpower structure, end-strength, and occupational mix are dynamic. Also, national fertility rates are decreasing while, at the same time, cultural expectations around parenting roles are changing. My model does not consider how these trends would impact the overall manpower burden exacted by the FY2022 NDAA Parental Leave Policy.

In Section C of this chapter, I consider the person-days lost to the NMS as a fungible resource, meaning the additional leave days correspond to direct billet or productivity loss. In reality, this duality is more nuanced. One day of parental leave does not necessarily

equal one lost day of productivity. Long absences at individual work centers, whether for medical issues, deployments, or gapped billets, are mitigated through various fixes. Work centers will figure out how to "do more with less." Supervisors, peers, and subordinates will continue the essential mission by picking up the slack: staying a bit later, coming in early, or dropping some non-essential work temporarily. Commands may request cross-support for some specialized occupations, but that is the exception rather than the rule. Cross-support requests function as a "robbing Peter to pay Paul" solution, though the supporting command may be better positioned to support the absence (larger workforce, specialist redundancy). However, extending parental leave so drastically will force more scrutiny of this balancing act.

Lastly, my data observation period does not contain a policy change for primary caregivers (females), limiting my ability to examine pre- and post-policy uptake patterns for this cohort. The Navy's force demographic somewhat minimized this effect: less than 19 percent of the Navy active-duty servicemembers were PCL-takers. Further, PCL-takers received less parental leave boost than SCL-takers, 42 days and 63 days, respectively. Additionally, the model assumes PCL-takers (overwhelmingly females) follow the same uptake patterns as SCL-takers (overwhelmingly males), with an average usage of 95.1 percent of the total available parental leave (as shown in Table 3). Bacolod et al. examined USMC female maternity leave uptake during a temporary increase to 18 weeks in 2015–2016 (2022). They found when leave increased from six to 18 weeks, the average uptake of the new 18-week policy was 95.7 percent. Females in the USMC are admittedly different than those in the Navy, and the overall leave schemes are dissimilar; however, these averages are within one percentage point of each other, giving credence to my model's framework. Using the more conservative SCL uptake pattern underestimates the policy's effect on PCL-takers (majority of females). Considering all the limitations, I believe my model's uptake patterns projected per QBE (low, average, high) likely underestimate the effect.

VII. RECOMMENDATIONS

Congress sees their authorization of leave expansion for new parents as "a matter of military readiness and national security" ("Bipartisan, Bicameral Group of Members Urge Department of Defense to Follow Congressional Intent and Provide Equal Access to Parental Leave," 2022) and a way to address morale, recruitment, equity, and retention. These assessments may very well be valid. However, not considering nor allocating additional resources to address the operational-level impacts of the policy constraints its potential. Dissent among those left to pick up the slack, work center disruption, and risk to the mission will further strain the Navy Manpower System and are potential unintended consequences. Congress should consider budgeting, at least incrementally, for this additional requirement in future iterations of the NDAA. Analysts could easily forecast and incorporate the gap during end-strength planning, similar to how they manage the Individuals Account. Funding the policy, at least partially, is Congress's most direct way to address the unresourced manpower burden and will underscore the policy's importance.

Backfilling parental leave absences with Navy reservist support is an option. However, covering the entire 12-to-18-week absence would require discretionary funding (coming from the supported commands' coffers) and is intended to support an unplanned manpower requirement (Navy Personnel Command, n.d.). Additionally, coverage of this nature is expensive and redirects resources from other needs; in our current resource-constrained environment, it is not a scalable option. Syncing reservists' Annual Training (AT) requirements (12-to-14-day activations) to cover parental leave gaps would be ideal. Each Navy reservist is required to complete this training yearly, and it is paid for with entitlement or programmed funding (non-discretionary) ("TNR Almanac," 2021). Utilizing reservist AT stints serves a two-fold purpose: 1) mitigating the unresourced parental leave gaps, and 2) refreshing or enhancing a reservist's skills in an actual active-duty billet. Utilizing AT support is not a panacea, however. At best, 14 days is 17 percent of the parental leave allowance; additionally, this number ignores the onboarding and offboarding administrative requirements and assumes perfect timing of support.

The immediate post-policy period promises a rich environment for program evaluation. Analysts should measure actual leave usage with a focus on disparate uptake rates among cohorts of interest (occupations, age groups, sea duty status, for example) and consequential impacts on mission or operations. Recruitment and retention effects must be estimated and monitored for their mitigation potential. For example, significant improvements in retention will counteract the manpower loss due to the reduced churn associated with onboarding and training sailors. Cyclical or seasonal uptake analysis is imperative as ADSMs now have increased flexibility regarding the timing of parental leave. Researchers may see increased usage during the summer or the holiday season.

However, data accuracy and interpretation issues inherent to the current electronic leave management system will hamstring robust research potential. Administrative guardrails should be incorporated into NSIPS. For example, a sailor should not be able to record taking over 100 percent of the authorized leave. Only those giving birth should access birth-specific convalescent leave. Most importantly, NSIPS should require linking each parental leave instance (including convalescence) with the relevant QBE to capitalize on research capability. Because of the new policy's flexibility, incremental usage, and waivable circumstances extending use beyond a year, researchers will have difficulty connecting leave periods to the correct QBE. Sailors with multiple QBEs in close intervals will exacerbate this problem. Additionally, formal documentation of forfeited parental leave would be helpful.

Lastly, Navy leadership should seek to understand the policy's immediate, second, and third-order effects. Are local leaders forced to ration parental leave due to mission requirements? If so, how frequently, and has it affected morale? How are decision-makers ensuring equitable access to parental leave? Do sailors report the inequitable distribution of leave? Are sailors considering delaying QBEs until a shore duty tour, when they are more likely to receive the full quota? Has increased parental leave improved their life-work balance? Analysts must assess and consider these second and third-order effects; the ideal and natural mechanism would be to incorporate pertinent questions into the annual Health of the Force Survey, which focuses on sailor well-being and life-work balance, among other factors (Department of the Navy, 2023b).

Expanding parental leave reinforces the Navy's commitment to attracting, developing, and investing in its most valuable resource: its people. Notably, the policy values all parents equally and normalizes same-sex partnerships. Our all-volunteer military service competes with a robust civilian labor market, including federal workers with similar benefits. Such sweeping policy change, though forward-thinking, has the potential to be disruptive and deserves ongoing observation and analysis.

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