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Impacts of Participating in the Australian Defence Force Cadets

March 2022

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Prepared for the Naval Postgraduate School, Monterey, CA 93943

ACQUISITION RESEARCH PROGRAM
DEPARTMENT OF DEFENSE MANAGEMENT
NAVAL POSTGRADUATE SCHOOL

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ABSTRACT

Australian Defence Force (ADF) cadet programs create awareness of the ADF and ADF careers among young people. In doing so, ADF cadets informally provide the ADF with recruiting efficiencies for cultivating and converting interest in the ADF into enlistments. But recruiters must assign weight to participation in a cadet program when making suitability assessments. The value of participating in a cadet program, therefore, requires definition. As little is understood regarding cadet behaviors once they enter full-time service, to bridge the gap our research uses Kaplan-Meier survival analysis, linear probability models, and logistic regressions to compare the retention and performance behaviors of former cadets against non-cadets. We find that cadet participation is not a consistent signal that recruiters should apply as universally positive when making selection decisions. Our research into the ADF cadets is the first of its kind for Australia and could inform ADF recruiting policy in terms of how to weight ADF cadet participation when assessing preparedness and suitability for service in the ADF.

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This thesis marks the end of a difficult but enjoyable period of my life. Working online from my home in Australia for the first nine months saw me attending classes remotely during the night, but being able to take my children to school in the morning and at home enough to finally show my wife, Rebekah, the support I've always promised. This made my moving to California and leaving Rebekah, Matthew, and Alice for over 12 months even more difficult, for which Rebekah bore the brunt. I am eternally grateful for her ongoing support when she had so little capacity to offer it, working full-time and effectively as a single parent all during a pandemic. I am very thankful to my parents, Diane and Brian, and Rebekah's mum, Karen, for supporting my family through this rough time. I am also grateful to my classmates who adopted me into their families during my time overseas. Finally, I am eternally thankful to Maxim Massenkoff and Yu-Chu Shen: both excellent instructors and thesis advisors.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAC	Australian Army Cadets
AAFC	Australian Air Force Cadets
ADF	Australian Defence Force
ADFA	Australian Defence Force Academy
ANC	Australian Navy Cadets
ASCS	Australian Service Cadet Scheme
ATC	Air Training Corps
BR	Bishop Report
CBA	Cost-Benefit Analysis
CMCC	Commonwealth Military Cadet Corps
CMF	Commonwealth Military Forces
DFR	Defence Force Recruiting
FVEY	Five Eyes
IMPS	Initial Minim Period of Service
JROTC	Junior Reserve Officers' Training Corps
KM	Kaplan-Meier
LPM	Linear Probability Model
LR	Logistic Regression Model
MLPM	Many Linear Probability Models
RAAF	Royal Australian Air Force
YOS	Years of Service

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I. INTRODUCTION

A. INTRODUCTION

The Australian Defence Force (ADF) administers and delivers several youth development programs. Principal among them is the ADF Cadets, which it delivers in cooperation with the Australian community (Department of Defence, 2020a, p. 122). Through three service-aligned programs, ADF Cadet programs aim to develop participants' capacity to contribute to society and generate interest in ADF careers, not prepare participants for military service (Australian Government, 2019, p. 5). Regardless of whether participants join the ADF when age-eligible, the ADF, and Australians in generals, benefit from the programs. For instance, cadet units provide the only visible ADF presence in many regions within Australia (Rohan-Jones, 2007, p. 21). So, while programs create benefits at the individual level and within the local community, the ADF also benefits by maintaining a cost-effective presence in geographical areas where it could not otherwise provide a full-time presence, further supporting recruiting in those areas. Cadet units also host a higher concentration of young people already considering the ADF as a career option. Informally, Cadet units are a spotlight; illuminating those more likely to be responsive to recruiting effort.

The recruiting efficiencies that the programs provide to Defence Force Recruiting (DFR) are amongst the most apparent benefits to the ADF; however, we expect that participation in a Cadet program offers more subtle and valuable information for assessing preparedness and suitability for service in the ADF. This study aims to explore the links between participating in ADF Cadet programs and other in-service behaviors once members have joined the full-time ADF. Such behaviors include retention, separation during training, separation for negative reasons, and attaining rank milestones. While the ADF has previously explored these behaviors amongst former cadets, this study represents the first empirical investigation.

Independent studies indicate that institutional alignment—that is, the congruence of personal interest and values with the values and culture of an organization—is key to an

individual's expectations for longer periods of service in the ADF (McCallister, 1995). For a young person in Australia, other than participating in a Cadet program, very few youth-activity options provide tangible signals that suggest alignment to Defence's values. But while Cadet participation may be indicative of such alignment, it may not be indicative of preparedness for service. Alternatively, it could be. Therefore, we aim to identify how the ADF should interpret the cadet participation signal.

Because young people who choose to join ADF Cadets may have a higher propensity to join the ADF independent of the merits of the Cadet program, it is not possible to attest to program value or quality in this research. Alternatively, our research aims to identify the risks and opportunities associated with recruiting those who participated in Cadets; to improve hiring and personnel management policy in the ADF.

B. PROBLEM STATEMENT

ADF Cadet programs create awareness of the ADF and ADF careers amongst young people in Australia. In doing so, ADF Cadets informally provide the ADF with recruiting efficiencies for cultivating and converting interest in the ADF into enlistments (Australian Government, 2019, p. 9). But recruiters must also assign weight to participation in a Cadet program when making suitability assessments. The value of participating in a Cadet program, therefore, requires definition.

C. RESEARCH QUESTIONS

Our primary question is: What impact does participation in an ADF Cadet program have on retention? This question extends to how retention differs by gender.

Our secondary questions include:

- Does participating in an ADF Cadet program change the likelihood of an enlistee's success during initial training?
- Does participating in an ADF Cadet program change the likelihood of a service member being involuntarily separated for negative reasons?

- Does participating in an ADF Cadet program change the likelihood of a service member's promotion to key ranks?

D. THESIS ORGANIZATION

The remainder of the thesis proceeds as follows. In Chapter II, we will provide the context to our research. Here we will discuss the institutional background to the ADF Cadets and summarize the existing literature. In Chapter III we will discuss the data used to explore our research questions before describing our analytical methodology and findings in Chapter IV. Finally, in Chapter V, we will discuss the implications of our findings and provide recommendations.

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II. BACKGROUND

A. INSTITUTIONAL BACKGROUND

The ADF Cadets has a history dating back to the 1850s. For many decades, the curriculum and activities centered around military skills consistent with a land force (Stockings, 2007, pp. 7, 11). As Army Cadet organizations matured and iterated alongside the political and social environment, other service-aligned cadet schemes emerged. This section describes the modern purpose of ADF Cadets, units and participation, and the recruiting of cadets into full-time military service.

1. Modern Purpose

The modern ADF Cadets comprises three service-aligned organizations (Navy, Army, and Air Force) that provide personal development programs for young people between 12.5 and 18 years of age. The three organizations use a service-specific curriculum to elicit interest in the ADF, develop a sense of community amongst participants, and generate interest for careers in the ADF (Department of Defence, 2020a, p. 122). While the ADF delivers enterprise leadership, resources, and equipment, and periodically assigns members to support unit activities, typically adults within the local community don uniforms to provide the week-to-week leadership, instruction, and administration for the 584 ADF Cadet units across the country. There is no requirement for staff to have prior military service, and neither cadets nor staff become members of the ADF by virtue of their involvement (Defence Act 1903, 2021, p. 124).

In their earliest form, Cadet units were entirely school-based, yet were considered able to provide legitimate military utility in times of crisis. Changes in the social landscape caused the abandonment of this position. Of note, the legal context in which Cadet programs now operate has matured. As signatories to the Optional Protocols to the Convention on the Rights of the Child, which protects against use of child soldiers, Australia restricts the activities that ADF Cadets may conduct. For instance, activities are to be only military-like in nature without any operational context. Approved activities may include wearing a uniform, participating in ceremonial parades, exposure to hierarchical

organizational structures, first-aid training, and rifle shooting that is both voluntary and consistent with civilian regulations. Organizers of ADF Cadets activities are prohibited from conducting military training that would equip participants with offensive or defensive capabilities. This eliminates any activity where real or simulated use of force may be used against another human in order to gain dominance over them (Australian Government, 2019, pp. 6–7).

2. Units and Participation

There are currently 28,029 participants across the three organizations, serving in both school- and community-based units. The Australian Navy Cadets (ANC) represents the smallest organization, with 2,245 participants across 84 units and nine headquarters. ANC participation had been on a decline between 2015 to 2020; however, since 2020, it has grown by 1.15% (Department of Defence, 2021, p. 8). ANC participation currently includes 726 females. As the smallest of the Cadet organizations, this translates to the ANC hosting the highest percentage of females at 32.91% (Department of Defence, 2021, p. 12).

The Australian Air Force Cadets (AAFC) is the second-largest organization, with 7,478 participants across 145 units and 46 headquarters. The AAFC has enjoyed steady growth over the last ten years; yet 2020 to 2021 saw a 14.41% reduction in participation (Department of Defence, 2021, p. 8). The 1,959 female participants make up 25.44% of the total AAFC participants (Department of Defence, 2021, p. 12).

Finally, the largest organization is the Australian Army Cadets (AAC), which hosts 18,306 participants across 349 units and 51 headquarters. This organization has the smallest percentage representation of females at 24.43%. Yet at 4,472 total, the AAC hosts greater than 2,500 more females than the AAFC. Overall the AAC has enjoyed 3–4% growth each year since 2017 (Department of Defence, 2021, pp. 8, 12).

3. Translating Cadet Participation to Recruitment

Rather than actively preparing participants for military service, modern ADF Cadets is deliberate when communicating its intention to merely generate awareness in ADF careers. As a result, ADF Recruiting (DFR) is also deliberate in recognizing that

participation in ADF Cadets is only one of many indicators when it considers applications. Further, DFR promotes that Cadet units provide only a slightly more concentrated pool of recruitable Australians when compared to any other corners of Australian society (Hoglin, 2018, pp. 1–2). Nevertheless, cadets have a greater propensity to apply for service in the ADF compared to non-cadets.

Recruitment through DFR consists of three holistic milestones: inquiry, application, and enlistment. Those with Cadet program experience have demonstrated a higher conversion rate for transitioning through each milestone. It takes an average of 3.4 applications to generate a single enlistment from those with experience in the program, while it takes an average of 3.6 applications to generate a single enlistment from their non-cadet peers (Bishop, 2004, p. 16). While this difference may appear minuscule, efficiency occurs between the first and second of the milestones. Generating those 3.4 applications from former cadets takes about 7.7 inquiries to DFR. This is compared to the 18.6 inquiries from non-cadets to garner the 3.6 applications for one enlistment (Bishop, 2004, pp. 16–17). In short, cadets are seemingly more likely to make DFR inquires and attend an assessment day, but once assessed, enlistment and appointment efficiencies are only slight thereafter (Bishop, 2014, p. 10).

Between 2004 and 2013, 13.2% of all ADF-entrants were cadets (Bishop, 2014, p. 14). By gender, 14% of all male-entrants and 8.2% of all female-entrants had previously participated in a Cadet program.

4. Conclusion

This institutional background has discussed the modern purpose of ADF Cadets as a youth develop program—rather than preparing participants for military service—the organizational composition of the program, and the recruiting behaviors related to program participants. Throughout our investigation, we explore whether participation in ADF Cadets is indicative of other behaviors. A brief history of the ADF Cadet program is also provided at Appendix 1.

B. LITERATURE REVIEW

There is little academic research into the Cadets program within Australia. This also appears to be the case for similar youth development programs within the Five Eyes (FVEY) community. For what does exist, we can explore via national lenses. In this section we aim to demonstrate the boundaries of the existing literature on Cadet programs.

1. Australia

Australia's only specific study into the modern ADF Cadets is captured in the Bishop Reports (BR). Across four publications, the BRs condense descriptive information regarding the composition of the ADF and ADF Cadets from 1999 through 2019 to develop human resourcing insights as they apply to the permanent forces and the Department of Defence. Starting with BR1 in 2004, subsequent publications summarize and build upon the previous ones, and their conclusions mature, but so does the purpose of the documents. Initially, BR1 intended to simply examine "the existing information available on ADF Cadets entering Defence" (Bishop, 2004, p. 1). By 2007, under BR2, the overall intent had expanded to include identifying "evidence to demonstrate the value of ADF Cadets to Defence" (Rohan-Jones, 2007, p. 1). Information sources vary across and within publications depending on data availability and the focus of each chapter. The ADF Census, the ADF Cadet Census, and information from DFR are, however, the most consistent primary sources.

Using Census data presents several issues that limit BR findings. First, individuals were not tracked over time. Therefore, changes in many behaviors are limited to simple differences between the current and preceding census results, which are in aggregate and five years apart. Likewise, respondents' understanding of the questions limits findings, as was the case in the 2003 census. Questions about Cadet program participation were more detailed and ambiguous than in other years, limiting the reliability of BR1 and BR2 findings, which both use the 2003 data. Furthermore, the ADF census is voluntary, creating self-selection issues and general inconsistencies as ongoing self-reporting is required. Finally, as echoed in all four publications as a minor consideration due to anonymous participation in the ADF census, "Defence personnel may avoid reporting their ADF Cadet

experience due to the perception that such an experience may lead to discrimination" (Bishop, 2019, p. 3). Hence, some individuals may choose not to report their involvement in ADF Cadets.

In terms of our research questions, BR1, BR3, and BR4 use the proportions of former cadets at each rank band to make retention inferences for the permanent ADF. As each publication reports rank groupings slightly differently, we can summarize findings as showing the proportion of former cadets increases with each increase in rank-banding. For instance, of those who responded to the 2011 census, 20% of senior enlisted respondents had participated in ADF Cadets, compared to 28% of junior officer respondents and 31% of senior officer respondents (Bishop, 2014, p. 32). As attaining senior ranks requires extended service periods, the publications infer that having a higher proportion of cadets at senior levels indicates that cadets must remain in service for longer periods and are more likely to promote (Bishop, 2004, p. 30). While this may be the case, we assess that these findings may instead suggest that retention is higher amongst higher-performing cadets rather than cadets in general, which is the same behavior we would expect from non-cadets. Alternatively, rank groupings could be a proxy for cohorts. Therefore, these proportions may simply indicate past cadet and non-cadet hiring mix. Using raw proportions may also be misleading as the total number of individuals within each rank-grouping decreases as seniority increases, which means the impacts of a single cadet increases alongside seniority.

BR1 and BR2 also present years of full-time service completed by former cadets who responded to the 1999 and 2003 censuses. Presented as proportions of cadet participants that reach years of service brackets, findings appear to mirror results that consider rank-bandings (Bishop, 2004, p. 32). For instance, approximately 19% of those between 15 and 19 years of service had participated in cadets. The proportion of cadets increases to about 26% for those between 20 and 24 years of service; increasing again to about 33% for those at 25 years of service and above. We presume that this is simply the mechanical relationship between years of service and rank attainment, as discussed previously.

The earlier BR publications also consider success in initial training using data provided by the Army Recruit Training Centre, and BR1 and BR2 conclude that cadet participants are more likely to succeed during Army basic training than non-cadets (Bishop, 2004, p. 36). As their conclusions are based solely on the success rate of former cadets and non-cadets during an eight-month training period in 2004, we are cautious that these findings can be applied to all cohorts. The statistical significance of the findings also remains untested. Nevertheless, a similar empirical analysis could be quite insightful when increasing the observation period.

Despite the data limitations and the analytical methods used due to these limitations, the Bishop Reports provide the most detailed exploration of cadet participants that enter the full-time ADF to date. While our investigation does not intend to identify "evidence to demonstrate the value of ADF Cadets to Defence," our research will add to the discussion of cadet behaviors in novel ways. For instance, we use yearly personnel data and a single instance where individuals self-reported their cadet participation. We will also use empirical analysis, where we will be able to test for statistical significance. In doing so, we will be able to control covariates, such as the yearly cadet and non-cadet hiring mix, to better isolate the effects of cadet participation.

2. United States of America

In a practical sense, ADF Cadets mirror the Junior Reserve Officer Training Corps (JROTC) programs in the United States. The key difference is that while Australian schools may host cadet units, activities are independent of classroom objectives. In short, ADF Cadet programs are not intended to lower school dropout rates or improve classroom behavior (Pema & Mehay, 2009a, p. 533). However, the programs are equivalent in that they both use a military-style curriculum targeted at young people to generate community conscientiousness, understanding of the military, and awareness of military careers (Department of Defence, 2020a, p. 122; Pema & Mehay, 2009a, p. 535). There have been four empirical investigations into the JROTC program, three of which are by Pema and Mehay.

In their first study, Pema and Mahey (2009a) investigated the effects of JROTC programs on (senior) high school and post-high school outcomes, including enlistment. Aiming to assess claims by program advocates that JROTC participation improves academic achievement and boosts high school completion rates, they found evidence to the contrary. Ordinary least squares, probit, and logit estimates suggest that program participants remain similar to non-participants as far as 12th-grade test scores and exhibited similar disciplinary problems (Pema & Mehay, 2009a, pp. 542, 544). Estimates from one of two data sets also indicated JROTC participants are less likely to complete high school. Furthermore, JROTC participants are less likely to attend post-secondary education, but are two to four times more likely to enlist in the military (Pema & Mehay, 2009a, p. 550, 2009b, p. 6).

Descriptive statistics identified that participation is higher amongst minority and high-risk youths, with higher participation amongst students attending urban public schools. Therefore, geographical access and disadvantage may account for low post-secondary education amongst JROTC participants. Nonetheless, the authors did not rule out a sorting effect: suggesting that enlistment and pursuing post-secondary study are mutually exclusive (Pema & Mehay, 2009a, p. 550). When controlling for school fixed effects, Pema and Mehay's findings suggested that JROTC program administrators may target schools where students have higher propensities for enlistment (Pema & Mehay, 2009a, p. 544).

In another of their studies, Pema and Mahey also investigated how the duration of JROTC programs that participants undertake impacts school and enlistment outcomes. They found that while all JROTC participants improved their test scores, there were additional benefits for those who participated in programs for longer periods. In terms of enlistment, while there was little difference between participants and non-participants who engaged with the program in their more senior years of high school, those that joined early and remained in the program were far more likely to enlist (Pema & Mehay, 2010, p. 243).

In the last of their parallel studies, Pema and Mehay investigated how occupation-related vocational education throughout school years impacts behaviors once participants enter the same occupation. To assess differences in turnover and job performance between

those who had and had not undertaken such education, researchers followed the performance of new U.S. Navy recruits between 1994 and 2001 who had and had not participated in JROTC (Pema & Mehay, 2009b, p. 7). As previous research on adaptation to service life suggested that females have greater difficulty making the transition, the authors assessed program effects separately by gender (Pema & Mehay, 2009b, p. 14).

Baseline probit findings suggested that the JROTC participant attrition rate for both males and females is 9% to 17% lower than that of non-participants groups at 12, 24, 36, and 48-month intervals. Conditional on serving at least 36 months, JROTC participants were also 8% more likely to re-enlist (Pema & Mehay, 2009b, p. 14). After including controls for whether there was a JROTC unit in an individual's zip code while the participant was in high school, retention effects increased three-fold, and were more pronounced amongst females. But re-enlistment effects were isolated to males (Pema & Mehay, 2009b, pp. 16, 17). Logit fixed-effects models that compared participants and non-participants from the same zip code showed similar findings regarding retention. But, both males and females demonstrated similar positive re-enlistment effects. The lower baseline estimates (i.e., estimates without geographical controls that act as proxies for socio-economic conditions and access to JROTC units) provided evidence to support negative-selection: that JROTC programs attract and are targeted toward those who are more disadvantaged (Pema & Mehay, 2009a, pp. 550, 544, 2009b, pp. 10, 15). The same publication also investigated the promotion of JROTC participants.

Conditioning on 48-month survival, baseline probit models showed that both male and female JROTC participants are less likely to promote to E4 and E5, and controlling for the advanced pay grade participants receive upon entry only increased the difference. Other methods they explored supported these findings (Pema & Mehay, 2009b, p. 18).

Prior to Pema and Mahey's research, Days and Ang also compared re-enlistment amongst JROTC graduates against non-graduates using probit and logit models. JROTC graduate first-term completion rates were also compared against non-graduates using Cox hazard-survival analysis. In all instances, JROTC graduates remained in service longer than non-participants (Days & Ang, 2004, p. 112).

Unfortunately, the data we use in our research does not include the pre-enlistment covariates used in the JROTC studies. Therefore, we are unable to control for socio-demographical influences of members during their formative years that may inform in-service behaviors. Furthermore, we are unable to separate cadet participation into duration categories nor control for self-selection, which we assess as fundamental to achieving the goal of the Bishop Reports to evaluate the value of ADF Cadet programs. Nevertheless, using empirical methods similar to those used by researchers exploring JROTC participants, we anticipate that our research may hint at similar results.

3. United Kingdom

Researchers at the University of Northampton explored the social impacts and returns on investment from the Cadet Forces in the United Kingdom. Social impacts were assessed by exploring differences in self-efficacy between disadvantaged children who do and do not participate in the Cadet Forces program (Denny et al., 2021, p. 13). Cost-benefit analysis (CBA) methods were then used to monetize these increases in self-efficacy, alongside access to vocational education that cadet participation creates. Benefits were mainly in terms of reduced general medical and mental health costs, and lifetime public and private benefits due to the increased likelihood of attaining higher education (Denny et al., 2021, p. 17). Their findings suggest that having young people participate in the Cadet Forces produces a net benefit of up to £95 million per annum (2019 prices).

Like the ADF Cadets, the purpose of the Cadet Forces is not to solve social problems or create returns on investment. These findings simply indicate the additional benefits of such programs. While our investigation does not explore CBA methods, the research conducted into the Cadet Forces in the UK provides a clear example for future analysis that the ADF might pursue and may form the primary research methods for future volumes of the Bishop Report.

4. Conclusion

Taken together, these findings suggest those who participated in a military-stylized youth development program are more likely to enlist and have longer military careers than non-participants. Yet career progression is likely to be slower. Of the literature reviewed,

our research is most similar to the work conducted on the JROTC programs, particularly Pema and Mahey's investigation into occupation-specific educational training, and the survival analysis completed by Days and Ang. The reason for this similarity is that this empirical research assesses the value of participation relative to in-service behaviors rather than program value. Relative to their work, we believe we can add to the discussion by providing a different national perspective. In terms of the Australian literature, we add to the knowledge base by testing and clarifying some of the existing conclusions in the BR, thereby extending their work. Finally, we believe that our research will be the first in Australia that could inform ADF recruiting policy in terms of how to weight ADF Cadet participation.

III. DATA

A. SOURCES

The ADF does not store cadet information within its personnel data management system; hence, two data sources were necessary for this study. Personnel data spanning 2002 to 2021 was sourced from the ADF Data Warehouse and consisted of yearly observations of the entire full-time workforce as captured on 30 June of each year. To supplement that information, DFR provided details for service personnel who enlisted between 2005 and 2021 and who, during recruitment, had reported participating in Cadet programs. Only those who enlisted after mid-2005 are included in the analysis, leaving 77,636 unique individuals across 466,589 observations. Of these individuals, 10,640 were cadets.

B. VARIABLES

Key variables include indicators for whether the member is currently not in full-time service; if they participated in cadets; their branch of service, and gender; and if they ever became an officer or attended the Australian Defence Force Academy (ADFA). Key continuous variables include years of service and age at the time of enlistment. Descriptions of all variables are provided in Table 1.

Table 1. Variables Used in Analysis.

uniqueid	Unique identification number for each individual.
was_cadet	= 1 if member participated in cadets.
datevalue	Date Value of the observation captured on 30 Jun each year.
branch	Service Branch (Navy, Army, Air Force).
officer	= 1 if the member ever became an officer.
adfa	= 1 if the member attended ADFA (includes those who did not graduate).
rank	Member's rank.
gender	Gender (male, female, intersex).
age_at_enlistment	Age member entered full-time service.
yos	Cumulative years of full-time service (across all contracts).
max_yos_sep_rejoin	Years of service prior to the first separated period greater than 6-months.
hiredate	Full-time contract start date.
separationdate	Full-time contract end date.
finalseparationtype	Final full-time contract separation type (Voluntary, Involuntary, Still-in-Service).
separationreason	String description detail reason for separation.
nlis	= 1 if the member is currently not in full-time service.
training_sep	=1 if separation was during training.
negative_sep	= 1 if separation was for disciplinary reasons, not in the interest of the ADF, etc.
total_contracts	The number of contracts entered.

C. LIMITATIONS

As Defence only issues a PMKeyS employee number upon enlistment, the pairing of cadet and personnel data was via name and birthdate. While not the most desirable pairing method, we assess that this is unlikely to detract from the results. However, as DFR only records limited information on cadet participation, results will be general. For instance, despite initially recording the member's branch of cadet service, DFR has been progressively transitioning towards collecting only holistic participation. Therefore, it is impossible to distinguish cadet participation by cadet branches for the entire period, and a general participatory indicator variable must be used. Other absent yet highly desirable variables would include years participating in ADF Cadet programs, rank achieved, unit

location, proximity to an ADF establishment, and whether the unit was community or school-based. Personnel data is more comprehensive but not without limitations.

Australian military contracts can be considered open-ended and do not require periodic renewal. While members enter new contracts when they separate from full-time service and then rejoin later, this also often occurs when they undertake a branch transfer or commission from the enlisted ranks. As a result, the number of contracts cannot be used as a proxy for breaks in service, and the separation type variable only captures the most recent separation event.

We must be cognizant that members cannot remain in service indefinitely, and those who are currently in a separated state may re-enter. As such, the research period ends before we can ever knowingly capture any members' final separation date. The key outcome variables of *years of service*, therefore, only reflects members' length of service up until 2021. Members' true length of service will always be greater than or, at a minimum, equal to what is recorded within the *years of service* variable. This issue extends to the *no longer in service* variable. Members currently in a separated state may in fact go on to have many more years of fulltime service. Hence, the *no longer in service* variable is limited to indicating only that the member was not in service at the end of the research period.

D. DESCRIPTIVE STATISTICS

In Table 2, we compare key variables by splitting the data by cadet participation. Indicator variables are presented as proportions, while continuous variables are communicated as averages. From Table 2, it is worth highlighting several interesting characteristics. First, female representation is lower amongst cadets than amongst non-cadets. Only 11% of cadets were female compared to 21% in the non-cadet group. Cadet participants also, on average, enter full-time service 2.3 years younger than non-cadets; and the proportion of officers and ADFA attendees is also higher amongst cadets. While the proportion of members currently still in service is higher for cadet participants than their non-cadet colleagues, cadets appear more likely to separate during training and for negative reasons. Finally, the average years of service is about one month less for cadets

than non-cadets. But as demonstrated by Figure 1, this arises mechanically since a higher proportion of cadets enlisted in later years. This plot shows the distribution of cadet and non-cadet hires throughout the observation period. We see that the greatest number of non-cadet hires occurred around 2010, while the greatest number of cadet hires happened around 2017. Measures such as Achieved 4+ YOS and Achieved 5+ YOS in Table 2 adjust for this and suggest that cadets are more likely to remain in service.

Table 2. Descriptive Statistics, by Cadet Participation.

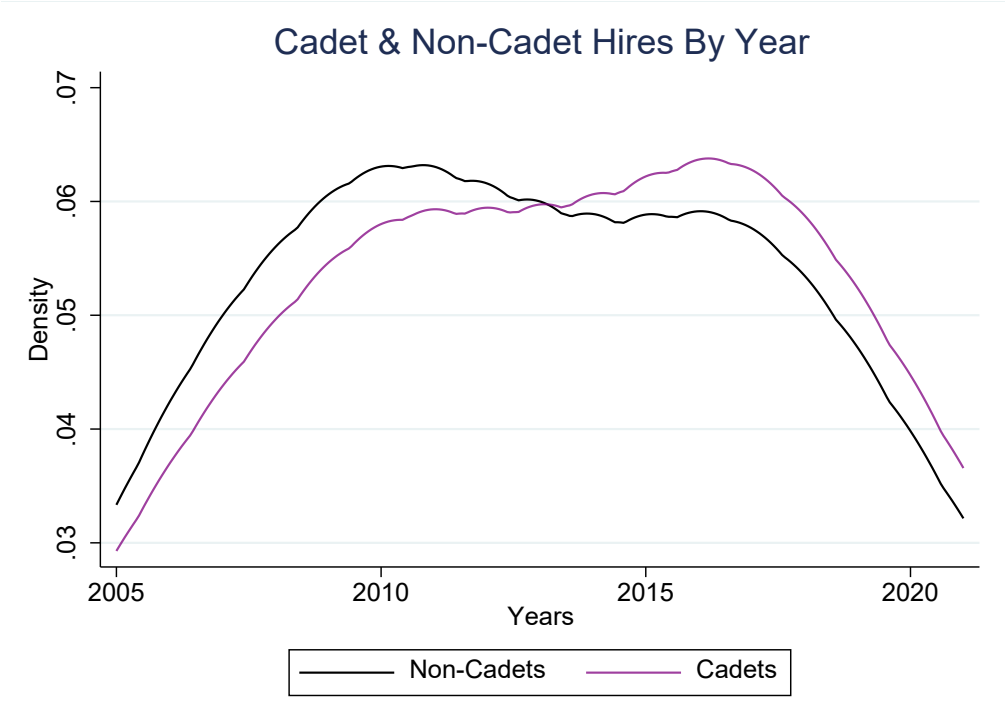
	Cadets (1)	Non-Cadets (2)	All (3)
Navy	0.211	0.248	0.243
	(0.408)	(0.432)	(0.429)
Army	0.603	0.569	0.574
	(0.489)	(0.495)	(0.494)
Air Force	0.186	0.182	0.183
	(0.389)	(0.386)	(0.387)
Male	0.891	0.792	0.805
	(0.312)	(0.406)	(0.396)
Female	0.109	0.208	0.194
	(0.311)	(0.406)	(0.396)
Age at Entry	20.520	22.837	22.520
	(4.579)	(6.647)	(6.452)
Officer	0.237	0.177	0.185
	(0.425)	(0.381)	(0.388)
ADFA	0.127	0.053	0.063
	(0.333)	(0.224)	(0.243)
YOS	5.833	5.915	5.904
	(4.004)	(4.019)	(4.017)
Achieved 4+ YOS	0.843	0.829	0.831
	(0.364)	(0.376)	(0.375)

	Cadets (1)	Non-Cadets (2)	All (3)
Achieved 10+ YOS	0.479 (0.500)	0.443 (0.497)	0.447 (0.497)
4-YR Attrition Rate	0.183 (0.387)	0.203 (0.402)	0.200 (0.400)
6-YR Attrition Rate	0.338 (0.473)	0.369 (0.483)	0.365 (0.481)
10-YR Attrition Rate	0.528 (0.499)	0.563 (0.496)	0.559 (0.497)
Voluntary Separation	0.218 (0.413)	0.271 (0.444)	0.263 (0.441)
Involuntary Separation	0.179 (0.383)	0.183 (0.386)	0.182 (0.386)
Still in Service	0.603 (0.489)	0.547 (0.498)	0.554 (0.497)
Training Separation	0.074 (0.261)	0.067 (0.250)	0.068 (0.251)
Negative Separation	0.066 (0.249)	0.059 (0.236)	0.060 (0.238)
Died within 10 years	0.003 (0.058)	0.004 (0.065)	0.004 (0.064)
1 Contract	0.970 (0.170)	0.973 (0.163)	0.972 (0.164)
2 Contracts	0.029 (0.168)	0.027 (0.161)	0.027 (0.162)
2+ Contracts	0.001 (0.027)	0.001 (0.026)	0.001 (0.026)
Observations	10640	66996	77636

(i) Standard deviations are shown in parentheses.
(ii) Statistics are based on each unique member's last chronologically recorded observation.
(iii) Intersex gender omitted. Of the 77,636 individuals, seven are intersex; two of whom participated in cadets.

(iv) Achieved 4+ YOS and 10+ YOS observations are limited to only those eligible to achieve such periods of service. Cadet observations are 7,621 and 3,257, respectively. Non-Cadet observations are 50,189 and 23,567, respectively.
(v) Attrition Rate observations are limited to only those eligible to achieve such periods of service. Cadet observations are 7,621; 6,315; and 3,257, respectively. Non-Cadet observations are 50,189; 48,649; and 23,567, respectively.
(vi) For context, there were 5,262 training separations throughout the period; 785 were cadets.
(vii) There were 183 total deaths; 22 were cadets.

Figure 1. Distribution of Cadet and Non-Cadet Hires by Year.



IV. METHODOLOGY AND RESULTS

A. SURVIVAL AND ATTRITION

This section explores differences in the retention behaviors of cadets and non-cadets. We first use Kaplan-Meier (KM) analysis to explore survival out to 16-years of service, utilizing data from all members. We then explore survival by gender and commissioning status for those eligible to be observed for at least ten years. We then shift to linear and logistic regressions to estimate the likelihood of separating during a ten-year horizon.

1. Kaplan-Meier Survival Analysis

To pursue KM survival analysis, we dropped all but the final observation for each individual. Then, using the "no longer in service" indicator as the failure criteria, we plotted survival curves for cadets and non-cadets based on years of service. Figure 2 depicts the survival for the entire population—including intersex members, and the survival function for key point estimates is summarized in Table 3. These exhibits suggest that cadets consistently have higher survival estimates than non-cadets. For instance, 82% of cadets in the data are still in service after four years compared to 80% of non-cadets. Similarly, 69% of cadets in the data are still in service after six years compared to 63% of non-cadets. Four and six years of service coincide with completing the initial minimum period of service (IMPS) for many job categories. Despite the *years of service* variable accommodating interrupted service, these estimates remain indicative that a higher proportion of cadets achieve IMPS than non-cadets. As similar differences are observed after ten and 15 years of service, estimates also indicate that a higher proportion of cadets qualify for long-service leave and the long-service medal, respectively. Reflecting on the disparity between years of service in Table 2 in Chapter III, it is important to note that KM analysis estimates survival based on the number of individuals *at-risk* of separating during each time interval. If individuals are censored out of the data (i.e., the research period ends while an individual is still in service), they cease to be included in calculating the survival estimate once their maximum years of service has been reached. So, despite cadets generally having a lower

average years of service due to censoring, the Kaplan-Meier survival estimates compensate for that censorship.

Figure 2. Kaplan-Meier Survival Curve – All

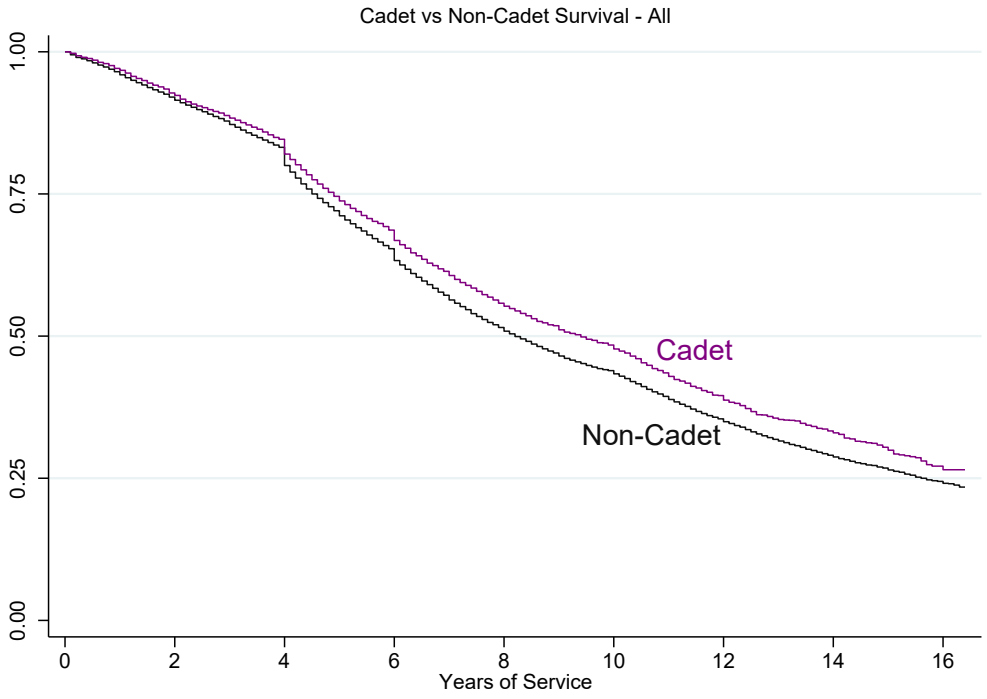


Table 3. Summary of Point Estimates for Figure 1: Kaplan-Meier Survival Curve – All.

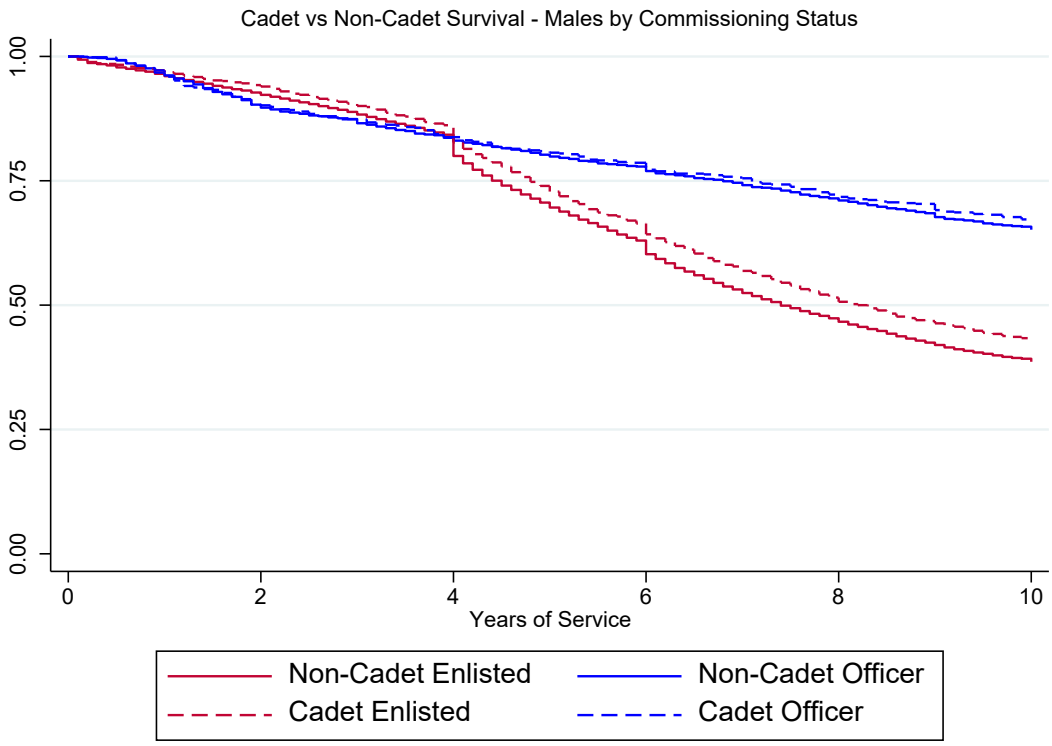
Years of service	Survival: Non-Cadet	Survival: Cadet
4	0.80 (0.002)	0.82 (0.004)
6	0.63 (0.002)	0.69 (0.005)
10	0.43 (0.002)	0.48 (0.006)
15	0.27 (0.003)	0.30 (0.009)

Standard errors in parentheses.

Naturally, gender diversity and the representation of females are of particular interest to policy and decision makers, both in the ADF and the ADF Cadets. Hence, we also explored differences between cadets and non-cadets by gender and commissioning

status to observe any differences between male and female cadets in terms of their workplace positions. For this purpose, we looked at survival out to ten years as this is generally beyond IMPS for much of the workforce—that is, when contractual obligation precludes voluntary separation. In doing so, the sample was restricted to only those observable for at least ten years. This eliminates the issue of censoring but still allows for interrupted service. Findings for males and females are depicted in Figures 3 and 4, respectively, and the survivability of cadet groups is consistently presented as dashed lines in both plots. We find in Figure 3 that there is little difference between the survivability of cadet and non-cadet males who are officers, yet cadets have higher survivability when comparing enlisted groups. The higher survivability we observe in officer groups was expected due to their (generally) longer IMPS, and the officer group also includes those who commissioned from enlisted ranks, which mechanically extends the length of service of affected members.

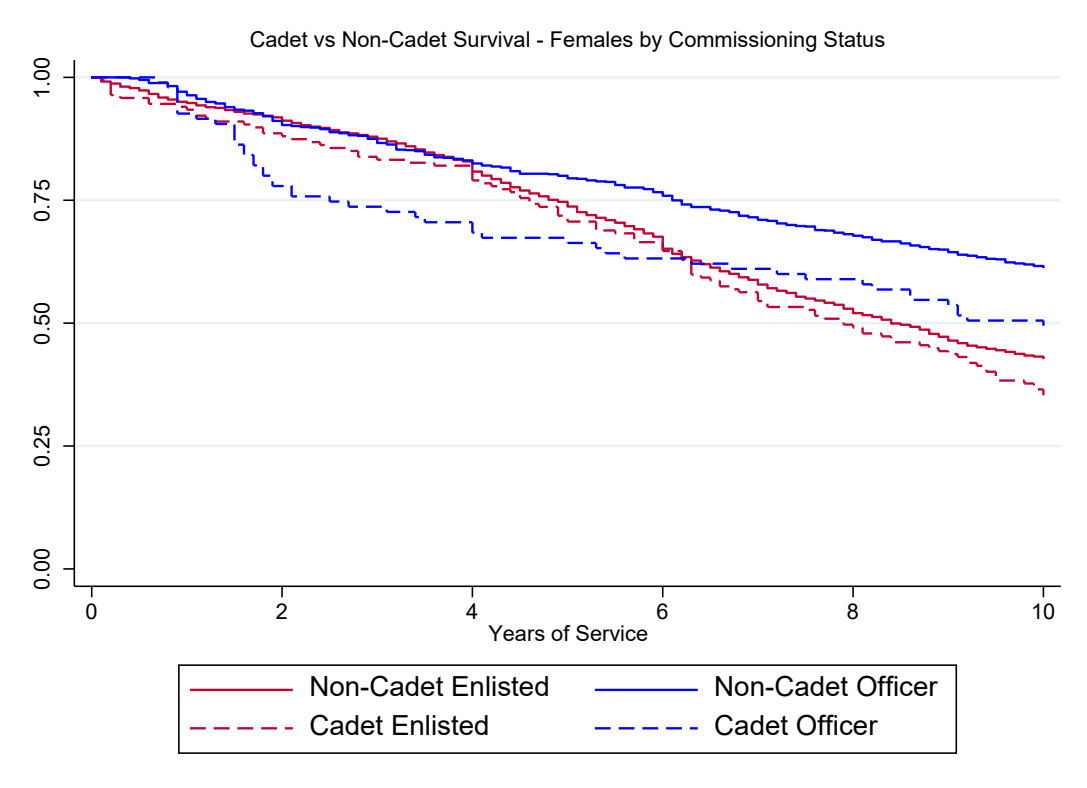
Figure 3. Kaplan-Meier Survival Curve – Males by Commissioning Status



Alternatively, cadet survivability is lower for both female officers and enlisted females—see Figure 4. For instance, at eight years of service, 58 percent of female cadet officers are still in service as compared to 68 percent of female non-cadet officers. After the same period, 49 percent of enlisted female cadets are still in service while 52 percent of enlisted non-cadet females remain. In contrast to male groups, we see a sizeable disparity between female officers and a relatively small difference between cadet and non-cadet enlisted. Surprisingly, cadet officer survivability is the lowest of all subgroups out to six years of service but is higher than both enlisted groups thereafter. The scope of our investigation precludes further investigation as to why this is the case. But in-service conditions and life events, such as motherhood, are expected to affect cadet and non-cadet officer groups equally. So we expect that any causal analysis would need to focus on pre-entry covariates. While we have some speculative theories that could be investigated, we see research akin to what was conducted by Ahn et al. (2021) to be the most accessible

starting point. Their research explored how masking certain candidate information during U.S. Naval promotion boards altered who was being promoted. Their findings suggested reliance on "cheaper information" and that board members are at risk of overvaluing it (Ahn et al., 2021, pp. 604, 608). It may be prudent for the ADF to investigate if, throughout the recruiting process, information pertaining to cadet participation is being overvalued when assessing the preparedness of females for officer entry. At a minimum, DFR could explore whether its value on cadet participation varies between genders. Gender differences will be explored again throughout subsequent analysis, but it is clear that enlisted males drive the improved survivability of cadets observed in Figure 2.

Figure 4. Kaplan-Meier Survival Curve – Females by Commissioning Status



2. Linear Regression Analysis

We selected linear probability models (LPM) as the primary means to compare the likelihood of cadets and non-cadets separating. These were estimated using the ordinary

least squares method. Once again, a ten-year horizon was selected as this period is generally beyond IMPS for much of the workforce. While members who graduate ADFA typically have IMPS that approach and even surpass ten years, we are able to control for both ADFA attendance and graduation.

First, we collapsed the data so there was only one observation per individual. Service branch variables were then amended so as to represent the branch in which members had served for the majority of their careers. Using the hire date of their first contract, we identified those members eligible to be observed for the full duration of the attrition horizon of ten years, and then determined whether they had separated during that period. Members who rejoined the ADF were still considered separated, and those who died during service were excluded. We then built three models using a binary separation outcome against the binary cadet participation variable, and controlled for first-hire yearly fixed effects to absorb variations that were common to all members hired in the same year. In doing so, we could better isolate changes in our variables of interest from the year-to-year variations occurring across the ADF. As shown in Table 4, additional controls were introduced in each subsequent model to further isolate the effect of cadet participation, and all models use robust standard errors to account for heteroscedasticity.

Table 4. Ten-Year Attrition Horizon Models.

LPM1-1	$\widehat{10yr\_Sep}_{it} = \delta_t + \beta_0 + \beta_1 Cadet_i + \sum_{j=2005}^{2010} \beta_j (FirstHireYear = j) + \varepsilon_{it}$
LPM2-1	$\widehat{10yr\_Sep}_{it} = \delta_t + \beta_0 + \beta_1 Cadet_i + \beta_2 Army_i + \beta_3 AirForce_i + \beta_4 Female_i + \sum_{j=2005}^{2010} \beta_j (FirstHireYear = j) + \varepsilon_{it}$
LPM3-1	$\widehat{10yr\_Sep}_{it} = \delta_t + \beta_0 + \beta_1 Cadet_i + \beta_2 Army_i + \beta_3 AirForce_i + \beta_4 Female_i + \beta_6 Officer_i + \beta_7 ADFA_i + \sum_{j=2005}^{2010} \beta_j (FirstHireYear = j) + \varepsilon_{it}$

As LPM1-1 to LPM3-1 consider all members who enter the service regardless of whether they survive initial training, like Marrone (Marrone, 2020, Chapter 4), we excluded those that separated during initial training and ran LPM3-1 to create LPM4-1.

This also removes the differences observed in Table 2, wherein the proportion of training separations was higher amongst cadets. Estimates are presented in Table 5.

Table 5. Separated within Ten Years.

	LPM1	LPM2-1	LPM3-1	LPM4-1
Cadet	-0.0334***	-0.0311***	-0.0200*	-0.0245**
	(0.0093)	(0.0092)	(0.0091)	(0.0093)
Army		0.0605***	0.0628***	0.0548***
		(0.0074)	(0.0073)	(0.0075)
Air Force		-0.1863***	-0.1536***	-0.1670***
		(0.0091)	(0.0091)	(0.0093)
Service Transfer		-0.2713***	-0.2364***	-0.2019***
		(0.0235)	(0.0238)	(0.0242)
Female		0.0007	0.0188*	0.0153
		(0.0087)	(0.0086)	(0.0089)
Officer			-0.2088***	-0.2394***
			(0.0089)	(0.0090)
ADFA			-0.0183	-0.1602***
			(0.0147)	(0.0133)
Constant	0.5616***	0.5678***	0.5956***	0.5799***
	(0.0032)	(0.0066)	(0.0066)	(0.0068)
Non-Cadet Mean	0.562	0.562	0.562	0.530
R-squared	0.003	0.043	0.071	0.096
N	26,712	26,712	26,712	24,881

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.
(iv) LPM4-1 uses the same specifications as LPM3-1. However, members that separate during training are excluded.

Across all models, we find the coefficient on Cadet to be negative and statistically significant at the 95% confidence level or higher. LPM1-1 is the simplest of the models wherein the coefficient on Cadet estimate indicates that cadets are 3.4 percentage points less likely to separate when compared to non-cadets. Since the outcome mean implies that 50.62% of non-cadets will attrit during the period, the 3.4 percentage point effect can also be interpreted as a 5.9% decrease in the likelihood of separation. Yet, without additional controls, we see the coefficient on Cadet in LPM1-1 has the highest magnitude across all of the models in Table 5. The decrease in magnitude when controls are introduced suggests that the current estimate is suffering from negative omitted variable bias. That is, the model is attributing the effects of variables that have not been included to the Cadet variable, thereby exaggerating its impact. For instance, undertaking a service transfer lowers a person's likelihood of separation as he or she transitions to a better job match. Suppose more cadets conduct service transfers (as is the case), but we omit the service transfer variable. In that instance, the effect that service transferring has on lowering separation gets attributed to being a cadet. Therefore by adding controls, we hope to refine the estimation closer towards the true effect.

LPM2-1 adds branch and gender controls. In LPM2-1, the coefficient on Cadet shows that cadets are 3.1 percentage points less likely to separate during the ten-year horizon than non-cadets. We note there is no statistically significant premium on being a female.

LPM3-1 extends upon LPM2-1 by including Officer and ADFA controls. Here the coefficient on Cadet shows that cadets are 2.0 percentage points less likely to separate than non-cadet. Like LPM2-1, there was no statistically significant premium for females, and branch and service transfer premiums remain relatively stable from LPM2-1. Holding all else constant, non-ADFA Officers—which includes officer-trainees and those that commissioned from enlistment—are 21.1 percentage points less likely to attrit compared to those who remained enlisted. Somewhat surprising, though, there was no statistically significant premium on ADFA attendance; despite ADFA attendees incurring higher IMPS. We suspected that higher separation rates during ADFA, prior to IMPS being imposed, may be the cause. This was explored via LPM4-1.

The coefficient on Cadet in LPM4-1 shows that holding all else constant, cadets who do not separate during initial training, including during ADFA, are 2.5 percentage points less likely to attrit than their non-cadet peers. We also find statistically significant differences in the likelihood of separation for Officers who graduated ADFA.

Noting once again the interest in gender and diversity, as cadet participation had been thus far inclusive of both genders, we introduced a female-cadet interaction to LPM2-1, LMP3-1, and LPM4-1 to create LPM2-2, LMP3-2, and LPM4-2; respectively. In doing so, we can estimate gender-based retention differences that may prove informative to the ADF's Reserve and Youth Division, DFR, and other decisions makers that focus on inclusivity with the ADF. This interaction fundamentally alters the interpretation of the coefficient on Cadet to be the premium on cadet males. Results are presented in Table 6.

Table 6. Separated within Ten Years – Including Female-Cadet Interaction.

	LPM1	LPM2-2	LPM3-2	LPM4-2
Cadet	-0.0334***	-0.0411***	-0.0311**	-0.0318**
	(0.0093)	(0.0096)	(0.0095)	(0.0097)
Female		-0.0077	0.0094	0.0092
		(0.0090)	(0.0089)	(0.0092)
Female x Cadet		0.1160***	0.1298***	0.0944**
		(0.0322)	(0.0321)	(0.0349)
Non-Cadet Mean	0.562	0.562	0.562	0.530
R-squared	0.003	0.043	0.071	0.096
N	26,712	26,712	26,712	24,881

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.
(iv) LMP1 additional controls not shown: Nil
(v) LMP2-2 additional controls not shown: Branch and Service Transfer.
(vi) LMP3-2 additional controls not shown: Branch, Service Transfer, Officer, and ADFA.
(vii) LMP4-2 additional controls not shown: Branch, Service Transfer, Officer, and ADFA.

By separating the impact of cadet participation by gender, we find that while male cadets are still less likely to separate than their non-cadet peers, female cadets exhibit different behavior. Male cadets are between 3.2 and 4.1 percentage points less likely to

separate during the ten-year horizon, whereas female cadets are 6.7 to 10.8 percentage points more likely to do so. These findings reinforce the findings during KM analysis. Appendix 2 provides additional commentary for the connectivity between KM and LPM findings.

3. Logistic Regression Analysis

As the percentage likelihood of separating should fall between zero and 100 percent, findings for Royal Australian Air Force (RAAF) Officers graduating ADFA in LPM4-2 (not shown) would demonstrate one of the key limitations of using an LPM. Male cadets, in this instance, have less than 0% likelihood of attrition, which is impossible. It is also intuitively inconceivable to consider that no single male cadet who graduated ADFA separated during a ten-year horizon. Logistic models do not suffer these same limitations.

As a robustness check, we also ran a logistic regression using the LPM4-2 specifications to create LR1. Table 7 provides a comparison using both methods; logistic estimates are presented as marginal effects at the mean of each variable. Logistic estimates were consistent with LPM findings.

Table 7. LPM4-2 vs. LR1 (Marginal at Means).

	LPM4-2	LR1
Cadet	-0.0318**	-0.0359***
	(0.0097)	(0.0108)
Army	0.0551***	0.0595***
	(0.0075)	(0.0081)
Air Force	-0.1667***	-0.1862***
	(0.0093)	(0.0104)
Service Transfer	-0.2030***	-0.2451***
	(0.0241)	(0.0296)
Female	0.0092	0.0100
	(0.0092)	(0.0101)
Female x Cadet	0.0944**	0.1085**
	(0.0349)	(0.0401)
Officer	-0.2391***	-0.2581***
	(0.0090)	(0.0105)
ADFA	-0.1618***	-0.2704***
	(0.0133)	(0.0246)
Non-Cadet Mean	0.530	
R-squared	0.096	
N	24,881	24,881

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) Logit estimates using marginal effects at means.
(iv) Both models control for first-hire yearly fixed effects.

Using the same logistic model (LR1), we also made predictions for separating within the ten-year horizon to help illustrate findings. Results in Table 8 indicate that male cadets are consistently less likely to separate during the ten-year horizon when compared to both non-cadet males and females. On the other hand, female cadets are more likely to separate when compared to both non-cadet males and females. For example, approximately 16% of cadet males who become Army Officers via ADFA are expected to separate within

ten years, but the expectation for cadet females under the same conditions is about 26%. In comparison, about 17% of non-cadet males and 18% of non-cadet females who become Army Officers via ADFA are predicted to separate during the same time frame.

Table 8. LR1 Predictions.

	Cadet Male	Non-Cadets Male	Cadet Female	Non-Cadet Female
Enlisted Navy	54%	58%	66%	59%
Enlisted Army	60%	64%	71%	65%
Enlisted RAAF	36%	40%	48%	41%
Officer (Non-ADFA) Navy	30%	33%	41%	34%
Officer (Non-ADFA) Army	35%	38%	46%	39%
Officer (Non-ADFA) Air Force	17%	19%	24%	19%
Officer (ADFA) Navy	13%	14%	21%	15%
Officer (ADFA) Army	15%	17%	25%	18%
Officer (ADFA) Air Force	6%	7%	11%	8%

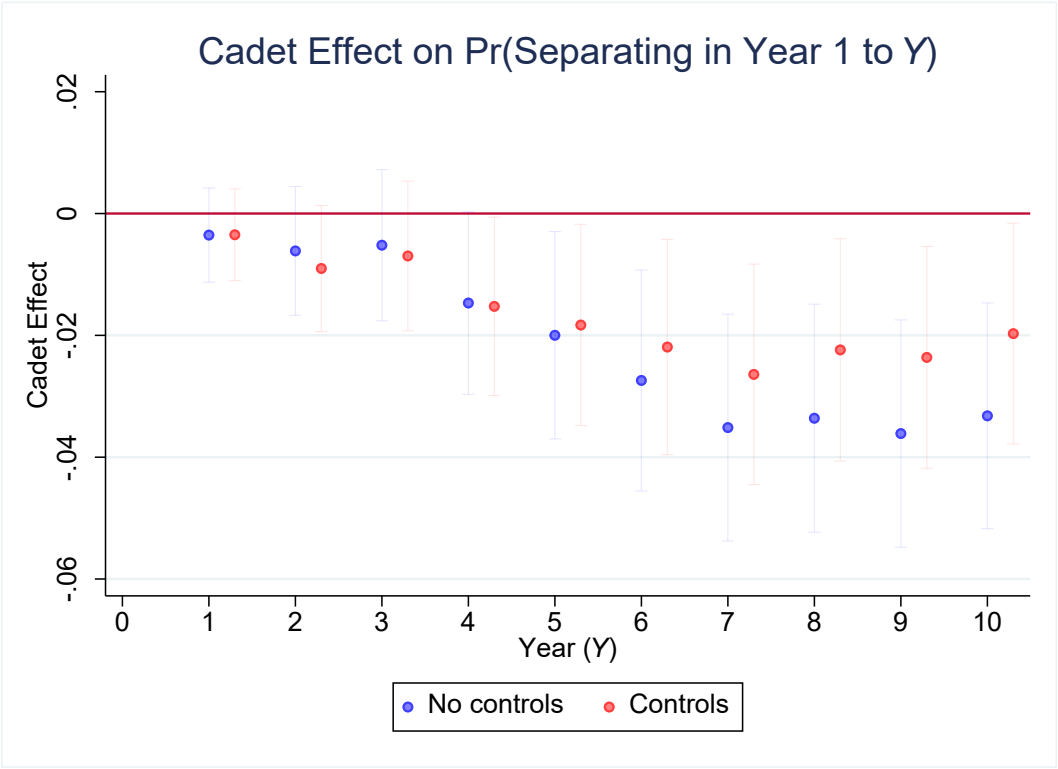
4. Many Linear Probability Models Analysis

We once again looked at the ten-year attrition horizon for all those eligible to be observed for that duration, and created ten outcome variables that correspond with surviving up to each consecutive year (i.e., separating within one year, separating within two years, etc.). Members who died during the ten-year horizon were excluded, and those who separated and rejoined were still considered separated. But unlike the KM, years of service did not continue to accumulate. We then estimated ten linear probability models (MLPM) using cadet participation as the dependent variable while controlling for yearly fixed effects. These models correspond to MLPM1 in Table 9. We then replicated these models but included controls for branch, service transfers, officers and ADFA attendance—presented as MLPM2. Note that unlike earlier LPMs, gender controls and the female-cadet interaction were not included. The cadet-variable coefficients for each of the MLPM1 and MLPM2 models were then isolated and plotted as Figure 5 to observe the cadet effect across the two structures. The 95% confidence interval has been included for each data point.

Table 9. Many Linear Probability Models.

MLPM1	$P(Separated\ by\ year\ Y) = \beta_0 + \beta_Y Cadet_i + \sum_{j=2005}^{2010} \beta_j (FirstHireYear = j) + \varepsilon_{it}$
MLPM2	$P(Separated\ by\ year\ Y) = \beta_0 + \beta_Y Cadet_i + \beta_2 Army_i + \beta_3 AirForce_i + \beta_6 Officer_i + \beta_7 OfficerADFA_i + \sum_{j=2005}^{2010} \beta_j (FirstHireYear = j) + \varepsilon_{it}$

Figure 5. Many LPMs – Cadet Effect (No Controls and Controls)



In Figure 5, we can consider non-cadets to have a cadet-effect equal to zero. For cadets, negative and statistically significant differences from non-cadets first occur around the four-year separation LPMs. While the economic effects are small, ranging from 1.5 to 2.6 percentage points for LPMs where additional controls have been used, there is once again evidence to suggest differences in retention behaviors between cadets and non-cadets.

B. TRAINING AND NEGATIVE SEPARATION; RANK ATTAINMENT

This section briefly explores indicators from which we may infer differences in performance and quality between cadets and non-cadets. Using simple LPMs, we investigated the likelihood of separating during training, separating for negative reasons, and whether members attained certain rank milestones.

1. Training Separation

From Table 2, we were somewhat alarmed that training separations were higher amongst cadets than non-cadets. We estimated three LPMs where training separation was the binary outcome to explore these concerns—controlling for first-hire yearly fixed effects in each model. All individuals were included, less the 183 who died. LMP5 uses generic cadet participation for the dependent variable. LPM6 then adds branch controls, and LPM7 delineates cadet participation by the service in which the member served the most years. Results are presented in Table 10.

Table 10. Separated during Training.

	LPM5	LPM6	LPM7
Cadet	0.0075**	0.0062*	0.0088
	(0.0027)	(0.0027)	(0.0048)
Army		0.0362***	0.0366***
		(0.0020)	(0.0021)
Air Force		0.0200***	0.0205***
		(0.0025)	(0.0027)
Army x Cadet			-0.0031
			(0.0061)
Air Force x Cadet			-0.0042
			(0.0077)
Non-Cadet Mean	0.067	0.067	0.067
R-squared	0.004	0.008	0.008
N	77,453	77,453	77,453

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.

LPM5 and LPM6 show positive and statistically significant effects for both models. Findings indicate that cadets are between 0.6 and 0.7 percentage points more likely than non-cadets to have separated during training. These findings translate to a 9.3% and 11.2% increase in the likelihood of separating during training, respectively. In splitting out the effects by branch which cadets join, in LMP7, we see that the largest effect was for cadets who joined the Army, and the lowest was for cadets who joined the Navy.

2. Negative Separation

Separating for a negative reason includes dismissal for making false statements during enlistment, disciplinary and civilian offenses, or when retention is not in "service interest." To explore negative separation, we adapted the three previous models by simply changing the outcome to the negative separation binary variable. Statistically significant findings for LPM8 and LPM9 in Table 11 indicate that cadets are 0.9 percentage points more likely to separate for negative reasons than non-cadets, which represents a 16% increase. When we split out the effects by the branch in which cadets serve, we see that cadets in the Navy and Army are between 0.9 and 1.7 percentage points more likely to separate for negative reasons—or a 16% and 30% increase in likelihood, respectively. But cadets who serve in the Air Force are 4.69 percentage points less likely to do so. This translates to a 79% decrease in likelihood.

Table 11. Separated for Negative Reasons.

	LMP8	LMP9	LMP10
Cadet	0.0094***	0.0095***	0.0094
	(0.0026)	(0.0026)	(0.0057)
Army		0.0053*	0.0048*
		(0.0022)	(0.0023)
Air Force		-0.0478***	-0.0464***
		(0.0021)	(0.0023)
Army x Cadet			0.0030
			(0.0068)
Air Force x Cadet			-0.0099
			(0.0065)
Constant	0.0591***	0.0646***	0.0646***
	(0.0009)	(0.0018)	(0.0019)
Non-Cadet Mean	0.059	0.059	0.059
R-squared	0.010	0.017	0.017
N	77,453	77,453	77,453

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.

3. Rank Attainment

With a similar model structure to what was used to investigate training and negative separations, we looked to explore the likelihood of attaining ranks of O5 and E8 for those eligible to be observed for at least ten years. We used a binary outcome variable corresponding to each of the rank milestones to create LPMs that used cadet participation as the dependent variable. First-hire yearly fixed effects were included in each model, and members who separated during training, or who died during the 10-years, were excluded. There were only three cadets within the entire dataset who reach O5, and only two eligible to be observed for at least ten years. As such, the models showed close to a 100% decrease

(or more) in the likelihood of a cadet reaching O5 compared to a non-cadet. We, therefore, only concentrated on the E8 milestone. See Appendix 3 for findings for attaining O5.

In Table 12, we see statistically significant differences for the cadet participation coefficients, suggesting cadets are up to 68% less likely to attain the rank of E8. When we split out the effects by the branch in which cadets serve, we see negligible effects for the Air Force, but between 1.0 and 1.5 percentage point decreases in the likelihood of attaining E8 for cadets who join the Navy and Army. These findings translate to a 40% and 60% decrease in the likelihood of achieving E8, respectively. In Table 13 we have restricted the sample to only those observed as being enlisted at one point in their career—and observed similar behaviors to those when the larger sample was used.

Table 12. Attain E8.

	LPM11-1B	LPM12-1B	LPM13-1B
Cadet	-0.0162***	-0.0163***	-0.0095*
	(0.0019)	(0.0019)	(0.0042)
Army		0.0071***	0.0087***
		(0.0021)	(0.0023)
Air Force		0.0030	0.0020
		(0.0026)	(0.0028)
Cadet – Army			-0.0143**
			(0.0047)
Cadet – Air Force			0.0069
			(0.0072)
Constant	0.0251***	0.0205***	0.0198***
	(0.0010)	(0.0017)	(0.0018)
Non-Cadet Mean	0.025	0.025	0.025
R-squared	0.003	0.003	0.003
N	26,712	26,712	26,712

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.

Table 13. Attain E8 – Conditioned on Enlisted.

	LPM11-2	LPM12-2	LPM13-2
Cadet	-0.0184***	-0.0186***	-0.0108*
	(0.0024)	(0.0024)	(0.0049)
Army		0.0081**	0.0100***
		(0.0025)	(0.0027)
Air Force		0.0080*	0.0065
		(0.0034)	(0.0036)
Army x Cadet			-0.0166**
			(0.0055)
Air Force x Cadet			0.0127
			(0.0102)
Non-Cadet Mean	0.030	0.030	0.030
R-squared	0.003	0.004	0.004
N	22,329	22,329	22,329

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.

V. CONCLUSION

A. SUMMARY OF FINDINGS

Participating in the ADF Cadets program has different retention implications for males and females, enlisted and officers. Using survival analysis, we found there to be little difference between male cadets and non-cadets who were officers, but survival was significantly lower amongst female officers who had participated in the program compared to non-cadet female officers. Enlisted behaviors were quite the opposite. Enlisted female groups exhibit similar survival, but enlisted males who had participated as cadets had greater survival than non-cadets. Trends observed in survival analysis were confirmed via linear probability models and logistic regressions, highlighting that while male cadets are less likely to separate within ten years compared to non-cadet males, female cadets are more likely to separate than non-cadet females. Cadet participation was also found to be associated with a lower likelihood of success during initial training and attaining rank milestones. Furthermore, cadets are more likely to encounter involuntary separation than their non-cadet peers for negative reasons. Yet, cadets who join the Air Force have better outcomes than cadets that join the Navy or Army.

B. IMPLICATIONS AND RECOMMENDATIONS

In aggregate, cadet participation is seemingly a positive predictor of improved survival and retention; but this predictor should not be applied universally. Leaning more heavily on LPM and LR methods, we recommend that the key distinction between how cadet participation should be weighted when assessing preparedness to join the ADF is based on gender. Males who have participated in the ADF Cadets are less likely to separate, thereby constituting a positive signal for preparedness. Participation for females, on the other hand, may be a risk signal relative to non-cadet females. But we have two ideas that may explain this behavior amongst female cadets; one that supports the notion of participation being a risk signal, the other quite the opposite. Researching both ideas would be prudent prior to making policy changes.

Our first idea is that ADF Cadet programs in their current form are providing a positive experience for young women that inspires commitment, but the experience is too far removed from the actuality of service life. Upon joining the ADF, commitment wanes as a matter of disappointment. In this instance, cadet participation represents a risk signal for preparedness. Our second idea is on the premise that males and females interpret their time in ADF Cadets differently; that females perceive service life as a continuation of the cadet experience.

The modern labor market is far more transitional than in previous generations, with individuals changing employers and even careers more frequently (Pandey, 2019, p. 1). Therefore, like their civilian counterparts, service members are expected to explore other employment options after a certain number of years of performing the same job or in the same environment. Perhaps, for females, this duration is not limited to just years of full-time service but includes any time spent participating in a Cadet program. If this is the case, a female cadet may seek a *sea change* earlier into their full-time career. Through this lens, female cadet participation would not be a risk signal.

We interpret findings for training and negative separations as suggestive that cadet participation is being overvalued when making preparedness and suitability assessments. Further, the increased likelihood of negative separation amongst cadets may be indicative of negative selection, as discussed by Pema and Mehay (2009a; 2010). That is, attraction to ADF Cadets is high amongst those who are disadvantaged or more at-risk. The key takeaway we see from these findings is that participation in the program should not necessarily be interpreted as universally positive when making selection decisions. Rather, it may be a cue that prompts deeper assessment.

Our findings regarding rank attainment are congruent with Pema and Mahey's findings (2010) that participants are less likely to promote. We note that these findings also oppose claims made in the BR. These findings might cause disappointment as a higher likelihood of promotion may be suggestive of program value. But we recommend that this information is simply *nice to know*. If anything, it is perhaps a testament that Cadet programs are indeed acting as youth development programs, rather than preparing participants for military service.

APPENDIX 1 – A BRIEF HISTORY OF THE ADF CADETS

A. INTRODUCTION

Despite its long history, there is very little written about the cadet movement in Australia. Prior to 2007, there was in fact no authoritative history of any of the service-aligned organizations. Two publications have emerged since: one by Craig Stockings, dedicated to the Army Cadets, and the other by Matthew Glozier, which focuses on the Air Force Cadets. While we do not do either of these authors or their work justice, in the subsequent paragraphs, we attempt to provide a short history of the ADF Cadets in Australia by summarizing key historical components of the publications alongside Department of Defence releases.

B. EDUCATIONAL ORIGINS

Introducing military-style *drill* into 1850s' school curriculum was likely the first step towards establishing Army Cadet units in Australia (Stockings, 2007, p. 7). In many ways, *drill* instruction represented both the genesis of the ADF Cadets as well as early school-based physical education. With the rationale of raising collective discipline and individual character, students would perform prescribed body movements under a teacher's direction, and in doing so, movements were synchronized across the class. As far as what those prescribed movements were, education departments borrowed doctrine directly from British military training manuals. By the mid-1860s, isolated schools with access to British servicemen took further steps and commenced instructing boys in military art as a matter of "outdoor amusement" (Stockings, 2007, pp. 8–9). Initially, this was purely for educational ends: developing individual character and creating social benefit for young boys. There was a seemingly broad consensus that cadet service had a positive social and community impact (Stockings, 2007, p. 34). This sentiment remains central to the modern cadet movement; yet as more early cadet units were raised, participation started to be perceived as enhancing military personnel-inventory, and participants, despite their age, were considered part of the colonial militias (Stockings, 2007, p. 8). Training school-boys

for the purposes of national defense was initially, however, a secondary agenda for expanding cadet units throughout each colony.

With Federation in 1901, control of militias and Cadet units was transferred to the Commonwealth. Cadets therefore departed from the control of departments of education and fell under the jurisdiction of Commonwealth Military Forces (CMF) (Stockings, 2007, p. 37). Despite administration functionally remaining unchanged throughout the early 1900s, plans for a federal cadet scheme was developing that would continue to push both educational and social agendas, but a military agenda would soon take primacy (Stockings, 2007, pp. 12, 34, 37). The Defence Act of 1903 empowered the establishment of a *Military Cadet Corps* in which boys aged 12–19 could voluntarily participate; out of which the Commonwealth Military Cadet Corps (CMCC) was raised in mid-1906. The CMCC concept represented a truly national system where boys would be separated into Junior and Senior groups (Stockings, 2007, p. 37). Under the departments of education, those aged 14 and below undertook Junior Cadets within school-based units. Curriculum was delivered by male teachers granted commissions. Participants of Seniors Cadets came under the control of the military in community-based units. The clear role of Senior Cadets was to maintain connectivity between Junior Cadets and the Citizen Army. At age 17, a Senior Cadet could transfer to the Citizen Army with a letter of recommendation from the unit's Commanding Officer (Stockings, 2007, pp. 39–42). There were also cadet-like organizations based upon the navy during this same period, but unlike the modern Australian Army and Air Force Cadets who both enjoy at least one comprehensive historical account, the Australian Naval Cadets does not have such a record.

C. THE WORLD WARS

The birth of the CMCC coincided with growing societal concerns surrounding national security. In 1911, as a result of the Defence Act 1909, military service became an obligation. It was mandated that boys aged between 10 and 14 were to participate in Junior Cadets, those aged 14–17 were now legally required to participate in the Senior Cadets, and men aged 18–25 were obligated to join the CMF (Stockings, 2007, p. 60). Despite their ages, boys came under the military laws applicable to adults and were liable for prosecution

under the Defence Act. Even parents or employers who obstructed boys from attending training could be fined (Stockings, 2007, p. 68). Conscription under the Universal Military Training provision remained in effect until 1929 (Department of Defence, 2018).

Having fallen from favor, particularly after end of the First World War, the obligatory system was abandoned and a voluntary system re-emerged in its place (Stockings, 2007, p. 89). Now rather than split based on age, two types of Army-style units emerged based on administrative. *Regimental Cadet* detachments were completely removed from schools and came under the command and administration of collocated CMF units. School-Cadets, on the other hand, were not affiliated with the militias (Department of Defence, 2018). As such, the educational considerations were returned to the forefront for these units, but School-Cadets also received no military support (Department of Defence, 2018; Stockings, 2007, p. 89). At a similar time, the Australian Air League units emerged. These units promoted air-mindedness amongst Australian youths and would later become the model for what would eventually develop into the modern Air Force Cadets (Glozier, 2016, p. 2).

With increased demand for resources leading into the Second World War, the Australian Army re-absorbed all permanent military staff allocated to Regimental Cadet detachments. Subsequently, these detachments were closed (Department of Defence, 2018; Glozier, 2016, p. 32). Having gone through almost 90 years of teething to discover what role a land-force cadet program was to contribute to society and the national interest, this experiment had come full-circle and was once again back in its entirety to school-based units. Yet, the early air battles of the Second World War were announcing a new type of need for preparing young people for possible military service.

In mid-1941 and in the model of the Australian Air League, the Australian Air Training Corps (ATC) was raised by the Royal Australian Air Force for boys aged 16 to 18 to prepare them for later service. The curriculum covered drill and ceremony, mathematics, flight theory, and radio communications. Completing it would reduce initial training by three months should participants enlist once they were of age (Glozier, 2016, p. 13). Unlike the Army-inspired cadet units, while the ATC used school facilities and other installations within the community to deliver training, schools did not directly influence

the curriculum or its intended outcomes. The ATC curriculum nevertheless incentivized schools to host units as the technical and scientific syllabus complemented and promoted the existing curriculum (Glozier, 2016, p. 54). Hosting an ATC unit thereby created the opportunity by which the school could benefit.

D. DISBANDING, REINSTATING, AND MOVING TOWARD THE MODERN ERA

The ATC, Army's Australian Cadet Corps, and presumably the Naval Reserve Cadets and other Navy-aligned organizations saw evolution and expansion during the interceding decades, including increased military support, involvement, and funding. Negative feelings towards the Vietnam War did see Cadet units begin to distance the curriculum from some military context (Glozier, 2016, p. 206). Further, the post-Vietnam War strategy saw reducing Defence expenditure as critical to the government agenda. Perceiving that Cadet spending returned only minor gains in military value, the Whitlam Government disbanded all Cadet programs in 1975 (Glozier, 2016, pp. 203–204). While a new government reinstated the Cadets programs the following year, several fundamental changes occurred. Firstly, there was to be a preference for community-based units rather than school-based units; but both were to be under an armed services-controlled curriculum (Stockings, 2007, p. 186). As a result of its structure and control under the RAAF, the ATC was relatively unaffected by this new agenda, which had a greater impact on the Australian Army Cadet Corps. Community-based units would be entitled to full support from the Army, while school-units received only limited support (Department of Defence, 2018). It was not until 1994 that the *Limited Support Units* that remained had full support granted. The second outcome of the 1976 reinstatement was the stricture on engaging in warlike activities which is now formalized under Australia's commitment to the Optional Protocols to the Convention on the Rights of the Child.

In 1991, all three service-aligned Cadet organizations united under the Australian Service Cadet Scheme (ASCS), yet parent services remained in control of their cadet organizations (Glozier, 2016, p. 260). As a result of a Government-commissioned review in 1999, the Chief of the Defence Force appointed a Director-General of Cadets to oversee the three cadet organizations and rebranded the ASCS to the ADF Cadets. Standardized

naming also meant rebranding the three cadet organizations as the Australian Navy Cadets (ANC), Australian Army Cadets (AAC), and Australian Air Force Cadets (AAFC). No longer being controlled by the parent services meant that the ADF Cadets had the formal authority to conduct, administer, and focus itself toward the primary function of being a youth development organization (Glozier, 2016, pp. 281–282).

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APPENDIX 2 – INVESTIGATING THE CONNECTIVITY BETWEEN FIGURE 4 AND TABLE 6

Taking LPM3-2, which does not condition on surviving training, we simplified this model to include only the control for being female and the female-cadet interaction, thereby creating LMP3-2A. Estimates for LMP3-2A see female cadets as only 2.9 percentage points more likely to separate during the ten-year horizon, a significant reduction from the 10.8 percentage point premium found in LMP3-2. We then considered which controls were key contributors to creating this difference. While service transfer had the highest magnitude for reducing separation in Table 5, we discovered that service transfer was more prevalent amongst males. Instead, we looked at whether the absence of Officer and ADFA controls were the key explanations for the difference. We found that by re-introducing the Officer control alone, the likelihood of female cadet separation jumped to a 7.7 percentage point increase. Adding the control for ADFA attendance saw further increases to 8.1 percentage points. These findings suggest, once again, that further research is warranted into female cadet behaviors before and after they enter the ADF, and include those who participate in ADF Cadets but never serve.

Table 14. Re-introducing Controls to LPM3-2.

	LPM3-2A	LPM3-2B	LPM3-2C	LPM3-2
Cadet	-0.0461***	-0.0346***	-0.0332***	-0.0311**
	(0.0098)	(0.0096)	(0.0096)	(0.0095)
Female	-0.0422***	-0.0193*	-0.0192*	0.0094
	(0.0090)	(0.0089)	(0.0089)	(0.0089)
Female x Cadet	0.1175***	0.1305***	0.1337***	0.1298***
	(0.0327)	(0.0325)	(0.0326)	(0.0321)
Non-Cadet Mean	0.562	0.562	0.562	0.562
R-squared	0.004	0.041	0.042	0.071
N	26,712	26,712	26,712	26,712

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.
(iv) LMP3-2A additional controls not shown: Nil.
(v) LMP3-2B additional controls not shown: Officer.
(vi) LMP3-2C additional controls not shown: Officer & ADFA.

APPENDIX 3 – ATTAINING O5

Table 15. Attain O5

	LPM11-1A	LPM12-1A	LPM13-1A
Cadet	-0.0087***	-0.0086***	-0.0098***
	(0.0008)	(0.0008)	(0.0020)
Army		-0.0030*	-0.0033*
		(0.0014)	(0.0016)
Air Force		0.0000	0.0003
		(0.0019)	(0.0021)
Army x Cadet			0.0026
			(0.0022)
Air Force x Cadet			-0.0016
			(0.0025)
Non-Cadet Mean	0.009	0.009	0.009
R-squared	0.002	0.002	0.002
N	26,712	26,712	26,712

(i) Standard errors in parentheses.
(ii) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
(iii) All models control for first-hire yearly fixed effects.

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