An Early Evaluation of the My Career Advancement Account Scholarship for Military Spouses

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Preface

Past research has shown that compared to spouses of U.S. civilians, spouses of U.S. military personnel tend to earn less and are more likely to be unemployed or underemployed, even when they have more years of education or more work experience. To mitigate the impact of the demands of military life, in 2007 the Department of Defense established the Spouse Education and Career Opportunities (SECO) program, a portfolio of initiatives that provide career development and employment assistance for military spouses. One such initiative is the My Career Advancement Account (MyCAA) Scholarship, designed to help a targeted demographic of military spouses to pursue associate's degrees, occupational certificates, or licenses in portable career fields. The design of the scholarship at the time of this report dates back to October 2010.

The Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy asked the RAND Corporation to use objective program, personnel, and earnings data to evaluate the potential for MyCAA Scholarships to support the educational and employment outcomes for eligible military spouses. To do so, RAND examined MyCAA application and use, scholarship plan completion, spouse employment and earnings, and the continuation of military service rates for personnel married to MyCAA-eligible spouses.

This research effort is part of a larger RAND study to address the design, monitoring, and evaluation of Military Community and Family Policy's SECO initiatives. This project produced a previous report that analyzed selected responses to the 2012 Active Duty Spouse Survey (ADSS): *Advancing the Careers of Military Spouses: An Assessment of Education and Employment Goals and Barriers Facing Military Spouses Eligible for MyCAA*, by Esther M. Friedman, Laura L. Miller, and Sarah Evans (RR-784-OSD, Santa Monica, Calif.: RAND Corporation, 2015). Another report from this study intended to support program management strategies is *The Military Spouse Education and Career Opportunities Program: Recommendations for an Internal Monitoring System*, by Gabriella C. Gonzalez, Laura L. Miller, and Thomas E. Trail (RR-1013-OSD, Santa Monica, Calif.: RAND Corporation, 2016). An initial report on another SECO initiative from a related RAND study is also available: *Evaluation of the Military Spouse Employment Partnership: Progress Report on First Stage of Analysis*, by Gabriella C. Gonzalez, Luke Joseph Matthews, Marek Posard, Parisa Roshan, and Shirley M. Ross (RR-1349-OSD, Santa Monica, Calif.: RAND Corporation, 2015).

This research should be of interest to decisionmakers responsible for programs and policies supporting military spouse quality of life, as well as scholars who study military spouse issues. It may also interest scholars who study education and employment benefits more generally.

This research was sponsored by the Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy and conducted within the Forces and Resources Policy Center of the RAND National Defense Research Institute, a federally funded research and

development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the Unified Combatant Commands, the Navy, the Marine Corps, the defense agencies, and the defense Intelligence Community.

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Introduction

Aspects of military life, such as frequent geographic moves and deployments, can present challenges to military spouses seeking to complete an education, find suitable employment, and receive and maintain earnings trajectories comparable to their counterparts married to civilians. Within this context, research continues to document the economic and social return to individuals who invest in obtaining higher education. Employers are increasingly seeking to hire employees with occupational licenses, certificates, or college degrees. Overall, tuition and fees have been increasing, and most students rely on grants and loans to help finance their education. Private for-profit schools entered the realm of education as a business, and online and outsourced education has been on the rise.

The Department of Defense (DoD) established the My Career Advancement Account (MyCAA) Scholarship to support the education and training of military spouses. The ultimate aims of promoting spouse education and employment continuity are to improve satisfaction with military life, family financial stability, the health and wellness of the military community, retention of military personnel, and the overall readiness of the Armed Forces (Office of the Deputy Under Secretary of Defense, 2008). Scholarship eligibility focuses on spouses whose service member is early in their career: spouses of service members who are on active-duty Title 10 orders (i.e., full-time federal service) in the pay grades of E-1 to E-5 (enlisted), W-1 to W-2 (warrant officers), and O-1 to O-2 (officers). Eligible spouses cannot be on active-duty Title 10 orders themselves. The scholarship provides up to $4,000 in financial assistance for spouses pursuing associate's degrees, occupational certificates, or licenses in portable career fields.

Research Approach

The RAND Corporation conducted an early evaluation of MyCAA. Using military administrative data files and information collected by MyCAA, RAND examined the demographic and military service characteristics of spouses who applied to MyCAA relative to spouses who did not. We also explored MyCAA spouse and school data to understand more about who was able to complete which courses of study and what factors might influence these completion rates. RAND also evaluated the potential for the MyCAA Scholarship to improve the employability and earnings of eligible military spouses. To assess the scholarship, RAND examined the 2007–2013 employment and earnings of spouses who were eligible for the scholarship when the current version of the MyCAA Scholarship began (between October 2010 and December 2011). Focusing on early users allowed adequate time for at least some of the early recipients to complete their education or training program and find employment—thereby

providing us the ability to observe changes in employment and earnings before and after receiving the scholarship, and to compare MyCAA Scholarship users to nonusers. Finally, we followed the service history of members of MyCAA-eligible spouses to explore whether personnel married to MyCAA users were more likely to remain in the military than personnel married to eligible nonusers.

Who Applied for a MyCAA Scholarship?

Over 380,000 military spouses were eligible for the scholarship between October 2010 and December 2011, of which 91 percent were women, 93 percent were married to an enlisted service member rather than an officer or warrant officer, and 74 percent were under the age of 30. **Eligible spouses in this cohort who applied for a MyCAA Scholarship differed in several ways from eligible spouses who did not apply.** Our analyses showed that in December 2011, MyCAA applicants were more likely than eligible nonapplicants to:

- live in the South
- live in states with higher unemployment rates
- have two or more dependent minor children in the household
- be married to enlisted noncommissioned officers (NCOs) in the pay grade of E-5
- be married to Army personnel than personnel from other branches
- be married to personnel who had at least one permanent change of station (PCS) move between 2007 and 2011 and during their marriage
- be married to personnel who had been deployed between 2007 and 2011 and during their marriage.

All eligible applicants whose study plans met the MyCAA criteria were approved for scholarships, although 19 percent did not end up using any funds due to loss of eligibility or other reasons not apparent from the data sources. MyCAA applicants who were least likely to use their funds were Army spouses, spouses who are men, spouses whose sponsors had no PCS moves by December 2011, and spouses whose sponsors either were of lower enlisted ranks (E1–E3) or were promoted to E-6 (beyond the MyCAA eligibility window) by December 2011.

Which MyCAA Users Completed Their Education and Training Plans?

In this study, *MyCAA users* refers to military spouses who used any scholarship funds toward their MyCAA-approved plans. **Overall, MyCAA data indicate that at least 34 percent of the users in the 2010/2011 cohort were known to have completed their plans by December 2014.** Additional completion not observed by MyCAA is likely, as schools would not report to MyCAA completion for spouses who take courses or licensing exams after they are no longer using MyCAA funds. Still, these numbers of known completion among MyCAA users are in line with completion rates of certificates and associate's degrees observed for other populations, especially when we consider that some completions may not have been visible to the MyCAA

administrators because users who hit the scholarship fund ceiling or whose spouses were promoted out of the eligibility window were likely to no longer interact with the MyCAA Scholarship portal or with MyCAA representatives.

Demographic and Military Service Characteristics

When we descriptively compare the different characteristics of MyCAA users reported to have completed their plans with the characteristics of other MyCAA recipients who started their plans, we find differences in race/ethnicity, education, and pay grade of sponsors. However, statistical models examining multiple characteristics simultaneously find that, of those characteristics, only pay grade continues to be correlated with known completion. Spouses whose sponsors were promoted out of eligibility to E-6 or O-3 by December 2011 were 8.2 to 10.5 percentage points less likely to be documented as completing their plans than spouses married to sponsors who were E-5 (the most common pay grade in our sample). Of course, some of those spouses may have gone on to complete their plans on their own, but their schools would not have reported that completion to MyCAA because MyCAA funds would no longer have been used.

Turning to the characteristics of spouses themselves, spouses who are men were 7 percentage points less likely to be recorded as completing their MyCAA plans compared to observationally equivalent spouses who are women. Spouses who were themselves in the guard or reserve were 9 percentage points less likely to be recorded as completing their plans than spouses who were civilians, which could be related to their ineligibility to use their MyCAA Scholarship whenever they serve on active-duty status under the authority of Title 10 of the United States Code (i.e., federal service). Known plan completion rates were higher, however, among MyCAA users who lived in states with higher unemployment rates, even when holding constant other factors. Each percentage point increase in the state unemployment rate was associated with a 0.5 percentage point increase in known completion among the MyCAA students located in that state.

The statistical models show that after controlling for observable factors, the number of children was not significantly associated with higher or lower completion rates known among MyCAA users.

School and MyCAA Plan Characteristics

The schools attended by the 2010/2011 MyCAA cohort of scholarship recipients were fairly diverse, with 1,630 schools represented in the sample. However, there were a small number of schools attended by a large number of individuals. **Differences in MyCAA users' schools, plans, or other academic factors appear to be quite important when comparing known completion to noncompletion.** These factors were the strongest ones in the descriptive analyses and persisted in the multivariate statistical models. It is not surprising that spouses pursuing shorter programs (certificates and licenses rather than associate's degrees) were more likely than others to be known to complete their plans within the three-year scholarship window. Known

completion rates were slightly higher for spouses enrolled in private for-profit programs. Spouses attending schools with state, national, or regional accreditation were more likely to complete their educational plans relative to spouses attending schools with industry accreditation. While schools that offer only online instruction may be appealing to spouses, especially those who anticipate moving, live in remote areas, do not have a means of transportation, or are trying to juggle many commitments, our analyses found that attending schools that offer *only* online instruction was associated with lower overall rates of known completion, compared to attending schools that offer traditional classroom instruction or a combination of both classroom and online courses. Our results suggest that MyCAA students in programs or schools that offer only online learning and lack traditional sources of accreditation were less likely to be known to complete their MyCAA plan, although some of these results may be driven by very low completion rates at a few specific schools. DoD may determine that MyCAA funding for such schools may not be an effective use of resources, and that spouses would be better steered toward other institutions that might offer greater likelihood of academic success.

We also found that MyCAA users who failed at least one class were much less likely than others to be recorded as having completed their plan, which could reflect some combination of spouses giving up on their academic plan (and thus not finishing the coursework) and spouses struggling academically with the coursework. If spouses fail more than once, they are not allowed to receive any further funds from MyCAA, with the exception of an appeal for a waiver in the instance of a documented hardship (e.g., hospitalization, family emergency). Only 4 percent of MyCAA users known to have completed their plans ever failed a course, compared to 45 percent with no record of completion. Of spouses who failed a course, only 14 percent attempted to continue their plan, and 35 percent of those failed another course in a subsequent term. We investigated the spouses who failed classes more closely in our descriptive analyses and found that they tended to be similar to those who did not fail in terms of their overall characteristics. Once again, the main differences between those who failed a class and those who did not were differences in school and plan characteristics. For instance, descriptive multivariate analyses showed that spouses who failed a class were more likely than spouses who did not fail a class to attend a public nonprofit than a private for-profit institution, or to attend an industry-accredited institution, or to attend schools that offer only online instruction.

Our results generally suggest that there may be ways to improve outcomes for users without requiring that military spouses meet additional criteria. One would be to focus on the schools and courses approved for MyCAA funding to ensure that they are meeting DoD's standards. Also, MyCAA could provide additional guidance to spouses in terms of school choice for their particular area of study, and outreach and assistance for those who fail a course. Through such strategies MyCAA may be able to improve outcomes and efficiency.

Is MyCAA Use Associated with a Near-Term Improvement in Spouse Employment or Earnings?

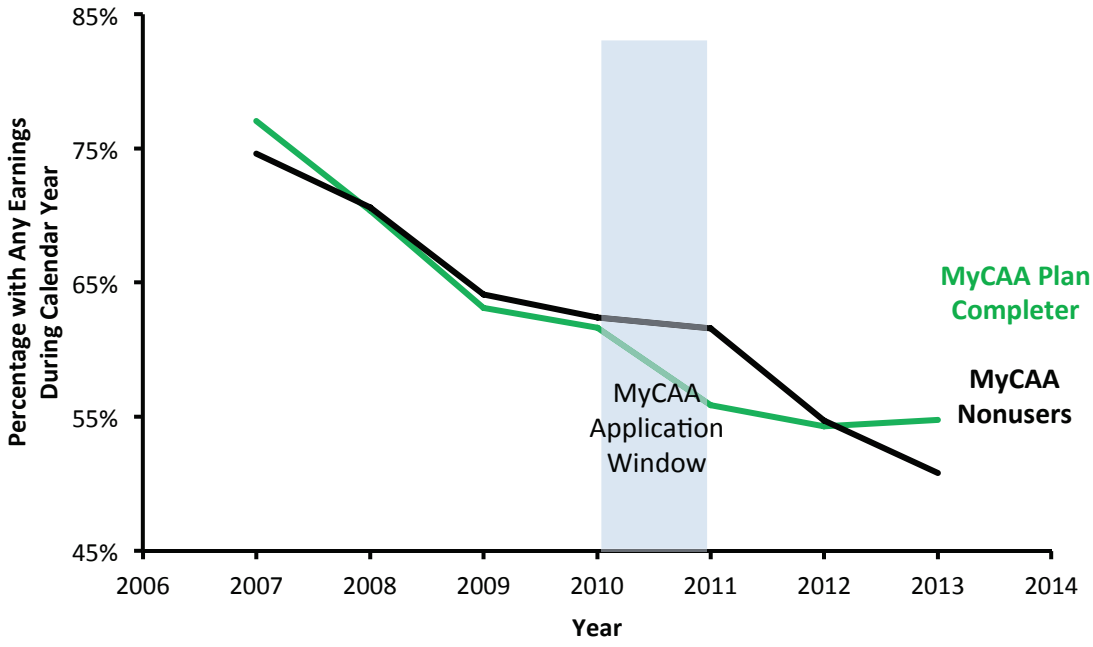
This early evaluation explored whether the employment and earnings trajectories of MyCAA-eligible spouses provide any indication of a greater need for education assistance among those who used MyCAA or a positive change following scholarship use. Although further analyses with additional data are necessary to support any causal claims, the findings at this stage are consistent with such claims.

Employment

In the U.S. married civilian population, the percentage of working adults typically rises between the ages of 18 and 30. For spouses of military personnel, however, frequent moves, deployment cycles, and other aspects of military life can disrupt education and employment for military spouses, compounding fluctuations that already occur in the civilian labor market. To control for the strong life-stage influences related to marriage, education, and earnings, as well as differing employment constraints when living abroad, we present descriptive results for the subset of women spouses aged 24–26 in December 2011 and living in the United States. RAND's analyses of employment among this pool of military spouses eligible for the MyCAA Scholarship found that employment of women spouses aged 24–26 who did not use the scholarship declined from 75 percent in 2007 to 51 percent in 2013. For the spouses who used the MyCAA Scholarship and were known to have completed their plan by the end of 2014, employment declined from 77 percent in 2007 to 55–56 percent in 2013 (Figure S.1).

Controlling for other observable differences, we find that as we would expect, MyCAA users with scholarships approved in late 2010 or 2011 were on average less likely to be working in 2011, when they would have been in school, than they were before 2011. We define *working* as having positive income reported to the Social Security Administration (SSA). It could be that MyCAA users had already enrolled in school or planned to attend in 2011 and MyCAA facilitated that choice. Or it could be that the MyCAA Scholarship encouraged career-minded MyCAA users to exit the workforce to improve their occupational credentials or switch fields to a more portable career. It is also possible that MyCAA users had lost or left their job (e.g., following a PCS move), and MyCAA offered them an opportunity to retrain or recertify in another state. **Regardless of the reasons that MyCAA users' employment dropped in 2011, we observe that over time MyCAA users began to return to the workforce, and indeed were more likely than eligible nonusers to be employed in 2013 (as was also the case in 2007).** This finding appeared despite a strong downward trend in the percentage of military spouses working each year, which our analyses show was associated with a household having children, as well as the service member's promotion, continued service, and deployments.

Figure S.1. Fewer MyCAA-Eligible Spouses Worked for Pay over Time, but Known MyCAA Plan Completers Were More Likely Than Eligible Nonusers to Work in 2013



SOURCE: MyCAA data, Defense Manpower Data Center (DMDC) data, and SSA earnings data merged together.
SAMPLE SIZE: 59,192.
NOTES: Figure presents the percentage of spouses working (i.e., with Medicare reportable earnings greater than zero) by calendar year. The sample is further restricted to women military spouses between the ages of 24 and 26 that are married to active service members in December 2011, for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas), and with a successful SSA earnings record match.

Controlling for other observable differences, we also examined whether there were differences in employment associated with the type of educational plan pursued and the type of institution attended. MyCAA users known to have completed their associate's degrees within the scholarship period (by December 2014) were less likely to be working in 2013 relative to other user groups, which could be explained by continued work toward their degree in 2013. Regarding institution type, known completers at private for-profit institutions were more likely to be working in 2013 than in 2009, while known completers at public nonprofit institutions were no more or less likely to be working in 2013 than in 2009. This finding could reflect the longer educational programs on average in public nonprofit institutions but, importantly, at this point the results do not suggest worse outcomes for those attending for-profit private institutions.

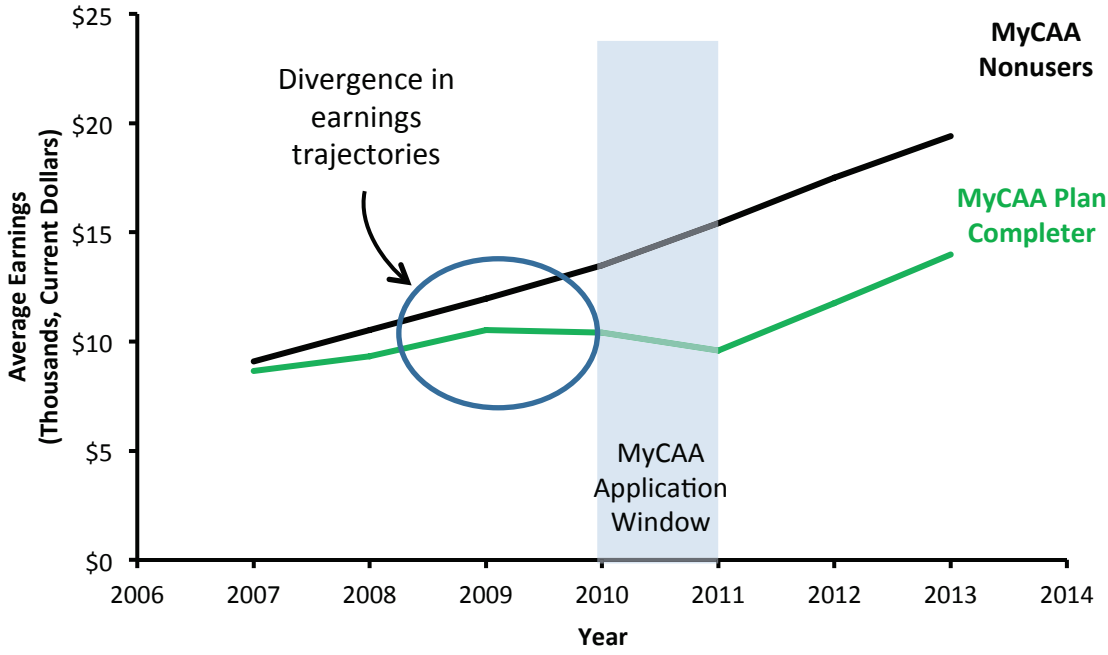
The overall decline in the fraction of MyCAA-eligible military spouses in this cohort working each year is important and may in part be due to the coinciding Great Recession in the United States that began in December 2007. When a spouse is no longer employed, the household may become dependent on the service member for its only income.

Earnings

RAND compared the average annual earnings patterns for working, MyCAA-eligible spouses ages 24 to 26 in 2011 who used the scholarship and completed their educational plan to those who did not use any MyCAA Scholarship funds (Figure S.2). Generally, in the U.S. population, earnings growth is significant over the first two decades that an individual is in the labor force, consistent with nonusers' earnings in the figure. In contrast, **the average annual earnings of working spouses who used the scholarship to complete an educational or training plan had stagnated for several years or even declined prior to October 2010, when the current version of the MyCAA Scholarship became available.**

Declining earnings could reflect a career interruption due to a family move or layoff. It could also reflect a voluntary or involuntary reduction from full-time to part-time employment, or the decision or need to seek a new career or additional schooling. This pattern has been often observed and well documented for other adult populations just prior to their entry into higher-education and job-training programs. While we do not know the reason for the stagnation or decline in average earnings, we do observe that earnings for this group of scholarship users grew after December 2011.

Figure S.2. Annual Earnings of Spouses Who Used a MyCAA Scholarship Stagnated Before the Selected MyCAA Application Window and Grew After the Application Window



SOURCE: MyCAA data, DMDC data, and SSA earnings data merged together.
SAMPLE SIZE: 59,192.
NOTES: The figure represents the average earnings of two MyCAA-eligible spouse populations based on SSA earnings data. The sample is further restricted to women military spouses between the ages of 24 and 26 that are married to active service members in December 2011, for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas), and with a successful SSA earnings record match. Results exclude earnings for years when individuals were not military spouses and/or not working.

We also note that the $4,000 MyCAA Scholarship amount (capped at $2,000 each year) is rather large relative to average annual earnings for working spouses, which were about $10,000 in 2010.

Not shown in Figure S.2, even after the statistical models controlled for other factors that could explain the difference between these two populations (such as pay grade, deployments, number of children, and PCS moves), we found that earnings for users declined sharply relative to nonusers before and during the MyCAA application window selected for our study. These more sophisticated results show the average annual earnings for known MyCAA plan completers growing statistically significantly faster than for nonusers from 2011 to 2013, although that faster increase is not visually apparent from the descriptive results shown in Figure S.2. These early results from 2013 suggest that military spouses' use of the MyCAA Scholarship could be related to an improving rate of earnings growth.

Controlling for observable characteristics, we find differences by degree and institution. Working spouses who were MyCAA users attending private for-profit institutions and who were also known to have completed their educational plans had their average earnings grow between 2009 and 2013 at the same rate as those of nonusers, while known completers at public nonprofit institutions who were working saw their earnings grow by 9 percentage points less than those of nonusers over this period. Lower average annual earnings growth among working spouses may reflect the greater percentage of associate's degree seekers at public nonprofit institutions, who may still have been working toward their degrees in 2013. In all cases, earnings among working spouses declined for known completers between 2009 and 2011, so the catch-up in earnings growth occurred after the MyCAA application window used to define our cohort.

Were Service Members Married to MyCAA Users More Likely to Remain on Active Duty Than Service Members Married to Nonusers?

Promoting spouse education and employment in a portable career are the immediate goals for the MyCAA Scholarship. DoD expects that spouses who want or need to work and whose careers are better able to weather the demands of military life will be more satisfied with military life and more willing to support their service member and family remaining in the military. Thus, longer-term outcomes of interest for MyCAA include increasing family financial stability, satisfaction with military life, and retention of military personnel—thereby increasing overall readiness. Links between military family programs and retention, however, are often hypothetical, so we explored whether there was any evidence of such a connection between spouses' use of MyCAA and the continuation of their service members.

RAND examined the likelihood that married active-duty service members in the scholarship-eligible pay grades as of December 2011 were still members of the active component at the end of 2014. We compared the service members of scholarship users and nonusers (Figure S.3).

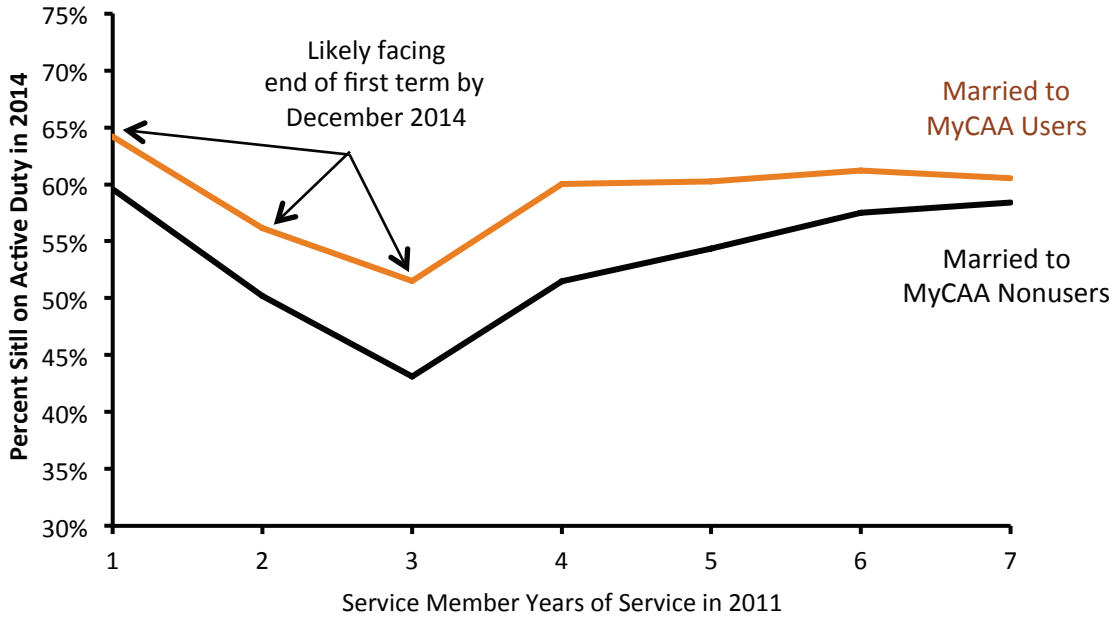
Since most enlistment contracts last three to four years, the continuation rates of members with two to four years of service at the end of 2011 are of particular interest because most would

have faced a reenlistment decision by the end of 2014. Additionally, first-term attrition, or departure prior to the completion of the enlistment contract, is a persistent challenge that the services work to address.

As Figure S.3 indicates, service members whose spouses use the MyCAA Scholarship were more likely to stay in the military. As with earnings, RAND examined whether other factors—such as number of children, deployments experienced before and after 2011, or family moves before and after 2011—might explain the difference in continuation decisions between these two groups.

But our findings consistently showed that active-duty service members with two to four years of service in 2011 and whose spouses used a MyCAA Scholarship were 6 to 8 percentage points more likely than similar personnel to remain in the active component three years later. This result could reflect some combination of MyCAA having a positive impact on spouses' and service members' preference to remain in the military, as well as the MyCAA Scholarship supporting spouses of service members who already had a greater preference for or compatibility with military service.

Figure S.3. Service Members Whose Eligible Spouses Used MyCAA Were More Likely to Be on Active-Duty Military Service Three Years Later



SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: By year of service in 2011, for nonusers/users: 15,727/872 (0), 27,462/3,955 (1), 35,270/5,213 (2), 39,496/5,214 (3), 29,542/3,708 (4), 27,620/3,365 (5), 22,027/2,386 (6), 21,648/2,193 (7), 18,060/1,548 (8), 15,253/1,268 (9), 12,508/1,025 (10).
NOTES: The figure represents the percentage of service members still on active duty by his or her years of service in 2011 and whether or not his or her spouse used a MyCAA Scholarship. The sample consists of married active-component service members in MyCAA-eligible pay grades (E-1 to E-5, W-1 to W-2, or O-1 to O-2) between October 2010 and December 2011. To be considered a MyCAA user, the spouse must have been approved for the scholarship in 2010 or 2011, and used MyCAA funds any time 2010–2014. The MyCAA users in this figure may or may not have completed their MyCAA plans within the three-year scholarship period.

Conclusions and Implications of This Research

Our analyses suggest that MyCAA Scholarships are reaching the intended population—including spouses who want or need work, who are likely to be early in their careers, and who face military moves and deployments. More than personal characteristics of spouses, their sponsors, or households, it is MyCAA plan and school characteristics that appear to be important for the completion of MyCAA plans. DoD can use this information to help counsel spouses preparing their plans (e.g., caution them about institutions that offer only online courses), as well as refer to it when reviewing which schools, programs, and types of instruction are eligible to receive MyCAA funding.

In comparing MyCAA users and nonusers, our statistical models have ruled out many other factors besides MyCAA that could explain the differences in employment, earnings, and service member retention. MyCAA users were less likely than similar nonusers to be working during the initial scholarship period, but by 2013 they were more likely than nonusers to be working. In addition, scholarship users known to have completed their MyCAA plans saw their annual earnings grow statistically significantly faster than nonusers from 2011 to 2013. These results suggest that MyCAA is associated with employment and higher earnings; however, the relationship is not necessarily causal. It may be that scholarship recipients had a greater need or desire to work and therefore sought out the scholarship. But without the scholarship, these spouses may not have worked at as high a rate in 2013 or been able to improve their 2013 earnings to the degree that we observed. Either way, these results reflect positively upon the MyCAA Scholarship. Finally, our analyses suggest that service members of MyCAA Scholarship users are more likely than similar married service members to be on active duty three years after the spouse is awarded the scholarship.

These findings regarding economic measures are promising, but the available data ended early, while many spouses were still in school. As of 2013, MyCAA users' earnings remained below nonusers', but appeared to be growing faster than nonusers'. Additional earnings data beyond 2013 would reveal whether the initial impact is sustained, and whether earnings growth continued to trend upward and distinguish users from nonusers. Follow-on research could explore whether employment and earnings vary by spouses' chosen career field. Additionally, if MyCAA were to collect data on new applicants' intentions for the education or training, future research could examine whether these measures vary by intent (e.g., obtain a first postsecondary degree; change career fields; further develop expertise in an established career field; reestablish credentials following a military move).

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Abbreviations

ADSS	Active Duty Spouse Survey
AFQT	Armed Forces Qualification Test
ANOVA	analysis of variance
DEERS	Defense Enrollment Eligibility Reporting System
DMDC	Defense Manpower Data Center
DoD	U.S. Department of Defense
GAO	U.S. Government Accountability Office
MyCAA	My Career Advancement Account
NCO	noncommissioned officer
OMB	U.S. Office of Management and Budget
PCS	permanent change of station
SECO	Spouse Education and Career Opportunities
SSA	Social Security Administration

Part I: Background and Context

1. The My Career Advancement Account Scholarship and Rationale for an Evaluation

Persistent U.S. military spouse education and employment challenges provided the impetus for the U.S. Department of Defense's (DoD's) Spouse Education and Career Opportunities (SECO) program.[1] This chapter describes these challenges and offers a brief history and overview of one of the DoD initiatives, the My Career Advancement Account (MyCAA)[2] Scholarship. It then describes the motivation and objectives for this relatively early evaluation of MyCAA, and conveys our research questions and how we approached them. The chapter closes by outlining the organization of the remainder of this report.

Military Spouse Employment Challenges

Research has found that military spouses tend to earn less than spouses of civilians and are less likely to be employed, even when they have more years of education or more work experience (Booth, 2003; Booth et al., 2000; Harrell et al., 2004; Heaton and Krull, 2012; Hisnanick and Little, 2014; Kniskern and Segal, 2010; Lim, Golinelli, and Cho, 2007; Lim and Schulker, 2010; Maury and Stone, 2014). In a recent example using post-2008 Great Recession data, an analysis of the Deployment Life Survey found that employed women spouses earn less than comparable employed civilian peers in terms of raw dollars and percentage earnings (Meadows et al., 2016a).[3] Moreover, military wives who are working earn significantly less even when their earnings are compared to civilian counterparts who work just as many hours (Meadows et al., 2016a).

Military spouses' experiences in the labor market can vary by education level. The last two Active Duty Spouse Surveys (2012 ADSS and 2015 ADSS) found that military spouses with fewer years of education were more likely to be unemployed than those with more schooling (Defense Manpower Data Center [DMDC], 2013, 2015). In 2015, 15 percent of military spouses with no college were unemployed, compared to 12 percent of those with some college, a two-year degree, or a vocational diploma, and 11 percent of spouses with a four-year degree or greater (DMDC, 2015, p. 90). These surveys also found that military spouses with more years of education were more likely to be employed in their career field (DMDC 2013, 2015). In 2015,

[1] Much of the content in this chapter appeared as background for other publications produced by this study as well (Friedman, Miller, and Evans, 2015; Gonzalez, Miller, and Trail, 2016).

[2] We abbreviate the scholarship's name to "MyCAA" because of frequent reference to it in this report and to simplify the headings and labels in our charts and figures. Readers should note, however, that in general the SECO program prefers referring to the scholarship by its full name.

[3] The Deployment Life Survey's baseline assessments were conducted between March 31, 2011, and August 31, 2012 (Meadows et al., 2016b).

48 percent of military spouses with no college education reported working within their area of education or training, compared to 50 percent of military spouses with some college or a vocational diploma, 54 percent of spouses with a four-year college degree and possibly some graduate school, and 75 percent with master's, doctorate, and other professional degrees (DMDC, 2015, p. 154).

Military spouses often differ from civilian spouses along characteristics that may be associated with challenges to earnings and employment, which is why scholars typically try to compare only similar military and civilian spouses to one another. In 2014, 93 percent of spouses of active-duty service members were women, and 52 percent were 30 years of age or younger (Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy, 2015, p. 132). According to the 2015 ADSS, 68 percent of military spouses had children living at home, and of those spouses, 59 percent had children under the age of six (DMDC, 2015). According to the 2012 American Community Survey (ACS), the 95 percent of active-duty military spouses who are women are younger, on average, than civilian spouses (33 years old compared to 47), and are more likely to have minor children at home compared with their civilian counterparts (74 percent versus 59 percent) (Maury and Stone, 2014 p. 5).[4] Prior research has found that for military spouses, underemployment persists even after adjusting for demographic differences between military and civilian spouses, and military spouses have lower employment rates than demographically similar civilian spouses (Heaton and Krull, 2012, p. 7).

Research has attributed several features of military life to these differences in employment and earnings, such as rigid and demanding work hours for military personnel, frequent permanent change of station (PCS) moves, deployments that may leave spouses with responsibilities similar to those of single parents, employer bias against hiring military spouses, and depressed labor markets around military bases (Booth, 2003; Booth et al., 2000; Booth, Segal, and Bell, 2007; Castaneda and Harrell, 2008; Cooke and Speirs, 2005; Cooney, 2003; Cooney, De Angelis, and Segal, 2011; Harrell et al., 2004; Heaton and Krull, 2012; Hisnanick and Little, 2014; Hosek and MacDermid Wadsworth, 2013; Kniskern and Segal, 2010; Lim, Golinelli, and Cho, 2007; Little and Hisnanick, 2007; Savych, 2008). The 2013 Military Spouse Employment Survey, administered to active-duty military wives by the Institute for Veterans and Military Families at Syracuse University, suggests that underemployment and unemployment among military spouses are the result of PCS moves, or relocations; a mismatch between education level and jobs available; and the perception that employers will not hire military spouses (Maury and Stone, 2014). Civilian husbands of military women may earn more than civilian wives of military men, but these husbands are less satisfied with their employment than are civilian wives of military men (Cooney, De Angelis, and Segal, 2011). In a more recent survey by the U.S. Chamber of Commerce Foundation, an opt-in panel sample of spouses of

[4] A study comparing statistics for military spouses on gender, age, race, education, and "having minor children" as recorded in the ACS and in DoD administrative data concluded that "the ACS does a good job of capturing a representative sample of this population" (Heaton and Krull, 2012, p. 5).

current and recent service members reported challenges with unemployment and underemployment, a need or preference for two incomes within the family, and that the lack of employment opportunities for spouses is a factor in the respondents' and their service members' decision to stay in the military (U.S. Chamber of Commerce, 2017).

Department of Defense Initiatives to Support Spouse Education and Career Opportunities

To mitigate the impact of the demands of military life, in 2007 DoD's Military Community and Family Policy office established the Spouse Education and Career Opportunities (SECO) program. SECO contains a portfolio of initiatives that provide career development and employment assistance for military spouses. DoD characterizes SECO as a part of its broader military family readiness system (DoD, 2012). These initiatives include:

- career-counseling services available through the SECO Call Center at Military OneSource
- resources for testing, education, and training for portable career fields, available through the MyCAA Scholarship
- avenues to connect spouses with potential employers through the Military Spouse Employment Partnership
- efforts by the DoD State Liaison Office to improve the portability of occupational licenses and credentials across state lines and to expand unemployment compensation eligibility to military spouses following their service member after a PCS move.[5]

Military Community and Family Policy goals for the SECO program are a reduction in military spouse:

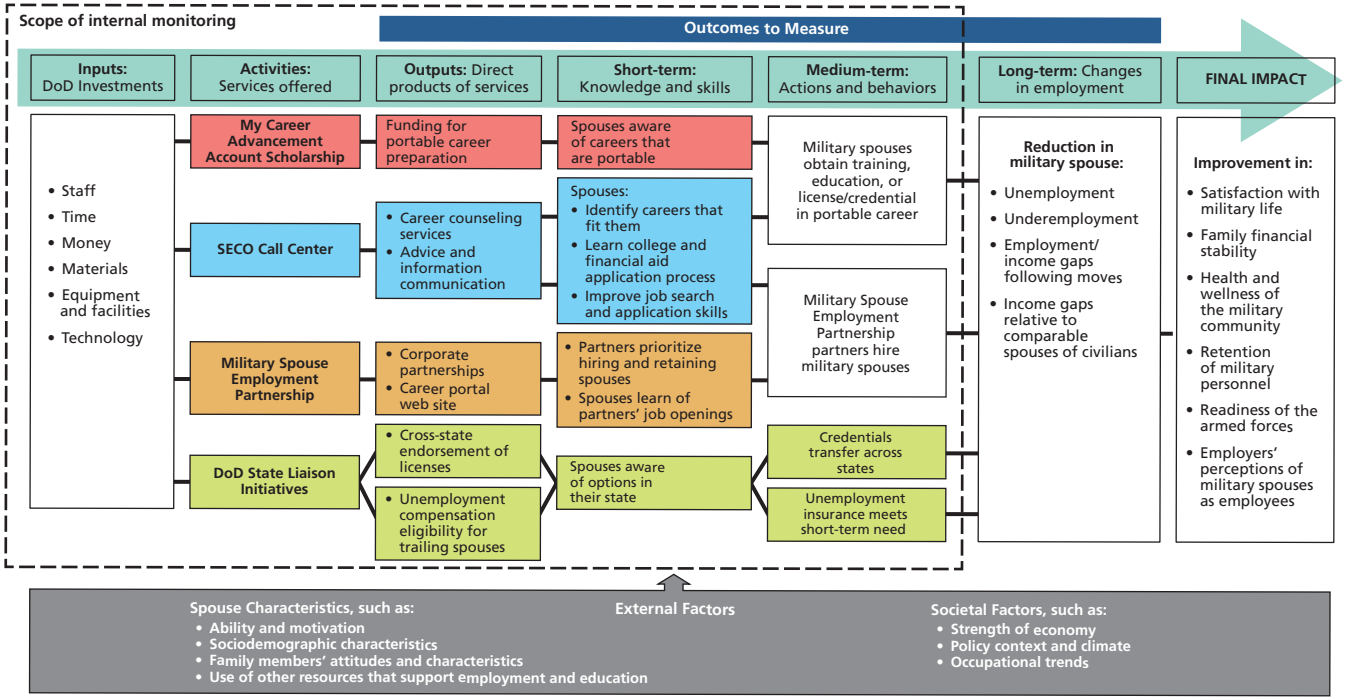
- unemployment (lack of employment *despite seeking work*)
- underemployment (working fewer hours than desired or in jobs for which the spouse is overqualified)
- employment gaps following PCS moves
- wage gaps between military spouses and their counterparts who are married to civilians.

The ultimate aims of promoting spouse education and employment continuity are to improve satisfaction with military life, family financial stability, the health and wellness of the military community, retention of military personnel, and the overall readiness of the Armed Forces (Office of the Deputy Under Secretary of Defense, 2008). In 2012, as an initial step for this study, we developed a logic model (see Figure 1.1) that articulates the overall strategy for the SECO program initiatives and shows MyCAA's place within it.[6]

[5] These other SECO initiatives are described more fully in Gonzalez, Miller, and Trail, 2016.

[6] This logic model was previously published in Gonzalez, Miller, and Trail, 2016. In a complementary effort, RAND also developed logic models to describe the features and intended outcomes of DoD, Department of Veterans Affairs, and Department of Education educational assistance programs available to military personnel to use while they are still in the service (Buryk et al., 2015).

Figure 1.1. MyCAA Scholarship Located in RAND Logic Model of SECO Program Initiatives



NOTE: Figure previously published in Gonzalez, Miller, and Trail, 2016.

The MyCAA Scholarship

DoD's MyCAA Scholarship provides up to $4,000 in tuition and examination assistance for eligible spouses pursuing associate's degrees, occupational certificates, or licenses in portable career fields. Spouses may attend school full-time or part-time and may also work while in school. DoD defines portable careers as high-demand, high-growth careers likely to have job openings near military duty locations and identified by the Department of Labor as likely to be sustainable over time. MyCAA emphasizes these careers based on the following rationale:

> (Attainment of) a portable degree or credential funded with a CAA [Career Advancement Account] will help military spouses enter and advance in the workforce even as they relocate when their service member spouses transfer to other bases. A longer-term goal…is to encourage the retention of the service member in the military by improving his or her spouse's job prospects and increasing the satisfaction of the entire family with life in the military (Zaveri, Pisciotta, and Rosenberg, 2009, p. 1).

The MyCAA Scholarship is relatively new and has gone through three iterations. Across these iterations, the consistent goal has been to support spouses in their pursuit of careers that are better able to weather the frequent moves of the military lifestyle.

The first version of this effort began in July 2007, when DoD and the Department of Labor collaborated to launch the Military Spouse Career Advancement Account Demonstration on a small scale at 18 installations in eight states.[7] The goal of the initiative was to employ military spouses in portable careers to help manage the "mobile military lifestyle" (Office of the Deputy Under Secretary of Defense, 2008, p. 1). To be eligible, military spouses had to have a high school diploma or General Education Diploma at the time of application and be married to a service member with at least one year remaining at his or her current duty station. Eligible spouses at the participating installations were provided with up to $3,000 a year for two years to use toward tuition, fees, or other relevant expenses at accredited two-year colleges and technical training centers, or to use toward fees required for career credentials and licenses. As of May 2009, about 17 months after the selected states were to begin providing these awards, 5,366 grants were awarded (Needels and Zaveri, 2009, p. 17). An implementation study documented successes and challenges of that initial effort, and found in group discussions that spouses participated to

- further career and job prospects
- improve themselves and their self-esteem
- further their education
- contribute to family financial well-being
- engage in a positive distraction during their service member's deployment (Zaveri, Pisciotta, and Rosenberg, 2009, p. 57).

[7] The states were California, Colorado, Florida, Georgia, Hawaii, Maine, North Carolina, and Washington.

The evaluation of the demonstration project was conducted too early to be able to assess individual-level short- and long-term outcomes: Most spouses had not completed their training or employment at that time (Needels and Zaveri, 2009; Zaveri, Pisciotta, and Rosenberg, 2009).

Following that demonstration project, a full-scale MyCAA tuition assistance scholarship initiative was launched across DoD in 2009 to promote employment and portable career opportunities by offering up to $6,000 a year to any military spouse. Subsequent analyses revealed that the average earnings of military spouses were approximately $15,000, thus $6,000 in 2009 represented a substantial contribution toward the cost of higher education (Burke and Miller, 2018). In less than a year, DoD was overwhelmed by the demand: 136,000 spouses enrolled in MyCAA, for an estimated $250 million in benefits (Harkin, 2010b, p. 6). The budget would not sustain an initiative of this scale, and in February 2010 MyCAA was closed to any new applicants. To save the initiative and contain costs, DoD scaled it back in 2010 by limiting eligibility, approved uses, and the amount of the scholarships (Harkin, 2010b, p. 6).

To further support spouses' moving realistically and efficiently toward their education and occupational goals, SECO has required since 2012 that spouses who apply for a MyCAA Scholarship consult with the career counselors at the SECO Call Center. Those career counselors can help them make decisions about which careers to pursue, develop an educational plan, and access additional scholarship information, should the spouse need funds beyond those available through MyCAA. MyCAA recipients must also register for the Military Spouse Employment Partnership, which is designed to help them locate job opportunities. The remainder of this section describes the eligibility, approved uses, amount of awards, and usage of the scholarship.

Eligibility Requirements

The strategy for the redesigned MyCAA Scholarship is to focus on the spouse population most likely to have the greatest need for assistance and on courses of study likely to provide the most direct and immediate benefit to military spouses' employment opportunities. In October 2010, DoD launched the redesigned initiative, which restricted eligibility to spouses of military personnel in the earliest pay grades of a military career.[8] Eligible spouses cannot be on active duty, and must be married to service members who are serving on full-time active-duty federal service (i.e., under the authority of Title 10 of the United States Code) and in the pay grades of E-1 to E-5, W-1 to W-2, and O-1 to O-2. These military personnel tend to be in their first term of service, so there is also the possibility that the scholarship could serve as a retention tool. Educational benefits from the Post-9/11 GI Bill cannot be transferred to spouses until military personnel have at least six years of service in the armed forces, so most of these spouses would

[8] Most warrant officers are well advanced in their military careers, but for some Army aviators, this is the entry-level pay grade.

not yet be able to acquire funds from that source. Spouses who do not take advantage of MyCAA before their spouses are promoted out of these pay grades lose the opportunity to do so.

Approved Uses

MyCAA funds can be used to pay for education, training, and testing in portable careers only, which covers hundreds of occupations falling into a diverse range of career fields. The original demonstration project specified five career fields that met its focus: construction, education, financial services, health care, and information technology. In response to feedback from military spouses, DoD expanded the career fields offered to include human resources, hospitality, homeland security, and business administration (Needels and Zaveri, 2009, p. 24). A complete list of current portable career fields and a sample of approved occupations are listed in Table 1.1.

Table 1.1. Sample MyCAA-Approved Portable Occupations by Career Field

Career Field	Sample Occupations
Aerospace	Aircraft mechanic, aircraft service technician
Animal services	Animal groomer, animal trainer, veterinarian
Automotive services and transportation	Automotive mechanic, police/fire/ambulance dispatcher
Business, finance, and administration	Accountant, real estate agent, tax preparer
Construction	Carpenter, interior designer, painter, welder
Education	Child care worker, K–12 teacher, librarian
Energy	Electrical power-line installer and repairer
Health and human services	Dentist, dietician, medical billing, psychologist
Homeland security	Detective, firefighter, police officer, security guard
Hospitality	Bartender, chef, lifeguard, event planner
Information technology	Database administrator, software engineer
Legal	Court reporter, lawyer, paralegal
Skilled trades	Barber, journalist, nail technician, translator/interpreter

SOURCE: SECO, 2016.

Scholarship funds can be used for tuition assistance for associate's degrees, occupational licenses, and certificates in portable careers. The scholarship supports pursuit of a high school equivalency certificate or diploma only as a part of a plan to obtain one of these portable career degrees, licenses, or certificates, not as an end in itself. The scholarship does not support general studies or the pursuit of bachelor's or graduate degrees. Tuition for graduate-level courses that are a part of an approved educational plan or for necessary continuing education in an approved career field may also be authorized.

In addition to tuition, scholarships can cover the costs associated with recertification, occupational license, or credential examinations. This can include courses at any level (including at the bachelor's and graduate levels) that are required as part of the recertification, license, or credential examination. For example, a teacher holding a bachelor's degree who needs

professional recertification in a new state following a PCS move can use funds from a scholarship to pay for any courses or exams required for that recertification. Many occupations and professions are regulated by state licenses and certificates; a few examples not included in Table 1.1 include truck driver, cosmetologist, electrician, licensed practical nurse, physical therapist, home inspector, computer network administrator, pharmacy technician, and human resource specialist.

Scholarship Amounts

Since October 2010, scholarships have provided a maximum education benefit of $4,000 with an annual fiscal year cap of $2,000. Annual cap waivers are available for licensure and certificate programs if there is an upfront tuition cost that exceeds $2,000 (up to the maximum education benefit of $4,000). This scholarship is not taxable. The funds are sent one school term at a time, directly to the training or license/certification testing institution, not to spouses. Military Community and Family Policy must approve the accredited institution or testing facility before granting the scholarship. Approved institutions may be public or private, and for-profit or not-for-profit. Spouses must be able to finish their program of study within three years from the start date of the first sponsored course; funds are no longer available after that expiration date. Spouses will also lose access to funds if during this period they become ineligible (e.g., through divorce, by becoming active-duty on Title 10 orders themselves, or if their service member is promoted out of an eligible pay grade or leaves the military).

Use of MyCAA Scholarships October 2010 through December 2014

SECO accepts all eligible spouses who apply for a scholarship for an approved course of study at an approved institution (i.e., there is no set number of scholarships for which spouses must compete). DoD reports that 101,144 spouses used MyCAA funds between the scholarship redesign at the end of October 2010 and the end of December 2014.

Table 1.2 shows the estimated number of associate's degrees, certificates, and licenses obtained by military spouses using MyCAA Scholarships in that more than four-year time frame. These numbers are estimates because the schools did not always directly confirm completion of the educational plan. In some cases, however, the school indicated that the final course or the

Table 1.2. MyCAA Scholarship Education Plans Estimated to Be Completed Between October 25, 2010, and December 31, 2014

Education Plan	Estimated Number Completed
Associate's degree	8,075
Occupational certificate/credential	26,621
Occupational license	1,511
Total	**36,207**

SOURCE: Data for the MyCAA Scholarship provided by the Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy.

occupational license or certification exam was successfully completed with a passing grade. These numbers likely underestimate completion, as spouses who lost eligibility while still in school have no incentive to return to the system and record that they completed their education plan. In Chapter Two, we will provide context for the completion rates relative to those observed in the broader U.S. population.

Why Evaluate MyCAA?

DoD interest in evaluating MyCAA reflects a broader federal agency practice of assessing the implementation and impact of programs and policies. The Government Performance and Results Act of 1993 (Public Law 103-62) and its successor, the Government Performance and Results Act Modernization Act (GPRAMA) of 2010 (Public Law 111-352) require federal agencies to track their programs' progress toward achieving their goals. GPRAMA emphasizes government-wide priority-setting and cross-organizational collaboration to achieve shared goals. The U.S. Office of Management and Budget's (OMB's) *Fiscal Year 2014 Analytic Perspectives for the Budget* (2013) operationalizes the GPRAMA 2010 for the federal government: It describes the federal performance framework, strategic and annual plans, the performance management cycle, the role of program evaluation, and detailed guidance on conducting program evaluations. This guidance requires federal leaders and managers to set specific short-term performance goals and indicators for their programs, as well as long-term goals and objectives, and lists six practices the White House has emphasized:

- goal-setting
- frequent measurement of performance and other indicators
- ongoing analysis
- use of evidence in decisionmaking
- data-driven reviews
- information dissemination that is timely, accessible, and user-friendly (OMB, 2013, p. 87).

Within this context, there have been multiple calls from different actors for an evaluation of the cost-effectiveness of federal efforts to promote military spouse employment and education, as well as whether these efforts meet the needs of the military spouses they were designed to help. In May 2010, President Barack Obama directed the National Security Staff to develop a coordinated, federal government–wide approach to supporting military families. Subsequently, an interagency policy committee identified four priority areas to address the concerns and challenges of military families. The committee's report, *Strengthening our Military Families: Meeting America's Commitment*, stated that one priority was for a government-wide commitment to develop career and educational opportunities for military spouses by:

- increasing opportunities for federal careers
- increasing opportunities for private-sector careers
- increasing access to educational advancement

- reducing barriers to employment and services due to different state policies and standards
- protecting the rights of service members and families (White House, 2011, p. 2).

The report concluded by asserting that "each commitment has associated metrics and will undergo recurring assessments" (White House, 2011, p. 23).

In December 2010, U.S. Senator Tom Harkin, chairman of the Health, Education, Labor and Pensions Committee, published a report (Harkin, 2010b) questioning whether educational benefits for service members, veterans, and military spouses were benefiting for-profit schools more than they were benefitting the recipients. For-profit schools receive a significant share of military educational benefits, including funds provided by MyCAA for the education of military spouses. To inform the committee's inquiry, the Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy was called upon to provide statistics on MyCAA, which was named explicitly in the report. As noted above, Military Community and Family Policy decides which institutions it will approve as eligible to receive My Career Advancement Account Scholarships. During the first year of the MyCAA Scholarship, 46 percent of military spouse recipients who were enrolled in degree-seeking programs that were tracked by sector were attending for-profit schools (Harkin, 2010b, p. 6). The report highlighted prior investigations (Harkin, 2010a) into evidence that the majority of students who enroll in for-profit schools accumulate debt but do not complete their course of study. Furthermore, Harkin asserted that the default and low loan-repayment rates for those who do graduate call into question whether those degrees lead to higher-paying jobs (Harkin, 2010b, p. 17).[9] Thus, Harkin called upon Congress, DoD, and the Department of Veterans Affairs to investigate the quality and outcomes of education at for-profit schools to ensure that new federal military education benefits work as intended and that taxpayer dollars are spent wisely. Thus, one reason to evaluate MyCAA would be to determine whether spouses who use their scholarships at for-profit schools are indeed less likely to complete their studies or have poorer outcomes than spouses attending nonprofit schools.

In early 2012, the Office of Cost Assessment and Program Evaluation (CAPE) in the Office of the Secretary of Defense required that the Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy evaluate its military spouse programs. CAPE emphasized that evaluations should focus on the impact of the programs on users' lives rather than on the program processes. In December 2012, the U.S. Government Accountability Office (GAO) recommended that DoD describe its overall strategy for how its programs should coordinate to help military spouse employment and improve its monitoring and evaluation of these programs.

[9] Harkin states, "It is noteworthy that four of the five for-profit schools receiving the most Post-9/11 GI Bill funding in the first year have loan repayment rates of only 31 percent to 37 percent. The same four schools have at least one campus with a student loan default rate above 24 percent over three years" (2010b, p. 13).

In December 2014, the U.S. Congress mandated as part of the 2015 National Defense Authorization Act that the Secretary of Defense collect data to evaluate the effectiveness of military spouse employment initiatives (particularly the Military Spouse Employment Partnership) "in addressing underemployment of military spouses; in matching military spouses' education and experience to available employment positions; and in closing the wage gap between military spouses and their civilian counterparts" (Public Law 113–291, 2014, Sec. 568). Early findings from the Military Spouse Employment Partnership evaluation are available in Gonzalez et al., 2015.

Since the inception of the SECO program, Military Community and Family Policy has routinely gathered usage and performance statistics on each of the SECO initiatives. At the time we began our study, however, there had been no formal evaluation to understand implementation or the potential effectiveness of the initiatives. In 2012 the Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy asked the RAND Corporation to explore the feasibility of evaluating SECO initiatives. As a part of that effort, RAND developed the logic model for SECO that provided a framework against which data sources could be identified and assessed. RAND determined that although MyCAA was a relatively new initiative, of the SECO initiatives it held the most potential for an evaluation, as SECO had been collecting detailed individual-level data on participation. Furthermore, the 2012 ADSS included items that asked military spouses about their perspectives and use of MyCAA Scholarships as well as about their education and employment preferences and experiences more broadly, thus providing the opportunity to gain additional insights on MyCAA (Friedman, Miller, and Evans, 2015). Subsequently RAND sought to build a detailed dataset and evaluate the potential for the MyCAA Scholarship to support the educational and employment outcomes for eligible military spouses. We considered this to be an early evaluation because (1) this version of the scholarship began in October 2010, (2) spouses have up to three years to complete their education or training plan, and (3) even if the scholarship were effective, spouses might not immediately find jobs in their career field.

Research Questions

Military Community and Family Policy sponsored an early evaluation of MyCAA to better understand the use of the scholarship and to discover whether the scholarship appears to be having the intended impact. To meet this objective, the MyCAA evaluation was organized around exploring the following main research questions:

Question 1: Who applies for a MyCAA Scholarship?
Question 2: Which MyCAA users complete their education and training plans?
Question 3: Does MyCAA improve the employment or earnings of spouses?
Question 4: Are service members married to MyCAA users more likely to remain on active duty than service members married to nonusers?

Elsewhere we have proposed a system for Military Community and Family Policy to continuously assess SECO program implementation and track whether its initiatives are meeting the needs of their participants by supporting participants' acquisition of skills and knowledge (Gonzalez, Miller, and Trail, 2016). Such a system could thereby inform ongoing improvements.

Organization of the Report

Chapter Two outlines the context in which MyCAA is offered, to include patterns in higher education and tuition assistance in the United States.

Part II of this report, which comprises Chapters Three and Four, explores patterns in MyCAA application and scholarship use by military spouses. Chapter Three examines who applies for a MyCAA Scholarship, defining the user groups and the cohort under study and using descriptive statistics and regression models to explore MyCAA application as a function of spouse characteristics, service member characteristics, and household characteristics. Chapter Four explores which MyCAA users completed their education and training plans, and considers possible associations not only with spouse, service member, and household characteristics but also with MyCAA plan and school characteristics.

Part III of this report (Chapters Five and Six) discusses associations between MyCAA Scholarship use and other factors that DoD would consider desired outcomes of scholarship use. Chapter Five explores near-term associations between MyCAA use and spouse employment and earnings. Chapter Six analyzes the association between military spouse MyCAA use and service member likelihood of continuing in active-duty military service.

Finally, in Part IV's Chapter Seven we conclude by succinctly highlighting key results from our analyses, their implications, recommendations for program implementation, and suggestions for future evaluations.

Appendixes (available online) provide more technical details likely of value primarily to other scholars. Appendix A provides a more detailed list of the variables. Appendix B contains the equations for measuring income that were used in the analyses reported in Chapter Five. Appendix C provides the regression estimates associated with the results presented in Chapters Three through Six.

2. The Context of U.S. Higher Education

Military spouses typically pursue their educational goals within the U.S. system of higher education. Their educational goals, school choices, and ability to afford their preferred course of study are shaped by their available opportunities. Their ability to obtain their education or training, to complete it in a timely manner, and subsequently to succeed in the labor market may depend in part on features of their educational goal and institutions, and not just on their own characteristics or features of military life. In this chapter, we review the educational context for its insights into the relative value of a $4,000 MyCAA Scholarship.

This chapter examines the factors that could influence students' success in higher education. First, it describes the importance of higher education and the types of undergraduate education goals students might pursue and the general types of institutions of higher education. Second, it discusses the costs and types of assistance for such education. Then it describes outcomes for students pursuing these educational goals, including certificate and degree program completion rates, which provides context for understanding military spouse student outcomes.

The Value of Obtaining Higher Education

It is well documented that obtaining more years of education is associated with individual benefits such as a greater likelihood of being employed, higher earnings (for a detailed review of this literature, see Card, 1999), increased job satisfaction (Strulik, 2015), and better decisionmaking about health, marriage, and parenting (Chetty, 2006; Cutler and Lleras-Muney, 2010; Lundborg, 2013; Kaushal, 2014). It has also been associated with improved patience, making individuals more goal-oriented and less likely to engage in risky behavior (Brunello et al., 2016; Strulik, 2016). And it can have positive effects on health and well-being (Heckman, Humphries, and Veramendi, 2016). Further, schooling has been shown to be positively associated with improved trust and social interaction, and may offer substantial consumption value to some students (Oreopoulos and Salvanes, 2009). These relationships hold even when analyses consider a variety of individual family backgrounds or other characteristics (Becker, 1962, 1994; Heckman, Humphries, and Veramendi, 2016). There is a general consensus that in the United States and other developed countries: (1) the monetary returns to annual adult income from spending one year in high school or college are about 7 to 12 percent, on average; (2) returns are generally higher among individuals from more disadvantaged backgrounds; and (3) returns have generally increased since the 1980s (Oreopoulos and Salvanes, 2009). College enrollment may also generate social benefits that exceed the individual returns. For example, postsecondary education has been linked to higher levels of volunteering and voting (Dee, 2004), better birth outcomes and higher levels of school readiness in the next generation (Currie and

Moretti, 2002), lower levels of criminal behavior (Lochner and Moretti, 2004), and higher levels of economic growth (Aghion et al., 2009).

Employers are increasingly requiring some type of postsecondary education credential or degree, and higher education can yield higher earnings for those who attain it compared to those who do not. Employment projections suggest that by 2018, 63 percent of new jobs will require at least some postsecondary education (Carnevale, Rose, and Cheah, 2011). A survey conducted for Business Roundtable in the same time frame that the current MyCAA initiative was being developed revealed that almost two-thirds of U.S. employers require all, most, or some new employees to have earned an associate degree or higher (Business Roundtable, 2010). From 1999 to 2011, the premium for a college education grew to 84 percent: On average, a bachelor's degree is worth $2.8 million over a lifetime (Carnevale, Rose, and Cheah, 2011). There is also a premium for people with associate's degrees, who earn, on average, one-third more than those with only a high school diploma (Carnevale, Rose, and Cheah, 2011). Postsecondary occupational certificate holders earn 20 percent more than high school graduates without any postsecondary education (Carnevale, Rose, and Hanson, 2012). Thus, students can realistically expect an economic return on the time, effort, and costs of pursuing higher education.

What Educational Goals Are Students Pursuing and at What Types of Institutions Do They Study?

Students at undergraduate educational institutions may pursue a variety of educational goals. Bachelor's degrees and associate's degrees are often referred to as "four-year" and "two-year" degrees, respectively, although those terms may be misleading, as we will discuss later in this chapter. Not all college students are pursuing degrees: They may be seeking personal enrichment, or pursuing or refreshing job skills or credentials. Credentials may take the form of an occupational license, obtained by passing a test either as a part of or after academic or vocational courses are completed. Occupational certificates are another type of labor market credential that students earn by successfully completing a required course of study. These credentials have become increasingly popular during the past several decades: Fewer than 2 percent of adults had a certificate as their highest level of education in 1984 compared to 12 percent in 2009 (Carnevale, Rose, and Hanson, 2012, p. 4).

Undergraduate institutions may be characterized as four-year or two-year institutions, based on the highest level of educational attainment they offer. Two-year community colleges are public institutions that offer associate's degrees as the highest degree, and their programs are typically vocational. For some two-year college students, the intended end goal is a certificate or associate's degree; in some states, two-year institutions also offer students who wish to study further the opportunity to transfer some or all of their coursework toward a bachelor's degree, depending on articulation agreements in place with public colleges and universities or admission policies in private colleges.

Postsecondary schools may also be characterized by the type of governance and funding mechanisms in place. Public schools' operating costs are funded within state government budgets. Alternatively, private schools rely upon tuition, fees, and private contributions for their operating budget. To illustrate, in the fall of 2010, 19 percent of revenues collected by public four-year institutions came from student tuition and fees, compared to 33 percent of revenues coming from student tuition and fees at private nonprofit four-year schools and 91 percent at private for-profit four-year schools (Knapp, Kelly-Reid, and Ginder, 2012). For-profit schools are corporations with the business goal of generating a profit by selling education as their product. Entry requirements at for-profit schools are generally minimal (e.g., a GED or high school diploma, with no minimum grade point average or college entrance exam required) and vocational programs are common. The history of private for-profit higher education dates back to the late nineteenth century when there was increased demand by students for vocational and technical training (Deming, Goldin, and Katz, 2011). Some of those early for-profit schools are still in operation today. For example, Bryant and Stratton College began operating in 1854, Strayer University opened in 1892, and Blair College (which became Everest College) opened in 1892 (Deming, Goldin, and Katz, 2011, p. 3). As shown in Table 2.1, 76 percent of students pursuing an associate's degree are enrolled in a public two-year institution; however, only 38 percent of students pursuing a certificate are attending a public two-year institution, as 46 percent are enrolled at private for-profit schools.

Table 2.1. Percent of Students Enrolled in Undergraduate Education Institutions in the U.S. During the Period Most of the MyCAA Cohort Began Using Their Scholarships (2011–2012)

Undergraduate Program	Public 4-Year	Private Not-for-Profit 4-Year	Public 2-Year	Private for-Profit	Others, or Attended More Than One School	Total[a]
All students	28	12	38	13	9	100%
Certificate	4	1	38	46	11	101%
Associate's degree	6	1	76	10	8	101%
Bachelor's degree	54	23	2	11	9	99%
Not in a degree program/others	12	7	62	4	15	100%

SOURCE: Skomsvold, 2014.
[a]May not total 100% due to rounding.

What Is the Average Cost to Students of Higher Education?

The average cost for students pursuing occupational certificates, two-year college degrees, and four-year college degrees varies widely, with determining factors including the course of study and whether the institution is private or public and for-profit or not-for-profit. This context is important for considering factors that might relate to the cost of military spouses' chosen educational goals, where they pursue them, and the relative value of a MyCAA Scholarship. Of course, the relative value will also correspond to other factors we are unable to observe for

MyCAA users, such as whether they are also using other grants, scholarships, loans, or aid and how much they may be spending out of pocket or charging to credit cards.

Tuition and Fees at Two-Year Schools

Table 2.2 displays the average tuition and required fees for an academic year by type of two-year institution in current and inflation-adjusted dollars (National Center for Education Statistics, 2015a).[1] *Current dollars* refers to the costs for that specific academic year, while 2013 dollars adjust these costs for inflation. This table shows that average tuition and fees were markedly higher at private nonprofit schools than at public nonprofit institutions. Private for-profit schools tended to charge the highest tuition and fees, except for the 2011 to 2012 academic year. In general, tuition and fees tended to increase at public and private nonprofit institutions between 2009 and 2013. The exception was a decline in costs by private nonprofit schools for the 2012 to 2013 academic year. Table 2.2 shows that private for-profit schools have reduced their average tuition and fees, after adjusting for inflation.

Table 2.2. Average Tuition and Required Fees by Type of Two-Year Institution and Academic Year (in Current and Inflation-Adjusted 2013 Dollars)

	Public Nonprofit		Private Nonprofit		Private For-Profit	
	Current	Inflation-Adjusted	Current	Inflation-Adjusted	Current	Inflation-Adjusted
2009–2010	2,285	2,439	12,656	13,510	15,146	16,167
2010–2011	2,439	2,553	12,669	13,257	14,654	15,334
2011–2012	2,652	2,696	14,077	14,312	13,992	14,225
2012–2013	2,792	2,792	13,747	13,747	14,193	14,193

SOURCE: National Center for Education Statistics, 2015a.
NOTES: Inflation-adjusted dollars are based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor, adjusted to a school-year basis. Data are for the entire academic year and are average charges for full-time students. Tuition and fees were weighted by the number of full-time-equivalent undergraduates, but were not adjusted to reflect student residency.

Tuition and Fees at Four-Year Schools

Table 2.3 displays the current and inflation-adjusted costs by type of four-year institution (National Center for Education Statistics, 2015a). This table shows that private nonprofit schools have the highest average costs. Further, the costs for private for-profit schools were higher than

[1] The costs displayed in Tables 2.2 and 2.3 may not include all scholarship discounts for students that affect the final cost of attendance. For example, in the 2007–2008 academic year, 58 percent of students at public universities, 81 percent of students at private nonprofit schools, and 72 percent of students at private for-profit institutions received grants (U.S. Departments of the Treasury and Education, 2012). Moody's Investors Service estimates that these tuition discounts have expanded at colleges and universities in recent years (Moody's, 2014, p. 2).

those for public nonprofit schools. In general, these costs tended to rise between academic years 2009 to 2010 and 2012 to 2013. The exception to this trend is declines in the average costs of private for-profit schools starting in the 2011 to 2012 academic year.

Table 2.3. Average Tuition and Required Fees by Type of Four-Year Institution and Academic Year (in Current and Inflation-Adjusted 2013 Dollars)

	Public Nonprofit		Private Nonprofit		Private For-Profit	
	Current	Inflation-Adjusted	Current	Inflation-Adjusted	Current	Inflation-Adjusted
2009–2010	6,695	7,147	25,552	27,275	13,437	14,343
2010–2011	7,136	7,467	26,523	27,755	14,162	14,819
2011–2012	7,703	7,832	27,615	28,075	13,713	13,941
2012–2013	8,070	8,070	28,746	28,746	13,689	13,689

SOURCE: National Center for Education Statistics, 2015a.
NOTES: Inflation-adjusted dollars based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor, adjusted to a school-year basis. Data are for the entire academic year and are average charges for full-time students. Tuition and fees were weighted by the number of full-time-equivalent undergraduates, but were not adjusted to reflect student residency.

The Cost of an Occupational Certificate

The cost of certificate programs can vary for several reasons. First, as noted above, government subsidizes public nonprofit schools, but not private for-profit institutions, and thus tuition and fees tend to be lowest at the public nonprofits. Additionally, program length can vary by course of study. For example, the University of the District of Columbia (UDC) offered a certificate of completion for an Aircraft Mechanic's License, and according to UDC's website, in 2014 this certificate program included "about 2000 hours of comprehensive lecture and laboratory instruction and experience" (UDC, 2014a). In contrast, UDC also provided a certificate in customer service retail, which in 2014 was a 100-hour program (UDC, 2014b). Earnings potential may also factor into the price that for-profit schools, in particular, charge for their programs. Estimates in 2009 dollars show that the average annual earnings of certificate holders was $70,400 in the computer and information services field, $65,642 in aviation-related jobs, and $61,668 in the electronics field (Carnevale, Rose, and Hanson, 2012, p. 23). In comparison, these same estimates report that average in-field earnings of certificate holders were $17,600 in food service, $25,217 in cosmetology, $30,577 in health care, and $40,000 in business and office management (Carnevale, Rose, and Hanson, 2012, p. 23). The earnings potential from certificates may also vary by the race or gender of graduates from these programs. For example, the median earnings of men with certificates in the computer and information services field was $45,461 while this figure was $29,986 for women (Carnevale, Rose, and Hanson, 2012, pp. 24–25).

Costs vary within a school type. In one report, BMO Capital Markets attempted to compile the average program costs for certificate and associate's degree programs offered by several publicly held for-profit schools. The report acknowledged difficulty in obtaining these data; however, the information that was available illustrates that costs can vary dramatically. Table 2.4 shows that, where available, the average cost at each institution for a certificate program ranged from $9,000 to $37,000. The mean cost of these programs across the selected institutions is $20,143, and the median cost is $21,000. The average cost at each institution of an associate's degree ranged from $16,000 to $46,000. The mean cost for these associate's programs across institutions is $33,538, and the median cost is $34,000.

Table 2.4. Average Certificate and Associate's Degree Program Costs for Publicly Held For-Profit Postsecondary Companies, 2013

	Certificate/ Diploma	Associate's
American Public Education	N/A	16,000
Bridgepoint Education	N/A	27,000
Apollo Group (Univ. of Phoenix)	N/A	26,000
Graham Holdings Company (Kaplan)	9,000	35,000
DeVry	N/A	40,000
Career Education	15,000	30,000
Grand Canyon Education	N/A	N/A
Strayer Education	N/A	34,000
Education Management	17,000	39,000
National American University	21,000	33,000
Capella Education	N/A	N/A
Corinthian Colleges	21,000	37,000
ITT Educational Services (ITT Technical Institutes)	N/A	30,000
Lincoln Educational Services	21,000	43,000
Universal Technical Institutes (UTI)	37,000	46,000
Mean	20,143	33,538
Median	21,000	34,000

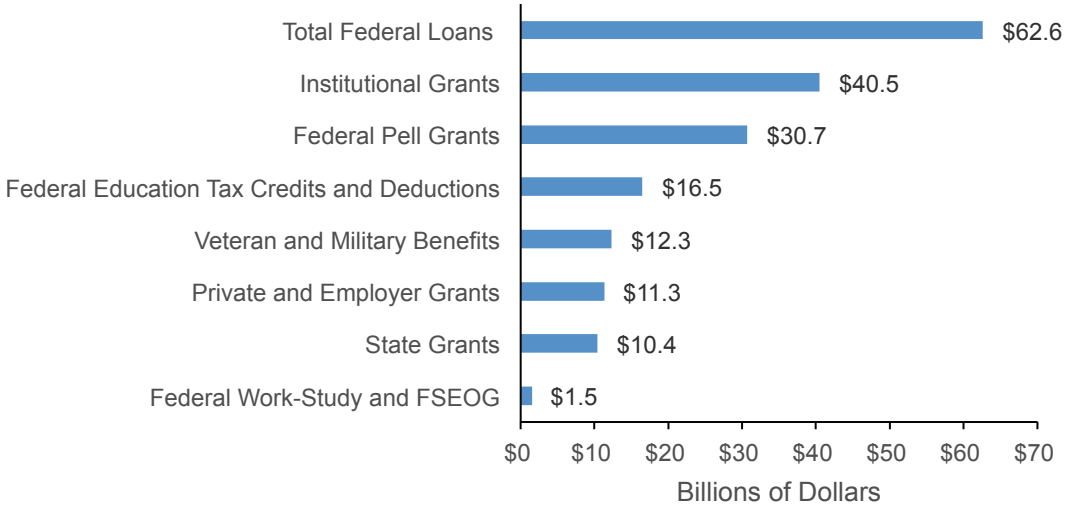
SOURCE: Silber and Chien, 2014.
NOTE: "N/A" is "not available."

What Types of Financial Aid Do Students Use?

According to the National Center for Education Statistics (2015c), most students use some amount of grants and loans to help pay for their postsecondary education. During the 2012–2013 academic year, 85 percent of students at four-year institutions and 78 percent of students at two-year institutions received financial aid. Figure 2.1 displays the total undergraduate student aid by source in billions of dollars for the 2014–2015 academic year. Grants and loans by the federal government and grants by schools are the largest sources of student aid. According to The

College Board (2016a, p. 11), undergraduate students received $62.6 billion in federal student loans during the 2014–2015 academic year. Institutions of higher education gave out $40.5 billion in grants during this time. There was also $30.7 billion in Federal Pell Grants (which do not have to be repaid to the federal government) during the 2014–2015 academic year (The College Board, 2016a, p. 9). For individual students, this means significant debt loads are common. In the 2014–2015 school year, undergraduate students received an average of $14,210 in aid per student (The College Board, 2015, p. 11).[2] Debt loads grow over the course of the educational career. Sixty-one percent of bachelor's degree recipients in the 2014–2015 school year graduated with debt, with an average borrowing amount of $28,100 (The College Board, 2016a, p. 23). Expectations for timely repayment are poor as well; 9 percent of those completing their studies and 24 percent of those failing to complete are in default two years after beginning their debt repayment.[3] Older students, students with dependents, those taking longer to graduate, and minorities tend to have higher debt loads (The College Board, 2015, p. 25–27). Although MyCAA does not track how else military spouses are funding their education, these national patterns give insights into the other options these students may be using or that MyCAA might be helping them to avoid (e.g., debt or inability to attend school).

Figure 2.1. Total Undergraduate Student Aid by Source and Type (in Billions), 2014–2015



SOURCE: The College Board, 2016b.
NOTE: Loans reported here include only federal loans to students and their parents.

[2] Calculated per full-time-equivalent student. Total amount includes $8,170 in grants from all sources, $4,800 in federal loans, and $1,240 in work study, tax credits, or other special credits (The College Board, 2015).

[3] Based on the cohort entering repayment during 2011–2012.

Ensuring Quality of Programming: Concerns About Outsourcing

To help ensure the quality of instruction for MyCAA users and the value of DoD dollars spent to support spouse education, MyCAA screens schools for eligibility to receive MyCAA funds. Instruction quality is relevant for an initiative like MyCAA, which emphasizes the need for students to be able to successfully apply their education in their chosen occupation. Thus, schools must be accredited to be able to receive MyCAA Scholarship funds. Additionally, DoD becomes concerned when spouses report that the instruction they received did not align with the content required to pass certification or license exams.

For these reasons, one trend of concern to SECO leadership is outsourcing instruction, because it could be difficult for MyCAA to determine the quality of a course or program if its instruction or grading is outsourced and therefore not under the quality-control auspices of accreditation providers. Outsourcing refers to the "process of a campus contracting with an outside vendor to provide a service rather than providing the service itself" (Kaganoff, 1998, p. 14). Institutions of higher education have outsourced various elements of their operations to third parties during the past several decades (Bailey, Jacobs, and Jenkins, 2003). Operations that schools may outsource include food services or facilities management; however, it also may include the design of curriculum, course instruction, and grading of assignments for instructors.

Instructional Outsourcing

Since at least the 1990s, some colleges have outsourced the design of curriculum and instruction of their courses to third parties. The reasons for this type of outsourcing vary, but some have proposed that it was largely a response to student demand for highly specialized, technology-related certification (Bailey, Jacobs, and Jenkins, 2003). An exploratory study of community colleges in 2003 found outsourcing of instruction for noncredit courses, but that it was rare for institutions to outsource credit-bearing courses (Bailey, Jacobs, and Jenkins, 2003, pp. 3, 12–13).

Credits represent a unit of measurement for recording what students learn in a course (Shedd, 2003, p. 11). The concept of college credits has roots in the "Carnegie unit," representing the time that students spent in a particular course (Shedd, 2003, p. 8). Today, college credits may represent the time students spend in courses (i.e., lectures), their applied experiences (i.e., internships), or independent learning (i.e., writing a dissertation). The U.S. Department of Education defines a credit hour as

> a unit of measure that gives value to the level of instruction, academic rigor, and time requirements for a course taken at an educational institution. At its most basic, a credit hour is a proxy measure of a quantity of student learning. The higher education community has long used the credit hour, as defined by the Carnegie unit, as part of a process to establish a standard measure of faculty workloads, costs of instruction, and rates of educational efficiencies as well as a measure of student work for transfer students. (Ochoa, 2011, p. 2)

The U.S. Department of Education does not require institutions of higher education to have a single, uniform policy on credit hours across their programs and units that offer student instruction (Ochoa, 2011, p. 7). The government does require that these institutions "have policies and procedures that ensure sufficient consistency to gain the confidence of accrediting agencies through peer review that their assignment of credit hours conforms to commonly accepted practices in higher education" (Ochoa, 2011, p. 7). Further, the U.S. Department of Education does not accredit institutions of higher education; instead, it recognizes accrediting agencies deemed "reliable authorities as to the quality of education or training provided by the institutions of higher education and the higher-education programs they accredit" (U.S. Department of Education, 2015). These accrediting authorities are responsible for determining what schools will and will not receive accreditation.

College credits are not the only unit of measurement for student learning. For example, some institutions of higher education award continuing education units (CEUs). These CEUs "signify successful completion of non-credit programs and courses intended to improve the knowledge and skills of working adults" (U.S. Department of Education, 2008). According to the U.S. Department of Education (2008), CEUs differ from academic credits in two ways. First, CEUs do not represent academic study or credits toward a degree. Second, CEUs represent a broader scope of experiences "whose only common criterion is that they be measurable, supervised educational or training experiences with defined starting and ending points" (U.S. Department of Education, 2008, p. 1).

There are several reasons that institutions have outsourced the curriculum development or the instruction of noncredit courses and not their credit-bearing coursework. First, research finds that accrediting authorities are resistant to this practice for credit-bearing courses. Since these authorities determine which schools meet acceptable levels of quality, this resistance is likely to influence school policies on instructional outsourcing (Bailey, Jacobs, and Jenkins, 2003, p. 27). Second, faculty members tend to resist the outsourcing of instruction for credit-bearing courses that they typically teach (Bailey, Jacobs, and Jenkins, 2003, p. 27; Russell, 2010). In the United States, tenured faculty members and administrators tend to share the responsibilities for governing their institutions. Therefore, tenured faculty members may exert pressure on their administrative leaders in shaping policies related to the design and delivery of curriculum to students. Still, some higher-education institutions partner with nonaccredited vendors who offer instruction and credit under the name of the accredited institution (Russell, 2010). In other words, courses offered by an accredited institution are not necessarily taught by the accredited body itself.

From the perspective of colleges and universities, outsourcing of instruction for noncredit courses has several benefits. During eras of declining student enrollment, this outsourcing could offset losses in tuition revenue (Bailey, 2003, p. 15; Bailey, Jacobs, and Jenkins, 2003, p. 26). Further, university administrators may have more discretion in what they do with these revenues than other funding sources (Bailey, 2003, p. 15). The vendors of these courses may also benefit from lower overhead costs by relying on the physical space and equipment of their university

partners or offering online instruction (Bailey, Jacobs, and Jenkins, 2003, p. 24; Russell, 2010). These partnerships also provide vendors a means to expand their base of students by collaborating with universities that have widely known brands (Bailey, Jacobs, and Jenkins, 2003, p. 24). However, there are concerns by some that "outsourcing may result in a lack of control by faculty over course design, instructional materials, and choice of instructors" (Bailey, Jacobs, and Jenkins, 2003, p. 1).

Outsourcing of Grading

Schools have begun to experiment with outsourcing various components of the student experience during their courses. For example, Western Governors University is an online school that hires adjunct professors throughout the country to grade student's work for other faculty members (Young, 2011). The nonprofit organization EdX—a joint venture by Harvard University and the Massachusetts Institute of Technology—has developed computerized software capable of grading the answers to students' assignments in college courses (Randall, 2013). After observing a human grading the first 100 assignments, this technology estimates an algorithm that will grade future assignments in a similar manner. EduMetry Incorporated has overseas staff with advanced degrees who will grade student assignments and provide feedback to students based on rubrics given to them by college faculty in greater detail than the faculty member might have time to provide alone (June, 2010; Russell, 2010).

In sum, one way higher-education institutions have adapted to the growing demand for vocationally focused education is to outsource instruction and grading. As enrollments have dropped, this expansion in offerings allows public institutions to continue to compete for this student population. For-profit schools and vendors as well as nonprofit public institutions may find outsourcing to make good business sense, and it may help contain costs for students. The question remains, however, whether such outsourcing, particularly to nonaccredited vendors, has an impact on the return on investment of higher education. Furthermore, outsourcing could potentially subvert DoD's processes for selecting MyCAA-eligible institutions by allowing schools to appear to be providing a quality of education congruent with their reputation while hiding the actual source of the instruction and grading on student work.

How Long Does It Take Students to Complete a Certificate or Undergraduate Degree?

Today students are rarely able to complete "one-year," "two-year," and "four-year" programs within the time frames those labels imply. Complete College America and the National Governor's Association criticized the federal Integrated Postsecondary Education Data System for focusing on first-time, full-time students who, they argue, are only 25 percent of all public college students (Complete College America, 2011, p. 7). In an effort to include part-time students and older students in completion metrics, they analyzed public college data provided by 33 states. On average, for this sample of public institutions, they found that it took full-time

students 3.3 years to complete a one-year certificate program and part-time students 4.4 years to complete it (Complete College America, 2011, p. 12). With associate's degrees, on average, full-time students took 3.8 years to complete a two-year degree, and part-time students took five years to complete it (Complete College America, 2011, p. 12). Full-time students pursuing a bachelor's degree took 4.7 years on average to complete the four-year degree, and part-time students took 5.6 years to complete it (Complete College America, 2011, p. 12). Part-time students are the new norm at public institutions, as 75 percent of student bodies also juggle job and family obligations, and not only take longer to graduate but are less likely to ever graduate (Complete College America, 2011).

One possible explanation for the lack of timely student completion would be the number of "excessive" credits that students take, or credits that a student completes beyond the required credits for their program of study. Table 2.5 displays the findings of an effort to estimate the number of excessive credits students are taking.

Table 2.5. Estimated Average Number of "Excessive" Credits Students Take in Public Institutions Beyond the Requirements, by Program Type

	Credits Taken	Expected Number of Credits	Number of "Excessive" Credits
Certificate Program	63.5	30	33.5
Associate's Degree	79	60	19
Bachelor's Degree	136.5	120	16.5

SOURCE: Complete College America, 2011, p. 12. Includes data provided by 33 states on first-time, older, full-time, and part-time college students.

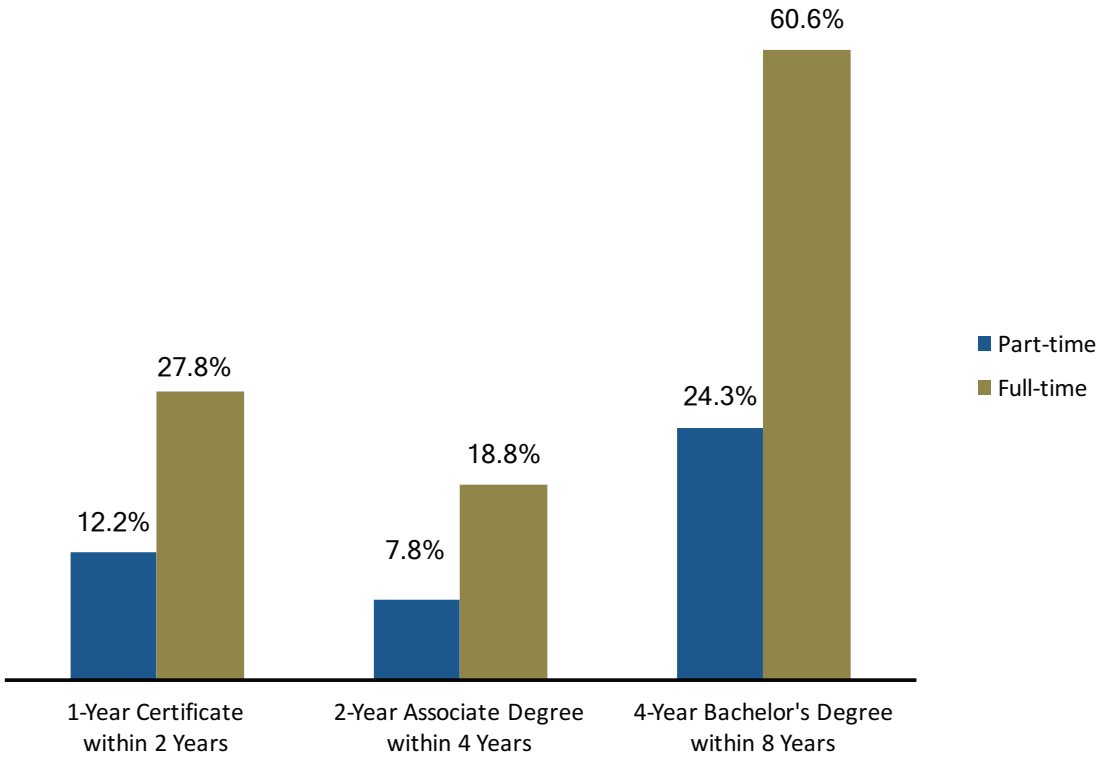
On average, students who should have needed only 30 credits to obtain their certification actually took 63.5 credits, or more than twice as many as necessary. Students in associate's degree programs who should have needed only 60 credits to graduate took 79 credits on average. Students in bachelor's degree programs took the relatively fewest number of excessive credits (136.5 on average when only 120 should have been necessary to graduate). The more credits students take that do not apply toward the educational goal, the more time and expense required to obtain a certificate or degree.

How Many Students Complete the Course of Study They Begin?

Recent U.S. undergraduate completion rates provide an important reference for MyCAA Scholarship parameters and what military spouses might be able to accomplish, or at least how their progress might relate to other U.S. college students'. Figure 2.2 compares the overall U.S. public institution graduation rates by program type for part- and full-time students. This rate is defined as students who graduated within double the amount of the time that is required for

their program. So, students who completed a two-year associate's degree in four years or less would count toward this graduation rate. On average, Figure 2.2 shows that the graduation rates for all programs are higher for students enrolled full-time versus part-time.

Figure 2.2. Average Graduation Rate Within Double the Time Needed to Graduate, by Part- and Full-Time Status of Students at Public Colleges and Universities



SOURCE: Complete College America, 2011, p. 8.

On average, only 28 percent of full-time students completed their one-year certificate program within two years. As expected, part-time students, in comparison, had a lower completion rate, with 12 percent finishing in two years. An estimated 19 percent of full-time students finished their two-year associate's degree within four years, while only 8 percent of part-time students did. Finally, only about 61 percent of full-time students earned their four-year bachelor's degree in eight years, and about 24 percent of part-time students did.

These data provided by the educational institutions raise questions about why students spent time and funds on courses they did not need, why they did not complete their programs, and whether military spouses might be doing the same. However, the estimates discussed above regarding time to completion, excessive credits, and graduation rates do have some limitations. First, the data used by Complete College America includes 33 participating U.S. states, representing only 66 percent of all states, so if these schools' experiences are not representative then national estimates could vary. Second, the credit requirements for degree programs vary across programs and among institutions. According to a second report commissioned by

Complete College America, the number of credit hours that community colleges require for associate's degrees varies widely across programs and institutions (Johnson et al., 2012, p. 2). Among the sample programs reviewed, career-oriented or program-specific associate's degrees usually required more than 60 credits, and general-studies associate's degrees (which would not be MyCAA-eligible) typically required 60 credits (although many of those required more as well). Thus, coursework beyond 60 hours may not be excessive, as the original Complete College America study had assumed. Additional study would be needed to be more precise, and to learn more about the cases where students are actually taking extra courses beyond what is necessary. Possible explanations for extra courses could include:

- required courses being full or not offered, so students fill in other courses to meet funding requirements or feel as though they are making progress
- confusion or lack of information about what is required
- certificate and associate's students using this time to explore or try out different occupational options, rather than entering with a concrete plan or interest in a particular field.

These issues are relevant for understanding college costs, completion rates, and time to completion, which are relevant for initiatives like DoD's MyCAA Scholarship.

Summary

U.S. education trends provide the backdrop against which our study is set. Research continues to demonstrate the economic and social value of higher education. Employers are increasingly expecting employees to have some form of higher education, and recent decades have seen the growth of occupational certificates as a specialized educational requirement falling between the high school diploma and associate's degree level. Colleges and universities are increasingly offering certificates and vocational study, and in some cases are outsourcing their instruction to meet the demand or expand into this "market." Accompanying the rise of occupationally specific certificates is the growth of private for-profit institutions. These for-profit education businesses often focus on career-related education, and like private nonprofit institutions their student tuition and fees are substantially higher than those at public nonprofit institutions. Still, their tuition and fees have been declining as other schools' have been rising. Student enrollments have been dropping across all types of institutions, but there are a growing number of institutions competing for students. Most students receive some form of financial aid, with loans forming a significant portion of that aid. Yet data from some public institutions suggest that students may be taking far longer to complete their educational goals than labels such as "one-year certificate," "two-year degree," and "four-year degree" might suggest, and many may never complete their studies. As the MyCAA Scholarship is a form of financial assistance focused on occupational licenses, certificates, and associate's degrees, and DoD expects recipient spouses to complete their studies within three years, this information about higher education in the United States can help provide realistic expectations about what military spouses and the MyCAA Scholarship may be able to achieve.

Part II: MyCAA Application and Use

3. Who Applies for a MyCAA Scholarship?

Introduction

In this chapter, we explore our first research question: **Which eligible spouses are most likely to apply for a MyCAA Scholarship?** The answer to this question can help us understand where there may be unevenness in awareness, interest, or need, and how well the MyCAA Scholarship is reaching the intended populations of spouses who may have greater need. More specifically, we ask: **Are there statistically significant differences in the demographic characteristics or military experiences of spouses who apply for a MyCAA Scholarship and the eligible spouses who do not?**

To answer our research question, we use bivariate descriptive statistics and a multivariate regression model exploring MyCAA application as a function of spouse characteristics, sponsor (service member) characteristics, and household characteristics. The descriptive statistics presented in this chapter provide an overview of the relationship between these various characteristics and spouse application for a MyCAA Scholarship during the period of observation. The multivariate model then allows us to compare the relationship between, for example, MyCAA application and geography versus MyCAA application and sponsors' pay grade. It also lets us look at the relationship between MyCAA application and each factor after adjusting for the other factors in the model. More details of the multivariate model appear in Appendix C (available online).

At the conclusion of this chapter, we briefly explore differences between applicants who actually use funds toward their approved plans and applicants who do not. In the next chapter, we follow the progress of applicants who used funds toward their approved plan for an occupationally focused associate's degree, license, or certificate.

User Group and Cohort Definitions

Table 3.1 provides an overview of how this study categorized MyCAA-eligible spouses according to their level of interaction with MyCAA. These comparison groups were used in the analyses we discuss in this and subsequent chapters. We could have defined our "user" and "nonuser" groups to be more or less inclusive. To understand how our choice of comparison groups may have influenced the results, we conducted sensitivity analyses and robustness checks by substituting alternate comparison groups. We note the results of these additional analyses following the discussion of our primary ones.

Spouses who did not interact with MyCAA (i.e., those who did not set up a MyCAA profile) are referred to as **"absolute nonusers."** Absolute nonusers may be unaware of MyCAA, or have no interest or need for it. The absolute nonusers group does not include spouses who are ineligible for MyCAA, as those individuals are excluded from all analyses.

Table 3.1. User Group Definitions for MyCAA-Eligible Spouses, by Level of Use in 2010/2011

Applicant/ Nonapplicant	Nonuser/User Distinction	Label	Brief Description
Nonapplicants 89%	Nonusers 91%	Absolute nonuser 88%	No interaction with MyCAA.
		Interested nonusers 1%	Set up a MyCAA account, but took no further steps. Did not apply for or receive any funds.
Applicants 11%		Nonstarters 2%	Set up a MyCAA account, worked with a school to create an education/testing plan, and applied for the scholarship, but did not use any funds.
	Users 9%	Starters 6%	Subset of applicants who used some scholarship funds, but for whom MyCAA has no record of plan completion. Would include those who completed their plans after they lost MyCAA eligibility.
		Known Completers 3%	Subset of applicants who used some scholarship funds, and for whom MyCAA has a record that their education/testing plans were completed.
100% N = 388,220	100% N = 388,220	100% N = 388,220	MyCAA-eligible active component spouses in our 2010/2011 window.

NOTE: Boxes not scaled to relative sample size.

We define spouses who took the first step and set up a MyCAA account, but did not actually submit an application with an education plan, as **"interested nonusers."** For this population, we know they were at least aware of MyCAA and considered, however briefly, the possibility of pursuing higher education. We chose not to consider them to be "users" of the MyCAA Scholarship, however, because they did not end up requesting a scholarship, and thus never received any funds.

Combining the applicants who were approved for a scholarship but never used any funds, interested nonusers, and absolute nonusers creates the group we refer to generally in this report as **"nonusers."** Although this chapter focuses primarily on all nonapplicants as the comparison group for MyCAA applicants, we will also report the results of a sensitivity analysis where the comparison group is instead limited to the interested nonusers, who we know were aware of the scholarship and had some interest in higher education and funding to support it.

We define MyCAA **"applicants"** as those individuals who interacted with the scholarship opportunity in more than just a passing fashion. MyCAA "applicants" referenced in this chapter have fulfilled the following minimum steps in the MyCAA Scholarship application process: established a MyCAA account, set up a career goal (e.g., to become a licensed cosmetologist or certified paralegal), worked with a school to set up a plan for reaching that goal (all required courses and exams and the associated fees), and submitted official school documentation of that plan to MyCAA. Recall that eligible plans will seek an associate's degree, a certificate, or a license in a portable career field. These steps are required before MyCAA administrators can

award a scholarship and recipient spouses can begin using funds (becoming **"users"**). The following chapters will discuss further the distinction between users of MyCAA Scholarship funds in our cohort who completed their education or testing plan within the three-year scholarship window, and users for whom MyCAA has no record of plan completion.

The data for the analysis comparing applicants to nonapplicants are cross-sectional in nature, in that we observe most of the information about the cohort of spouses during a bounded period of time: between October 2010 (when the new scholarship parameters were introduced) and December 2011. We bounded the cohort at the end of the 2011 calendar year because, as documented in subsequent chapters, our study also required some window of time after MyCAA application for spouses in this cohort to use their scholarships and potentially experience the desired outcomes assessed in later models.[1] This range also captures a large enough sample of MyCAA applicants to examine smaller subpopulations (e.g., spouses of warrant officers, spouses using MyCAA to obtain licenses). Of the 388,220 spouses eligible to apply for MyCAA between October 2010 and December 2011, 42,739, or 11 percent of the eligible population, had a MyCAA plan approved.

Demographic and Military Service Characteristics

Our descriptive statistics and multivariate model include variables available for the sponsors (service members) of MyCAA-eligible spouses, the spouses, and the couples' households. This information includes sponsor age, race/ethnicity, education, service, pay grade, years of service, and Armed Forces Qualification Test (AFQT) score. Less information about spouses is available in the records, but we were able to obtain age, gender, and whether they are guard or reserve members. Household characteristics include number and ages of children, whether the couple experienced a deployment or PCS move, home address census division, state unemployment rate, and location in a rural or urban area. More details on these variables are available in Appendix A (available online).

Descriptive Statistics of MyCAA Applicants and Nonapplicants

As noted above, an examination of the characteristics of applicants relative to nonapplicants can help us understand where there may be unevenness in awareness of MyCAA, interest or need in working or job training, and how well the MyCAA Scholarship is reaching the intended populations of spouses who may have greater need.

[1] Over time, additional spouses become eligible for the scholarship, either through new marriages or as married individuals enter the military (recall that MyCAA targets entry-level enlisted, warrant officer, and officer pay grades), as other spouses become ineligible (e.g., through death, divorce, sponsor promotion beyond an eligible pay grade, sponsor separation from military service).

Sponsor, Spouse, and Household Characteristics Differed Considerably Between Eligible Spouses Who Applied to MyCAA and Those Who Did Not

We begin by examining basic bivariate relationships between applying for a MyCAA Scholarship and each of the spouse, sponsor, and household characteristics of interest. We include measures on all MyCAA applicants and all nonapplicants in our sample. Our sample reflects the population of those eligible for MyCAA from October 2010 to December 2011. Therefore, observed differences are the actual population difference in the period from which we selected our sample, so our focus in the discussion is on substantive differences between MyCAA applicant spouses and nonapplicants.[2] These basic cross-tabulations allow us to examine numerous variables, including several different constructions of the key variables to be included in the multivariate models.

Sponsor Characteristics

Table 3.2 shows the characteristics of sponsors of MyCAA-eligible spouses in our cohort, including their demographic characteristics and service characteristics. Sponsors' age categories, race/ethnicity, education, service, pay grade, and AFQT showed statistically significant differences for MyCAA applicants compared to nonapplicants based on chi-squared (chi^2) tests, and years of service showed a statistically significant difference based on an analysis of variance (ANOVA). Although chi-squared tests do not allow us to infer significant differences for specific subgroups within categories (e.g., one particular age group or one race-ethnic group), we describe some of the most pronounced differences below. First, MyCAA applicants were more likely to be married to younger service members than were nonapplicants (50 percent under the age of 26 compared to 43 percent). MyCAA applicants were also more likely than nonapplicants to have sponsors who are non-Hispanic black (18 percent compared to 14 percent), and less likely to have sponsors who are white (62 percent of applicants compared to 64 percent of nonapplicants). MyCAA applicants are more likely to be married to sponsors whose highest education level is a high school diploma or equivalent than are nonapplicants (84 percent compared to 81 percent). MyCAA applicants are also more likely to be Army and Marine Corps spouses than are nonapplicants (50 percent of applicants are Army compared to 47 percent of nonapplicants; 17 percent of applicants are Marine Corps compared to 14 percent of nonapplicants), and thus are less likely to have sponsors in the Navy (17 percent of applicants

[2] In the tables, we include chi-squared tests (for categorical variables) and analysis of variance (for continuous variables) to determine whether differences between these groups are statistically significant at the $p < 0.05$ levels. While chi-squared tests provide useful information on whether there are statistically significant differences for MyCAA applicants and nonapplicants on categorical variables of interest (e.g., by race/ethnicity), these tests do not allow us to infer statistically significant differences for specific subgroups (e.g., for white MyCAA applicants compared to white nonapplicants). Significance tests in this context serve primarily as a means of detecting whether the variance across outcomes is substantial and which variables to focus on in our descriptions of the results.

Table 3.2. Characteristics of Sponsors for MyCAA Applicants and Nonapplicants, December 2011

		Sponsors of MyCAA Applicants %	Sponsors of MyCAA-Eligible Nonapplicants %
Sponsor's age*	<21 Years Old	4	4
	21 to 25 Years	46	39
	26 to 30 Years	33	36
	31 to 35 Years	11	14
	36 to 40 Years	4	5
	>40 Years Old	2	3
Race/ethnicity*	American Indian/Alaskan Native	2	2
	Asian/Pacific Islander	4	5
	Black, not Hispanic	18	14
	White, not Hispanic	62	64
	Hispanic	13	13
	Other	2	2
Education*	Less than 12 years of school (no diploma)	5	5
	High school graduate (diploma or equivalent)	84	81
	Associate's degree (e.g., AA, AS)	5	5
	Bachelor's degree (e.g., BA, AB, BS)	5	7
	Master's degree or more	1	1
Service*	Army	50	47
	Air Force	16	20
	Marine Corps	17	14
	Navy	17	20
Pay grade*	E-1	1	3
	E-2	2	3
	E-3	16	14
	E-4	38	32
	E-5	35	34
	E-6[a]	3	6
	W-1 and W-2	2	2
	O-1	1	2
	O-2	2	3
	O-3[a]	1	2
Years of service (mean)*		6.22	5.46
AFQT*[b]	CAT1 (best scores, 93–99)	4	5
	CAT2 (65–92)	32	32
	CAT3A (50–64)	25	24
	CAT3B (31–49)	29	27
	CAT4A (21–30)	5	5

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: For sponsors leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed with the exception of average years of service.
* Sponsors of MyCAA applicants differ significantly from sponsors of MyCAA nonapplicants at $p < 0.05$ based on chi^2 test (categorical measures) or ANOVA (continuous measures).
[a] Because the cohort window spans October 2010 through December 2011, our sample includes a small number of spouses whose sponsors were promoted beyond the MyCAA eligibility window (i.e., beyond E-5 and O-2) by December 2011.
[b] With the exception of those who began as enlisted personnel, officers do not have AFQT scores.

compared to 20 percent of nonapplicant spouses) or Air Force (16 percent of applicants compared to 20 percent of nonapplicant spouses). MyCAA applicants are more likely than nonapplicants to have sponsors who are in the pay grade of E-4 (38 percent compared to 32 percent), and are more likely to have sponsors who scored below the average (below the 50th percentile) on the AFQT than are nonapplicants (34 percent compared to 32 percent).

Spouse Characteristics

As shown in Table 3.3, MyCAA applicants differed from MyCAA nonapplicants along all the spouse factors considered here. Although we did not test subgroup differences for statistical significance, we focus on the differences in the distribution of characteristics between the two groups that are substantive. For instance, MyCAA applicants are younger than nonapplicants (58 percent of applicants are less than 26 years of age compared to 46 percent of nonapplicants). Applicants are more likely than nonapplicants to be women (97 percent of users versus 90 percent of nonapplicants). Data on spouse's education is not available for spouses without a MyCAA account, and spouses with an account are able to update their educational status over time. We are unable to determine educational achievement at time of application.

Table 3.3. Characteristics of Spouses Eligible for MyCAA at Some Point October 2010 to December 2011, Including Both Applicants and Nonapplicants

		MyCAA Applicants %	MyCAA-Eligible Nonapplicants %
Age*	<21 Years Old	10	7
	21 to 25 Years	48	39
	26 to 30 Years	27	31
	31 to 35 Years	10	13
	36 to 40 Years	3	5
	>40 Years Old	2	4
Gender*	Women	97	90
	Men	3	10
Military status*	Guard or Reserve	1	2
	Not Guard or Reserve	99	98

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: Sample sizes vary slightly for some measures due to missing data.
* MyCAA applicants differ significantly from MyCAA nonapplicants at $p < 0.05$ based on chi^2 testing (categorical measures) or ANOVA (continuous measures).

Household Characteristics

Table 3.4 shows the characteristics of households of MyCAA applicants and MyCAA-eligible nonapplicants. MyCAA applicants have slightly more children on average than nonapplicants (average of 1.25 compared to average of 1.16), and they have more children under

Table 3.4. Characteristics of Households of MyCAA-Eligible Spouses Who Are Applicants and Nonapplicants as of December 2011

		MyCAA Applicants %	MyCAA-Eligible Nonapplicants %
Number of children < age 18 (mean)*		1.25	1.16
Number of children < age 6 (mean)*		0.82	0.72
Years married (mean)*		3.23	3.32
Deployed during marriage*	Yes	58	53
	No	42	47
PCS moves during marriage*	Yes	78	71
	No	22	29
State unemployment rate (mean)*		7.68	7.41
Home address rural or urban*	Metropolitan	75	73
	Micropolitan	13	12
	Small Town	2	3
	Rural	1	1
	Not Classified	9	12
Home address census division*	East North Central	2	2
	East South Central	6	6
	Middle Atlantic	3	3
	Mountain	8	8
	New England	1	1
	Non-U.S.	7	10
	Pacific	23	22
	South Atlantic	31	28
	West North Central	4	5
	West South Central	15	14

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: For households of service members leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated. Note that from the Defense Enrollment Eligibility Reporting System (DEERS) we are only able to observe years the couples are married and registered in DEERS, so any years married before the service member joined the military would not be captured here.
* MyCAA applicants differ significantly from MyCAA nonapplicants at $p < 0.05$ based on chi^2 testing (categorical measures) or ANOVA (continuous measures).

the age of six (average of 0.82 compared to average of 0.72), although these differences are small. Applicants are more likely than nonapplicants to have sponsors who deployed during their marriage as of December 2011 (58 percent compared to 53 percent) and who made a PCS move during their marriage as of December 2011 (78 percent compared to 71 percent). Although such disruptions could make utilizing MyCAA more difficult, spouses who experienced PCS moves or their sponsor being deployed may also be the ones with the greatest need or interest in a high-demand, portable career. Those who applied to MyCAA are from states with slightly higher unemployment on average than nonapplicants (average of 7.7 percent compared to 7.4 percent). Home census division showed a significant difference as well. While we cannot say which specific divisions are significantly different for applicants compared to nonapplicants, it is evident from the descriptive information that MyCAA applicants are even more likely than other

MyCAA-eligible but nonapplicant spouses to live in southern states, particularly in the South Atlantic census division, which extends along the U.S. East Coast from Delaware to Florida. We examine this in more detail in the probit models in the next section. See Appendix A for a complete list of states falling in each region and division.

Thus, spouses who applied for a MyCAA Scholarship October 2010 through December 2011 differed from MyCAA-eligible spouses who did not. Most notably, applicants were more likely to be women, to be under the age of 26, to be married to sponsors in the E-4 pay grade, and to be married to sponsors who deployed or had a PCS move during their marriage.

Results of Probit Models on Likelihood of Applying for a MyCAA Scholarship, Controlling for Observable Characteristics

The analyses described above assess the relationship between two variables, and each does not adjust for other potentially confounding factors (e.g., would not reveal if statistically significant differences in sponsors' service between MyCAA applicants and nonapplicants is actually due to different average ages of spouses in each service). The next step in answering our research question is to examine differences in MyCAA application rates between spouses in our sample who differ in one particular factor, but are otherwise similar in terms of their own characteristics, service member's characteristics, and household characteristics. To do so, we estimate a probit model where the outcome is applying for a MyCAA Scholarship (defined as "one" if individual i is a MyCAA applicant, and "zero" if not).[3] Table 3.5 lists the variables incorporated in our MyCAA application model.

After controlling for observable characteristics (i.e., those for which we have data) in these multivariate analyses, many factors that were statistically significant in the bivariate descriptive statistics still remain statistically significant. Figures 3.1 through 3.5 show the notable factors of interest from the probit analyses. The marginal effect of each factor (i.e., the difference in the likelihood of MyCAA application associated with a change in the factor of interest) is presented as a percentage point change in the likelihood of MyCAA application.[4] Note that despite our use of the standard methodological term *marginal effect*, we are in fact measuring a relationship that is not necessarily causal. The results of the full model specification and the marginal effects are reported in Appendix C (available online).

[3] The coefficient of a probit equation cannot be interpreted as a marginal effect, so appropriate adjustments are taken at the time of coding so that the marginal effects can be calculated during the estimation process. Fortunately, this is a very straightforward process. See Appendix C (available online) for more details about the model and estimation strategy.

[4] The fact that we focus on percentage point differences is important for interpretation. Percentage points are measures of magnitude, whereas percentage changes represent relative magnitude. For example, if we observe that MyCAA application increased from 10 percent to 12 percent, we would say that it increased by 2 percentage points. Alternatively, we could have said that it increased by 20 percent (i.e., an additional 2 percentage points from a base on 10 percent implies a 20-percent relative change in magnitude).

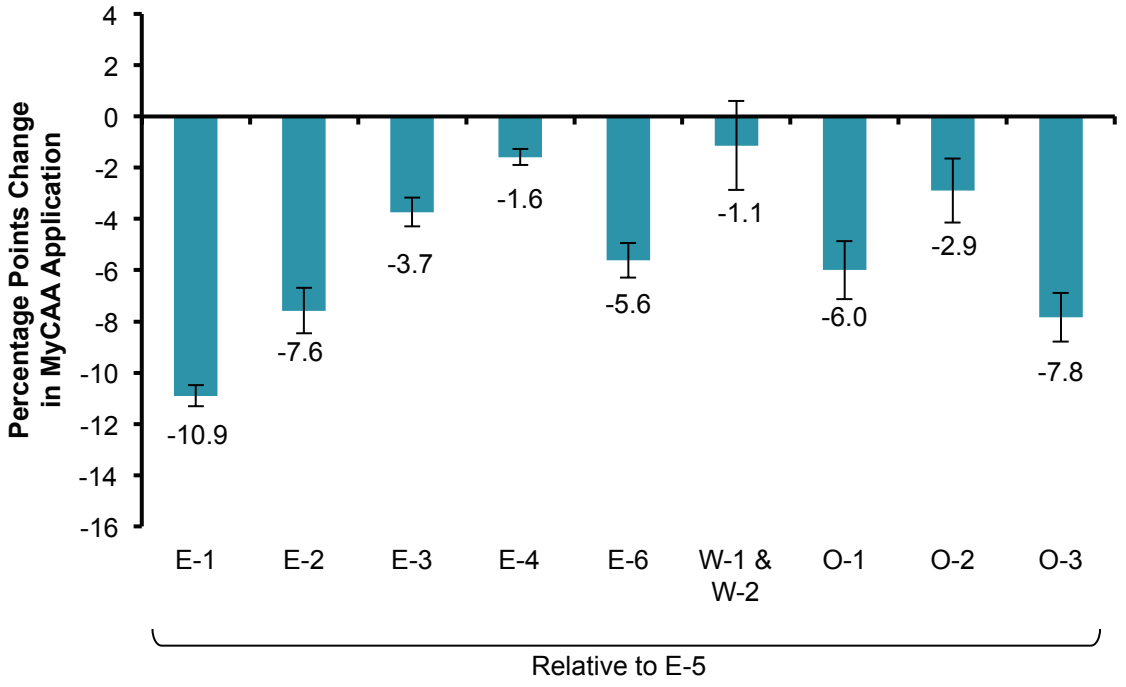
Table 3.5. Variables Used to Calculate Probability of an Eligible Spouse Applying for a MyCAA Scholarship

Sponsor	Race/ethnicity: White (not Hispanic), American Indian/Alaskan Native, Asian/Pacific Islander, Black (not Hispanic), Hispanic, other, unknown, missing. AFQT category: 1 (>90%), 2 (70–90%), 3A (50–70%), 3B (30–50%), less than 3B, and none. Pay grade: E-1, E-2, E-3, E-4, E-5, W-1, W-2, O-1, O-2. Years of service. Service: Army, Navy, Marine Corps, Air Force. Education level: Less than high school diploma, high school, associate's degree, bachelor's degree, postbachelor's degree, and missing.
Spouse	Gender: Men, women. Age. Age difference from spouse. Military status: In the guard or reserve, or not.
Household	Spouse/sponsor number of years married as recorded in DEERS. Number of children below age 18, categories: 0, 1, 2, 3, 4+. Number of children below age 6, categories: 0, 1, 2, 3, 4+. Any deployments since marriage or 2007 (whichever is earliest): One or more, none. Months deployed since marriage or 2007 (whichever is earliest). PCS moves since marriage or 2007 (whichever is earliest): None, one, two, and three or more. Home address census division. State unemployment rate. Home address rural or urban: Metropolitan statistical area, micropolitan statistical area, small town, rural area, not classified area.

NOTES: The reference category in the model is the spouse who is a woman who is not in the guard/reserve; and who is married to an E-5 in the Army who is white, not Hispanic, with an AFQT score in category 1 and a high school diploma as the highest education level; and where the household has no children, is located in the South Atlantic census division in a Metropolitan Statistical Area, and the sponsor has not been deployed but has experienced one PCS move since the marriage or 2007 (whichever is earliest). Note that from DEERS we are only able to observe years the couples are married and registered in DEERS, so any years married before the service member joined the military would not be captured here.

As these figures show, even after controlling for other factors, eligible spouse MyCAA application for our sample cohort still varies by sponsor pay grade (Figure 3.1), and these differences are statistically significant. Spouses of sponsors who are in the enlisted E-5 pay grade (junior noncommissioned officer, or NCO) were most likely to apply for a MyCAA Scholarship, and of all other pay grades, spouses of E-1 service members were least likely to apply. E-1 is the most common entry-level pay grade for enlisted personnel, and these service members are typically promoted to E-2 within six months of entry. Spouses typically do not accompany service members to the temporary location for initial entry training during the first months of service. Rather they join their service member once they are assigned to their first duty station. Thus, given this small window of opportunity for military spouses of E-1 personnel to become aware of MyCAA and complete the application process, it is not surprising that these spouses of personnel who just entered the military are least likely to have already applied for the scholarship.

Figure 3.1. MyCAA Application by Sponsor Pay Grade as of December 2011, Relative to a Spouse of an E-5 Sponsor

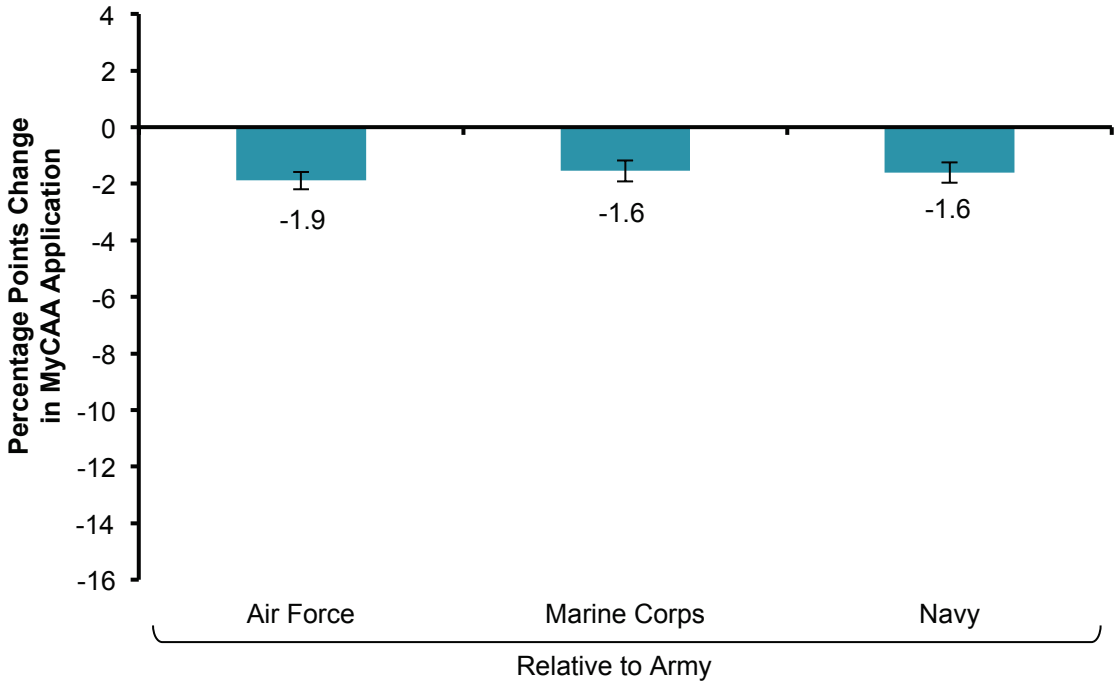


SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero (no MyCAA application), then we infer that the outcome measure (e.g., E-1) is significantly different from the reference group, here E-5. Reference category is pay grade E-5, because it is the most populous pay grade within the MyCAA-eligible population. Because the cohort window spans October 2010 through December 2011, our sample includes a small number of spouses whose sponsors were promoted beyond the MyCAA eligibility window (i.e., beyond E-5 and O-2) by December 2011. For sponsors leaving the military before December 2011, we use the last observed record.

In addition, relative to Army spouses, Air Force, Marine Corps, and Navy spouses are less likely to apply to MyCAA (Figure 3.2). The greater number of Army spouses does not explain these results, because these analyses compare the likelihood that spouses in each group would apply. Again, these results are statistically significant, and appear even after controlling for other demographic and military service characteristics such as age or geographic location.

MyCAA application also varies by geographic location of the household (Figure 3.3). As found above in the descriptive statistics, in the multivariate probit model, spouses whose household's home address was located in the South (which includes the South Atlantic, East South Central, and West South Central census divisions) were most likely to apply for a MyCAA Scholarship. Least likely to apply were spouses whose household address was in New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey,

Figure 3.2. MyCAA Application by Sponsor Service as of December 2011, Relative to an Army Spouse



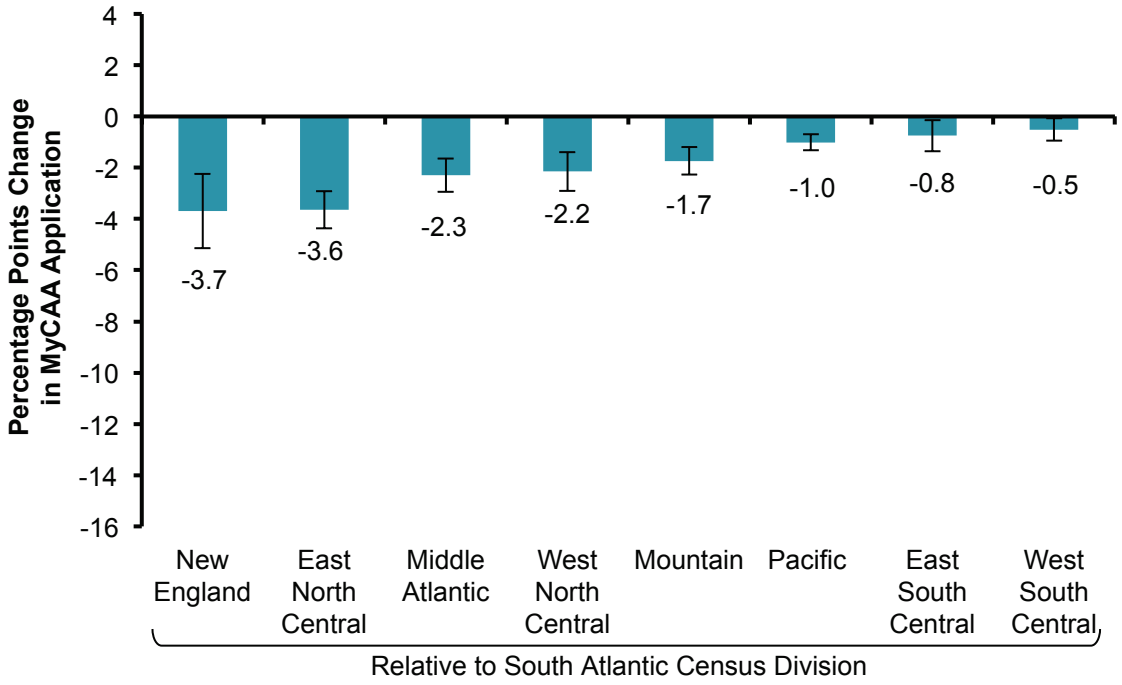
SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero (no MyCAA application), then we infer that the outcome measure (e.g., Air Force) is significantly different from the reference group, here Army. Reference category is the Army, because it is the largest service within the MyCAA-eligible population.

New York, Pennsylvania) or the East North Central census division (Wisconsin, Illinois, Indiana, Michigan, and Ohio). Geographic factors associated with MyCAA application may reflect differences in awareness or promotion of MyCAA, and differences in educational or employment opportunities.[5]

Differences in military service characteristics also remained significant in the multivariate analyses. As Figure 3.4 shows, spouses who applied to MyCAA are more likely to be married to sponsors who had at least one PCS move during the marriage and after 2007 (whichever was

[5] The interest here is in whether broad geographic or economic measures are associated with differences in participation. Since our population is military spouses, we emphasize common broad geographic and economic measures that may reveal important relationships or mechanisms that the research sponsor may benefit from understanding better. The results suggest that census division and state unemployment rate are associated with differential MyCAA application. In additional regressions not shown here, we removed census division and state unemployment rate and considered state fixed effects incrementally to see if any of the other measured results were somehow biased by their inclusion. In general, we found little impact with one exception to our reported findings. Relative to the original estimates, non-Army spouses became slightly more likely to participate, but were still less likely than Army spouses to apply for MyCAA.

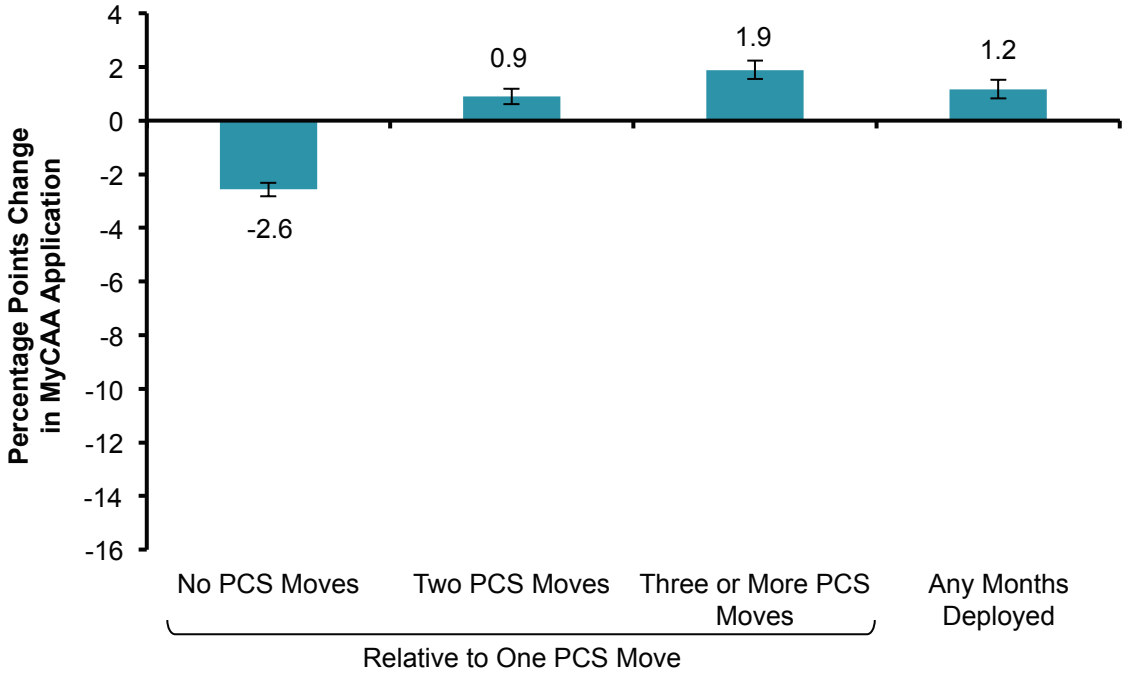
Figure 3.3. MyCAA Application by Geographic Location of the Household as of December 2011, Relative to a Spouse Whose Household Is in the South Atlantic Census Division



SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero (no MyCAA application), then we infer that the outcome measure (e.g., household in New England) is significantly different from the reference group, here household in South Atlantic census division. Census divisions are defined in Appendix A (available online). For households of service members leaving the military before December 2011, we use the last observed record.

earliest). Having two PCS moves during the marriage and since 2007 is associated with spouses being 1-percentage point more likely to apply for a MyCAA Scholarship, while spouses with three or more PCS moves are 2-percentage points more likely to apply. Also, MyCAA applicants are more likely than MyCAA nonapplicants to be married to a sponsor who had been deployed during the marriage and after 2007. The relationship between MyCAA application and deployment is not straightforward; each additional deployment month is associated with lower likelihood of application to MyCAA, and the association with deployment becomes negative once the sponsor has deployed for more than 20 months (the relationship between application and months of deployment is not shown in the figure). This means that spouses of sponsors who deployed for more than 20 months were less likely to apply for MyCAA, relative to spouses whose sponsors had no deployments and relative to the overall group of spouses whose sponsors deployed at all.

Figure 3.4. MyCAA Application by PCS Moves and Deployment Since Marriage as of December 2011 (Relative to at Least One PCS Move and No Deployment)

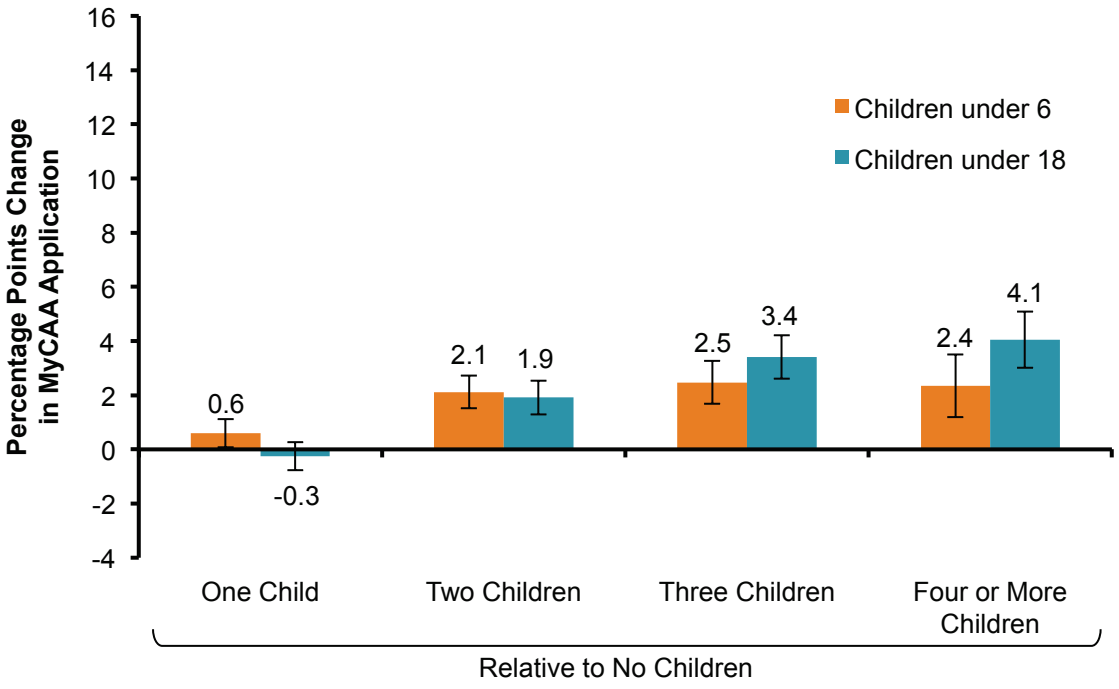


SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero (no MyCAA application), then we infer that the outcome measure (i.e., no PCS moves and any months deployed) is significantly different from the reference groups. Reference category for the category "No PCS Moves" is at least one PCS move. Reference category for "Any Months Deployed" since marriage is no deployment since marriage. We also incorporated a quadratic in months deployed in our specification. While the coefficient on "Any Months Deployed" incorporates the association of any deployment with MyCAA application, the quadratic specification captures the relationship between MyCAA application and the marginal month deployed. We found that MyCAA application among those whose sponsors deployed declined with more months deployed. At approximately 20 months deployed, the positive association of "Any Months Deployed" would be eliminated. For sponsors leaving the military before December 2011, we use the last observed record.

We also examined the relevance of the number of dependent children in the household under the age of 18 (as reflected in the sponsors' records), including a focus on households with very young children. Spouses with two or more children in the household are more likely to apply for MyCAA (even if children are under age six) than spouses with no children (see Figure 3.5).

Finally, in results not shown here, looking across states we found that a five-percentage-point higher state unemployment rate (in December 2011) is associated with a one-percentage-point increase in likelihood of MyCAA application. This is a substantive difference. Although we cannot presume causality, this finding suggests that regional economic conditions could be a factor in MyCAA application for job-related training and education. State-level unemployment rate differences may represent not only differences in labor markets but also differences in state-level policies and programs.

Figure 3.5. MyCAA Application by Number and Age Group of Dependent Children in the Household as of December 2011 (Relative to No Children)



SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 388,220.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero (no MyCAA application), then we infer that the outcome measure (e.g., number of children) is significantly different from the reference group, here no dependent children. Reference category is no children under the age 18 because it is the largest group (39 percent of nonapplicants have no children, and 26 percent of MyCAA applicants have no children). For households of sponsors leaving the military before December 2011, we use the last observed record.

Comparing MyCAA Applicants to Eligible Spouses Who Established MyCAA Accounts but Did Not Apply

We also compared MyCAA applicants to interested nonusers using our probit model from the previous section. That is, we switched the nonapplicant comparison group to those who set up a MyCAA profile but never applied for funding, and thus we excluded from our comparison group the absolute nonusers. This limits the analysis to a comparison with those spouses who are similar to the MyCAA applicants in that they were aware of the scholarship and at least at some point considered using it, thus allowing us to understand how our comparison population definitions relate to our results. These analyses are thus looking for the difference between those who were aware of MyCAA and had some interest and those who had enough motivation or need for job training (or funding for job training) that they took the additional steps of putting together an education plan with the school and submitting it to MyCAA. The results are reported in Appendix C, Table C.1 (available online). We summarize the key findings here.

In general, the associations between most variables and the act of applying for MyCAA are not statistically different from zero, meaning that on these demographic and military service characteristics, spouses who applied to MyCAA are no different from interested nonusers who set up a MyCAA account but did not apply during our window of observation. There are some significant differences that reflect the design of the scholarship, however. For example, spouses whose sponsor is promoted to E-6 by December 2011 are much less likely to apply to MyCAA. This makes sense given that they would be made ineligible by his or her promotion. Another example is that spouses who are in the guard or reserve themselves are significantly less likely to apply. These spouses are ineligible for MyCAA when they are on Title 10 active-duty status. Other results are less clear. For example, among spouses who set up a MyCAA profile, spouses located in Pacific or West South Central census divisions are more likely to apply for the scholarship. Air Force spouses are less likely to apply (which through our analyses, as with the other variables, is completely unrelated to the size of this population relative to other spouses). Finally, the shorter the amount of time a couple has been married or the more children they have, the more likely the spouse is to apply relative to interested nonusers.

Thus, although many differences between MyCAA applicants and nonapplicants disappear when we limit the applicant comparison group to those who established a MyCAA account (and thus who we know were aware of it and had at least a passing interest), a few differences remain. Among spouses with MyCAA accounts, newlyweds, spouses with more children, and spouses in certain regions are more likely to have applied for a scholarship, and spouses with enlisted sponsors at the edge of the eligibility window, spouses who are guard or reserve members, and Air Force spouses are less likely to apply.

Comparing Approved Applicants Who Used Any Funds to Approved Applicants Who Did Not

As noted in Chapter One, all spouses whose applications meet the eligibility criteria were approved for a MyCAA Scholarship. In the next chapter, we will focus on the progress of MyCAA applicants who make use of those funds for their approved plan. However, we note here that 19 percent of MyCAA applicants with approved plans never used any funds toward their course of study. To better understand why so many spouses who applied for and were approved for scholarships did not actually use them, we modified the comparison groups in our probit models to explore differences between approved spouses who did and did not use their funds. For this analysis, we limited our sample to only MyCAA applicants. The results are reported in Appendix C, Table C.2 (available online). We summarize the key highlights here.

As with our previous multivariate models, our analyses used reference groups. In this model, the goal was to determine whether other subgroups of MyCAA applicants were more or less likely to use any funds. Because all of these spouses had MyCAA-approved courses of study, in addition to demographic and military service characteristics, we were also able to examine the chosen career field for the MyCAA plan and whether the spouses intended to pursue an associate's degree, certificate, or license.

This model shows that MyCAA applicants who were least likely to use their funds were Army spouses, spouses who are men, spouses whose sponsors had no PCS moves by December 2011, and spouses whose sponsors either were of lower enlisted ranks (E1–E3) or were promoted to E-6 (beyond the MyCAA eligibility window) by December 2011. Of the 19 percent of spouses in our cohort with approved plans but who never used their funds, 6 percent were no longer eligible for MyCAA as of December 2011 because their sponsor was promoted beyond an eligible pay grade. Thus, 94 percent of those who never used funds were still eligible at that time. With regard to selected courses of study, spouses least likely to use their MyCAA funds were spouses whose approved plan was in the skilled trades, spouses seeking an associate's degree to become a dental hygienist or assistant, and spouses seeking certificates for elementary school teaching or registered nursing (results conditional on intended course of study are not included in online Appendix C, but are available from the authors).

The results suggest that certain groups may be at greater risk for not following through and starting their plan; however, with the exception of spouses whose sponsors were soon promoted to E-6, we do not know whether the observed differences were related to certain groups having less interest in, less need for, or more obstacles to education and training.

Summary

We found that many different spouse, sponsor, and household demographic and military service characteristics were related to the likelihood of eligible spouses being a MyCAA applicant, and many of these differences remain even after holding constant other relevant factors. Many of these differences are both statistically and substantively significant. For example, the results from our probit model indicate that MyCAA applicants are younger than nonapplicants, and are more likely to be married to enlisted sponsors, particularly those who are E-4s or E-5s and who are in the Army. Spouses who apply for MyCAA are also more likely than nonapplicants to live in southern states, to live in states with higher unemployment rates, and to have sponsors who experienced PCS moves and/or short deployments during their marriage. Eligible spouses who have two or more dependent children are more likely to apply to MyCAA relative to spouses with one or no children.

These findings suggest that MyCAA applicants align with the target population: spouses with likely greater needs for portable careers are applying to MyCAA. In particular, our findings suggest that MyCAA is reaching spouses whose sponsors recently deployed or had a PCS move and spouses in states with higher unemployment.

The factors most strongly associated with not applying to MyCAA were sponsor's pay grade, the census division of home address, and service. One possible explanation is that awareness of the scholarship is uneven across pay grade, region, and service. Army spouses, spouses of sponsors in pay grades E-4 and E-5, and spouses who live in the South may be more aware of the MyCAA Scholarship than are others. It is also possible that warrant officer and officer spouses are aware of the scholarship but perceive it as an initiative for enlisted spouses. Additionally,

there could be differences in applicability of the scholarship, as the educational goals of spouses who already have or are pursuing bachelor's or graduate degrees may not align with MyCAA eligibility criteria (which support related certification or testing but not pursuit of bachelor's or graduate degrees in general). Indeed, in the 2012 ADSS, 56 percent of MyCAA-eligible spouses who indicated that they did not use MyCAA in the past year because of perceived educational ineligibility also indicated that they already held bachelor's degrees or higher (Friedman, Miller, and Evans, 2015, p. 26).

In the next chapter, we look beyond who applies to MyCAA and examine the characteristics of spouses who do and do not complete their proposed education and training using MyCAA Scholarships.

4. Which MyCAA Users Complete Their Education and Training Plans?

Introduction

Chapter Three addressed which eligible spouses were likely to apply for a MyCAA Scholarship by submitting an education and training plan for an occupational license, certificate, or associate's degree in a high-demand portable career field. In this and subsequent chapters, we will focus on understanding patterns for the military spouses who are approved for a MyCAA Scholarship and who use any funds toward their course of study. As noted earlier, all plans from eligible spouses that meet the scholarship criteria are approved for funding. We will refer to spouses who use MyCAA funds as MyCAA **"users."** Our analytic sample for this chapter consists of 34,762 MyCAA users with the plan and academic data relevant for these analyses.

In this chapter, we explore our second research question: **Which MyCAA users complete their MyCAA education and training plans?** Completion of a MyCAA plan marks the receipt of a degree, certificate, or license designed to allow the spouse to continue or begin work in his or her field and career of interest. We refer to spouses who are known to have completed their plans as MyCAA **"completers."** Through this question, we also aim to understand what factors might account for noncompletion of plans among MyCAA users. Noncompletion for a spouse in our 2010/2011 cohort is defined as having used some funds in support of an approved MyCAA plan, but having no record in MyCAA of that plan being successfully completed within the three-year scholarship window (that is, no later than December 2014). Because users, by definition, did make at least some progress toward their plan by taking a MyCAA-funded course or exam, we refer to MyCAA users who did not complete their plans, or for whom completion was not reported to MyCAA, as **"starters."** In this chapter, we note particular data-reporting challenges, suggesting that some completion may just not be visible in the dataset.

We address completion and noncompletion through this research question primarily to identify whether there are factors associated with noncompletion that can inform DoD program support to MyCAA applicants and recipients, or support decisions about which types of schools or courses of study to approve. However, some factors possibly associated with noncompletion, such as a sponsor leaving the military or having to move to a new assignment at an installation far away from the spouse's school, will be beyond spouses' control or beyond the SECO program's influence.

A few policy details regarding spouses' use of funds are necessary as background for understanding use and completion. Use may occur within a relatively brief period of time or may take years. For example, a spouse may use the MyCAA Scholarship solely for an examination required for an occupation license, or, on the other end of the spectrum, a MyCAA Scholarship could be used throughout the entire three-year scholarship period to fund pursuit of an

associate's degree. Additionally, the SECO program never sends MyCAA funds directly to spouses, and typically does not pay for an extended course of study all at once. When a MyCAA plan spans multiple school terms, funds are released incrementally as the spouse enrolls in and passes classes or key milestones. The SECO program sends the funds directly to the schools, and program staff track MyCAA plan completion based upon the schools reporting grades and other completion information for the MyCAA students.

This chapter next provides some simple usage statistics to give an overview of the characteristics of the MyCAA plans in our sample. It then describes known MyCAA plan completers in our cohort, how that percentage compares to completion in the general population, and why the MyCAA group we label as "starters" likely contains some completers as well, particularly given patterns for time to completion and MyCAA eligibility criteria. We next compare known completers to starters, using both descriptive statistics and multivariate models. Before concluding the chapter, we explore characteristics associated with course failure, as those who failed a course were less likely to complete a plan and thus perhaps could benefit from additional support or outreach.

Characteristics of MyCAA Plans and Schools

Overall, 40 percent of MyCAA users in our cohort were pursuing associate's degrees, 56 percent were pursuing occupational certificates, and 3 percent were pursuing licenses. The most common career goals noted on MyCAA users' plans were typically in medical, pharmacy, or veterinary careers. More than 1,000 students each were pursuing career goals for medical billing; medical coding; medical secretary; medical assistant; medical transcription; health administration and management; dental hygienist or assistant; pharmacy technician; veterinary technician or technologist; business, finance, and administration; K–12 teacher; and other careers in education. In addition, more than 1,000 students were pursuing career goals in the remaining health and human services careers not already listed.

One of the most powerful tools that SECO has to influence the type and quality of institutions that receive MyCAA funds is its ability to review and approve individual institutions for participation. School choice across the members of the 2010/2011 MyCAA cohort who spent some funds is fairly diverse, with 1,630 schools represented in the sample. In this cohort, spending of MyCAA funds is fairly concentrated among several schools, with many users attending one of these popular schools for at least part of their coursework. For example, there are seven institutions that were each attended by more than 1,000 of the 34,762 individuals from the 2010/2011 cohort who used any funds: Career Step, Allied Business Schools, University of Phoenix, Central Texas College, Penn Foster College–Career School, Florida Gulf Coast University, and Animal Behavior College.

The majority of MyCAA funding for this cohort (62 percent) was spent at private for-profit institutions, while 33 percent was spent at public nonprofits. The most commonly attended public nonprofit schools in this sample were Central Texas College, Florida Gulf Coast

University, and the University of Maryland University College. The most commonly attended private for-profit schools were also the most commonly attended schools overall: Career Step, Allied Business Schools, and the University of Phoenix. Private nonprofit institutions were relatively rare, and often included specialty or religious institutions (for example, Lakewood College, the American Council on Exercise, and Liberty University).

In general, Table 4.1 shows that MyCAA attendance and spending are more concentrated in private for-profit schools. This table also shows that there is variation by school sector in terms of whether students are known to have completed their MyCAA plans.

Table 4.1. 2010–2014 Usage Statistics by School Sector

School Sector	Number of Students	Number of Schools	Average MyCAA $/ Student	Known Plan Completion Rate
Private For-Profit	21,639	723	$2,765	36%
Private Nonprofit	2,140	159	$2,298	26%
Public Nonprofit	13,883	733	$1,730	33%
Not Reported	17	15	$3,067	24%

SOURCE: MyCAA data.
SAMPLE SIZE: 1,630 schools and 37,679 unique student-school pairs.
NOTE: Summary statistics are based on observations at the unique student-school combination level. The school, rather than the student, is the unit of analysis for average spending and completion rates.

Table 4.2 shows the same usage statistics as Table 4.1, but by a school's accreditation type. In this chapter, we will examine a school's accreditation type to understand further the variation seen here in the plan completion rates, and because it is one criterion DoD examines when determining whether a school is eligible for MyCAA funding.

Table 4.2. 2010–2014 Usage Statistics by Accreditation Type

School Sector	Number of Students	Number of Schools	Average MyCAA $/ Student	Known Plan Completion Rate
National	14,043	423	$2,888	35%
Regional	14,643	793	$1,821	33%
State	2,660	186	$2,380	58%
Industry	4,742	120	$2,644	23%
Not Reported	1,591	108	$2,348	37%

SOURCE: MyCAA data.
SAMPLE SIZE: 1,630 schools and 37,679 unique student-school pairs.
NOTE: Summary statistics are based on observations at the unique student-school combination level. The school, rather than the student, is the unit of analysis for average spending and completion rates.

In Table 4.3 we grouped schools based on the mode of delivery of courses offered at that school (online or classroom or both). Unfortunately, we do not have information about whether a

particular student's experience was online or in a classroom. Our data capture only whether the entire school offers classroom-only instruction, online-only instruction, or both. In the latter case, which was most schools, we do not know which modes of instruction an individual student received. For schools that report offering only a single type of instruction, the findings presented in Table 4.3 indicate that classroom-only schools in our sample are more expensive for MyCAA recipients than online-only schools in our sample. Additionally, Table 4.3 indicates that students in online-only schools in our sample exhibit lower completion rates. Our analyses will explore whether such variation remains after we control for other observable characteristics, such as having young children, that might be associated with both a school's available modes of instruction and ability to complete a plan.

Table 4.3. 2010–2014 Usage Statistics by Instructional Delivery Type

Mode of Instruction Offered	Number of Students	Number of Schools	Average MyCAA $/ Student	Known Plan Completion Rate
Classroom Only	1,997	275	$2,834	60%
Online Only	12,902	75	$2,075	24%
Both Classroom and Online	18,207	791	$1,930	36%
Not Reported	4,573	489	$2,489	47%

SOURCE: MyCAA data.
SAMPLE SIZE: 1,630 schools and 37,679 unique student-school pairs.
NOTES: Summary statistics are based on observations at the unique student-school combination level. Table indicates only instructional methods offered; which methods MyCAA students used at the schools offering both online and classroom instruction was not available. The school, rather than the student, is the unit of analysis for average spending and completion rates.

As demonstrated in this overview, MyCAA plan and school characteristics in our sample warrant further investigation in our analyses to understand better how they may be associated with known completion rates.

Approach to Understanding Completion

MyCAA data indicate that 34 percent (11,756) of users completed their MyCAA plan, or are known "completers." Completion as captured in the MyCAA dataset means that the school directly confirmed that the MyCAA plan was completed (e.g., AS or AA awarded), or the school reported that the student passed all the classes or exams needed to complete the plan, or the school reported that the student passed the class or exam marked as the final one needed to complete the plan.

As a frame of reference for the 34-percent completion rate within a three-year window among MyCAA recipients, the Complete College America study referenced in Chapter Two found that in the broader U.S. student population (not just military spouses) only 28 percent of full-time and 12 percent of part-time students completed a one-year certificate program in two years (Complete College America, 2011). Furthermore, only 19 percent of full-time students

and 8 percent of part-time students completed a two-year associate's degree within four years. These numbers are not directly comparable to MyCAA's, however, as time spans for completion are different. Additionally, MyCAA recipients may have started working on their license or certificate prior to applying for a scholarship, but we are only able to measure time to completion from when their scholarship period begins. Still, this contextual information suggests that the MyCAA completion rate is not low relative to completion rates of a comparable population.

Within the MyCAA user cohort, 66 percent of users we refer to as "starters" likely include both starters as well as completers for whom completion data are missing. Completion data may be missing especially for spouses who are no longer eligible for MyCAA, because they and their schools have no particular incentive to continue to report their educational progress. Because of this possibility, we compared not only known MyCAA completers with starters; we also conducted a robustness check limiting our starter sample to spouses who were still eligible at the end of 2014 (and thus ineligibility is not a possible explanation for MyCAA missing completion data). This narrower definition of our sample helped us see if any of the associations from our multivariate analysis would change if we had defined our comparison group differently. A critical examination of definitions is an important component of an objective analysis.

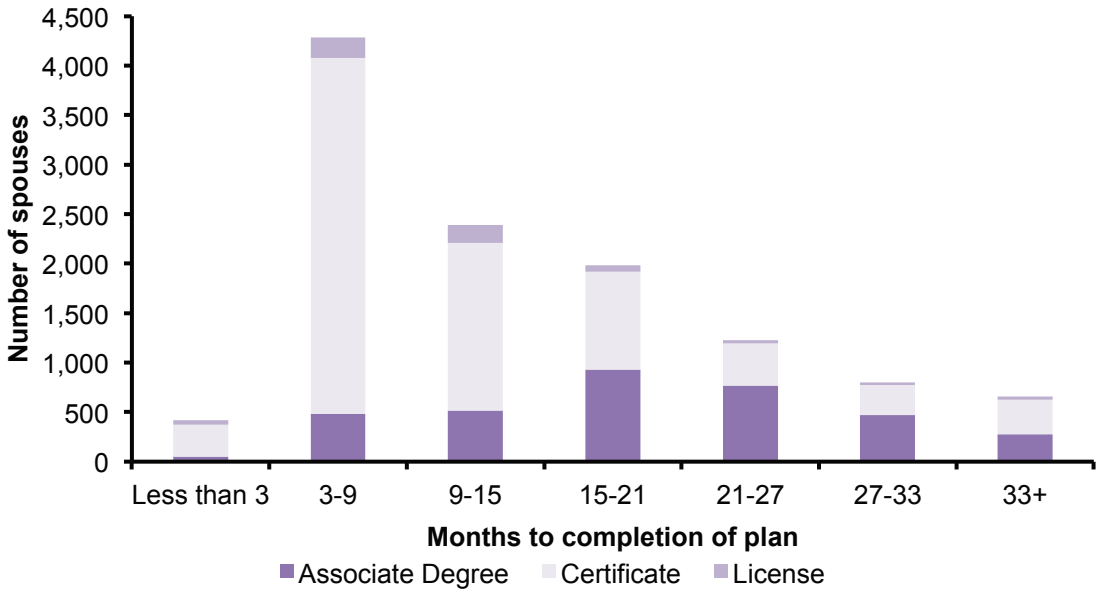
In the remainder of this chapter, we first briefly examine the MyCAA plan time to completion, and then we focus on the characteristics associated with our definitions of completion. As in the previous chapter, we begin with bivariate analyses to provide a description of the populations of interest, followed by multivariate analyses. We first compare the characteristics of the known MyCAA completers relative to MyCAA starters. These descriptive statistics establish a baseline of the characteristics defining MyCAA completers and starters. We then use a multivariate regression model explaining completion as a function of spouse characteristics, sponsor characteristics, household characteristics, and MyCAA plan characteristics (such as school type). For example, this model allows us to separate the relationship between completion and degree program from completion and spouse's age group. More details of this model appear in Appendix C (available online). Finally, we report the results of our robustness check, limiting "starters" to only those still eligible for MyCAA at the end of the scholarship period.

Time to Completion

As noted earlier, U.S. college students often take much longer to complete an occupational certificate or associate's degree than course catalog descriptions and terms like "one-year certificate" and "two-year degree" might suggest (Complete College America, 2011; Snyder, de Brey, and Dillow, 2016). Thus, we wondered whether MyCAA users' time to completion would show that most finished their plan just before their three-year scholarship window expired, thereby raising the question of whether the allotted time frame for completion was too short for those who did not finish. Based on MyCAA data, Figure 4.1 illustrates the time to plan

completion of spouses who completed at least one plan, grouped into six-month time periods.[1] This figure shows that the majority of known completers finished their plans well before the end of the three-year plan expiration window. As shown, plan completion of certificates and licenses occurred most frequently between three and 15 months, while completion of associate's degrees most commonly fell into the 15- to 27-month range. There are three important points relevant for the consideration of time to MyCAA plan completion rates reported in Figure 4.1. The figure reports plan completion time, not degree or certificate completion time. Spouses may have begun their studies prior to obtaining a MyCAA Scholarship, as suggested by the fact that a substantial proportion of known MyCAA completers finished an associate's degree within 21 months. Additionally, MyCAA applicants are required to work with the schools to establish an educational plan that lists all required courses and exams. This planning requirement may reduce

Figure 4.1. Time to Plan Completion for MyCAA Users with Known Completion by December 2014



SOURCE: MyCAA data.
SAMPLE SIZE (total users with known completion): 11,756.
NOTES: The histogram reflects only the number of spouses with MyCAA-approved plans that are observed completing their plan (i.e., their educational progress is reported back to a MyCAA administrator). The data are presented by time to completion, measured as the difference between the estimated date of completion and the date of plan creation.

[1] After successfully completing one plan, spouses can pursue an additional plan providing the spouses are still eligible, they have not yet hit the $4,000 scholarship cap, and the plan meets MyCAA criteria.

the potential for taking excessive credits that extend time to completion as described in Chapter Two (Complete College America, 2011). Finally, Figure 4.1 does not include spouses who may have still been working on their first plan after December 2014. While the MyCAA data cannot be used to calculate a time to degree completion, Figure 4.1 indicates that many MyCAA completers finish their MyCAA-funded certificate, license, or degree plans well before the three-year limit.

Descriptive Statistics of MyCAA Starters and Known Completers

Characteristics Differed Between MyCAA Starters and MyCAA Users Recorded as Completing a Plan by December 2014

As a first step to identifying the MyCAA users in our cohort who were most likely to complete their plans within the scholarship period, we descriptively assessed the factors that were correlated with completing a plan. As an important reminder, our "starter" category could include spouses who completed their education and training after they were no longer eligible for MyCAA (at the end of this section we will explain the relatively few differences that emerge when we further narrow our analyses to filter out the subgroup that lost eligibility). We compared MyCAA users who completed their plans to MyCAA users who started a plan but for whom MyCAA has no record of completion. Tables 4.4 through 4.7 report this information for a series of characteristics grouped by whether or not spouses are known completers.[2] We focus discussion on substantive differences between known completers and starters.

Sponsor Characteristics

Table 4.4 presents the results of our analysis of differences between the sponsors of known completers and starters with regard to their demographic and service characteristics. In general, the differences between known completers and starters are less pronounced than those between applicants and nonapplicants discussed in Chapter Three. Similar to the analysis comparing applicants with nonapplicants, the distribution of characteristics between known completers and starters was statistically significantly different for most of the characteristics (likely due to the large sample size). However, in the case of known completers and starters, these differences generally were not substantively large. One exception was that known plan completers were *less* likely to be married to sponsors in the Army than were starters. This difference is small when compared to the differences between these groups in school and plan characteristics, which are discussed below.

[2] Group differences were tested with chi-squared tests (ANOVAs for mean comparisons) to determine whether factors differed significantly for known completers and starters. Significance tests in this context serve primarily as a means of detecting whether the variance across measures is substantial.

Table 4.4. Characteristics of Sponsors of MyCAA Plan Starters and Known Completers

		Sponsors of MyCAA Plan Users %	Sponsors of MyCAA Plan Starters %	Sponsors of MyCAA Plan Completers %
Sponsor Age*	< 21 Years Old	4	4	5
	21 to 25 Years	46	46	47
	26 to 30 Years	33	33	32
	31 to 35 Years	11	12	10
	36 to 40 Years	4	4	3
	> 40 Years Old	2	2	2
Race/ethnicity*	American Indian/Alaskan Native	2	2	2
	Asian/Pacific Islander	4	4	5
	Black (not Hispanic)	17	18	16
	White (not Hispanic)	62	62	62
	Hispanic	13	13	13
	Other	2	2	2
Education*	Less than 12 years of school (no diploma)	5	5	4
	High school graduate (diploma or equivalent)	84	84	85
	Associate's degree (e.g., AA, AS)	5	5	5
	Bachelor's degree (e.g., BA, AB, BS)	5	5	5
	Master's degree or more	1	1	1
Service*	Army	50	51	47
	Air Force	16	16	16
	Marine Corps	17	17	18
	Navy	17	17	19
Pay grade*	E-1	1	1	0
	E-2	2	2	2
	E-3	17	16	18
	E-4	38	39	38
	E-5	35	35	35
	E-6[a]	3	3	2
	W-1 and W-2	2	2	1
	O-1	1	1	1
	O-2	2	2	2
	O-3[a]	1	1	0
Years of service (mean)*		5.39	5.48	5.22
AFQT[b]	CAT1	4	4	4

		Sponsors of MyCAA Plan Users %	Sponsors of MyCAA Plan Starters %	Sponsors of MyCAA Plan Completers %
	CAT2	32	32	33
	CAT3A	25	25	25
	CAT3B	29	29	28
	CAT4A	5	5	5

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 34,748 MyCAA users, of which 22,992 are starters and 11,756 are known completers.
NOTES: Measured as of December 2011. For sponsors leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated. Pay grades E-1 through E-6 refer to the first six enlisted pay grades; O-1 to O-3 refer to the first three officer pay grades; W-1 and W-2 refer to the first two warrant officer pay grades. AFQT score categories are defined as follows: CAT(egory) 1 indicates a score at or above the 93rd percentile (best scores); CAT2 indicates a score in the 65th–92nd percentile; CAT3A indicates a score in the 50th–64th percentile; CAT3B indicates a score in the 31st–49th percentile; CAT4A indicates a score in the 21st–30th percentile.

* Known completers differ significantly from starters at $p < 0.05$ based on chi^2 testing (or ANOVA for continuous measures).
[a]Because the cohort window spans October 2010 through December 2011, our sample includes a small number of spouses whose sponsors were promoted beyond the MyCAA eligibility window (i.e., beyond E-5 or O-2) by December 2011.
[b]With the exception of those who began as enlisted personnel, officers do not have AFQT scores.

Spouse Characteristics

As shown in Table 4.5, known MyCAA plan completers and starters were statistically significantly different on nearly all the spouse's characteristics (likely due to the large sample

Table 4.5. Characteristics of Spouses Who Are MyCAA Plan Starters and Known Completers

		MyCAA Plan Users %	MyCAA Plan Starters %	MyCAA Plan Completers %
Age*	< 21 Years Old	10	10	11
	21 to 25 Years	47	47	48
	26 to 30 Years	27	27	26
	31 to 35 Years	10	10	9
	36 to 40 Years	3	3	3
	> 40 Years Old	2	2	2
Gender[a]	Women	97	97	98
	Men	3	3	2
Military status	Guard or Reserve	0.5	0.5	0.4
	Not Guard or Reserve	99.5	99.5	99.6

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 34,748 MyCAA users, of which 22,992 are starters and 11,756 are known completers.
NOTES: Measured as of December 2011. For spouses of service members leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated.
* Known completers differ significantly from starters at $p < 0.05$ based on chi^2 testing.

size). Substantive differences, however, are small, so these characteristics are unlikely to be strongly correlated with the probability of completion.

Household Characteristics

Table 4.6 shows the characteristics of households of known MyCAA plan completers and starters. Most of the differences between the two groups were fairly small. Known completers and starters had a comparable number of children and young children and were equally likely to have had a PCS move during their marriage as of December 2011. State unemployment rates were also similar between the two groups, although they are slightly greater for known completers. This is interesting as higher levels of unemployment are correlated with higher levels of application to MyCAA (see Chapter Three). Later in this chapter we note that after controlling for other observed characteristics, unemployment is associated with completion; however, here in the descriptive statistics no clear pattern exists from direct comparison between known completers and starters. Known completers were less likely to have sponsors who deployed during their marriage as of December 2011 than were starters (56 percent compared to 59 percent).

Table 4.6. Characteristics of Households of MyCAA Plan Starters and Known Completers

		MyCAA Plan Users %	MyCAA Plan Starters %	MyCAA Plan Completers %
Number of children <age 18* (mean)		1.28	1.31	1.21
Number of children <age 6* (mean)		0.83	0.84	0.80
Years married (mean)*		3.2	3.3	3.1
Deployed since marriage, until Dec. 2011*	Yes	58	59	56
	No	42	41	44
PCS moves since marriage, until Dec. 2011	Yes	78	78	79
	No	22	22	21
Deployed after Dec. 2011	Yes	19	19	19
	No	81	81	81
PCS moves after Dec. 2011*	Yes	18	18	19
	No	82	82	81
State unemployment rate (mean)*		7.69	7.62	7.82
Home address rural or urban*	Metropolitan	75	74	77
	Micropolitan	13	14	12
	Small Town	2	2	2
	Rural	1	1	1
	Not Classified	9	9	9

Home address census division*	East North Central	1	2	1
	East South Central	6	6	6
	Middle Atlantic	3	3	3
	Mountain	8	8	8
	New England	1	1	1
	Non-U.S.	7	8	7
	Pacific	23	21	26
	South Atlantic	31	32	30
	West North Central	4	5	4
	West South Central	15	16	15

SOURCE: MyCAA data merged with DMDC data. State unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748 MyCAA users, of which 22,992 are starters and 11,756 are known completers.
NOTES: Measured as of December 2011, unless otherwise indicated. For households of service members leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated. Note that from DEERS we are only able to observe years the couples are married and registered in DEERS, so any years married before the service member joined the military would not be captured here.
* Known MyCAA completers differ significantly from MyCAA starters at $p < 0.05$ based on chi^2 testing (ANOVA for continuous measures).

MyCAA Plan and School Characteristics

Although statistically significant differences between starters and known completers have been substantively small thus far, larger differences emerge when we compare the MyCAA plans and the types of schools MyCAA users attended. Table 4.7 shows key characteristics of these MyCAA plans and schools, for known completers and starters. On these characteristics, we see differences that are both statistically significant and substantively important. Plan type, school type, and teaching method all differed significantly for starters compared to completers. While the chi-squared tests only assess differences in the distributions, based on the frequencies we see that known completers were:

- more likely than starters to pursue a certificate (65 percent compared to 52 percent) and less likely than starters to pursue an associate's degree (30 percent compared to 46 percent). One possible explanation is that because it takes longer to complete an associate's degree than a certificate program, it is easier to complete a certificate within the three-year scholarship window
- less likely than starters to be in schools with a regional accreditation (35 percent compared to 38 percent) or industry accreditation (7 percent compared to 14 percent), and more likely than starters to be in schools with a state accreditation (11 percent compared to 4 percent)
- less likely than starters to be enrolled in programs that offered only online courses (21 percent as compared to 39 percent).

The most pronounced difference between these two MyCAA user groups was whether the spouse had ever received a failing grade in a course funded by MyCAA. We used MyCAA's

Table 4.7. Characteristics of MyCAA Plans and Schools for Starters and Known Completers

		MyCAA Users %	MyCAA Plan Starters %	MyCAA Plan Completers %
Plan type*	Associate's Degree	40	46	30
	Certificate	56	52	65
	License	3	3	5
School type*	Mixed (more than one type of school attended)	4	3	5
	Private For-Profit	56	55	58
	Private Nonprofit	5	6	3
	Public Nonprofit	35	36	34
School teaching methods offered*	Classroom Only	5	3	9
	Mixed	50	49	53
	Not Reported	12	9	17
	Online Only	33	39	21
Accreditation of school(s) in plan*	Mixed	5	4	6
	National Only	36	36	37
	Not Reported	4	4	5
	Industry Only	11	14	7
	Regional Only	37	38	35
	State Only	6	4	11
Failing grade during plan*	Failing Grade	31	45	4
	No Failing Grade	69	55	96
Replaced first plan*	Yes	25	24	26
	No	75	76	74
Multiple campuses*	Yes	10	9	12
	No	90	91	88

SOURCE: MyCAA data.
SAMPLE SIZE: 34,748 MyCAA users, of which 22,992 are starters and 11,756 are known completers.
NOTES: Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated.
* Known MyCAA completers differ significantly from MyCAA starters at $p < 0.05$ based on chi^2 test.

definition of a failing grade, which is receiving an "F" (fail), "N" (not passing), or "U" (unsatisfactory).[3] In this chapter we refer to receiving a failing grade and failing a course interchangeably. Only 4 percent of MyCAA users who completed their plans ever failed a

[3] Incompletes must be updated by the school, or the spouse themselves must provide documentation to update the grade within six months. If this does not occur, the incomplete becomes a not pass, and the individual will be marked as failing.

course, compared to 45 percent of starters. Spouses who have failed for the first time may request a forgiveness waiver that would allow them to continue to use MyCAA funds; however, they must first contact a SECO career counselor to discuss the circumstances and how to prevent a repeat, and if they fail a second class their MyCAA account is closed. We will investigate the case of spouses who failed a course in more detail later in this chapter.

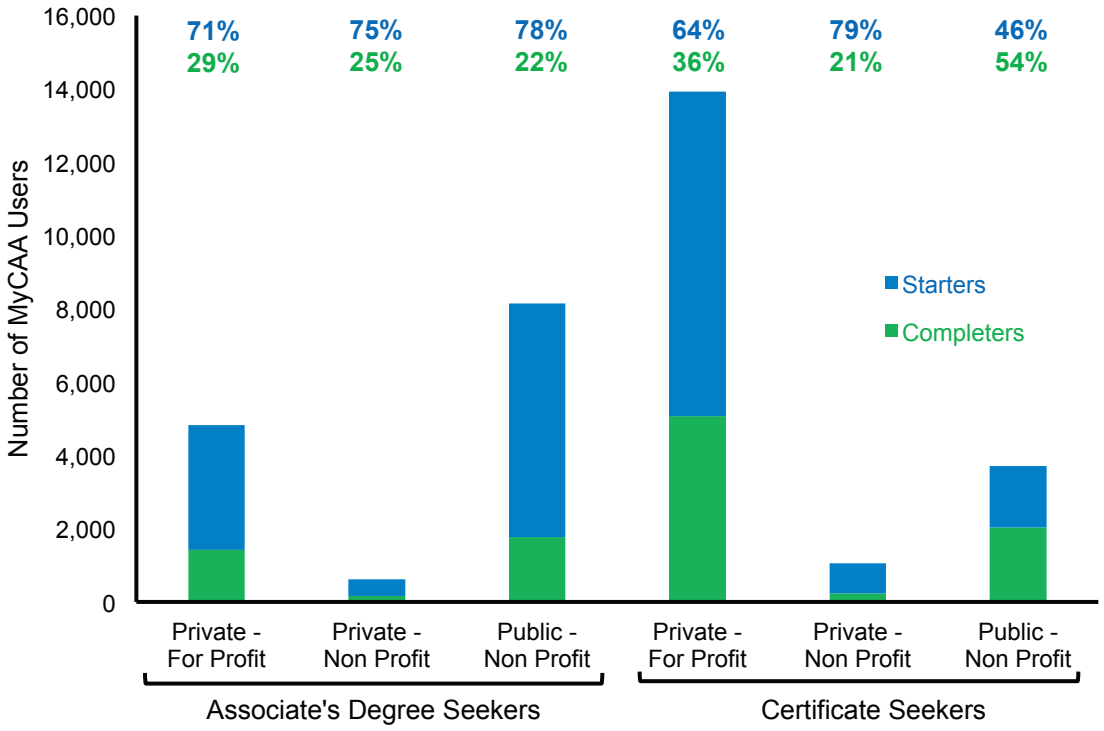
Table 4.7 also highlights some notable categories where differences in school characteristics were small between the two MyCAA user groups. In particular, we found that known completers were:

- more likely to attend private for-profit institutions than were starters (58 percent compared to 55 percent)
- more likely than starters to attend multiple campuses (13 percent as compared to 9 percent).

As noted in Chapter Two, congressional members have raised concern regarding private for-profit institutions. Therefore, the lack of a difference in completion rates is notable.

We noted that spouses attending private for-profit institutions were more commonly pursuing certificates, while spouses attending public nonprofit institutions were more commonly pursuing associate's degrees (see Figure 4.2). As discussed in Chapter Two, the time to completion of a

Figure 4.2. MyCAA Usage by School Sector and Plan Type



SOURCE: MyCAA data.
SAMPLE SIZE: 34,748 MyCAA known completers and starters.
NOTES: Counts of MyCAA users by school sector and plan type. Percentages at the top of the figure correspond to the percentage of a unique school sector–plan type combination that is starters (top) and known completers (bottom).

certificate program is generally much less than that of an associate's degree. Variation in plan type is an important factor contributing to observed differences in known completion rates by school type. For example, despite the overall higher plan completion rates at private for-profit schools, we observe in Figure 4.2 that completion rates for those seeking a certificate are greater at public nonprofits. For associate's degrees, the completion rates are higher at private for-profit institutions. Thus, it is clear that we need to take into account both plan and school characteristics.

Multivariate Model Results

The analyses described above assess the relationship between two variables, and each does not adjust for other potentially confounding factors. For example, the preceding results do not reveal whether the reason spouses attending private for-profit schools were more likely than other MyCAA users to complete their plans was related to a tendency to pursue shorter certificate programs at those types of schools (rather than any other characteristics of those institutions).

This section describes our findings using multivariate models to understand which factors contribute to a spouse completing his or her MyCAA educational plan. We examine the relationship between known completion of a MyCAA plan and other characteristics (demographic, military service, plan, and school) while simultaneously adjusting for, or holding constant, each of the other factors. To do so, we estimate a probit model where the outcome is defined as one if MyCAA user i completes his or her MyCAA plan, and zero otherwise.[4] Table 4.8 lists the variables incorporated in our completion model.

Note that the model includes statuses that are generally consistent over time (e.g., gender, race/ethnicity), variables that reflect status at the time of the MyCAA application window (e.g., previous deployments, PCS moves), and postenrollment variables (including course failure rates, whether a spouse ever replaces his or her initial MyCAA plan with a new plan, and whether or not the service member experiences a PCS move or a deployment after December 2011). This analysis is meant to inform MyCAA whether an observable factor is associated with completion, holding all other observable factors constant. The goal is to provide insights about characteristics of users or plans that could indicate a need for different types of support or additional follow-up from a MyCAA counselor during the scholarship period, or further monitoring to determine the mechanisms driving the observed relationships. For example, we demonstrate that online-only courses have a strong negative relationship with completion (even conditioning on failure, which is more common among students attending online-only institutions). Later in this chapter, we

[4] Because the probit model is nonlinear, the estimated coefficient of a probit equation is not directly interpretable as a marginal effect. However, marginal effects can be calculated from the regression results; see Appendix C (available online) for more details about the model, estimation strategy, and calculation of marginal effects.

Table 4.8. Variables Used to Calculate Probability of a MyCAA User Completing a MyCAA Plan

Sponsor	Race/ethnicity: White (not Hispanic), American Indian/Alaskan Native, Asian/Pacific Islander, Black (not Hispanic), Hispanic, other, unknown, missing. AFQT, categories: 1 (>90%), 2 (70–90%), 3A (50–70%), 3B (30–50%), less than 3B, and none. Pay grade: E-1, E-2, E-3, E-4, E-5, O-1, O-2, W-1 and W-2. Years of service. Service: Army, Navy, Marine Corps, Air Force Education level: Less than high school diploma, high school, associate's degree, bachelor's degree, postbachelor's degree, missing.
Spouse	Gender: Men, women. Age. Age difference from spouse. Military status: In the guard or reserve, or not.
Household	Spouse/sponsor number of years married as recorded in DEERS. Number of children below age 18, categories: 0, 1, 2, 3, 4+. Number of children below age 6, categories: 0, 1, 2, 3, 4+. Any deployments since marriage or 2007 (whichever is earliest): One or more, none. Months deployed since marriage or 2007 (whichever is earliest). PCS moves since marriage or 2007(whichever is earliest): None, one, two, and three or more. Any deployments after Dec. 2011: One or more, none. Months deployed after Dec. 2011. PCS moves after Dec. 2011: None, one, two, and three or more. Home address census division. State unemployment rate as of Dec. 2011. Home address rural or urban: Metropolitan statistical area, micropolitan statistical area, small town, rural area, not classified area.
MyCAA plan and school	Plan type: associate's degree, certificate, license. School type: private for-profit, private nonprofit, public nonprofit, mixed (when more than one school attended), not reported. Career (or career field for less common careers): *Careers*—accountant, bookkeeper, or auditor; dental hygienist or assistant; health administration/management; K–12 teacher; medical assistant; medical billing; pharmacy technician; registered nurse; medical coding; medical secretary; medical transcription; veterinary technician or technologist. *Career Fields*—aerospace; animal services; automotive services; business, finance, and administration; construction; education (excluding K–12 teachers); energy; health and human services (excluding the large careers noted above); homeland security; hospitality; information technology; legal; skilled trades. Accreditation of school(s) in plan: national only, regional only, state only, industry only, mixed (multiple types), not reported. Teaching methods offered by schools in plan: classroom only, online only, mixed, not reported. Any failed classes during MyCAA Plan: One or more, none. Replaced original MyCAA plan: Yes, no. Schools in plan offer multiple campuses: More than one campus, one campus.

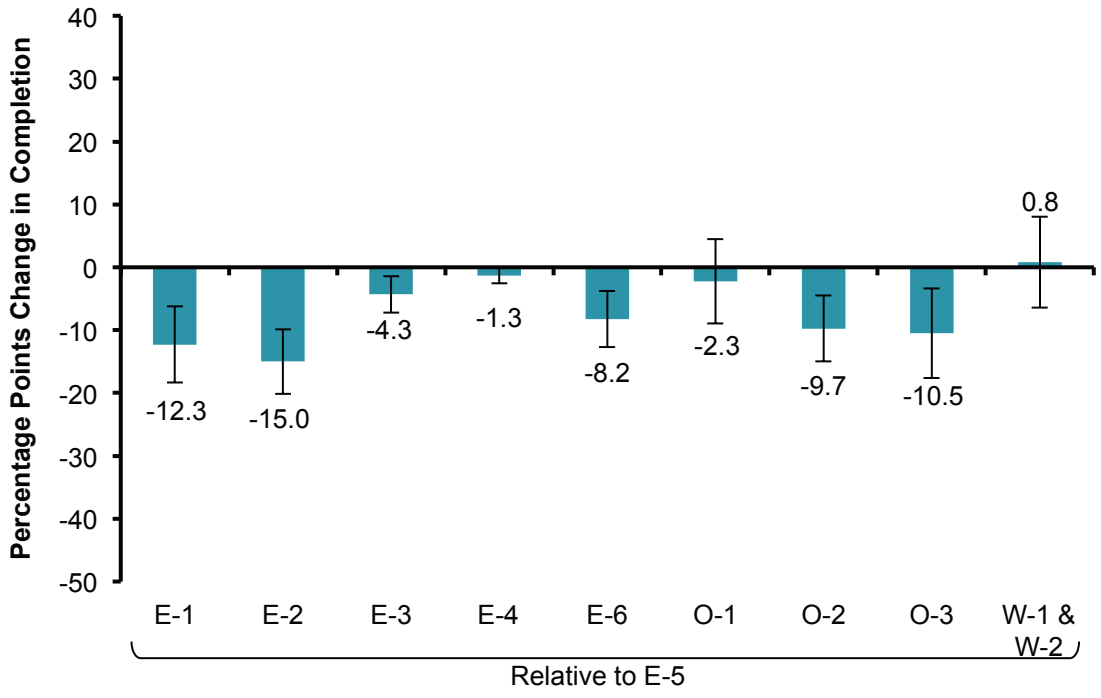
NOTES: The reference category is the spouse who is a woman, is not in the guard/reserve, and is married to an E-5 in the Army who is white, not Hispanic, with an AFQT score in category 1 and a high school diploma, where the household has no children, lives in the South Atlantic census division in a Metropolitan Area, and has not been deployed but has experienced one PCS move since marriage, and whose MyCAA plan is for an associate's degree in the health and human services career field that is not one of the large careers specified in the table, where the school is a public nonprofit, has regional accreditation, uses a mixture of classroom and online classes with a single campus, and the spouse has not failed any classes and has never replaced his or her MyCAA plan. The implicit reference for continuous variables is 0. Note that from DEERS we are only able to observe years the couples are married and registered in DEERS, so any years married before the service member joined the military would not be captured here.

will specifically consider what factors are associated with failure, an intermediate outcome, and will highlight if the factors associated with completion have similar relationships with failure.

Controlling for observable characteristics, many factors that were statistically significant in the bivariate descriptive statistics still remained statistically significant (likely in part because of the large sample). We highlight here notable factors of interest where differences were substantively large. Note that when we highlight differences in completion rates from a change in one factor (see Table 4.8; e.g., sponsor pay grade, service, age) we are doing so holding all of the other observable factors constant. The full model results with marginal estimates are reported in Appendix C (available online).

Sponsor pay grade is significantly associated with plan completion. Figure 4.3 demonstrates the percentage point difference between otherwise observationally equivalent spouses (those who otherwise are similar) who are married to sponsors of different pay grades. Spouses whose sponsors are promoted out of eligibility to E-6 or O-3 by December 2011 are 8.2 to 10.5 percentage points less likely to complete their plans than spouses married to sponsors who are E-5 (the most common pay grade in our sample). Similarly, spouses whose sponsors are new to the military, E-1 and E-2, are also far less likely to complete their plan relative to the spouse of an E-5. Since 34 percent of MyCAA users are known to complete their plan, a difference of

Figure 4.3. Known MyCAA Plan Completion by Sponsor Pay Grade, Relative to a Spouse of an E-5



SOURCE: MyCAA data merged with DMDC data, and state unemployment rates from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero completion, then we infer that the outcome measure (e.g., E-1) is significantly different from the reference group, here E-5. Reference category is pay grade E-5 because it is the most populous pay grade within the MyCAA-eligible population.

8.2 percentage points suggests that the spouse of an E-6 is 24 percent less likely to have completed her plan relative to the spouse of an E-5.

The multivariate models revealed that the significant differences associated with sponsor race/ethnicity and education in Table 4.4 disappeared once the other possible factors were considered simultaneously. Furthermore, although spouses of Air Force and Navy personnel are about two percentage points more likely to complete their MyCAA plan relative to spouses of Army personnel, this association is smaller than indicated by the descriptive statistics in Table 4.4, suggesting that there are many contributing factors that explain lower completion rates among Army spouses.

Our multivariate results reinforce that certain spouse characteristics are associated with noncompletion. Controlling for other factors, MyCAA users who are men have a plan completion rate that is seven percentage points lower than that of observationally similar MyCAA users who are women. Similarly, spouses in the guard or reserve have a plan completion rate that is nine percentage points lower than that of spouses who are not, which could be related to guard and reserve ineligibility to use their scholarship whenever they serve on Title 10 active-duty status. These differences are substantial; the association between gender and guard/reserve status of the spouse with completion are as large as that between completion and having a sponsor promoted beyond scholarship eligibility by the end of 2011.

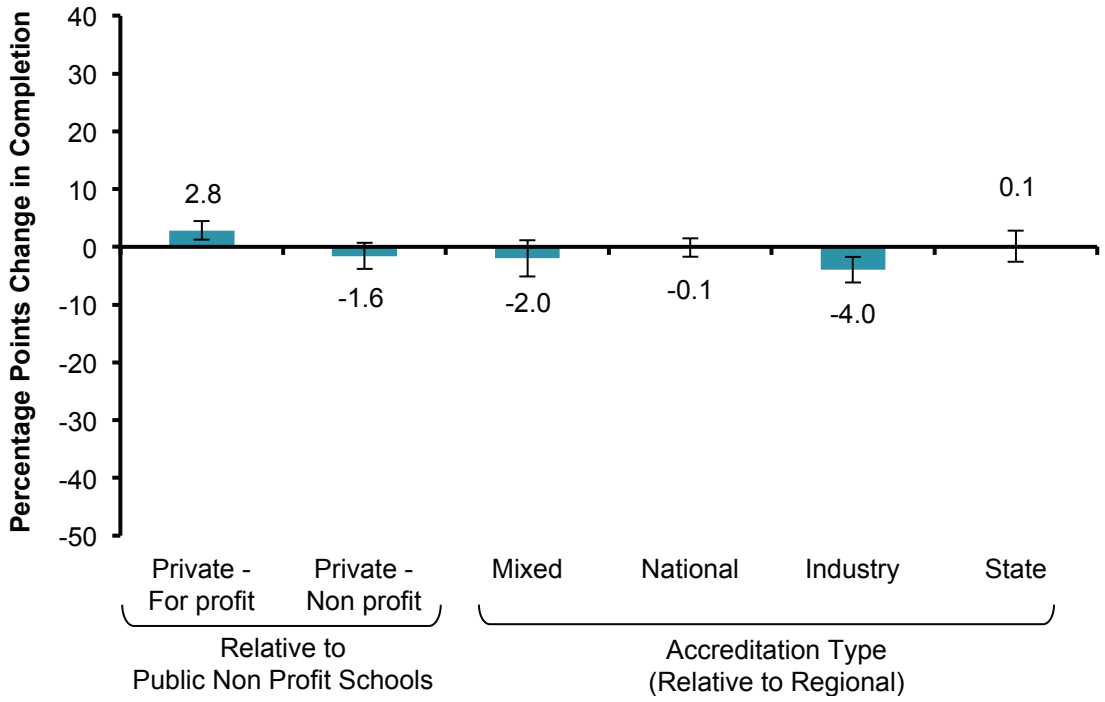
The household characteristics that are associated with completion are generally different from those reported in the previous chapter as associated with spouses applying for a MyCAA Scholarship. For example, after controlling for observable factors, the number of children is not significantly associated with higher or lower completion rates. However, the number of years married is associated with lower completion rates; each additional year of marriage is associated with a 0.7-percentage-point lower plan completion rate. We also find that a 5-percentage-point increase in the state unemployment rate is associated with a 2.5-percentage-point greater plan completion rate. Since 34 percent of the MyCAA users completed their MyCAA plan, this result suggests that a 5-percentage-point greater unemployment rate is associated with a 7-percent greater MyCAA completion rate. Recall from the previous chapter that higher unemployment rates are also associated with higher rates of spouses applying to MyCAA.

The potential disruptions of PCS moves and deployments during the MyCAA plan may inhibit a spouse's ability to complete his or her MyCAA plan. Both can result in additional demands on a spouse's time, and moves may take spouses away from the geographic location of their college or university. However, we do not find any statistically meaningful indication of this relationship. Neither having any deployments after December 2011 nor the number of months deployed are significantly associated with the completion rate. Counter to the theory that PCS moves inhibit completion, we find that having *no* PCS moves after December 2011 is associated with a 1.4-percentage-point lower completion rate. One possible explanation is that PCS moves from facilities in the contiguous United States are generally restricted to individuals with a minimum amount of service remaining on their contract. Thus, service members who do not undergo a PCS may be more likely to leave the service before their spouses complete their

MyCAA plan. Since spouses of service members exiting the service do not have an incentive to notify MyCAA that they subsequently completed their plan, service separation is a plausible reason why lack of a PCS move could be associated with lower known plan completion rates. Regardless, our results do not suggest that PCS moves or deployments during the MyCAA plan are related to lower known MyCAA plan completion rates.

The next set of figures (Figures 4.4 through 4.6) shows that even after controlling for other factors, plan completion varies by school and plan characteristics, and some of these differences are quite large. After controlling for other observable factors, we find that MyCAA users attending private for-profit schools have a 2.8-percentage-point greater known plan completion rate compared to users pursuing their MyCAA plan at public nonprofit institutions (Figure 4.4). Thus, these analyses confirm that the higher completion rates at the private for-profit schools do not solely reflect differences in the proportion of users pursuing certificates rather than associate's degrees. Still, this is smaller than the difference observed in Table 4.7, suggesting that other factors, like plan type, are also highly correlated with school type. Attending a school with an industry accreditation is associated with substantially lower completion rates than attending a school with regional accreditation.

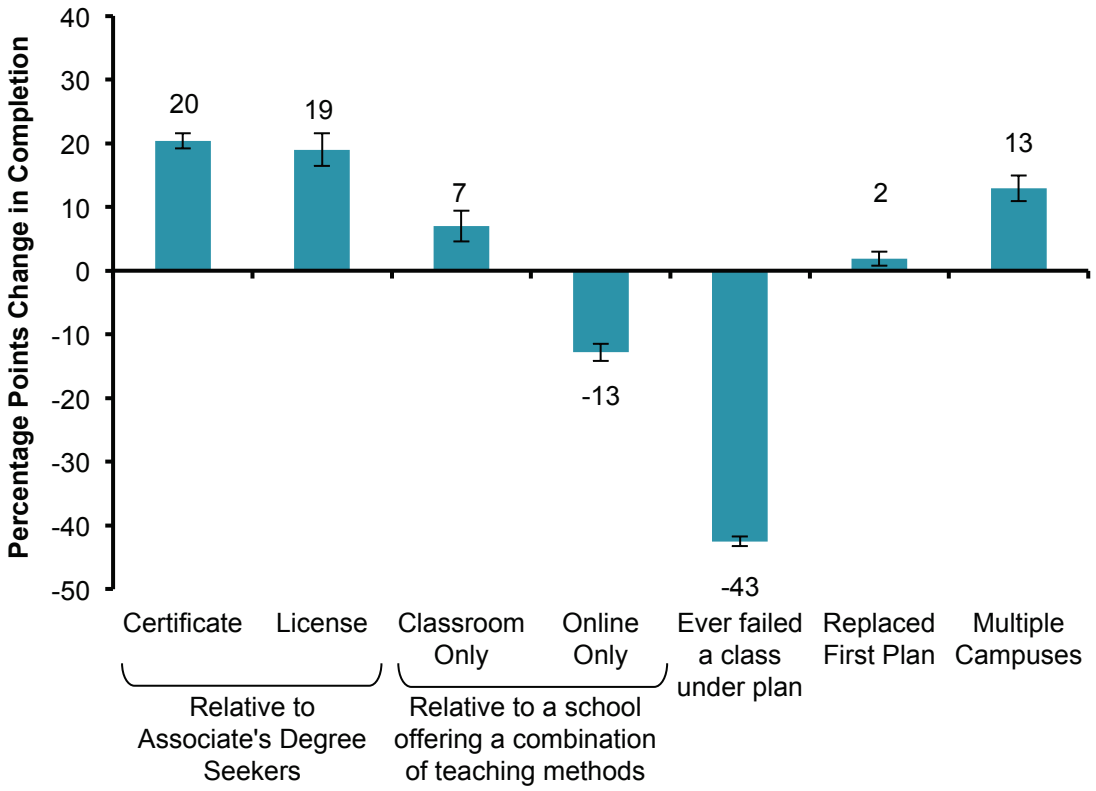
Figure 4.4. Known MyCAA Plan Completion by School Characteristics



SOURCE: MyCAA data merged with DMDC data, and state unemployment rates from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero completion, then we infer that the outcome measure (e.g., private for-profit) is significantly different from the reference group, here public nonprofit schools for the first two measures. Reference category is public nonprofit schools and regional accreditation, because these represent the largest unique category within their respective groups for the MyCAA user population.

As shown in Figure 4.5, MyCAA plans pursuing occupational certificates and licenses are far more likely to be known to be completed compared to plans for associate's degrees. Since most associate's degree programs require two years of full-time course work, an individual starting in September 2011 and successfully completing a full course load each school term would not complete until June 2013. As mentioned earlier, the average completion time for an associate's degree is four years, which is outside of the MyCAA three-year scholarship window and our period of observation (currently, we observe only individuals in our 2010/2011 cohort who complete by December 2014). In addition to the element of time, it may also be that associate's degree programs are more expensive, meaning that a user with such a plan could use the maximum MyCAA funds before completing the plan, and therefore their completion may not be visible in the MyCAA dataset (as there is little incentive for schools or students to report completion to MyCAA once funding is no longer available). We examine the group of MyCAA users pursuing associate's degrees more closely in Chapter Five, when we explore the MyCAA Scholarship's potential relationship with earnings and employment.

Figure 4.5. Known MyCAA Plan Completion by Plan and Academic Characteristics

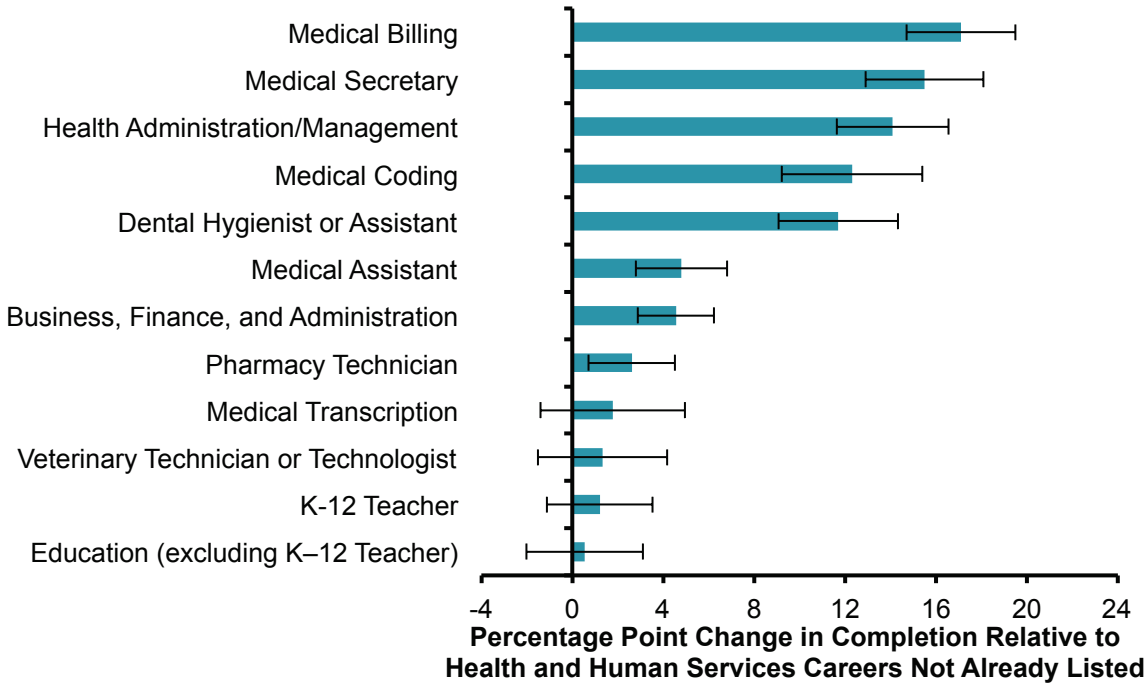


SOURCE: MyCAA data merged with DMDC data and state unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: Reference category is denoted in the figure. The largest category by sample size within a measure was chosen as the reference category. See notes to Figure 4.3 for other details.

Other academic characteristics also have a bearing on the user's likelihood of completion, even after controlling for other characteristics. As shown in Figure 4.5, schools that offer only online instruction are associated with lower completion rates, and schools that offer classroom instruction only are associated with higher completion. Ever failing a course is significantly and negatively associated with plan completion. We will explore this in greater detail in the next section. It was not the case that spouses who started a plan and then replaced it (as is permitted one time if they wish to change their MyCAA career or educational goal) had lower known completion rates for their new plan. Indeed, working with a school to create and submit a new education plan reflects some level of effort to continue working toward a degree, license, or certificate. Finally, attending schools with multiple campuses was associated with greater rate of completion.

Figure 4.6 compares how MyCAA completion varies by the plan's career (or career field if in a career pursued by relatively fewer spouses) for the careers and career fields with over 1,000 MyCAA users in our cohort. The health and human services career field contained several large careers, so we extracted the larger ones to obtain greater detail. Relative to the reference

Figure 4.6. Known MyCAA Plan Completion by Plan, for Careers or Career Fields with More Than 1,000 Users in This Study's Cohort



SOURCE: MyCAA data merged with DMDC data and state unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: The figure includes only careers or career fields where N > 1,000. The health and human services field was chosen as the reference category because it had the largest sample size. The health and human services field reference category excludes the relevant career fields where N > 1,000. See notes to Figure 4.3 for other details.

group of the broader health and human services career field that encompasses many smaller careers, the larger careers in this area, such as medical billing and medical secretary, have statistically significantly higher rates of completion.

Overall, our multivariate model results suggest that MyCAA plan type (associate's degree, certificate, or license), whether or not the student ever fails a course, and the pay grade of the sponsor are some of the most meaningful factors associated with known plan completion. We present a number of potential mechanisms for these associations that are consistent with these findings. Lower known completion rates among spouses pursuing associate's degrees could reflect that associate's degrees take longer to complete than other plan types. Additionally, associate's degree costs are more likely to exceed the maximum MyCAA contribution limit, so completion may be less visible in the MyCAA dataset because there is little incentive to report completion to MyCAA once funds are no longer available. Alternatively, it is possible that on average these approved associate's degree programs are more demanding of the student (e.g., encompass more difficult material) than other programs, regardless of program length. Course failure could be associated with lack of known plan completion if it is an indicator of MyCAA users' academic abilities, motivation, or availability to devote time to education or training. Additionally, spouses who fail a course for whatever reason may subsequently feel discouraged from attending college or pursuing that career, or they may feel too embarrassed to discuss their failure with a SECO career counselor so that they can access additional MyCAA funds. If MyCAA users fail more than once, they are not allowed to receive any further funds from MyCAA, with the exception of an appeal for a waiver in the instance of a documented hardship (e.g., hospitalization, family emergency). Spouses married to junior enlisted members or officers may have lower completion rates than spouses married to NCOs due to challenges adjusting to military life. Alternatively, there may be greater financial need among families of new service members that leads to working full-time rather than attending school full-time, thus limiting spouses' ability to complete a MyCAA plan within the given time frame.

Most of the potential mechanisms that we described above could benefit from intervention by SECO career counselors. For example, the spouse of a new service member can be encouraged to wait on schooling until his or her sponsor has completed occupational training and moved to their first permanent duty station. SECO career counselors could conduct outreach to failing students and help them reflect on whether the program is a good fit with the student's skill set or preferences, or identify whether there are ways to improve their academic outcomes (e.g., help them to locate tutoring services, secure assistance with learning disabilities, or reorient their career search). Finally, DoD could explore the possibility of following up with associate's degree seekers to figure out if the strong association found here is simply because MyCAA cannot observe the completion of this plan, or if it is driven by strong and systematic differences in completion rates between spouses pursuing associate's degrees and spouses pursuing certificates or licenses.

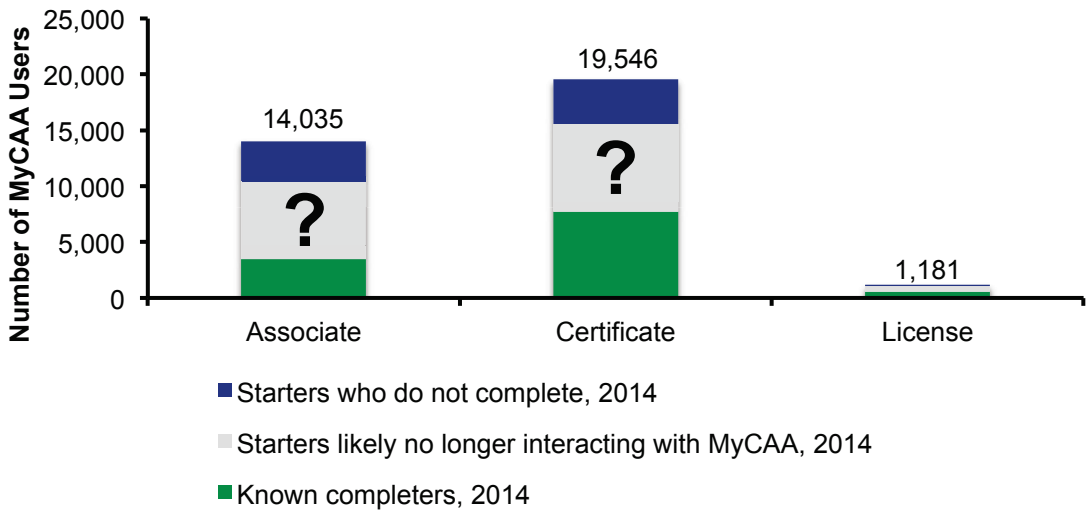
Robustness Check: Alternative Measure of Completion

A key limitation of our analysis is that it is difficult to accurately track completion information for all users. Tracking completion is difficult for several reasons. First, there are gaps in data reporting within the MyCAA data; in order for a plan to be marked as completed, the schools attended must supply grade and completion information to MyCAA, which does not always occur in a timely manner. Second, 66 percent of the 23,005 MyCAA starters (i.e., those for whom we have no completion data) became ineligible for the scholarship during the three-year scholarship window. Since these individuals were no longer eligible for funding, the schools would have no obligation to report their completion and grade information to MyCAA, and the spouses would have little incentive to log into their MyCAA profile and report their completion. Eleven percent of these starters had used their maximum scholarship amount ($4,000) before December 2014 without showing a plan completion. Forty-three percent of starters no longer appeared in December 2014 in DEERS as married to their sponsor. This could be either because they were no longer married (7 percent of starters no longer appear in DEERS, but their sponsor is still active) or because the sponsor was no longer in the military (37 percent of starters no longer appear in DEERS *and* their sponsor is no longer active in DEERS). An additional 5 percent were coded as being married, but the sponsor had moved from the active component to guard or reserve service. A further 18 percent were coded as spouses of active-component service members, but their sponsor had moved out of eligible pay grades. A very small number (<1 percent) of spouses became ineligible because they themselves entered the active component. Figure 4.7 illustrates in gray the portion of users for whom completion may be unknown, relative to the number of known completions and starters who were still eligible for MyCAA in December 2014.

While these unknown status individuals represent 44 percent of the overall population of MyCAA users, they used fewer MyCAA funds per person than those who either complete a plan or fail to complete but continue to be eligible throughout the scholarship window, as shown in Figure 4.8.

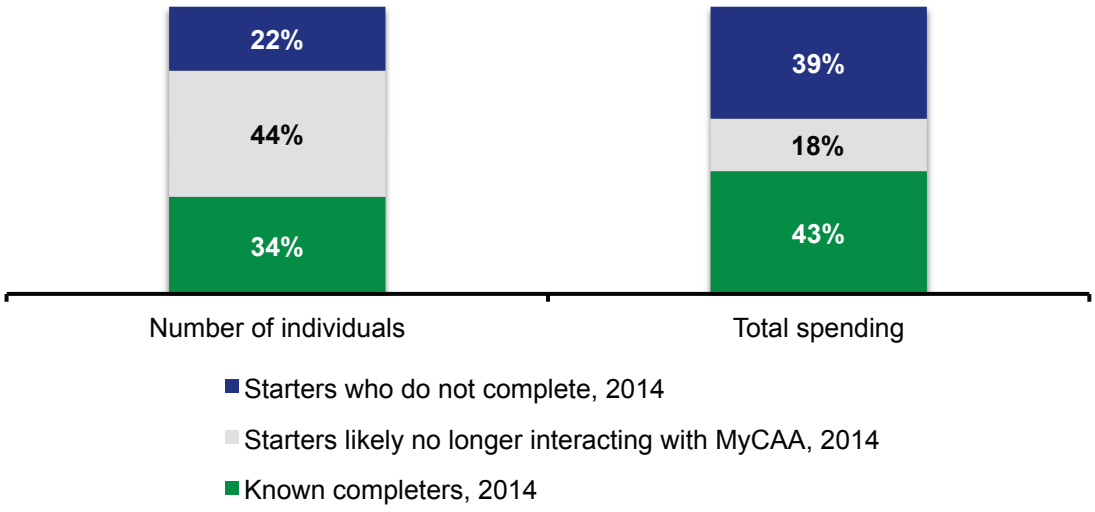
As a sensitivity analysis, we also estimated our probit model to account for potential loss of MyCAA visibility on spouse education activity due to spouses no longer being eligible for funds. In this model, we compared known completers to starters after removing spouses no longer eligible for MyCAA at the end of 2014 from our models. For the most part, the results were similar to the first comparisons with four major exceptions: (1) the negative association with the online-only teaching method is diminished, but remained negative; (2) the positive association with certificate and license programs diminishes, as well as the association with many of the careers and fields; (3) state accreditation is associated with a 10-percentage-point greater likelihood of completion; and (4) pay grade is no longer significantly associated with completion. Next, given the strong and negative association between receiving a failing grade and completing a MyCAA plan, we give special attention to students who ever received a

Figure 4.7. MyCAA Starters May Include Completers No Longer Interacting with MyCAA Due to Lost Eligibility



SOURCE: MyCAA data.
SAMPLE SIZE (total number of MyCAA fund users): 34,762.
NOTE: This sample size is slightly larger than the numbers used in the analyses because the analyses require additional data elements, some of which are missing.

Figure 4.8. Percentage of Spending on MyCAA User Groups



SOURCE: MyCAA data.
SAMPLE SIZE: 34,762.
NOTE: This sample size is slightly larger than the numbers used in the analyses because the analyses require additional data elements, some of which are missing.

failing grade during their MyCAA plan. As in previous sections, we compare the characteristics of the spouses, sponsors, households, schools, and plans.

Descriptive Analysis of Spouses Who Failed a Course

Characteristics Differed Between Those Who Failed a Course as of December 2014 and Those Who Did Not

As noted previously in Figure 4.5, failing a course was strongly related to the likelihood that a spouse would not complete his or her plan. Delving further into the data, we found that of spouses who failed a course, only 14 percent attempted to continue their plan and 35 percent of them failed another course in a subsequent term. In this section, Tables 4.9 through 4.12 explore whether spouse, sponsor, household, school, and plan characteristics are associated with whether a spouse failed a course. The method we used for examining course failure was similar to that which we employed to examine known completion. That is, group differences were tested with chi-squared tests (ANOVAs for mean comparisons) to determine whether factors differed significantly for those who did and those who did not fail a course. As discussed above, while chi-squared tests provide useful information on whether there are statistically significant differences for two groups on categorical variables of interest (e.g., by race/ethnicity), these tests do not allow us to infer statistically significant differences for specific subgroups. We used these tests to determine which variables are potentially most useful to discuss, but when we describe specific subgroup differences, this is often based on substantive differences. In addition, once again, the large sample sizes mean that many factors will be statistically significant even if differences are small. Thus, our focus is on substantive differences.

It is important to note that the analyses reported here may have included students who were dropping classes informally, without officially withdrawing (which may mean that they receive a grade of "F" without actually failing the course rather than an indicator of withdrawal). This may have occurred because there is little monetary incentive for students to notify their school's registrar of a withdrawal, as a course refund is returned to DoD, and not to the spouse.

Sponsor Characteristics

Table 4.9 shows the demographic and service characteristics of users' sponsors. All the factors considered here differed significantly between spouses who failed a course and spouses who did not. We found that spouses who failed a course were:

- more likely to have sponsors who were non-Hispanic black (20 percent of spouses who failed a plan compared to 16 percent of spouses who did not fail), and less likely to have sponsors who were white than did spouses who did not fail (60 percent of spouses who failed a plan compared to 63 percent of spouses who did not fail)

- more likely to be married to a high school graduate than spouses who did not fail (85 percent compared to 84 percent)
- more likely to have a sponsor in the Army than spouses who did not fail (55 percent of spouses who failed compared to 48 percent of spouses who did not), but less likely to have sponsors in the Navy (16 percent of spouses who failed compared to 18 percent who did not) or Air Force (14 percent who failed compared to 17 percent)
- more likely than spouses who did not fail to have sponsors who were E-4s (41 percent of spouses who failed a course compared to 37 percent of spouses who did not)
- more likely to have sponsors who were category 3B on the AFQT than spouses who did not fail (31 percent of spouses who failed a course compared to 28 percent who did not).

Table 4.9. Characteristics of Sponsors by Whether Spouses Ever Failed a Course in Their MyCAA Plan

		Did Not Fail (%)	Failed a Course (%)
Age*	< 21 Years Old	4	4
	21 to 25 Years	46	47
	26 to 30 Years	33	31
	31 to 35 Years	11	12
	36 to 40 Years	4	4
	> 40 Years Old	2	2
Race/ethnicity*	American Indian/Alaskan Native	2	2
	Asian/Pacific Islander	4	4
	Black (not Hispanic)	16	20
	White (not Hispanic)	63	60
	Hispanic	13	14
	Other	2	2
Education*	Less than 12 years of school (no diploma)	5	5
	High school graduate (diploma or equivalent)	84	85
	Associate's degree (e.g., AA, AS)	5	4
	Bachelor's degree (e.g., BA, AB, BS)	5	5
	Master's degree or more	1	1
Service*	Army	48	55
	Air Force	17	14
	Marine Corps	17	16
	Navy	18	16
Pay grade*	E-1	1	1
	E-2	2	3
	E-3	16	18

		Did Not Fail (%)	Failed a Course (%)
	E-4	37	41
	E-5	36	32
	E-6[a]	3	2
	W-1 and W-2	2	1
	O-1	1	1
	O-2	2	2
	O-3[a]	1	0
Years of service*		6	5
AFQT*	CAT1	4	4
	CAT2	33	31
	CAT3A	25	25
	CAT3B	28	31
	CAT4A	5	5

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 34,748, of which 10,796 spouses failed at least one course during their MyCAA plan, and 23,952 did not fail any course.
NOTES: Measured as of December 2011, unless otherwise indicated. For sponsors leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated. Pay grades E-1 through E-6 refer to the first six enlisted pay grades; O-1 to O-3 refer to the first three officer pay grades; W-1 and W-2 refer to the first two warrant officer pay grades. AFQT score categories are defined as follows: CAT(egory) 1 indicates a best score at or above the 93rd percentile; CAT2 indicates a score in the 65th–92nd percentile; CAT3A indicates a score in the 50th–64th percentile; CAT3B indicates a score in the 31st–49th percentile; CAT4A indicates a score in the 21st–30th percentile.
* MyCAA spouses who failed a course in their plan differ significantly from MyCAA spouses who did not fail at $p < 0.05$ based on chi^2 testing.
[a] Because the cohort window spans October 2010 through December 2011, our sample includes a small number of spouses whose sponsors were promoted beyond the MyCAA eligibility window (i.e., beyond E-5 and O-2) by December 2011.

Spouse Characteristics

As shown in Table 4.10, spouses who failed a course differed significantly from those who did not fail a course, although again, this was likely due to the large sample size, and most differences were substantively fairly small (and the gender differences are not even apparent when the figures rounded to whole percentages). Spouses who failed a course were close in age to those spouses who did not fail, and had only a slightly smaller age difference from their sponsors than spouses who did not fail (0.57 years on average compared to 0.75 years). Spouses who failed a course were also equally likely to be women, but less likely to be in the guard or reserve compared to those who do not fail a course (0.3 percent spouses who failed a course in their plan compared to 0.6 percent of spouses who did not fail).

Table 4.10. Characteristics of Spouses by Whether Spouses Ever Failed a Course in Their MyCAA Plan

		Did Not Fail (%)	Failed a Course (%)
Age*	< 21 Years Old	10	11
	21 to 25 Years	48	47
	26 to 30 Years	27	26
	31 to 35 Years	10	11
	36 to 40 Years	3	3
	> 40 Years Old	2	2
Gender*	Women	97	97
	Men	3	4
Military status*	Guard or Reserve	0.6	0.3
	Not Guard or Reserve	99.4	99.7

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 34,748, of which 10,796 spouses fail at least one course during their MyCAA plan, and 23,952 do not fail any course.
NOTES: Measured as of December 2011, unless otherwise indicated. For spouses of sponsors leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated.
* MyCAA spouses who failed a course in their plan differ significantly from MyCAA spouses who did not fail at $p < 0.05$ based on chi^2 testing.

Household Characteristics

Table 4.11 shows the characteristics of households of spouses who failed a course and who did not. As with spouse and sponsor characteristics, observed household differences were small. On average, spouses who failed a course were equally likely to be deployed and have a PCS move and similar state unemployment rates as those who did not fail. Although many of the other factors considered here differed significantly among spouses who failed a course and spouses who did not, differences were small. One exception was that spouses who failed a course had more children on average than spouses who did not fail (average of 1.35 compared to average of 1.20), and they had more children under the age of six (average of 0.90 compared to average of 0.79).

Table 4.11. Characteristics of Households by Whether Spouses Ever Failed a Course in Their MyCAA Plan

		Did Not Fail (Average)	Failed a Course (Average)
Number of children <age 18*		1.20	1.35
Number of children <age 6*		0.79	0.90
Years married		3.27	3.05
State unemployment rate		8.43	8.48
		Did Not Fail (%)	**Failed a Course (%)**
Deployed since marriage, until Dec. 2011	Yes	58	58
	No	42	42
PCS moves since marriage, until Dec. 2011	Yes	79	78
	No	21	22
Deployed since Dec. 2011	Yes	18	20
	No	82	80
PCS moves since Dec. 2011	Yes	18	18
	No	82	82
Home address rural or urban*	Metropolitan	75	75
	Micropolitan	13	14
	Small Town	2	2
	Rural	1	1
	Not Classified	9	9
Home address census division*	East North Central	1	2
	East South Central	6	6
	Middle Atlantic	3	3
	Mountain	8	7
	New England	1	1
	Non-U.S.	8	7
	Pacific	22	23
	South Atlantic	32	31
	West North Central	4	4
	West South Central	15	17

SOURCE: MyCAA data merged with DMDC data and state unemployment data from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748, of which 10,796 spouses fail at least one course during their MyCAA plan, and 23,952 do not fail any course.
NOTES: Measured as of December 2011, unless otherwise indicated. For households of sponsors leaving the military before December 2011, we use the last observed record. Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated. Note that from DEERS we are only able to observe years the couples are married and registered in DEERS, so any years married before the service member joined the military would not be captured here.
* Spouses who failed a course differ significantly from spouses who did not fail at $p < 0.05$ based on chi^2 testing.

MyCAA Plan and School Characteristics

Table 4.12 shows the characteristics of schools and plans for spouses who failed a course compared to those who did not fail. This table is where we see the largest differences between the two groups, and all differences here were statistically significant. Those who failed a course were:

- more likely to attend a private for-profit institute than are those who did not fail (64 percent of spouses who failed attended a for-profit compared to 53 percent of spouses who did not fail)
- more likely to be completing a certificate (68 percent who failed a course compared to 51 percent who did not) and less likely to be completing an associate's degree (29 percent who failed compared to 45 percent who did not)
- more likely than those who did not fail to be attending schools that offered only online instruction (56 percent who failed a course as compared to 22 percent who did not)
- less likely to be in schools with regional accreditation (24 who failed as compared to 43 who did not), and more likely to be in schools with an industry accreditation than those who did not fail (23 percent compared to 6 percent who did not fail a course)
- more likely to have replaced their original educational plan with a new one (30 percent compared to 23 percent for those who did not fail) and to take classes on multiple campuses (12 percent compared to 9 percent for those who did not fail).

Table 4.12. Characteristics of Schools and Plans by Whether Spouses Ever Failed a Course in Their MyCAA Plan

		Did Not Fail (%)	Failed a Course (%)
School Type*	Mixed	3	6
	Private For-Profit	53	64
	Private Nonprofit	4	6
	Public Nonprofit	40	24
Plan Type*	Associate's degree	45	29
	Certificate	51	68
	License	4	3
Teaching method*	Classroom Only	6	2
	Mixed	58	33
	Not Reported	13	9
	Online Only	22	56
Accreditation of school(s) in plan	Mixed	4	7
	National Only	35	39
	Not Reported	4	5
	Industry Only	6	23
	Regional Only	43	24
	State Only	8	2

		Did Not Fail (%)	Failed a Course (%)
Replaced first plan	Yes	23	30
	No	77	70
Multiple campuses	Yes	9	12
	No	91	88

SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZE: 34,748, of which 10,796 spouses failed at least one course during their MyCAA plan, and 23,952 did not fail any course.
NOTES: Sample sizes vary slightly for some measures due to missing data. Percentages are displayed unless otherwise indicated.
* Spouses who failed a course in their plan differ significantly from spouses who did not fail at $p < 0.05$ based on chi^2 testing.

In our analysis of completion, plan type (associate's degree, certificate, or license) was an important factor contributing to observed differences in known completion rates by school type. Thus we must also consider both plan type and school type when examining course failure. For example, for-profit schools represent a greater percentage of certificate seekers in our sample (71 percent) and a greater percentage of online-only instruction (88 percent). All of these are observed to be represented in greater proportions among the group of MyCAA users failing a course. Next, we parse which factors are consistently associated with greater rates of failing a course during a MyCAA plan using a multivariate model.

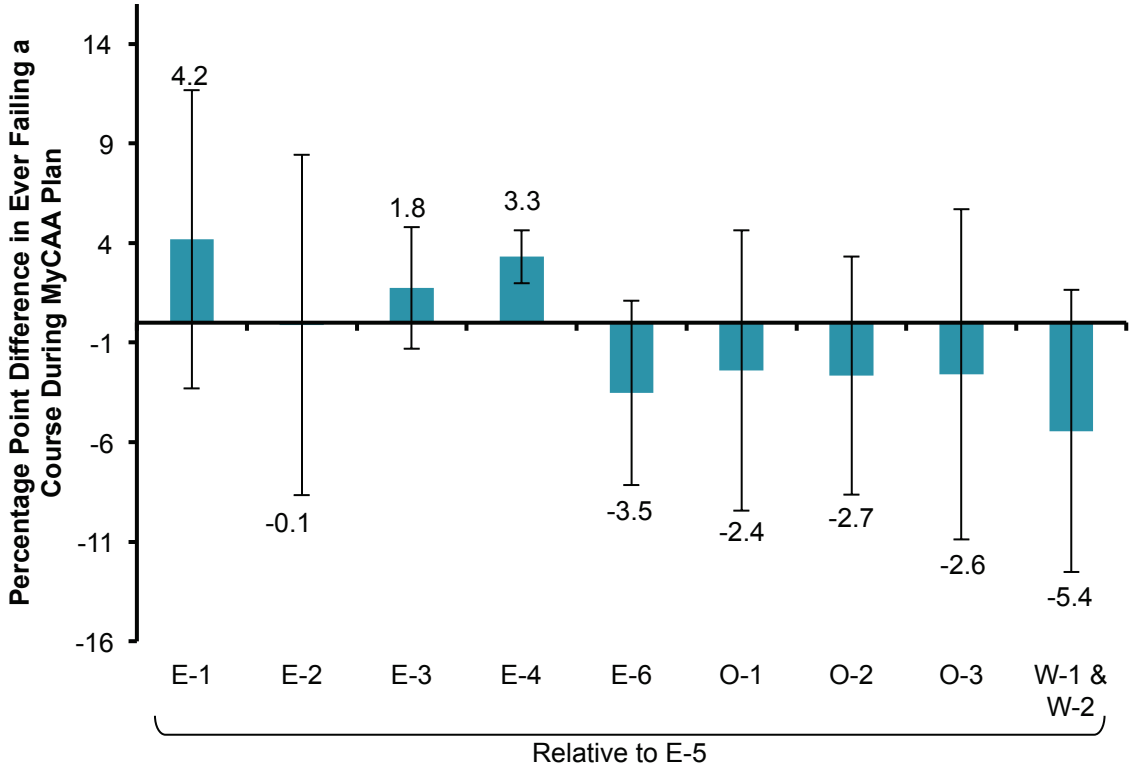
Multivariate Model Results of Spouses Who Failed a Course

As in our analysis of completion, we use multivariate models to understand which factors contribute to a spouse failing a course during his or her MyCAA educational plan. We examine the relationship between having at least one course failure during a MyCAA plan and other characteristics (demographic, military service, plan, and school) while simultaneously adjusting for, or holding constant, each of the other factors. To do so, we estimate a probit model where the outcome is defined as one if MyCAA user i fails a course, and zero otherwise. We use the same factors in Table 4.8 that were used in the multivariate completion analysis, with the exception of the factor "any failed classes during MyCAA Plan," since it is now our outcome of interest because of its relationship to plan completion.

Controlling for observable characteristics, many factors that were different in the bivariate descriptive statistics were also different in the multivariate analysis. We contrast here the factors that were notable for completion, and highlight where differences were substantive. We also highlight any factors that were strongly associated with failure, but were not substantively important for completion conditional on accounting for failure. Note again that when we highlight differences in rates of failing a course from a change in one factor (see Table 4.8, e.g., sponsor pay grade, service, age), we are doing so holding all of the other observable factors constant. The full model results with marginal estimates are reported in Appendix C (available online).

Sponsor pay grade is generally not associated with greater course failure rates relative to spouses of E-5s. Figure 4.9 demonstrates the percentage point difference between otherwise

Figure 4.9. Course Failure During MyCAA Plan by Sponsor Pay Grade, Relative to a Spouse of an E-5



SOURCE: MyCAA data merged with DMDC data and state unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero completion, then we infer that the outcome measure (e.g., E-1) is significantly different from the reference group, here E-5. Reference category is pay grade E-5, because it is the most populous pay grade within the MyCAA-eligible population.

observationally equivalent spouses (those who otherwise are similar) who are married to sponsors of different pay grades. Previously, we found that spouses of E-1s to E-3s and spouses of service members promoted outside of eligibility (i.e., E-6, O-3) had lower known plan completion rates, but here we find no consistent relationship with course failure rates. One exception is spouses of E-4s, who had 3.3-percentage-point greater rates of failing a course during their MyCAA plan relative to spouses of E-5s.

The multivariate models revealed that the significant differences associated with sponsor race/ethnicity and education in Table 4.9 are accentuated once the other possible factors were considered simultaneously. For example, spouses of non-Hispanic blacks and Hispanic service members had respectively 6- and 3-percentage-points greater rates of failing a course during their MyCAA relative to spouses of white service members, while spouses married to service

members whose highest attained education was an associate's degree had a 2-percentage-point lower rate of failing a course during their MyCAA relative to spouses married to service members whose highest attained education was a high school diploma. Furthermore, spouses of non-Army personnel had 3- to 4-percentage-points lower rates of failing a course during their MyCAA plan relative to spouses of Army personnel.

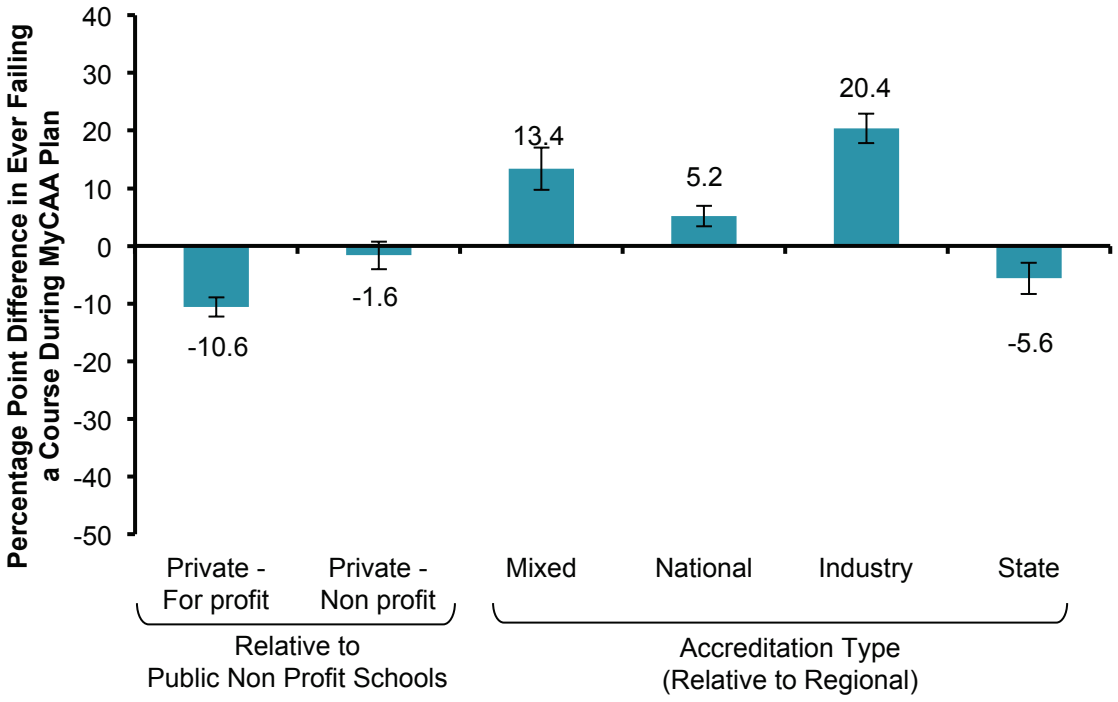
Our multivariate results reinforce that certain spouse characteristics are associated with failing a course during the MyCAA plan. In particular, MyCAA users who are men have a 7-percentage-point greater rate of failing a course during their plan of study compared to an observationally equivalent MyCAA user who is a woman. Spouses in the guard or reserve have a 12-percentage-point lower rate of failing a course during their MyCAA plan. However, as discussed earlier, they are less likely to complete. This observed response could correspond to limiting their ability to follow through with their plan whenever they serve on Title 10 active-duty status. These differences are substantial, suggesting potential characteristics that MyCAA could investigate further to understand the mechanisms driving these results.

The household characteristics that are associated with failure are generally different from those reported earlier in the chapter as being associated with spouses completing a MyCAA plan. For example, after controlling for observable factors, having two or more children is significantly associated with higher incidence of failing a course during the MyCAA plan. We find that the state unemployment rate is not associated with failure rates. Spouses who have been married to their service members longer, at least as recorded in DEERS, have lower failure rates than those who appear to be newlyweds. Each additional year of military marriage is associated with a 0.5-percentage-point lower rate of failing a course during a MyCAA plan.

PCS moves and deployments during the MyCAA plan may increase a spouse's nonacademic responsibilities, placing him or her at greater risk for failing a course. We did not find evidence that PCS moves are associated with higher course failure rates. However, we did find that a sponsor having had any deployments during the marriage and by the end of the MyCAA enrollment window (before December 2011) is associated with a 3-percentage-point greater rate of failing a course during a MyCAA plan. We did not find this same association between deployments and failing a course later in the scholarship window (after December 2011).

The next set of figures (Figures 4.10 through 4.12) shows that even after controlling for other factors, course failure rate during the MyCAA plan varies substantially by school and plan characteristics. After controlling for other observable factors, we find that MyCAA users attending private for-profit schools have a 10.6-percentage-point lower rate of a course failure during their MyCAA plan compared to users pursuing their MyCAA plan at a public nonprofit institution (Figure 4.10). Industry-accredited institutions and plans that include multiple schools with differing types of accreditations are associated with 20.4- and 13.4-percentage-points greater rates of failing a course during a MyCAA plan compared to regionally accredited institutions, while state-accredited institutions are associated with a 5.6-percentage-point lower rate (Figure 4.10).

Figure 4.10. Course Failure During MyCAA Plan by School Characteristics

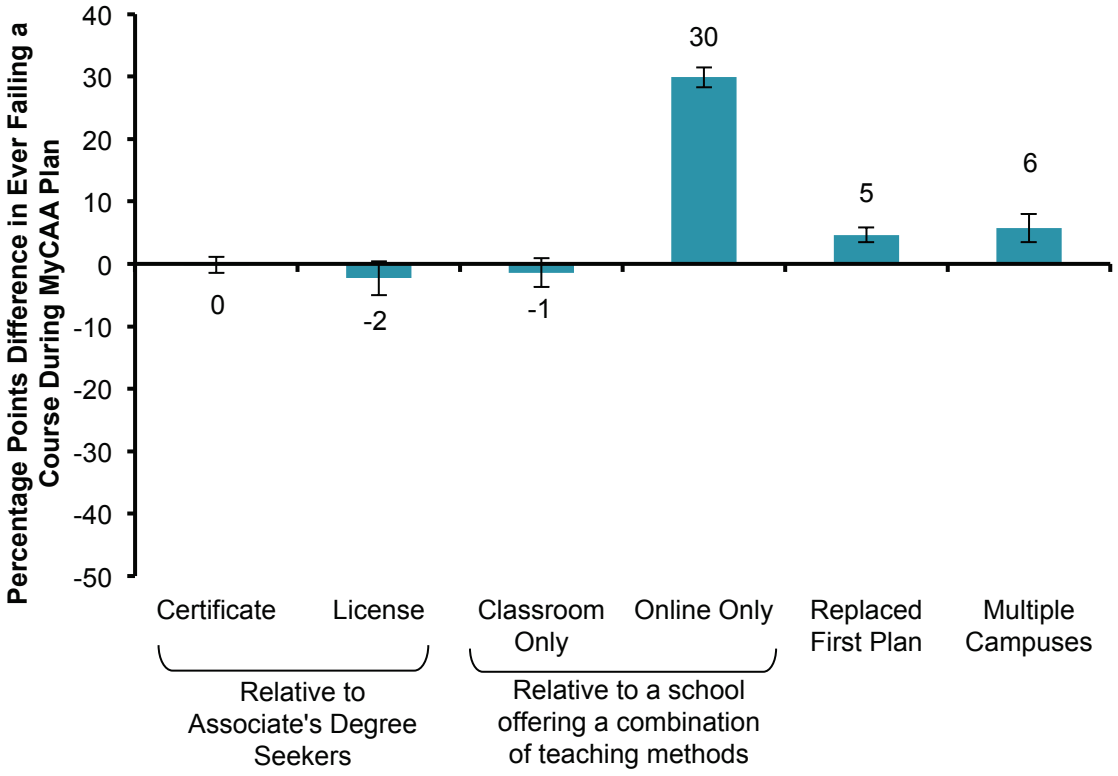


SOURCE: MyCAA data merged with DMDC data and state unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: Brackets correspond to the 95th percentile. If the brackets do not overlap with zero completion, then we infer that the outcome measure (e.g., private for-profit) is significantly different from the reference group, here public nonprofit schools for the first two measures. Reference category is public nonprofit schools and regional accreditation, because these represent the largest unique categories within their respective groups for the MyCAA user population.

As shown in Figure 4.11, MyCAA plans pursuing occupational certificates and licenses are not less likely to fail a course during the plan when compared to plans for associate's degrees. However, MyCAA plans associated with institutions offering only online education have a 30-percentage-point greater rate of failing a course during a MyCAA plan relative to plans at institutions with a mixture of instructional methods. This is aligned with the association between online-only institutions and lower plan completion rates.

Finally, although replacing an earlier MyCAA plan or having a plan at an institution that offers multiples campuses is associated with subsequent completion of the new MyCAA plan, each is also associated with a 5- or 6-percentage-point greater rate of failing a course during the new plan, respectively.

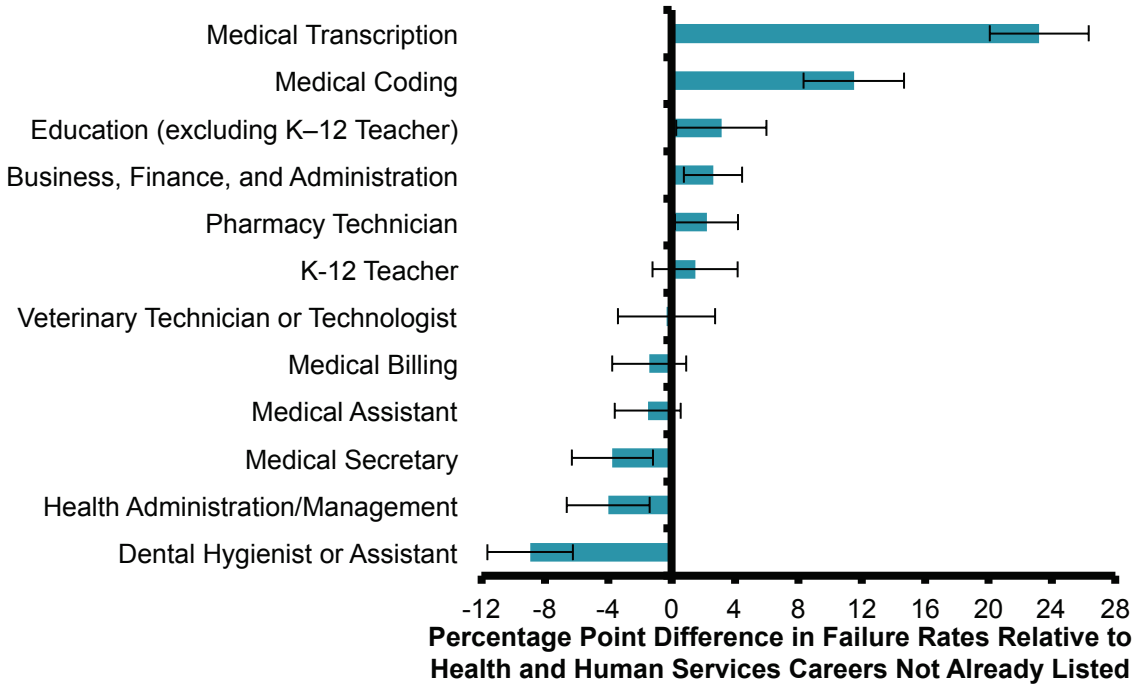
Figure 4.11. Course Failure During MyCAA Plan by Plan and Academic Characteristics



SOURCE: MyCAA data merged with DMDC data and state unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: Reference category is denoted in the figure. The largest category by sample size within a measure was chosen as the reference category. See notes to Figure 4.3 for other details.

Figure 4.12 compares how failure of a course during a MyCAA plan varies by the plan's career (or career field if in a career pursued by relatively fewer spouses) for the careers and career fields with over 1,000 MyCAA users in our cohort. As in Figure 4.6, the health and human services career field contains several large careers, so we extracted the larger ones to obtain greater detail. Relative to the reference group of the broader health and human services career field that encompasses many smaller careers, some of the larger careers in this area such as medical transcription and medical coding have significantly higher rates of failing a course during the plan (23 and 12 percentage points, respectively). Others, such as dental hygienist or assistant, or health administration/management, have lower rates of failing a course during the plan (9 and 4 percentage points, respectively). Some of the fields, such as medical coding or business, finance, and administration, are associated with significantly higher rates of failing a course during the plan despite having significantly higher completion rates conditional on nonfailure (compare with Figure 4.6). These results suggest that MyCAA could investigate plans with these careers to understand the mechanisms determining the higher failure and higher completion rates, should they still be problematic, to determine whether additional career counseling and support before or during the plan would be helpful. Since 2012 (after our cohort had their plans approved), spouses are required to consult with the career counselors at the SECO

Figure 4.12. Course Failure During MyCAA Plan by Plan, for Careers or Career Fields with More Than 1,000 Users in This Study's Cohort



SOURCE: MyCAA data merged with DMDC data and state unemployment rate from Bureau of Labor Statistics.
SAMPLE SIZE: 34,748.
NOTES: The figure includes only careers or career fields where N > 1,000. The health and human services field was chosen as the reference category because it had the largest sample size. The health and human services field reference category excludes the relevant career fields where N > 1,000. See notes to Figure 4.3 for other details.

Call Center when developing their plans. If some of the course failure and lack of plan completion was due to lack of understanding about what these courses and careers would entail, then ideally this counseling will mitigate this among recent cohorts.

Overall, our multivariate model results suggest that an institution's type, an institution's instructional methods, intended career, and certain demographic characteristics are strongly associated with failing a course during a MyCAA plan. We present a number of potential mechanisms for these associations that are consistent with these findings.

- The association between attendance at private for-profit institutions and lower rates of failing plan courses could reflect differences in the unobserved academic ability of students attending these institutions relative to the other institution types, or greater student engagement by the institution to prevent course failure. Alternatively, it could reflect more lenient evaluation by these institutions.
- Greater rates of course failure during plans at online institutions compared to other institutions could reflect that students who select online-only institutions have less time available for their coursework, are more distracted during the instruction, or are otherwise less academically engaged. Alternatively, online-only institutions may use less successful modes of communicating the course material or providing additional support to students who have difficulty understanding it.

- MyCAA plans in medical transcription or coding being associated with greater rates of failing a course during the plans could reflect differences in the difficulty of the course material relative to other careers, or stricter grading. Other possible explanations would include greater rates of mismatch (i.e., students learning after starting coursework that the course material does not match their expectations or career interests and thus failing due to lack of course completion).
- Spouses' demographic characteristics, such as gender, number of children, and length of marriage, being associated with greater rates of failing a course during MyCAA plans could be related to competing demands on spouses' time, such as full-time employment, child rearing, and adaptation to the military environment.

As we have suggested, there are numerous plausible mechanisms for observed differences in course failure rates, so we caution against making assumptions and recommend further research if greater understanding is desired.

The data do not tell us whether or how much course failure is explained by poor instruction, particularly challenging course material, stricter grading, high school providing insufficient preparation for higher education, student failure to formally drop classes they no longer attend, learning disabilities, poor fit between career and student interests or aptitude, distractions or responsibilities that compete with school, limited access (e.g., transportation or internet access), limited student motivation or ability, level of school engagement to prevent student failure, or other reasons. However, the interaction of the two analyses in this chapter highlight plan and school characteristics that MyCAA can explore further to understand potential mechanisms associated with key measures of success: plan completion and nonfailure.

Summary

Overall, MyCAA data indicate that at least 34 percent of the users in the 2010/2011 study cohort completed their plans by December 2014. These numbers compare reasonably well with the overall figures for completion of certificates and associate's degrees (Complete College America, 2011; Snyder, de Brey, and Dillow, 2016), especially when we consider that some plan completions may not have been visible to the MyCAA administrators, as spouses who use all benefits or whose sponsors are promoted out of the eligibility window are likely to no longer interact with the MyCAA portal or staff.

When we compare known completers and starters descriptively, we find differences in race/ethnicity, education, and pay grade of sponsors; however, only pay grade continues to be correlated with completion in our regression models. This suggests that other factors aside from sponsor education and race/ethnicity are related to completion. And even the pay grade result appears to be at least partly driven by sponsors who are promoted out of eligibility; this is apparent through our sensitivity analysis. This pattern also holds for other factors that we might expect to be associated with completion; for example, the number of children is not associated with completion. However, male spouses are less likely to complete their plan, as are spouses who are members of the guard or reserve. Additionally, even holding constant other factors, the

state unemployment rate is associated with plan completion—completion rates are higher among MyCAA users who live in states with higher unemployment rates. Recall from the previous chapter that MyCAA application is also higher among spouses in states with higher unemployment rates; taken together, these results suggest that MyCAA is attractive to those living in areas with poorer job opportunities.

Differences in schools, plans, or other academic factors appear to be quite important when comparing completion to noncompletion. These factors were the strongest ones in the descriptive analyses and persisted in the probit models. It is not surprising that spouses pursuing shorter programs (certificates and licenses rather than associate's degrees) are more likely than others to complete their plans within the window of time included in our data. Completion rates are slightly higher for plans in private for-profit schools; this is also the case among all students enrolled in two-year schools (Snyder, de Brey, and Dillow, 2016). State, national, or regional accreditation is associated with higher completion, and industry accreditation is associated with lower completion. While schools that offer only online instruction may be appealing to spouses, especially those who anticipate moving, live in remote areas, do not have means of transportation, or are trying to juggle many commitments, such instruction is associated with *lower* overall rates of completion. Our results suggest that struggling MyCAA users in programs or schools that offer only online learning and lack traditional sources of accreditation may benefit from additional academic or career counseling. It is also possible that students who enroll in online-only courses are less motivated or unwilling to invest a sufficient amount of time in pursuing their education. Some of these results, however, may be driven by very low completion rates at a few schools. DoD may determine that MyCAA funding for such schools may not be a good use of resources, and in general spouses would be better steered toward other institutions that might offer greater opportunities for success.

We also found that MyCAA users who failed at least one class were much less likely than others to complete their plan. Nearly half of spouses who did not fail a course went on to complete a plan (a figure that compares positively with all attendees at similar schools). Of spouses who failed a course, only 14 percent attempted to continue their plan, and 35 percent of them failed another course in a subsequent term. We investigated the spouses who failed classes more closely in our descriptive analyses and found that these spouses tended to be fairly similar to those who did not fail in terms of their overall characteristics. Once again, the main observable differences between those who failed and those who did not fail a class were primarily differences in school and plan characteristics. For instance, the multivariate analyses revealed that spouses who failed a class were less likely to attend a private for-profit institute than were those who did not fail, and were also more likely than those who did not fail to be in industry-accredited or online-only programs.

Our results generally suggest that many MyCAA users benefit from the scholarship because they use it to successfully complete courses and plans for licenses, certificates, and associate's degrees. Plan completion rates among MyCAA users are at least on par with the degree completion rates of the broader population of students enrolled in two-year associate's or

certificate programs. MyCAA users who fail at least one course often fail to complete their plans; both course failures and lack of plan completion are strongly associated with characteristics of the *academic plan and institutions*. Regardless of whether the results are driven by selection (different types of students select different types of plans or institutions) or causation (some institutions are more successful at supporting student plans than others), the high rates of noncompletion and failure of a course suggest that programs at certain types of institutions should be reviewed by DoD. Periodic review of MyCAA's list of approved institutions may identify where the shortcomings lie with the institutions and whether spouses would be better steered toward other institutions that offer greater opportunities for success. Such a review could include information gathered as a part of administering the scholarship, student feedback submitted through the online DoD complaint system, and interviews or focus groups with students and/or faculty. For issues that are specific to individuals, SECO's career counseling—now a standard requirement for MyCAA application—may be able to help some spouses better understand career field requirements before they enroll in a course of study and learn how to obtain support if they are struggling academically. By focusing on the schools and courses approved for MyCAA funding, and perhaps providing additional guidance to spouses in terms of choice of schools or assistance for those who fail a course, MyCAA may be able to improve outcomes and efficiency.

Part III: MyCAA Use, Spouse Employment and Earnings, and Service Member Continuation

5. Is MyCAA Use Associated with a Near-Term Improvement in Spouse Employment and Earnings?

Introduction

The MyCAA Scholarship is intended to improve spouse and service member's satisfaction with military life and family financial well-being. The goal is for additional education and professional credentials to expand a spouse's employment prospects or permit them to pursue an occupation that is more compatible with the demands of military service. Underlying this theory is that mitigating some of the negative impact of military life on spouse careers leads to greater spouse and family well-being, as well as greater earnings for the household.[1] Ideally this in turn could eventually improve the readiness and retention of military families.

A spouse's employment prospects could be measured by the medium-term outcomes of (1) greater earnings, (2) greater likelihood of employment, and (3) fewer unemployment gaps after a PCS move required by the service member's military responsibilities. In this chapter, we are able to examine the association of use of a MyCAA Scholarship with employment and earnings by working with the Social Security Administration (SSA) to link our sample data to the earnings records of spouses and service members. The linked administrative data reveal important differences in work and earnings trajectories. In the next chapter, we examine the relationship between MyCAA use and retention of the service members.

In this chapter, we present descriptive statistics of how SSA earnings before and after our selected MyCAA application window differ by spouse and service member characteristics. This analysis identifies common trends in military spouse work and earnings behavior outside of the MyCAA Scholarship. Then we provide work and earnings trajectories of military spouses who used a MyCAA Scholarship ("users") relative to MyCAA-eligible spouses who did not use a MyCAA Scholarship ("nonusers"). Because there could be systematic differences that explain differences in work and earnings based on our analyses in Chapters Three and Four, we follow up our descriptive analysis by examining whether MyCAA use is associated with greater employment and higher earnings using a regression framework. This method allows us to explore how these measures of interest differ between those who used the scholarship and those who did not. Measures include whether spouses work for pay and the amount of working

[1] An additional notion is that a military lifestyle may require sacrifice on the part of the household: the nonservice member can no longer remain attached to their career or job given frequent moves or deployments. As a result, the total household income may fall. To the degree that MyCAA provides a low-cost method of increasing total household income, it may represent a more cost-effective means relative to alternative retention policies such as higher basic pay, retirement benefits, or retention bonuses.

spouses' Social Security covered earnings.[2] As part of the regression framework, we use a difference-in-differences methodology to account for permanent differences between individuals. We parse MyCAA users into known completers (i.e., those individuals whose MyCAA records indicate they completed their plan by December 2014) and starters (i.e., those who used funds, but MyCAA has no indication that they completed their plan by December 2014). As in Part II of this report, we limit the population to those who were eligible for MyCAA between October 2010 and December 2011, meaning the spouse was married to a service member in the active component in a MyCAA-eligible pay grade at any point during this application window. As noted previously, the current version of MyCAA launched in October 2010, so our window covers a bit more than the first year of the new scholarship being offered. We use SSA earnings records from 2007 until 2013.[3]

First, we introduce the populations, discuss the data, introduce how we will define *work*, and provide descriptive statistics of a subsample of our population where the household was in the service and married as of December 2011. Next, we introduce the economic model meant to control for observable differences between individuals. This section clarifies what the model can add to our analysis, above and beyond the lessons we are likely to learn from our descriptive analysis. Then we introduce the estimates of the general version of the model and discuss potential threats to being able to identify the contributions of explanatory factors (e.g., pay grade, number of children) to the percentage of spouses working and average earnings. We then consider alternative versions of the model meant to address those concerns. Finally, we consider specific subsamples of interest (e.g., MyCAA users attending a for-profit institution) to explore the robustness of our findings.

Populations and Methodology

In this section, we discuss the data, introduce the populations, introduce how we will define *work*, and provide descriptive statistics of a subsample of our population where the household was in the service and married as of December 2011. To recap from our study populations described previously in Table 3.1, we use the following groups:

- **MyCAA nonusers** who never used any MyCAA Scholarship funds. This group includes MyCAA-eligible spouses who never had any contact with MyCAA, those who only set up a MyCAA profile, and those who were approved for a scholarship but never actually used any awarded funds. Because none of these spouses ever used any MyCAA funds to take a course or exam (at least not by 2014), we consider them "nonusers."

[2] Nonworking spouses are excluded from earnings calculations, as they have no earnings.

[3] The start date, 2007, was chosen to collect an extended pre-MyCAA earnings history, while the end date, 2013, was the latest date for which SSA data was available at the time of the analysis.

- **MyCAA users** in our cohort had a plan approved in 2010 or 2011 and used some funds toward their plan before the end of the scholarship period, which would have been December 2014 for the latest-approved plans. Users are further broken out into
  - **starters**, who used MyCAA funds, but MyCAA has no record of them completing their plan by December 2014
  - **completers**, who used MyCAA funds and appear in MyCAA records to have completed their plan by December 2014.

SSA Data

SSA administers the Old Age, Survivors, and Disability Insurance (OASDI) program, commonly known as Social Security. Payroll taxes are collected from employers and individuals working at U.S. firms that contribute to OASDI. In general, most firms are required to contribute, and the self-employed are also included. Federal civil service workers were added in 1987. Service members were added to OASDI in 1957. Most workers will appear in SSA's data, with the most common exception being state and local public-sector workers who are generally covered by their own plans. Social Security earnings are taxed up to a maximum threshold of earnings, which was $106,800 in 2011, after which earnings are not taxed for OASDI. SSA also administers the Medicare tax as part of the Federal Insurance Contributions Act (FICA); the maximum threshold of earnings does not limit the Medicare tax. Our analysis in this chapter will rely on earnings records based on the reported earnings for the Medicare portion of the FICA tax for those individuals contributing to OASDI.[4]

Our analyses are of interest not only to DoD, but to the SSA as well. Military service members and their spouses make up a notable portion of the OASDI population, and the earning capacity of these individuals is likely to have important relationships with the costs of the OASDI program. The less that military spouses earn, the less they contribute to Social Security, and the less support they will receive upon claiming Social Security benefits. Moreover, these MyCAA Scholarships can be used not only for initial occupations but also to support a career change, and thus the possible benefits would include the acquisition of new job skills for spouses who have or obtain a disability. Thus, if MyCAA can assist military spouses in avoiding employment gaps and increasing earnings, it could potentially benefit them not only in the near term, but also further in the future with greater retirement preparedness.

As part of this project, we were able to use DoD personnel data provided by DMDC linked to SSA administrative data. SSA was able to verify the link between 85.6 percent of our study's

[4] Because we are examining individuals who are contributing to OASDI through working, we may miss earnings of exempted groups, including some state and local employees, students working part-time for their university, or individuals working "under the table" (unreported employment); however, most worker's earnings should appear in Social Security's records.

sample with their Social Security earnings history from 2007 to 2013.[5] In order to be included in our sample for this chapter, a Social Security earnings record had to exist for both members of the household. In order for a record to be verified at SSA, the individual would have had to have been issued a Social Security number (SSN), and the SSN and name must match. Thus, it would not match if the administrative record from DMDC or SSA contained an incorrect SSN or name. The inability to verify a record is more likely to occur with younger individuals, primarily spouses, who have not used their service member family benefits in such a way as to flag an incorrect or missing Social Security number. Additionally, the inability to match names would occur, for example, if individuals did not notify Social Security of a name change due to marriage, divorce, or other reason.

Population and Sample

Our population consists of all military spouses who were eligible to apply for a MyCAA Scholarship between October 2010 and December 2011 and their sponsors (service members). Our sample for this chapter is limited to those individuals who had a matched earnings record at SSA. We observe spouse earnings for every year from 2007 to 2013, which precedes our cohort's application to MyCAA, but ends one year before their opportunity to use their scholarship closes (2014) because 2013 data were the most recent available at the time.

We consider several subsamples of this population when conducting our analysis. Before we present any results in a section or subsection, we will explicitly state whether the results reflect a subsample or represent the entire sample. Different subsamples are used to explore the robustness of our results, or to understand what the characteristics of the sample are at a "snapshot" in time. For example, when we explore the descriptive statistics of the sample, it is useful to look at only those households that were eligible as of December 2011 (as opposed to between October 2010 and December 2011). This way we know that all service members are employed, and there exists a common reference point for being in the sample so that we prevent duplication of households (e.g., service member X being married to spouse X1 until December 2010, then married to spouse X2 from January 2011 on) and samples ending before the period ends (e.g., service members exiting the service before December 2011).

[5] We did not work with the earnings data directly due to the sensitive and restricted nature of the data. We created individual-level data files that we sent directly to SSA. DMDC provided SSA a crosswalk between the unique identifiers in RAND's files and Social Security numbers; SSA was thus able to link individuals in our files to their SSA records by using their Social Security number. Then SSA was able to attach earnings records for those with verified links to create a dataset for our analyses that would remain at SSA. RAND sent SSA the computer programs necessary to run our analyses using that dataset. RAND received only analytical results that satisfied the SSA's data security and privacy requirements (e.g., only results that could not be used to identify individuals).

Defining Work

The SSA earnings-data file records an individual's income for an entire year, but it does not provide any guidance on (1) whether the individual was employed full-time or part-time, (2) whether the individual was employed for all or part of the year, or (3) whether the individual changed jobs or employers. Therefore, we had to specify the conditions for considering an individual as working or not in any given year. We define an individual as working in a year if earnings are greater than $0 in that year. Appendix B (available online) covers in detail why this definition of *work* was chosen from a set of available alternative measures.

Link to Existing Literature

The economics literature most closely associated with this research question is the literature on returns to community college (Jepsen, Troske, and Coomes, 2014; Lang and Weinstein, 2013; Jacobson, LaLonde, and Sullivan, 2005). In these papers, the authors typically link state unemployment insurance (UI) data (i.e., for UI, the state agency must know the earnings of each individual who is insured each month) with community college data. While our data have advantages over this method, state unemployment data offer information we do not have. For example, state UI data are reported at a higher frequency, usually monthly or quarterly, whereas SSA data are annual. DMDC and SSA data combined, however, have many more advantages. First, while our data are only annual, we observe them regardless of whether an individual moves (UI data are limited to the state in which they are collected). Second, we observe both members of the couple, including age and earnings, and are able to link them to one another. Third, we observe household characteristics, including the number of children. Finally, we have data on households of spouses who do not apply for or use a MyCAA Scholarship, but who are eligible, because they appear in the DMDC data. This is a rare feature in any analysis of returns to schooling for associate's, licenses, and certificate programs.

The literature on returns to schooling has noted a few empirical trends. The most common trend is known as the Ashenfelter dip (Ashenfelter, 1978): a decline in average earnings prior to the training or education event (schooling), typically within the four quarters prior to enrollment. Second, there are often lower earnings during the schooling process, known in the job-training literature as a lock-in effect (Lechner and Wunsch, 2009). The lock-in effect would be greater in degrees requiring significant coursework each semester. Finally, there can be a transitional effect, where it takes several quarters before the gains from education are realized. In Jepsen, Troske, and Coomes (2014), the Ashenfelter dip in earnings for men in Kentucky between the ages of 20 and 60 seeking an associate's degree, professional undergraduate diploma, or certificate was around two quarters (six months), and there was a lock-in effect that was most pronounced for diplomas. This study found that, "Average quarterly earnings for associate's degree and diploma recipients begin to increase dramatically after approximately 7 quarters after entering KCTCS [Kentucky Community and Technical College System]; the increase occurs slightly earlier for certificate recipients" (Jepsen, Troske, and Coomes, 2014, p. 111). These

findings suggest that due to the annual nature of our data and the short follow-up period, the effects of MyCAA on earnings may be reduced or unobservable in our relatively short time horizon. MyCAA recipients had until as late as December 2014 to finish using their scholarship, but our earnings data extended only as far as 2013. Ideally, we would want to know MyCAA users' earnings four or more years *after* they used their scholarship; thus, on these dimensions we consider this an early evaluation of MyCAA.

Previous research on the returns to community college has differed on whether the analyses should focus only on workers or if nonworkers are also included. For example, Jacobsen, LaLonde, and Sullivan (2005) evaluate the returns to community college schooling for displaced workers by analyzing the earnings histories of workers who had three or more years of job tenure when they were permanently laid off from their jobs. Jepsen, Troske, and Coomes (2014) focus their evaluation on the combined effect of employment and earnings by looking at students with zero and positive earnings, but also consider alternative models that evaluate employment and earnings separately, examining earnings only among those who are employed. Our analyses will consider the relationship between MyCAA use and (1) employment, (2) earnings averaged across working and nonworking spouses, and (3) earnings averaged only across spouses who are working.

Descriptive Statistics for This Subsample

In this section, we present descriptive statistics for the subsample of households where the service member was in the active component as of December 2011 and the spouse and service member were married. We observe earnings only after the couple is married, which occurs no later than December 2011, and we observe earnings thereafter as long as the couple is married and the service member remains in the military's active component.[6] These descriptive statistics offer the ability to observe the fraction of spouses working and their earnings, while also giving us the opportunity to validate the DMDC-SSA data match by comparing the fraction of service members working and the pay of these service members as recorded in both DMDC and SSA datasets.

Service Members' Basic Pay

Exploring the characteristics of service members serves as a validation test of the merge of the military personnel data from DMDC and the earnings data from SSA. For this purpose, we selected service members who in the DMDC data files appear to be present in the active component in December 2011, who we would expect to have nonnegative earnings recorded in the SSA data files. Indeed, we find that greater than 99.8 percent of the sample matched at SSA

[6] This design removes the potential impact of divorce or separation from the active component of the military as a competing explanation for the measures of interest.

has nonzero earnings in the SSA records. We explored different subgroups in our sample to see if any specific group stood out as having a large number of zero earnings; other than enlisted service members of pay grade E-1 (who could have been shipped to basic training at the end of the year and received their first paycheck in the following year), we detected no such patterns.[7]

We also examined the SSA data on pay of service members in December 2011 by pay grade and compared it to the pay tables for this time period published by the Defense Finance and Accounting Service (DFAS, 2017). Generally, only service member's basic pay is used in the calculation of FICA taxes; allowances (e.g., cost of living or overseas housing allowances) are not considered in payroll taxes. Table 5.1 provides a comparison between the pay for specific pay grades and the observed SSA earnings data in the sample as it appears in the linked DMDC-SSA dataset. We use the published pay authorizations table data corresponding to the lower bound of years of service that are common for each pay grade (e.g., promotion from O-1 to O-2 generally occurs between 18 months and three years after commission). The pay observed in the

Table 5.1. Comparison of Basic Pay Authorizations for 2011 with Observed Subsample That Was Active and Married in December 2011

Pay Grade (Years of Service Category)	Authorized for 12 months of Basic Pay (2011)	Observed Earnings from SSA Records	Sample Size
E-1 (Less Than 2 Years of Service)	$17,170	$17,675	3,304
E-2 (Less Than 2 Years of Service)	$19,739	$17,161	6,618
E-3 (Less Than 2 Years of Service)	$20,758	$20,814	38,648
E-4 (Over 3 Years of Service)	$25,481	$25,590	81,437
E-5 (Over 6 Years of Service)	$31,442	$33,072	86,178
O-1 (Less Than 2 Years of Service)	$33,408	$35,717	4,758
O-2 (Over 2 Years of Service)	$43,834	$48,570	7,492

SOURCE: Basic pay: Defense Finance and Accounting Service (2017). Observed: Linked SSA and DMDC data.
NOTES: Table compares the 2011 military pay tables to the average earnings of service members by pay grade for the sample of military households with a successful SSA earnings record match. The sample chosen for this comparison was that of all MyCAA-eligible military spouses described in Chapter Three, but further restricted to service members that are married and active in December 2011. The total sample size is 247,448 with nonzero SSA earnings from a sample of 247,802. Omitted from the table are pay grades that are less directly comparable to DFAS data, including a combined category for warrant officers and a category for enlisted service members whose spouses were eligible but who were promoted beyond eligibility by December 2011.

[7] We considered gender, population density at home address as of December 2011, number of children as of December 2011, service, age group, pay grade, and MyCAA user/nonuser category. All but one of these categories had a nonzero earnings rate of at least 99.6 percent. Service members of pay grade E-1 had a 93.8 percent nonzero earnings rate. E-1 is the entry-level pay grade in the armed services, usually held by service members during the first six months of service; it represents only 1.4 percent of the overall sample. It is possible that these individuals shipped to basic training in the last week of December, and consequently were not paid until January, or experienced other delays with initial pay or errors in entry of their Social Security numbers.

SSA earnings records is generally very close to the 12-month rate of basic pay, with most of the values observed exceeding the pay calculated using the common lower bound for service. The only substantive deviation occurs for E-2s. A close match to pay authorizations on E-2s, or E-1s, is difficult because these are entry-level pay grades, and the SSA earnings records would reflect pay (or lack thereof) prior to entering the military as well as earnings while service members were holding that pay grade. Additionally, service members often spend less than 12 months in these ranks. In the U.S. Army, a new recruit is promoted to E-2 usually after the successful completion of basic combat training, and there are exceptions that allow new recruits to bypass the rank of E-1. Promotion to E-3 usually comes after one year of service.

Demographic and Military Service Characteristics

We also compare our sample before the merge with SSA with our sample after the merge to see if there are differences in key demographic and military service characteristics, since not all spouses and service members in our sample could be matched with SSA records. In Table 5.2, we report the proportion of the premerge and postmerge sample by key characteristics, such as gender, pay grade, service, age, and MyCAA use. There are no notable differences between the samples.

Based on the descriptive results in Tables 5.1 and 5.2, we conclude that our sample after the match with SSA earnings records reflects the eligible MyCAA population that was active and married in December 2011.

Spouse Employment and Earnings

Matching military personnel and benefit records with SSA earnings histories allow us to observe how spousal earnings develop over a service member's career. Typically, this information is collected in cross-sectional surveys, such as the ADSS, which relies upon self-reports for a particular year. However, matching the household's earnings records provides a more direct way to observe a spouse's earnings trajectory longitudinally while a service member is on active duty.

Table 5.3 provides the percentage of spouses working and the earnings of working spouses by age, number of children, and service member pay grade. The patterns are informative: spouses of enlisted service members work at lower rates as rank and age increase. Sixty-nine percent of E-3 spouses were employed (i.e., had positive earnings), compared to only 58 percent of E-5 spouses. Moreover, the median earnings of spouses who do work are low: $7,389. Lower earnings may be due to part-time work or individuals transitioning into and out of the workforce (e.g., if an individual only worked for the last three months of 2011, then their earnings could be artificially low). Social Security earnings records report only annual income, so we cannot determine if the low income is due to part-time work, or full-time work for a limited period of time. The spouses that continue to work at older ages and with sponsors in higher ranks earn

Table 5.2. 2011 Sample Proportions by Key Spouse, Service Member, and Household Characteristics Before and After Merge with SSA Earning Records

		Original Sample %	Matched Sample %
	Sample Size	289,528	247,802
MyCAA Usage (Spouse)	Nonuser	89	88
	User	7	8
	Known Plan Completer	4	4
Gender (Spouse)	Women	92	91
	Men	8	9
Number of Children	0	50	50
	1	33	33
	2	14	14
	3+	2	2
Home Address Rural or Urban	Metropolitan	73	74
	Micropolitan	12	12
	Small Town	2	3
	Rural	1	1
	Not Classified	12	11
Service	Army	47	46
	Air Force	20	21
	Marine Corps	14	14
	Navy	19	19
Age Group (Spouse)	Age 18–20	8	7
	Age 21–23	24	24
	Age 24–26	25	26
	Age 27–29	18	18
	Age 30+	25	25
Pay Grade	E-1	2	1
	E-2	3	3
	E-3	16	16
	E-4	33	33
	E-5	35	35
	E-6	6	6
	W-1 or W-2	2	2
	O-1	2	2
	O-2	3	3

NOTES: Table compares the demographic characteristics of the military household sample RAND sent to SSA relative to the demographic characteristics of the sample with successful SSA earnings record matches. The sample chosen for this comparison was that of all MyCAA-eligible military spouses described in Chapter Three, but further restricted to military spouses that are married to active service members in December 2011.

Table 5.3. Percentage of MyCAA-Eligible Military Spouses Working, and Earnings of Working Spouses in 2011 by Key Characteristics

		Percent of Spouses Working	Average Earnings of Working Spouses	Median Earnings of Working Spouses
Service Member Pay Grade	E-1	73	$13,525	$8,808
	E-2	73	$10,819	$7,142
	E-3	69	$11,379	$7,389
	E-4	62	$13,418	$9,021
	E-5	58	$18,589	$13,351
	E-6	53	$21,271	$16,047
Age Group (Spouse)	18–20	71	$5,804	$4,341
	21–23	65	$9,459	$7,090
	24–26	62	$15,048	$11,168
	27–29	58	$19,372	$14,528
	30+	56	$24,817	$18,764
Number of Children	0	75	$16,743	$11,392
	1	53	$14,522	$8,934
	2	38	$13,360	$7,082
	3+	30	$11,430	$5,506
Gender (Spouse)	Women	60	$14,992	$9,728
	Men	75	$22,150	$15,852

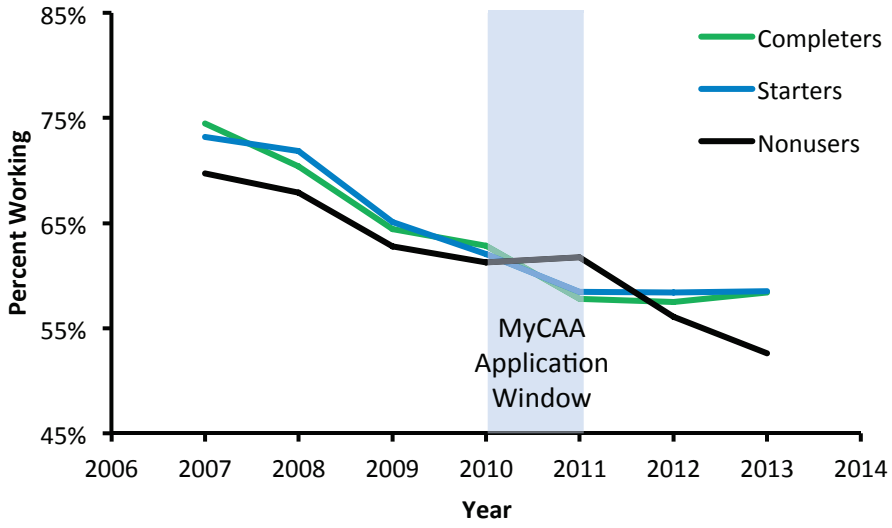
SAMPLE SIZE: 247,802.
NOTES: Table reports the measures of interest by demographic characteristics. The measures of interest include the percentage of spouses working (i.e., with Medicare reportable earnings greater than zero), and the average and median Medicare reportable earnings of spouses by calendar year. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members in December 2011 and with a successful SSA earnings record match.

more money, suggesting a positive selection on age into working as well as returns from experience. Additionally, spouses without children and spouses who are men worked at greater rates and earned more on average in 2011 than spouses with children and spouses who are women.

Employment among the pool of military spouses eligible for the MyCAA Scholarship who did not use the scholarship declined from 70 percent in 2007 to 53 percent in 2013. For the spouses who were awarded and used the MyCAA Scholarship, employment declined from

73–74 percent in 2007 to 58 percent in 2013. Figure 5.1 graphs the percentage of military spouses working between 2007 and 2013 by MyCAA nonusers, MyCAA users who at least started their MyCAA plan, and MyCAA users whose records indicate they completed their plan. The most notable feature of Figure 5.1 is the decline in the percentage of military spouses working. Part of the decline in working among eligible spouses may be the Great Recession starting in late 2007. Since most of our service members are young, the further we look back in time, the less likely the couple is to be married and included in our sample, and hence the percentage of military spouses working is calculated on a more selected population (e.g., individuals who marry early, or who were older as of 2011). To examine a wider and more diverse range of spouses, we will focus the discussion on the percentage of military spouses working for years 2009 (rather than 2007) to 2013. We observe that MyCAA plan starters and known completers are more likely to be working in 2009 than MyCAA nonusers, but are less likely to be working in 2011. As MyCAA starters and known completers enroll in school, it is logical for the percentage of military spouses working to decline relative to the nonuser sample; it is noteworthy, however, that this percentage falls only a small amount (from 62–63 percent to 57–58 percent). Following 2011, the percentage of MyCAA plan starters and known completers who are working returns to being greater than that of nonusers.

Figure 5.1. Percent of MyCAA-Eligible Military Spouses Working Each Year 2007–2013 by MyCAA User Group



SAMPLE SIZE: 247,802.
NOTES: Figure presents the percentage of spouses working (i.e., with Medicare reportable earnings greater than zero) by calendar year. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members in December 2011 and with a successful SSA earnings record match.

Figure 5.1 does not control for demographic or military service differences between MyCAA groups, such as differences in age and service member pay grade. In the next section, our model will control for person invariant characteristics, and we will conduct robustness checks by restricting to specific subgroups. If the differences over time and between user groups shown in Figure 5.1 remain, that would suggest that two years after the window in which MyCAA users applied to MyCAA, the users are more likely to be working than nonusers. The higher fraction of military spouses working could be due in part to use of a MyCAA Scholarship, but it could also be due in part to MyCAA users being more likely to want to work. Either way, the descriptive results in Figure 5.1 suggest that users of the MyCAA Scholarship are substantially more likely to be working in 2013 than nonusers.

Table 5.4 presents the numerical differences in the percentage of MyCAA-eligible spouses working between 2013 and 2009–2011. Between 2011 and 2013, 9 percent fewer nonusers were working, while the percentage working of starters and known completers was constant on average. Recall from Table 5.3 that the percentage of military spouses working declines as enlisted service member rank increases, which generally reflects a greater number of years serving on active duty. Between 2009 and 2013, the percentage of both MyCAA nonusers and users declined, but the difference was larger for nonusers (–10 percent) than users (–6 to –7 percent).

Table 5.4. Difference in Percent of MyCAA-Eligible Military Spouses Working Between 2013 and 2009–2011, by MyCAA User Group

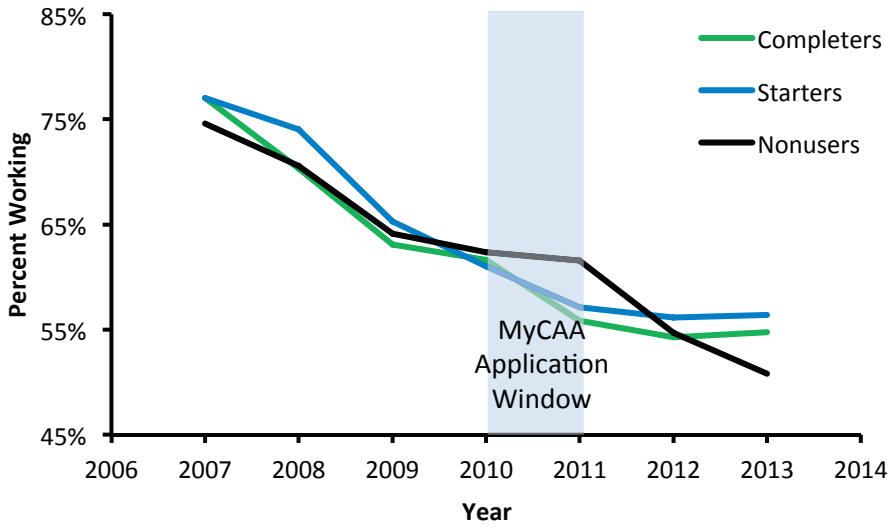
Difference in Percent Working Between:	MyCAA Nonusers	MyCAA Plan Starters	MyCAA Known Plan Completers
2013 and 2009	–10%	–7%	–6%
2013 and 2010	–9%	–4%	–4%
2013 and 2011	–9%	0%	1%

SAMPLE SIZE: 247,802.

NOTES: Table reports the difference in the percentage of spouses working (i.e., with Medicare reportable earnings greater than zero) by calendar year relative to the percentage working in 2009. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members in December 2011 and with a successful SSA earnings record match.

Up to this point, however, our models did not control for user and nonuser population differences due to gender, age, and location overseas, which could be associated with differences in employment trajectories. Thus, as a refinement, Figure 5.2 is restricted to women spouses who were ages 24–26 in 2011 and whose service members' home address was in the United States. This sample restriction also controls for differences in marital rates (and hence observation) by age group. The additional restriction to households with only a U.S. home address is done to control for equality of job opportunity. Households that are stationed overseas experience different work opportunities than those located in the United States. The importance of this restriction is highlighted when comparing Figures 5.1 and 5.2.

Figure 5.2. Percent of MyCAA-Eligible Military Spouses Working Each Year 2007–2013 by Spouses Who Are Women Ages 24 to 26 in 2011, by MyCAA User Group

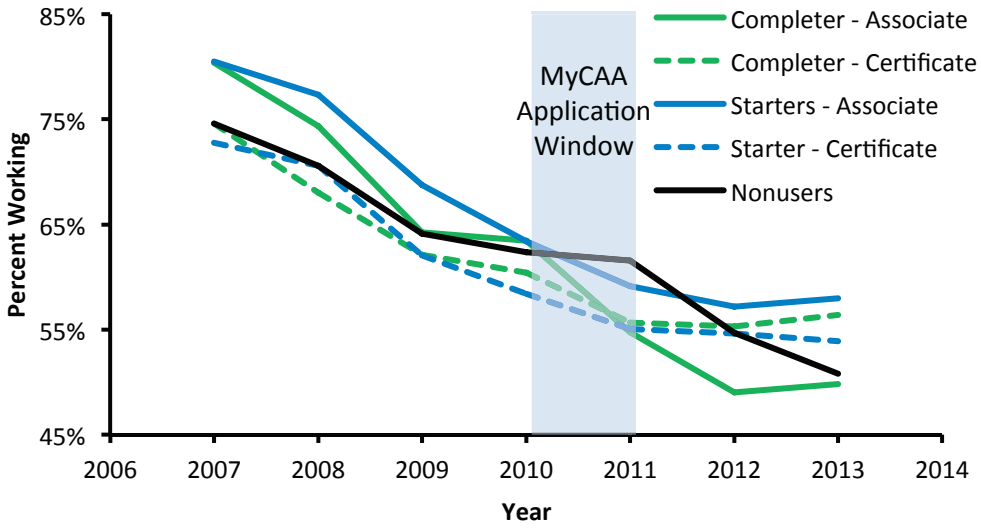


SAMPLE SIZE: 59,192.
NOTES: Figure presents the percentage of spouses working (i.e., with Medicare reportable earnings greater than zero) by calendar year. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to women military spouses between the ages of 24 and 26 that are married to active service members in December 2011, for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas), and with a successful SSA earnings record match.

Using the same sample restrictions, Figure 5.3 considers how the percentage of military spouses working differs by whether MyCAA users' plans were to obtain an associate's degree or an occupational certificate.[8] The results reveal that in 2010, approximately the same percentage of users seeking an associate's degree were employed (63 percent) as were nonusers (62 percent). However, the employment patterns look markedly different in later years. Nonusers were likely to continue working in 2011; however, the percentage dropped to 51 percent by 2013. Among users seeking associate's degrees who did not appear to complete their plans by December 2014, 58 percent were working in 2013. Users who *did* complete their associate's degrees by December 2014 were much less likely to be working in 2012 (49 percent) and 2013 (50 percent), which could be due to their attending school. In contrast, certificate seekers exhibit remarkably similar patterns regardless of whether they appear to have completed their course of study: Relative to nonusers, they are less likely to be working during the MyCAA application window of 2010 and 2011, but are more likely to be working by 2013 (54–56 percent).

[8] Recall from our findings in Chapter Four from the dataset prior to the SSA data merge that military spouses using their scholarships for occupational licenses were only 3 percent of MyCAA plan starters and 5 percent of known plan completers. Thus, this subsample was too small to include in this chapter's analyses of MyCAA plan types, and we focus on spouses pursuing associate's degrees and occupational certificates.

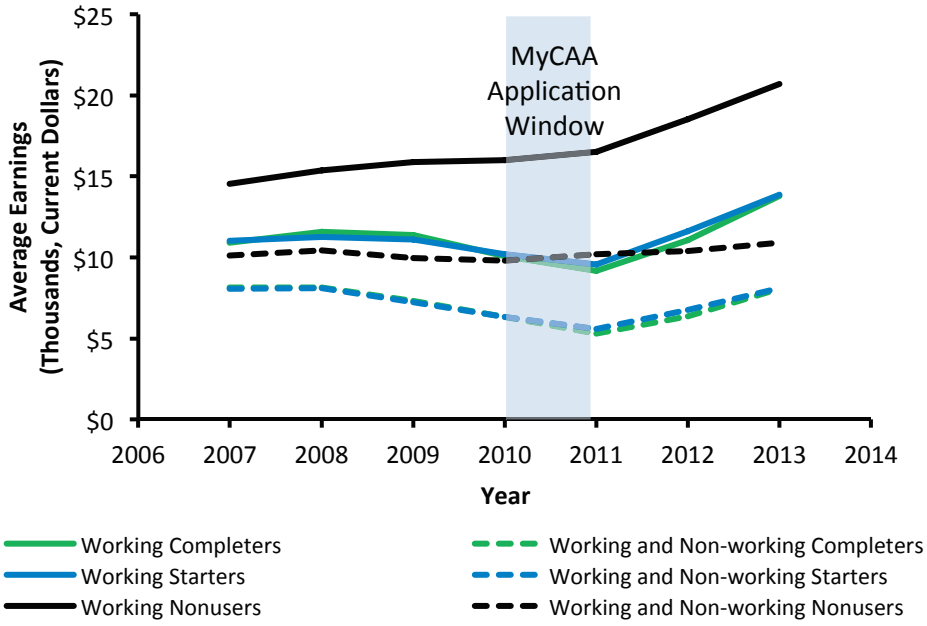
Figure 5.3. Percent of MyCAA-Eligible Military Spouses Working, by Spouses Who Are Women Ages 24 to 26 in 2011, by MyCAA Group and Plan Type



SAMPLE SIZE: 59,192.
NOTES: Figure presents the percentage of spouses working (i.e., with Medicare reportable earnings greater than zero) by calendar year. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to women military spouses between the ages of 24 and 26 that are married to active service members in December 2011, for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas), and with a successful SSA earnings record match.

Figure 5.4 presents differences in average annual earnings between MyCAA groups for the years 2007 through 2013. The dashed lines in Figure 5.4 demonstrate earnings of all MyCAA-eligible spouses, whether or not they were working in a given year. Thus, the averages include "0" earnings for nonworking spouses. We observe that the average annual earnings of these MyCAA plan starters and known completers are lower than the average annual earnings of MyCAA-eligible nonusers. Earnings are flat for these nonusers, while for starters and known completers earnings decline after 2008 and reach a low in 2011 before increasing to the 2008 levels by 2013. As seen in Figure 5.1, an explanation for no observable earnings growth is that many eligible spouses are leaving the labor force over this time period. Average earnings for working spouses only, represented by the solid lines in Figure 5.4, do grow over this time period for all MyCAA user and nonuser groups, although the lower average annual earnings persist for MyCAA plan starters and known completers who are working relative to the average annual earnings of MyCAA-eligible nonusers who are working. For example, in 2009 working MyCAA nonusers earned $15,870 on average, whereas working spouses who would later become MyCAA users were earning $11,105 (plan starters) to $11,363 (known plan completers) on average that year. The difference between working MyCAA users and nonusers is statistically significant. As MyCAA starters and known completers chose to return to school, the percentage working declined relative to the nonuser sample (recall Figure 5.1). We observe an Ashenfelter dip, or average decline in earnings prior to enrollment in an adult education or training program,

Figure 5.4. Average Earnings by Year for MyCAA-Eligible Spouses



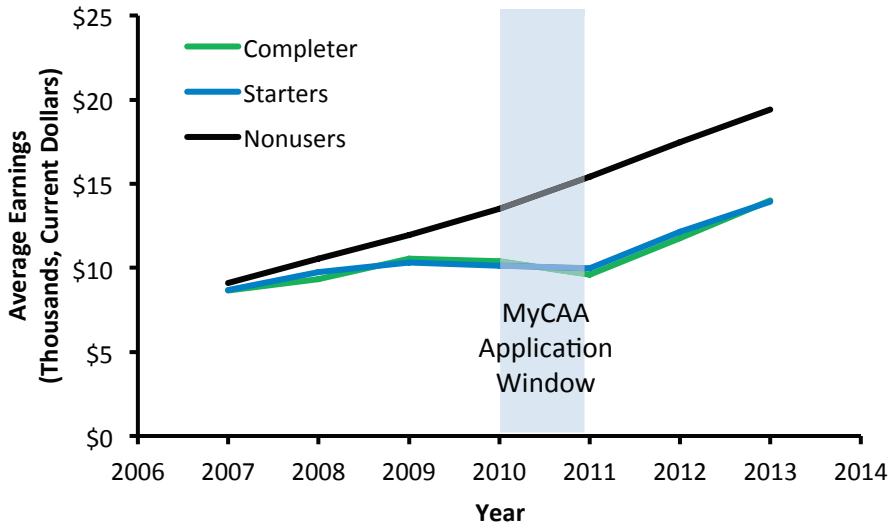
SAMPLE SIZE: 247,802.
NOTES: Figure presents the average Medicare-reportable earnings by calendar year. Average earning for only working spouses are computed based on military spouses working in that year. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members in December 2011 and with a successful SSA earnings record match.

through the decline of MyCAA users' average earnings from 2009 to 2011. Individuals experiencing this dip in earnings may have experienced job loss or work reductions associated with the Great Recession. We also observe what may be a transitional effect for known MyCAA completers who are working relative to starters who are working: Known completers have lower earnings in 2012, but the difference in earnings is indistinguishable in 2013.

Bear in mind that Figure 5.4 compares very different groups; nonusers are older and thus likely have more experience. For example, 12 percent of women spouses of any age in our cohort are MyCAA Scholarship users, while 14 percent of women spouses under the age of 27 in 2011 are users. Thus, in Figure 5.5 we focus the comparison on spouses who were ages 24 to 26 in December 2011 and whose service members' home address then was in the United States. Gone is the kink at 2011 for nonusers, which appears to have been due to the difference in age composition. Although slight and visually difficult to detect in this figure, earnings grew more rapidly for both MyCAA starters and known MyCAA plan completers after 2011 relative to earnings for nonusers.

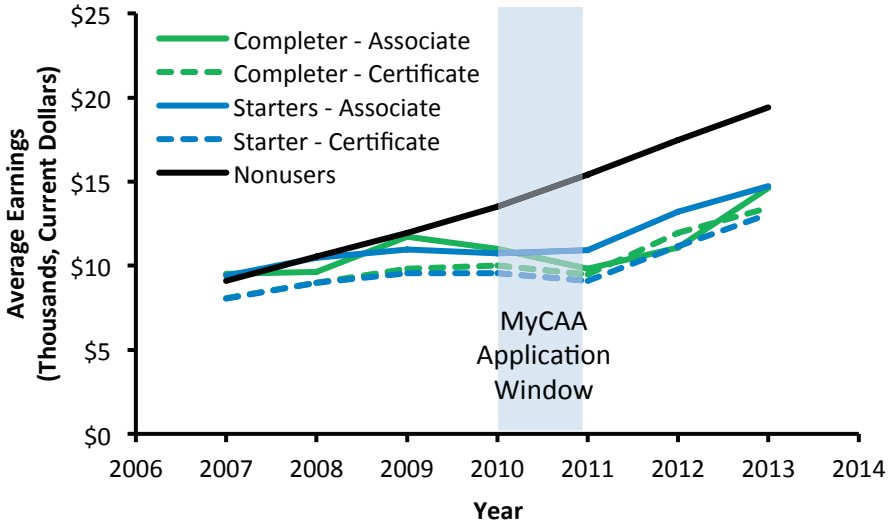
In Figure 5.6, we further separate starters and completers by whether they are seeking certificates or associate's degrees. Certificate seekers using MyCAA generally earned less on average than MyCAA associate's degree seekers and less than MyCAA-eligible nonusers. In 2010, nonusers' average earnings continued to rise while users' earnings stagnated or declined.

Figure 5.5. Annual Earnings of Spouses Who Used a MyCAA Scholarship Stagnated Before the Selected MyCAA Application Window and Grew After the Application Window



SAMPLE SIZE: 59,192.
NOTES: Figure presents the average Medicare-reportable earnings by calendar year, conditional on working that year, for military spouses. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to women military spouses between the ages of 24 and 26 that are married to active service members in December 2011, for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas), and with a successful SSA earnings record match.

Figure 5.6. Average Earnings by Year for Working Spouses Who Are Women Ages 24 to 26 in 2011 by MyCAA Group and Degree Type



SAMPLE SIZE: 59,192.
NOTES: Figure presents the average Medicare-reportable earnings by calendar year, conditional on working that year, for military spouses. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to women military spouses between the ages of 24 and 26 that are married to active service members in December 2011, for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas), and with a successful SSA earnings record match.

Model

To assess medium- and long-term MyCAA performance and measures of interest, we compare (1) MyCAA users to MyCAA nonusers and (2) MyCAA users before and after scholarship use begins.[9] In psychology, this design would be called the untreated control group design with pretest and posttest (those who did not use the scholarship with those who did use it, before and after); in economics, it is identified with the "difference-in-differences" statistical technique. This approach is strengthened by the ability to control for characteristics that may provide alternative explanations for differences in measures of interest, such as education or geographic relocation in the case of military spouses' employment and earnings. This research design, even when not conclusive, can narrow down the range of plausible alternative explanations (Meyer, 1995).

While getting additional education with the MyCAA Scholarship could be an important contributor to a spouse's decision to continue working or to her level of earnings, we expect that individual characteristics are likely to explain some of this variation. Therefore, we use panel data (data that follows individuals over time) and a difference-in-differences approach to control for differences between individuals that are permanent and that can be observed in our dataset (e.g., birth year) or that are unobserved (e.g., native language). This method uses covariation between the desired outcome and the potentially explanatory factor over time to identify, holding all other factors equal, the relationship between the explanatory factor and the desired outcome.[10] Accounting for the permanent differences between individuals allows us to capture the differences in pretreatment levels of work and earnings between MyCAA users and MyCAA nonusers that are likely correlated with latter work or earnings (e.g., if users are of higher ability than nonusers). What remains outside of the permanent fixed effect are factors that vary with time, such as age, service member's pay grade, and MyCAA use. One limitation is that the model cannot capture differences due to variables that are generally invariant, such as gender, but we can manage that limitation by running separate models for men and women. "MyCAA use" captures the relationship between the spouse's earnings and whether a spouse uses a

[9] We considered using interested nonusers as a control group instead of the broader nonuser group. The interested nonuser group is relatively small (3,827 out of a sample of 388,220) and represents a peculiar group. In order to be an interested nonuser, an individual had to establish a profile but not have an approved plan. There could be many reasons that someone would establish a plan but not follow through. Some examples include that he or she is no longer qualified for MyCAA, finds employment, or discovers that the MyCAA Scholarship does not cover his or her interests. The large size of the overall sample allows for overlap across the many observed characteristics.

[10] We choose to use a "within" estimator for our fixed effect analysis.

MyCAA Scholarship to attend courses or test for an occupational license under a MyCAA-approved plan at a MyCAA-approved institution. The model is:

$$
\begin{aligned}
outcome_{it} \quad = \quad & \gamma_1 \cdot spouse_{it} + \gamma_2 \cdot service\ member_{it} + \gamma_3 \cdot household_{it} \\
& + \sum \psi_k \cdot User_{it}^{k} + \sum_{\substack{k=[2007,2013] \\ k \neq 2011}} \xi_k\ Completer_{it}^{k} \\
& + \sum_{\substack{k=[2007,2013] \\ k \neq 2011}} \omega_k \cdot year_t^{k} + \alpha_i + u_{it},
\end{aligned}
\tag{5.1}
$$

where the dependent variable, $outcome_{it}$, is spouse i's intended outcome of interest in year t (i.e., work, earnings for all eligible spouses, earnings for employed spouses, natural logarithm of earnings).[11] Additionally, if the individual is in our cohort as a MyCAA user, $User_{it}^{k}$ takes a value of one in year k, and similarly for known MyCAA completers, $Completer_{it}^{k}$, and for individual year effects, $year_t^{k}$. Lastly, α_i, represents spouse i's time-invariant characteristics.

In a difference-in-differences specification, independent variables can only include time-varying household characteristics. For example, for each year of data, our models considered whether the service member was promoted, whether he or she experienced a PCS move or deployment, and whether there was a change in the number of children in the household. The independent variables are defined in Table 5.5.

Interpretation

The Ashenfelter dip, the lock-in effect, and the transitional effect are the primary reasons why we pursue a more flexible specification for the model presented in Equation 5.1 by allowing the pre- and post-MyCAA indicators to vary by year instead of a simple before/after response. With a simple before/after effect, the existence of an Ashenfelter dip would lower the before-treatment averages, thereby increasing or biasing upward the observed association between the dependent variable (e.g., work, earnings) and the MyCAA Scholarship. Additionally, due to the lock-in and transitional effects, a simple before/after effect would decrease the observed

[11] We also considered several other dependent variables, including (1) earnings not conditional on spouses being employed and (2) employment defined as earnings greater than $1,000, rather than greater than $0. These models did not yield substantively different results from what is described in this chapter.

Table 5.5. Time-Varying Explanatory Variables Used in the Economic Models

Level	Explanatory Variable
Service Member	Pay grade (categorical: E-1 to E-5, E-6+, O-1, O-2, O-3+, W-1 and W-2; reference group: pay grade E-5)
	Indicator for "Any PCS moves in current year"
	Indicator for "Any deployments in current year"
	Months deployed in current year
	SSA earnings
Spouse	SSA earnings
Household	State unemployment rate of home address[a]
	Number of dependent children under the age of 6 (categorical: 0, 1, 2, 3+; reference group: 0)
	Number of dependent children under the age of 18 (categorical: 0, 1, 2, 3+; reference group: 0)

NOTES: The table reports the explanatory variables used to control for characteristics outside of MyCAA use that could explain military spouse work and earnings.
[a] State unemployment is only used in robustness checks for military spouses, ages 24–26 in 2011, with a home address in the United States. Due to computational limitations, we could not include additional explanatory variables without also reducing the sample size. The robustness check conducted later in this chapter tests whether the exclusion of local economic conditions, as measured by the state unemployment rate, biases our MyCAA usage difference-in-differences estimates.

association of MyCAA, potentially masking the true magnitude of the relationship. This is particularly relevant in our case, because we have so few years after the MyCAA initiative was implemented to measure the association between the scholarship and work and earnings, implying that most of the post-MyCAA observations are likely to be contaminated by the lock-in or transitional effects.

In a standard difference-in-differences framework, a discrete "treatment" occurs at a single point in time. However, MyCAA use can occur over many years: An individual must sign up for MyCAA, have his or her plan approved, start a course of study, and then, ideally, complete their plan. Not everyone completes their plan, and not all plans have the same length. Since the current version of the MyCAA Scholarship was launched in October 2010 and we limit our sample to those establishing an account by December 2011, we refer to years 2010 and 2011 as the "MyCAA application window." As of December 2011, some users may not have taken their first class, while other users may have completed their plan. As a result, we will focus on describing the difference-in-differences estimates by comparing the main parameters of interest after the MyCAA application window to the main parameters of interest during and before the

window.[12] We use 2009 as the base year when representing the model's results, as it represents the last full year before the MyCAA application window. We recognize that this analysis is unlikely to reveal the long-term association of the MyCAA Scholarship and spouse work and earnings because some recipients in 2013, the last year of observed earnings, are likely in the process of beginning jobs in new careers, while others may still be working to complete their education. Therefore, benefits could accrue in the future that are not yet indicated here. However, we present the most recent data available at the time of our analyses.

As an example of how the difference-in-differences estimates can be used to calculate associations with MyCAA, consider the difference in earnings between a MyCAA user relative to a nonuser where 2009 is the pretreatment and 2013 measures the earnings after scholarship use has begun. From the model in Equation 5.1, ω_k represents the estimated difference in the measure in year *k* relative to 2011 for the entire sample, and ψ_k represents the estimated difference in the measure in year *k* relative to 2011 for MyCAA users. The first difference—the difference between 2009 and 2013, before and after MyCAA—for users is computed:

$$\Delta_{Users} = \left(\omega_{k=2013} + \psi_{k=2013}\right) - \left(\omega_{k=2009} + \psi_{k=2009}\right)$$

and for nonusers, it is computed:

$$\Delta_{Nonusers} = \left(\omega_{k=2013}\right) - \left(\omega_{k=2009}\right).$$

The difference-in-differences estimator then becomes:

$$\Delta_{Users} - \Delta_{Nonusers} = \left(\psi_{k=2013}\right) - \left(\psi_{k=2009}\right).$$

If, for example, the measure of interest was earnings, and $\Delta_{Users} - \Delta_{Nonusers} = 400$, this could be interpreted as: users who applied to MyCAA between October 2010 and December 2011 would have expected to earn $400 more in 2013 than observationally equivalent nonusers would have been expected to earn during that time frame.

In the program-evaluation literature, the ideal would be the ability of research to report that event X *caused* outcome Y. For the difference-in-differences estimates to be causal estimates, it would need to be true that, in the absence of the MyCAA Scholarship, the change in the measures of the MyCAA users would have been similar to the change in the measures of the comparison group (i.e., nonusers). This assumption, known as parallel trends, does not require that the groups are precisely comparable at baseline, just that their trajectories would have been

[12] We call the year coefficients (ω_k), the user-by-year coefficients (ψ_k), and the completer-by-year coefficients (ξ_k) the "main parameters of interest." The coefficient $\omega_{k=2007}$ represents the difference for the average MyCAA nonuser between their earnings in 2007 relative to their earnings in 2011, conditional on the controlled factors. The same difference for a MyCAA user is represented by $\omega_{k=2007} + \psi_{k=2007}$; and similarly, for a known MyCAA completer, the difference is represented by $\omega_{k=2007} + \psi_{k=2007} + \xi_{k=2007}$.

similar. We ultimately find that the parallel-trends assumption is likely violated for this population. This assumption may be violated because the subsample participating in MyCAA have an initial predisposition toward working that was not captured. Since the parallel-trends assumption is violated, we cannot say that MyCAA use or plan completion caused earnings to be higher, or that MyCAA users were more likely to work. Moreover, since many of the spouses were still using their scholarship in 2013, work and earnings in 2013 are not a "posttreatment outcome." However, we use these estimates to understand the association of MyCAA use with intended eventual outcomes, and specifically how the MyCAA users represent a unique and selected population.

Model Estimates

In this section, we report the results of the model outlined earlier in this chapter in Equation 5.1, which allows us to control for some characteristics that may provide alternative explanations for differences in work or earnings between MyCAA users and nonusers (such as differences in PCS moves or deployment experiences or change in the number of children). We consider three key measures: (1) probability that a MyCAA-eligible military spouse works, (2) earnings trajectories for MyCAA-eligible spouses, and (3) the trajectories of the logarithm of earnings for working.[13] Our sample used in estimating the model will include any spouse that was eligible for a MyCAA Scholarship between October 2010 and December 2011. It will also include annual-level observations only for married households where the service member is in the active component in December of the respective year. We do not include the observations before and after marriage or service member's time in service in order to exclude from the model the potential impact of marriage, divorce, death, and joining or leaving military service on employment and earnings. Again, to the degree possible the models attempt to eliminate explanations outside of MyCAA for differences between the employment and earnings patterns of spouses. When we highlight differences in spouses working or their earnings trajectories from a change in one factor (see Table 5.5, e.g., sponsor pay grade), recall that we are doing so holding all of the other observable factors constant.

As highlighted in Chapter Three, MyCAA applicants are generally younger, more likely to be women, and more likely to be married to a service member in the enlisted ranks.

[13] The logarithm of earnings is a measure of interest because the response to use represents the percentage change in earnings associated with use of a MyCAA Scholarship. This model is especially useful when comparing changes in wages across those with different levels of earnings. Other potential measures exist; for example, earnings not conditional on working. However, estimating the earnings as above allows us, to some extent, to examine how MyCAA use is correlated with changes on the extensive margin (probability of working) and on the intensive margin (intensity of work). We note that we do not measure the intensive margin precisely; doing so would require understanding the hours worked. But any understanding of how MyCAA influences the decision to work versus earnings may yield important insights in terms of future policies to pursue to improve outcomes for military spouses.

Consequently, the MyCAA user population may be substantively different from the eligible population of nonusers along some of these dimensions. We will consider subsamples along these dimensions to examine the robustness of the model's results to sample selection. Finally, we will consider possible differences according to MyCAA plan type (associate's degree versus certificate) and institution (private for-profit versus public nonprofit), in order to examine the sensitivity of the results to each. Finally, we will conclude with a discussion of the findings, and by reflecting upon appropriate interpretation of the results.

Percentage of Military Spouses Working

Table 5.6 presents the results of the main specification where the measure is work or no work. The parameter estimates in this table reflect spouse subgroup differences with spouses who fall in the reference categories: married to an E-5, with no PCS moves or deployment during 2011, with no children, and relative to 2011.[14] The results in Table 5.6 reflect patterns that are similar to what we observed descriptively (e.g., in Table 5.3 and Figures 5.1 and 5.2). As pay grade increases, the fraction of military spouses working declines. For example, the fraction of O-1 spouses working is 6 percentage points lower than the fraction of E-5 spouses working, and the fraction of O-2 spouses working is 9 percentage points lower than the fraction of E-5 spouses working, revealing that service members' spouses work at lower rates as the service members' careers progress. Any PCS moves within the past calendar year are associated with a greater fraction of military spouses working in that same year, which could reflect employment during the year but prior to the service member's change of station (with lower likelihood of working the subsequent year). Deployment has a negative relationship with spouse employment, and the magnitude of that association increases with longer deployments. The number of children in the household has a significant and negative relationship with work. The magnitude of this association increases with the number of children, and with the number of children under age six.[15] Finally, we observe that the fraction of nonusers working in 2010, 2012, or 2013 is not meaningfully greater or lower relative to 2011 after controlling for observable characteristics. While the differences in 2010 and 2012 are statistically significant, both are less than one percentage point different. This result suggests that the decline in the fraction of MyCAA-eligible military spouses working over time can be explained by factors associated with the

[14] Notice that there are no typically fixed characteristics here, such as gender or race. This is because the parameter estimates in Table 5.6 are being identified based on the average difference within a household over time. Since gender, race, and the service member's service generally do not change, there is no variation within an individual's history in order to identify the parameter. We do observe variation over time in the number of children within a household as well as in pay grade (in order to capture when the service member is promoted).

[15] The coefficient of children under age six is added to the coefficient of children under age 18. For example, if a household had one child under age six, then the spouse would be, on average, 26 percentage points (i.e., 0.09 + 0.17 = 0.26) less likely to work.

Table 5.6. Linear Probability Model of MyCAA-Eligible Military Spouse Employment, Including Household Fixed Effects

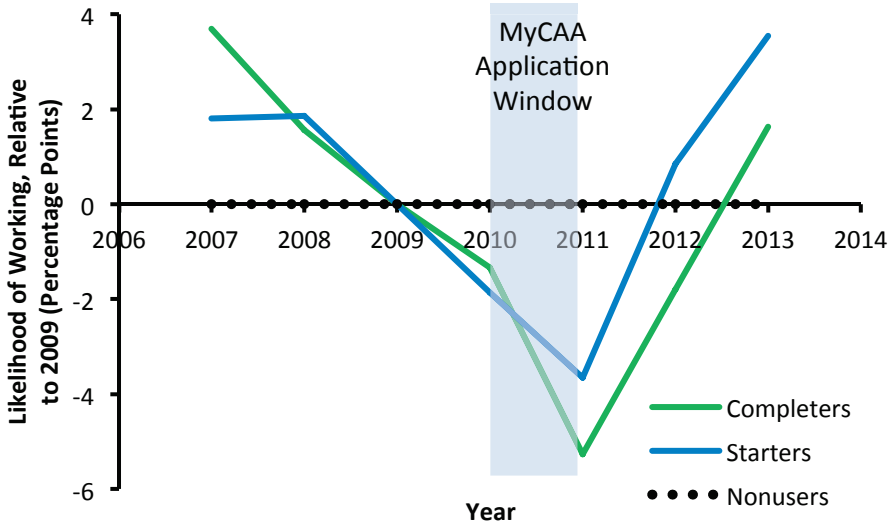
		Parameter Estimate	Standard Error
Service member pay grade (reference: E-5)	E-1	0.14	0.005
	E-2	0.11	0.003
	E-3	0.03	0.002
	E-4	0.02	0.002
	E-6	–0.02	0.002
	E-7	–0.05	0.010
	E-8	–0.07	0.026
	O-1	–0.06	0.006
	O-2	–0.09	0.007
	O-3+	–0.10	0.009
	W-1 and W-2	–0.07	0.009
	Any PCS moves in current year	0.01	0.001
	Any deployments in current year	–0.01	0.001
	Months deployed	–0.0001	0.000
	Service member earnings (per $10,000)	–0.02	0.000
Number of children under 6 (reference: 0)	One child	–0.09	0.002
	Two children	–0.14	0.003
	Three or more children	–0.17	0.005
Number of children under 18 (reference: 0)	One child	–0.17	0.003
	Two children	–0.25	0.004
	Three or more children	–0.30	0.005
Users (reference: year 2011)	2007	0.05	0.007
	2008	0.06	0.006
	2009	0.04	0.005
	2010	0.02	0.004
	2012	0.05	0.004
	2013	0.07	0.005
Known completers (reference: year 2011)	2007	0.04	0.012
	2008	0.01 (◊)	0.010
	2009	0.02 (◊)	0.009
	2010	0.02	0.007
	2012	–0.01 (◊)	0.007
	2013	0.00 (◊)	0.008
Year indicators (reference: year 2011)	2007	0.07	0.002
	2008	0.06	0.002
	2009	0.02	0.002
	2010	0.00	0.001
	2012	–0.01	0.001
	2013	0.00 (◊)	0.002
	Sample Size		296,283

NOTES: Table reports the results of a linear probability model (i.e., regression with a binary measure) of whether or not the spouse works (i.e., has earnings greater than zero) on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. All differences are statistically different from a zero effect at the 5% level unless indicated by a diamond next to the parameter estimate (◊). The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members and have a successful SSA earnings record match for both the spouse and service member.

presence of children in the household, the service member's increasing pay grade, and deployment in any given year.

Figure 5.7 presents the difference-in-differences estimates for MyCAA plan starters and known plan completers relative to 2009. Recall that the difference-in-differences estimates net out the association between the control group and the fraction of spouses working, in this case nonusers. A positive value for starters/known completers would suggest that the fraction of starters/known completers working exceeds nonusers after controlling for observable time-varying factors and permanent individual characteristics. We observe that prior to the MyCAA application window, just as we observed in the descriptive data, MyCAA starters and known completers were working at greater rates than during the window in which they would have applied to MyCAA and been approved for a scholarship. Likewise, MyCAA starters and known completers are working at greater rates in 2013 relative to 2009, all else equal. Recall from our discussion above that, in order for MyCAA use to be considered to have a causal impact using a difference-in-differences methodology, it must be the case that users and nonusers have "parallel trends." In this case, we can clearly observe that parallel trends do not exist before the treatment: The probability of MyCAA starters and known completers working declines relative to nonusers before the MyCAA application window.

Figure 5.7. Percent of MyCAA-Eligible Military Spouses Working over Time, Difference-in-Differences Estimates Relative to 2009 and Nonusers



SAMPLE SIZE: 296,283 for the full sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of how the probability of a military spouse working is associated with known MyCAA plan completion or plan initiation relative to 2009. See Table 5.6 and text for point estimates, sample restrictions, and further explanation.

The difference-in-differences estimates suggest that the percentage of MyCAA starters working in 2013 is 3.5 percentage points greater than the percentage working in 2009. Similarly, the percentage of known MyCAA completers working in 2013 is 1.6 percentage points greater than the percentage working in 2009. The estimates for both starters and known completers would be larger if compared to 2010 or 2011. We do not know what necessitated the decline in the proportion of military spouses working among MyCAA users, but regardless of using 2009, 2010, or 2011 as a baseline, a greater proportion of MyCAA users is working in 2013. However, a greater fraction of MyCAA users working does not guarantee greater earnings. It could be that the marginal worker actually worked full-time before 2011 and part-time after 2011. Next, we consider how earnings differ for spouses.

Earnings Trajectories

Table 5.7 presents the results of the main specification for two measures: earnings for all MyCAA-eligible spouses, regardless of whether or not they work, and earnings for only spouses that work. We present both results because each tells different parts of these spouses' experience. Overall earnings capture the same individuals over time, preventing differential selection into the workforce based on those who choose to work. This method combines the spouse's work decision with his or her earnings. It tells us about the relationship between MyCAA use and combined work and earnings. The second measure, earnings conditional on work, tells us about the earnings trajectories of spouses who choose to work. Given the sharp decline in labor force participation, policymakers may want to understand if the earnings while working have also improved. In this approach, the data in each year reflect the earnings of only working spouses ("0" was not included for spouses who were not working). Focusing on earnings conditional on working spouses abstracts away from the decision to not work or the inability to find work for an entire year. Since we only observe earnings for individuals that work, we do not know what a nonworker's "potential wage" would be if he or she had worked. Conditioning on earnings will allow us to observe if the average MyCAA user who works in 2012 or 2013 has earnings that are greater than what he or she earned before MyCAA.

Table 5.7. Regression Model of Earnings Conditional on Working, Including Household Fixed Effects

		Sample: Working and Nonworking Spouses		Sample: Working Spouses	
		Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Service member pay grade (reference: E-5)	E-1	1,845	103	2,660	144
	E-2	1,060	80	1,820	116
	E-3	–400	57	-326	83
	E-4	–89	40	-230	59
	E-6	1,834	66	-628	104
	E-7	–1,254	369	-944 (◊)	537

	E-8	–2,088	885	–1,726 (◊)	1,336
	O-1	–3,777	224	–3,768	346
	O-2	–3,392	256	–1,964	403
	O-3+	–4,481	302	–2,634	483
	W-1 and W-2	–2,973	283	–2,373	490
	Any PCS moves in current year	–907	19	–1,801	30
	Any deployments in current year	–481	31	–647	49
	Months deployed	–0.61	0	0.34 (◊)	0
	Service member earnings (per $10,000)	–206	0	–43 (◊)	0
Number of children under 6 (reference: zero)	One child	–1,224	65	–934	94
	Two children	–1,545	85	–1,406	133
	Three or more children	–1,353	112	–1,710	219
Number of children under 18 (reference: zero)	One child	–3,910	83	–3,881	117
	Two children	–6,246	115	–5,920	169
	Three or more children	–8,376	149	–8,066	233
Users (reference: year 2011)	2007	2,381	155	3,687	218
	2008	2,057	120	3,318	174
	2009	1,630	94	2,731	145
	2010	896	66	1,550	110
	2012	902	67	765	113
	2013	1,657	99	1,288	157
Known completers (reference: year 2011)	2007	695	240	856	345
	2008	599	198	954	291
	2009	579	157	839	243
	2010	445	106	529	177
	2012	-280	105	–299 (◊)	177
	2013	80 (◊)	156	202 (◊)	242
Year indicators (reference: year 2011)	2007	–2,272	69	–4,794	97
	2008	–1,282	55	–3,319	78
	2009	–1,009	41	–2,397	61
	2010	-652	27	–1,420	43
	2012	786	28	1,727	45
	2013	1,873	43	4,050	68

SAMPLE SIZE: 296,283 for working and nonworking spouses; 260,348 for working spouses.
NOTES: Table reports the results of a regression of the spouse's earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. All differences are statistically different from a zero effect at the 5% level unless indicated by a diamond next to the parameter estimate (◊). The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members and have a successful SSA earnings record match for both the spouse and service member. The last two columns further restrict the model to spouses with positive earnings. Standard errors are available from the authors.

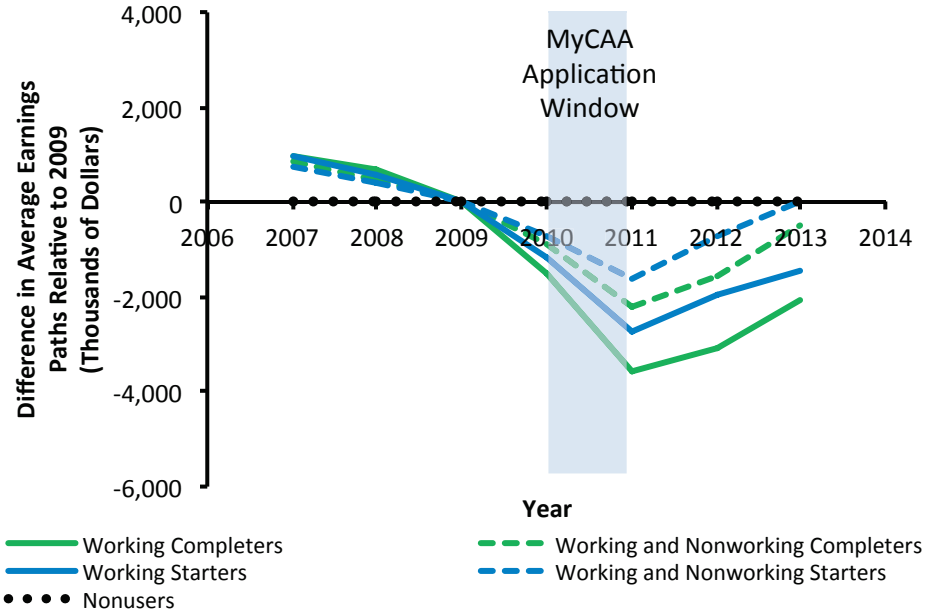
The results in Table 5.7 for military spouses of enlisted and officers follow a pattern similar to what we observed in the fraction of military spouses working model, with annual average spouse earnings generally declining with higher rank of the service member. However, it is notable that earnings for E-3 and E-4 are lower relative to E-5s, which would suggest that a lower probability of working is being offset by higher earnings for those spouses that do work.

Overall, the coefficients for the most common pay grades (E-3 to E-6) are relatively low, less than $700, suggesting that differences between the spouses of personnel in these pay grades and the spouses of E-5s are not substantively important. Other key covariates exhibit similar patterns to the fraction of military spouses working model, likely reflecting working less or intermittently rather than not working. The coefficient on PCS moves is a notable exception. In the fraction of military spouses working model we observed, PCS moves were associated with greater likelihood of work in that same year of the move. This relationship could be misleading: If spouses transition from work to nonwork as part of a PCS move, then in the PCS move year they are working but in the subsequent year they are not. Thus, these results should not be interpreted as PCS moves leading to higher employment. In Table 5.7, the measure of annual earnings captures the whole year of work activity, and we observe that it is strongly and significantly negative, providing support for our hypothesis that spouses are losing or giving up jobs in response to a PCS move. The year indicators suggest an upward growth trajectory of earnings as an individual ages.[16]

Figure 5.8 presents the graphical representation of the difference-in-differences estimates for MyCAA starters and known completers relative to 2009. Recall again that the difference-in-differences estimates net out the association between the control group (i.e., nonusers) and earnings trajectories (resulting in the nonusers being represented by the black line in Figure 5.8). In this case, a positive value for starters/known completers would suggest that the average salary of the starters/known completers exceeds that of nonusers after controlling for observable time-varying factors and permanent individual characteristics. First, we consider the model with the measure of interest as earnings for both working and nonworking MyCAA-eligible spouses. The results indicate that MyCAA users' earnings in 2012 and 2013 are greater relative to 2011, and for starters, their earnings have returned to the 2009 level accounting for nonuser earnings growth. However, known completers have not fully returned to their 2009 level accounting for nonuser earnings growth. Ashenfelter dip and lock-in effects clearly are apparent: Earnings decline prior to the MyCAA application window, and this decline continues until the end of the application window even after controlling for observed factors. The results are consistent with MyCAA use coinciding with a reversal in the direction of MyCAA users' earnings trajectories. The earnings for starters have returned to 2009 levels, and known completers are making annual improvements. An issue with this measure of interest is that we know that MyCAA users are more likely to be working in 2013 relative to 2009 compared to nonusers. If MyCAA users' average earnings for workers and nonworkers in 2013 are the same as in 2009 all else equal (as in the case of MyCAA starters in Figure 5.8), then their average annual earnings conditional on work are necessarily lower. This is shown in Figure 5.8. Our second measure of interest focuses

[16] In a specification like Equation 5.1, there is no difference between one additional year due to a "calendar year," and one additional year due to "age" because you are measuring the difference within a household. Therefore, the year indicators reflect the age trend in earnings conditional on work.

Figure 5.8. Earnings Difference-in-Differences Estimates Relative to 2009 and Nonusers



SAMPLE SIZE: 260,348 for the full sample.
NOTES: Figure presents difference-in-differences estimates (see Equation 5.1 and explanation) of the change in earnings associated with known MyCAA plan completion or plan initiation relative to 2009. See Table 5.7 and text for point estimates and further explanation.

on the earnings trajectories of those who work. As before, earnings increase after the MyCAA application window, but by 2013 earnings for those who work are, on average, below the level of their 2009 earnings (all else equal, including adjusting for the earnings growth experienced by nonusers). Although MyCAA users were more likely to return to working by 2013 (as seen in Figure 5.7), the findings in Figure 5.8 suggest that MyCAA users' earnings do not match the magnitude of earnings growth experienced by spouses who did not use a MyCAA Scholarship.

The lower earnings in 2013 relative to 2009 could be due to a number of factors. One potential factor is that whatever event that precipitated the decline in earnings before the MyCAA application window, for example, a job loss or move, could have a made it difficult to find an equivalent job. A second factor is that MyCAA plans, notably associate's degrees, could take two or more years to complete, suggesting that some individuals may not have completed their schooling by 2013 and may be working only part-time (and thus earning less in a given year), or may have finished school midyear and thus had earnings only for the latter part of the year. A third factor could be the nature of entering a new career: At the entry level, spouses may earn less per hour or be able to obtain only part-time work. Another factor might be a gap between completing school and being able to secure a job in the new career field. Additional years of earnings data, beyond the three-year scholarship window, would be valuable to explore. It could reveal changes in trajectories over time and relative to nonusers' trajectories. A comparison of earnings magnitudes may not be the most appropriate comparison, however, since

there is a large difference in earnings between the average MyCAA user and nonuser before the application window (see Figure 5.4). Thus, in the next section we will compare the annual percentage change in earnings.

Percentage Change in Earnings

The specification presented in the last subsection for working MyCAA-eligible spouses treated an additional $2,000 in earnings the same for an individual initially earning $10,000 as for an individual initially earning $40,000. However, for the first individual, this change represents a 20 percent growth in earnings, while the second experiences only a 5 percent growth in earnings. As seen in Figure 5.4, MyCAA users have lower average earnings relative to nonusers. In this case, a comparison on a level change in earnings may not accurately reflect the potential gains from MyCAA, and so we are also interested in what the percentage changes in earnings might be like for MyCAA users.

Table 5.8 presents the results of the main specification where the measure is the natural logarithm of earnings. The coefficient is interpreted as the percentage change in earnings relative to a change in the coefficient's unit. For example, the coefficient on E-4 suggests that the spouse of an E-4 service member earns 2 percent less relative to an E-5's spouse. Since the natural logarithm of zero is negative infinity, the model excludes individuals with no earnings.

Figure 5.9 presents the difference-in-differences estimates. In this case, the difference-in-differences estimates indicate that the percentage change in earnings were relatively similar in 2013 relative to 2009. Relative to Figure 5.8, where the estimates were based on earnings levels,

Table 5.8. Regression Model of the Natural Logarithm of Working Spouse Earnings, Including Household Fixed Effects

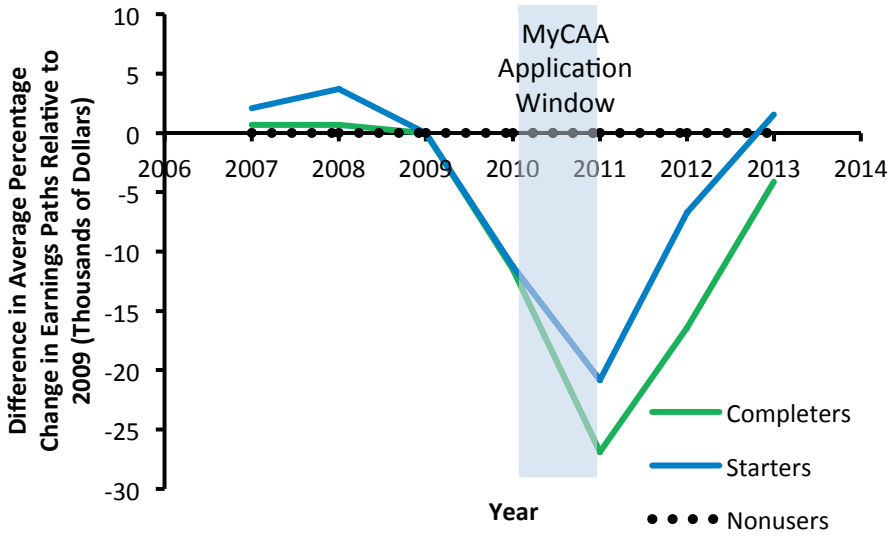
		Parameter Estimate	Standard Error
Service member pay grade (reference: E-5)	E-1	0.33	0.017
	E-2	0.16	0.013
	E-3	–0.08	0.009
	E-4	–0.02	0.006
	E-6	–0.08	0.009
	E-7	–0.07 (◊)	0.038
	E-8	–0.04 (◊)	0.097
	O-1	–0.32	0.026
	O-2	–0.25	0.030
	O-3+	–0.36	0.035
	W-1 and W-2	–0.24	0.038
	Any PCS moves in current year	–0.15	0.003
	Any deployments in current year	–0.08	0.005
	Months deployed	–0.0002	0.000
	Service member earnings (per $10,000)	–0.03	0.000

Number of children under 6 (reference: zero)	One child	–0.12	0.009
	Two children	–0.20	0.013
	Three or more children	–0.27	0.025
Number of children under 18 (reference: zero)	One child	–0.48	0.011
	Two children	–0.70	0.016
	Three or more children	–0.91	0.022
Users (reference: year 2011)	2007	0.29	0.028
	2008	0.31	0.024
	2009	0.26	0.020
	2010	0.12	0.017
	2012	0.18	0.017
	2013	0.28	0.020
Known completers (reference: year 2011)	2007	0.09 (◊)	0.049
	2008	0.07 (◊)	0.040
	2009	0.10	0.034
	2010	0.09	0.028
	2012	–0.04 (◊)	0.028
	2013	0.03 (◊)	0.032
Nonusers (reference: year 2011)	2007	–0.23	0.009
	2008	–0.18	0.007
	2009	–0.1566	0.006
	2010	–0.0935	0.005
	2012	0.1128	0.005
	2013	0.2899	0.006

SAMPLE SIZE: 260,348.
NOTES: Table reports the results of a regression of the natural logarithm of earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. All differences are statistically different from a zero effect at the 5% level unless indicated by a diamond next to the parameter estimate (◊). The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members, have a successful SSA earnings record match for both the spouse and service member, and have positive earnings.

logarithm earnings will place greater weight on changes at low levels of earnings, such as the gain of $2,000 from a base of $10,000 in our earlier example. The earlier example can be extended to indicate the differences between these two measures. Where in both cases we find a level change of $2,000, the first method would calculate the percentage change of the average, or $2,000/($10,000 + $40,000/2) = 8 percent, whereas the natural logarithm calculates the average of the percentage changes, or ($2,000/$10,000 + $2,000/$40,000)/2 = 12.5 percent. This second method places greater weight on the individuals with part-year and part-time earnings histories. The model based on the logarithm of earnings suggests that MyCAA use for known plan completers is associated with a small decline in earnings comparing 2009 and 2013, and a small increase in earnings for starters comparing those same years. Contrasting the differences in earnings levels observed in Figure 5.8 and Figure 5.9 suggests that the lower 2013 earnings levels

Figure 5.9. Percentage Change in Earnings, Difference-in-Differences Estimates Relative to 2009 and Nonusers



SAMPLE SIZE: 260,348 for the full sample.
NOTES: Figure presents difference-in-differences estimates (see Equation 5.1 and explanation) of the percentage change in earnings associated with known MyCAA plan completion or initiation relative to 2009. See Table 5.8 and text for point estimates, sample restrictions, and further explanation.

relative to 2009 represented in Figure 5.8 may reflect differences in the earnings levels between MyCAA users and nonusers.

Discussion of the Model Results

Our model results that controlled for observable characteristics mirror the results from the descriptive statistics, namely that the percentage of working military spouses is greater for MyCAA users relative to nonusers, and that earnings for users decline sharply relative to nonusers prior to the MyCAA application window and begin to converge after the MyCAA application window. Our empirical results indicate that fewer spouses work over the course of a calendar year, even part-time or part-year, as their household has children, their service member is promoted, or their service member is deployed. While any employment is positively associated with years that have a PCS move, earnings are significantly lower in years with a PCS move. One interpretation of this result is that PCS moves are disruptive to the spouse's earnings on average, which was a key motivation for the MyCAA initiative.

It is conceivable that some of our results may not hold true for specific subpopulations. Our fixed effects specification does not provide estimates for time-invariant differences, say between spouses of different genders, or spouses of enlisted relative to spouses of officers. In the next section, we carry out robustness checks by considering several alternative subsamples to see if there are any substantive differences in our results for these groups.

Robustness Checks

We explore three different subsamples of the sample used in our three main models from the previous section, including (1) spouses who are women, (2) spouses of enlisted service members, and (3) spouses ages 24 to 26. By narrowing the samples to control for key factors likely to be related to employment and earnings—specifically spouse gender, rank of service member, and spouse age group—we can explore whether the employment and earnings differences between user and nonuser groups can be explained by demographic differences between the two groups. For each, we repeat the analysis in the previous section, but here we report only the difference-in-differences estimates, and then only if the differences are substantive. Finally, we examine the robustness of the model by incorporating local employment conditions, represented by the state unemployment rate of the home address.

Women

The results (not shown, but available from the authors) show a gender earnings differential, where each year men earn more than women on average. As we saw in Chapter Three, MyCAA users are even more likely than nonusers to be women. As such we were concerned that the positive association between MyCAA use and the fraction of working military spouses, or MyCAA use and the relative stability in pay, may be reduced or eliminated if we were to select only women. However, when we reestimated our results on spouses who are women, the results were nearly equivalent with the results presented in Figures 5.7 through 5.9. This result was not unexpected, as the vast majority of MyCAA spouses are women. We did observe that the drop in earnings conditional on working before and during the MyCAA application window was smaller for women spouses. This is consistent with women earning less than men, on average, and therefore the decline in the level of earnings would also be smaller on average.

Spouses of Enlisted Personnel

Enlisted personnel earn less on average than officers, placing their household at greater financial risk from the loss of spousal income. As shown in Chapter Three, MyCAA applicants are more likely than eligible nonusers to be married to enlisted sponsors. The results from the model limited to enlisted sponsors and their spouses were qualitatively similar to those from the model that included officers and their spouses (not shown, but available from the authors). The only noticeable difference was that the probability of working, compared to 2009, was slightly lower for known MyCAA plan completers after the MyCAA application window compared to the full sample that included officers.

Spouses Ages 24–26 and Located in the United States

Earnings typically grow sharply over an individual's career. As shown in Chapter Three, MyCAA applicants are younger on average than nonapplicants. Our model assumes fixed individual characteristics, and uses year indicators to capture the marginal change in earnings by

age. If earnings exhibit diminishing marginal growth with age, then our model could exaggerate the change in earnings conditional on working, or in percentage terms. Additionally, the main model includes households outside the United States, where employment and earnings opportunities may differ significantly for military spouses who accompany their service members overseas. Since the characteristics may bias our results due to systematic differences between the MyCAA users and nonusers, we account for this sample selection by limiting our sample to spouses in a narrow age range (ages 24–26) and who are located in the United States. Tables 5.9 through 5.11 compare the numerical values in Figures 5.7 through 5.9 to values for the subsample whose ages were 24 through 26 in December 2011 and whose sponsor's home address was in the United States. These additional results confirm the age-related bias in previous results that we had suspected. Comparing the results of the full sample to the young sample in Table 5.9, the fraction of the younger military spouses working declines less during the MyCAA application window, and grows to a greater fraction working by 2013.

Table 5.9. Comparison of Fraction of Military Spouses Working over Time, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus U.S.-Based Spouses Ages 24–26 in 2011

	Full Sample		Young U.S.-Based Sample	
	Known Completers	Starters	Known Completers	Starters
2007	3.7	1.8	2.2	2.3
2008	1.6	1.9	1.8	3.3
2009	0.0	0.0	0.0	0.0
2010	–1.3	–1.9	–0.6	–1.5
2011	–5.3	–3.7	–4.3	–3.2
2012	–1.8	0.9	–1.8	1.5
2013	1.6	3.5	1.1	4.6

SAMPLE SIZE: 296,283 for the full sample; 65,309 for the young sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of how the probability of a MyCAA-eligible military spouse working is associated with known MyCAA plan completion or initiation relative to 2009. These changes in the probability of work are estimated as part of a linear probability model (i.e., regression with a binary measure) of whether or not the spouse works (i.e., has earnings greater than zero) on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. The sample of all eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members and have a successful SSA earnings record match for both the spouse and service member. This is referred to as the "full sample." The full sample is further restricted to military spouses between the ages of 24 and 26 in December 2011 and for whom the home address of the service member is in the United States (suggesting that the spouse is less likely to be located overseas).

Table 5.10 demonstrates that earnings for the combined population of working and nonworking MyCAA-eligible spouses, while still greater in 2013 relative to 2011, are lower than the levels reported in Figure 5.8. The patterns exhibited in the overall sample are still reflected in the young sample; namely, (1) starters exhibit a smaller decline in earnings relative to 2009

Table 5.10. Comparison of Earnings, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus U.S.-Based Spouses Ages 24–26 in 2011

	Full Sample		Young Sample	
	Known Completers	Starters	Known Completers	Starters
2007	866	751	395	398
2008	446	426	-32	414
2009	0	0	0	0
2010	–868	–735	–848	–806
2011	–2,209	–1,630	–2,521	–1,835
2012	–1,587	–728	–2,127	–988
2013	-472	26	–1,398	–318

SAMPLE SIZE: 296,283 for the full sample; 65,309 for the young sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of the change in earnings associated with known MyCAA plan completion or initiation relative to 2009. These changes in earnings levels are estimated as part of a regression of the spouse's earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. See the notes to Table 5.9 for sample restrictions.

compared to known completers, and (2) starters are closer to their own 2009 earnings levels by 2013 than to the earnings of known completers (denoted by proximity to zero in Table 5.10).

In Table 5.11, the difference in the percentage change in earnings between 2009 and 2013 is now more negative, suggesting that the drop in earnings is more substantial for this age group and that the upturn in earnings is not as substantial. This could be explained by spouses who are not using MyCAA that are ages 24 through 26 in 2011 experiencing substantial earnings growth, consistent with earnings growing more rapidly at younger ages.

Table 5.11. Comparison of Percentage Change in Earnings Among Working Spouses, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus U.S.-Based Spouses Ages 24–26 in 2011

	Full Sample		Young Sample	
	Known Completers	Starters	Known Completers	Starters
2007	0.7	2.1	1.4	4.9
2008	0.7	3.7	–2.8	5.8
2009	0.0	0.0	0.0	0.0
2010	–11.5	–11.3	–15.1	–13.1
2011	–26.9	–20.8	–31.4	–22.6
2012	–16.4	–6.7	–25.0	-9.1
2013	–4.1	1.5	–13.0	-5.3

SAMPLE SIZE: 260,348 for the full sample; 57,120 for the young sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of the percentage change in earnings associated with known MyCAA plan completion or initiation relative to 2009. These percentage changes are estimated as part of a regression of the natural logarithm of earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. See the notes to Table 5.9 for sample restrictions. For each year 2007–2013, the sample reflects only those with nonzero earnings.

Accounting for State Unemployment Rate

Local labor market conditions could have an impact on a MyCAA user's probability of work and earnings level. For example, one study using 1990 census data found average lower annual earnings and higher rates of unemployment among women who live in U.S. labor market areas with a 5 percent or greater presence of military personnel, relative to women who live in labor market areas with a lower concentration of military personnel (Booth et al., 2000; Booth, 2003). If labor market conditions differentially affect the measures associated with known MyCAA plan completion or plan initiation, then our difference-in-differences estimators could be biased. Although not as specific as a labor market area, we were able to consider state-level differences in unemployment.

Ideally, the state unemployment rate would be included as a control in our specifications presented above. However, when it came to state unemployment rates, computational limitations at SSA prevented the expansion to include all the controls presented in Table 5.5 for the entire sample. Thus, here we consider a model that includes the state unemployment rate of the home address as a control, restricting the sample to spouses ages 24 through 26 in 2011 and to households with a home address in the United States.

The coefficient on the unemployment rates is in the expected direction for each model (results not shown, but available from the authors). We observe that a 1-percentage-point increase in the unemployment rate is associated with a 0.2-percentage-point decrease in the probability of working among this subsample of MyCAA-eligible military spouses. For the models of earnings among working spouses, we observe that a 1-percentage-point increase in the unemployment rate is associated with a decrease in average annual earnings of $105, or 1.2 percentage points. Lower earnings are consistent with a higher unemployment rate: The surplus of labor in the market bids wages down.

This robustness check stemmed from the concern that local labor market conditions differentially affect the measures associated with MyCAA use or completion. However, the difference-in-differences estimators, after controlling for unemployment, are not meaningfully different from the model presented above for the same sample. This suggests that any potential bias in our estimates due to varied labor market conditions represented by the state unemployment rate is small.

Robustness Checks Summary

Our robustness checks suggest that analyses focused on populations with certain characteristics associated with potential greater vulnerability, such as women and enlisted spouses, do not substantively change our results. Nor does including labor market conditions as measured by state unemployment rates. However, our checks do indicate that the age composition of our sample may bias our estimates of a MyCAA Scholarship's association with work and earnings. As such, our preferred estimates, which we revisit in the chapter's summary

section, focus on the work and earnings measures of a sample with a shared spousal age range. In this way, we control for age in our model, and focus on a population that makes up 26 percent of the spouses in our SSA-earnings matched dataset and 62 percent of the working spouses in that dataset.

MyCAA Associate's Degree and Certificate-Seeker Employment and Earnings

In addition to individual and household demographic and military service characteristics, MyCAA users vary in terms of the types of occupational education and training they pursue with their scholarships. They may seek an associate's degree, certificate, or license, and those programs typically vary in length. Before the SSA match, 56 percent of MyCAA users who used funds were seeking a certificate, 40 percent were seeking an associate's degree, and the remainder were pursuing an occupational license. The average length for an associate's degree is longer than for a certificate or license, so it is possible that the lower earnings rates in 2013 could be driven by the limited earnings history of associate's degree seekers who are still in school. For example, many associate's degree programs are two-year programs, meaning that a spouse starting the program in September 2011, for example, completing it on time, and transitioning directly into a job would not start their associate's degree–based job until at least June 2013. As a result, most spouses pursuing an associate's degree who were also working would only have part-year or part-time earnings, causing our 2013 difference-in-differences estimates to be lower than if we focused on spouses in training and education programs to obtain occupational certificates. This difference in typical lengths of course of study could also affect the predicted fraction of military spouses working, to the degree that spouses took longer than two years to complete an associate's program or there was a transition effect resulting in a gap between the completion of the course of study and subsequent employment.

To test the influence of this factor, we reestimate the main model, but include only users seeking associate's degrees and nonusers (thus excluding spouses pursuing certificates and licenses). In Tables 5.12 and 5.13, we present comparisons between our full sample and the sample excluding users that are not seeking associate's degrees. As with Tables 5.9 through 5.11, these tables should be interpreted within an individual group and relative to 2009. For example, in Table 5.12 we observe that relative to 2009 the proportion of military spouses working in 2011 was 7.1 percentage points lower for known MyCAA completers seeking an associate's degree. For this same group, the proportion working in 2013 was 3.6 percentage points lower than in 2009. The difference indicates an increase between 2011 and 2013 in the percentage of military spouses working that go on to complete their associate's degree (some may not have completed it until 2014), but an overall decline in the percentage working in 2013 relative to 2009.

Table 5.12. Comparison of Percentage of Military Spouses Working over Time, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus Associate's Degree Seekers

	Full Sample		Associate's Degree Seekers	
	Known Completers	Starters	Known Completers	Starters
2007	3.7	1.8	3.8	0.6
2008	1.6	1.9	1.4	0.6
2009	0.0	0.0	0.0	0.0
2010	–1.3	–1.9	–1.4	–2.9
2011	–5.3	–3.7	–7.1	–5.6
2012	–1.8	0.9	–7.8	–1.9
2013	1.6	3.5	–3.6	1.8

SAMPLE SIZE: 296,283 for the full sample; 278,312 for the associate's degree seekers/nonusers sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of how the probability of a military spouse working is associated with known MyCAA plan completion or initiation relative to 2009. These changes in the probability of work are estimated as part of a linear probability model (i.e., regression with a binary measure) of whether or not the spouse works (i.e., has earnings greater than zero) on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members and have a successful SSA earnings record match for both the spouse and service member. This is referred to as the "full sample." The "associate's degree seekers" sample was created by excluding MyCAA users whose MyCAA plan was not to seek an associate's degree from the full sample.

Table 5.12 demonstrates that the fraction working in 2013 relative to 2009 is lower among known completers for the sample excluding non–associate's degree seekers (i.e., the difference-in-differences estimates are -3.6 versus 1.6). This supports the storyline above, where individuals who are engaged in their two-year program may not be able to return to employment by 2013. Additionally, a lower fraction working in 2012 relative to 2011 among associate's degree seekers reinforces the lock-in effect hypothesis, suggesting that those who entered a full-time program in 2010 or 2011 and would go on to complete it are not any more likely to be employed in 2012 relative to 2011. A comparison of starters in the full sample to the sample excluding non–associate's degree seekers reflects a similar pattern: The fraction working in 2013 relative to 2009 is lower among starters for the sample excluding non–associate's degree seekers. However, unlike known associate's degree completers, the fraction of associate's degree starters working is greater in 2013 relative to 2009.

Differences in the percentage change in earnings reflect the same patterns we observe for MyCAA use. In Table 5.13, earnings for working spouses who are known associate's degree completers in 2013 are 15.5 percent lower than in 2009. As with the percentage of military spouses working, the lower relative earnings in 2013 among working spouses could reflect MyCAA completers still being in school. Working spouses who are MyCAA starters seeking an associate's degree see a slight increase in relative earnings, 2 percent, over the same time period.

Table 5.13. Comparison of Percentage Change in Working Spouse Earnings, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus Associate's Degree Seekers

	Full Sample		Associate's Degree Seekers	
	Known Completers	Starters	Known Completers	Starters
2007	0.7	2.1	0.2	3.6
2008	0.7	3.7	–3.6	5.7
2009	0.0	0.0	0.0	0.0
2010	–11.5	–11.3	–15.7	–11.2
2011	–26.9	–20.8	–31.2	–19.0
2012	–16.4	–6.7	–30.2	–7.0
2013	–4.1	1.5	–15.5	2.0

SAMPLE SIZE: 260,348 for the full sample; 244,015 for the associate's degree seekers/nonusers sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of the percentage change in earnings associated with MyCAA completion or use relative to 2009, among working spouses only. These percentage changes are estimated as part of a regression of the natural logarithm of earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. See the notes to Table 5.12 for sample restrictions. Note that an additional restriction here is the spouse must be working.

Certificates generally take a shorter time to complete than associate's degrees. As a result, we would expect that the fraction of military spouses working and their earnings should be greater for this group by 2013. In Table 5.14, the percentage of military spouses working is greater in

Table 5.14. Comparison of Percentage of Military Spouses Working over Time, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus Certificate Seekers

	Full Sample		Certificate Seekers	
	Known Completers	Starters	Known Completers	Starters
2007	3.7	1.8	3.6	2.8
2008	1.6	1.9	1.7	3.0
2009	0.0	0.0	0.0	0.0
2010	–1.3	–1.9	–1.1	–1.1
2011	–5.3	–3.7	–4.3	–1.9
2012	–1.8	0.9	1.0	3.1
2013	1.6	3.5	4.0	4.8

SAMPLE SIZE: 296,283 for the full sample; 282,906 for the certificate seekers/nonusers sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of how the probability of a military spouse working is associated with MyCAA completion or initiation relative to 2009. These changes in the probability of work are estimated as part of a linear probability model (i.e., regression with a binary measure) of whether or not the spouse works (i.e., has earnings greater than zero) on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. The sample of all MyCAA eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members and have a successful SSA earnings record match for both the spouse and service member. This is referred to as the "full sample." The "certificate seekers" sample was created by excluding from the full sample MyCAA users whose MyCAA plan was not to seek a certificate.

2013 relative to 2009. The change in work is quantitatively similar for certificate seekers that complete their MyCAA plan and those who start the plan but for whom we have no indication of plan completion. In Table 5.15, we observe that earnings among working spouses are slightly greater for known completers in 2013 relative to 2009, a pattern that is also reflected for starters who are working. Comparing the trajectories for percentage change in earnings relative to 2009 of known associate's degree completers in Table 5.13 to known certificate completers in Table 5.15, the decline in earnings among working spouses during the MyCAA application window was much greater in percentage terms for associate's degree seekers. The greater relative drop in earnings for associate's degree seekers as they went back to school may reflect a greater effort and time commitment for these degrees relative to certificates.

Table 5.15. Comparison of Percentage Change in Working Spouse Earnings, Difference-in-Differences Estimates Relative to 2009 and Nonusers, for the Full Sample Versus Certificate Seekers

	Full Sample		Certificate Seekers	
	Known Completers	Starters	Known Completers	Starters
2007	0.7	2.1	0.2	1.4
2008	0.7	3.7	2.4	2.4
2009	0.0	0.0	0.0	0.0
2010	–11.5	–11.3	–8.7	–10.7
2011	–26.9	–20.8	–24.4	–23.0
2012	–16.4	–6.7	–8.8	–6.4
2013	–4.1	1.5	1.1	0.5

SAMPLE SIZE: 260,348 for the full sample; 247,916 for the certificate seekers/nonusers sample.
NOTES: Table reports difference-in-differences estimates (see Equation 5.1 and explanation) of the percentage change in earnings associated with MyCAA completion or initiation relative to 2009. These percentage changes are estimated as part of a regression of the natural logarithm of earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. See the notes to Table 5.14 for sample restrictions. Note that an additional restriction here is the spouse must be working.

Our results comparing the employment and earnings of MyCAA users seeking a certificate versus MyCAA users seeking an associate's degree have three general findings. First, in all cases we see a greater fraction of military spouses working in 2013 relative to 2011 for these MyCAA users compared to nonusers. Comparing 2013 to 2009, only MyCAA associate's degree seekers who will go on to complete their degree by December 2014 exhibit a lower fraction working in 2013 than nonusers, and this could be due to continued study in 2013. Second, annual average earnings in 2013 of MyCAA starters who are working, whether seeking an associate's degree or a certificate, are greater than in 2011 and quantitatively similar to their 2009 earnings. Finally, 2013 earnings among working spouses who are certificate seekers and who will complete their plan are greater than 2011 earnings and quantitatively similar to 2009 earnings. For working associate's degree seekers who will complete their plans, 2013 earnings are greater than 2011 earnings, but lower compared to 2009 earnings. This could be a timing issue. Our annual

earnings data extend only through 2013, so earnings for a person who completed their degree in 2013 may represent only a part of his or her true annual income postdegree, and capture no postdegree earnings for those who completed their plan in 2014.

These results clarify our earlier findings for the trajectory in percentage change in earnings among working spouses following approval for a MyCAA Scholarship. In Figure 5.9, we observed that earnings post-MyCAA approval for working spouses had not returned to pre-MyCAA earnings for known MyCAA plan completers. However, after parsing MyCAA users by the degree they are seeking, we observe that these earnings estimates may be lower than expected because associate's degree seekers have not had a full year of earnings in 2013 due to the length of time their educational plan requires. Restricting attention to only certificate seekers indicates that annual earnings of working spouses have returned to at least 2009 levels, on average.

Our findings suggest that at this early stage of the evaluation, MyCAA users are more likely to work, but that with earnings data that end in 2013, it is too early to determine if MyCAA use is positively associated with higher earnings for associate's degree seekers. For certificate seekers, we do observe a positive association between MyCAA Scholarship use and earnings, albeit a small one.

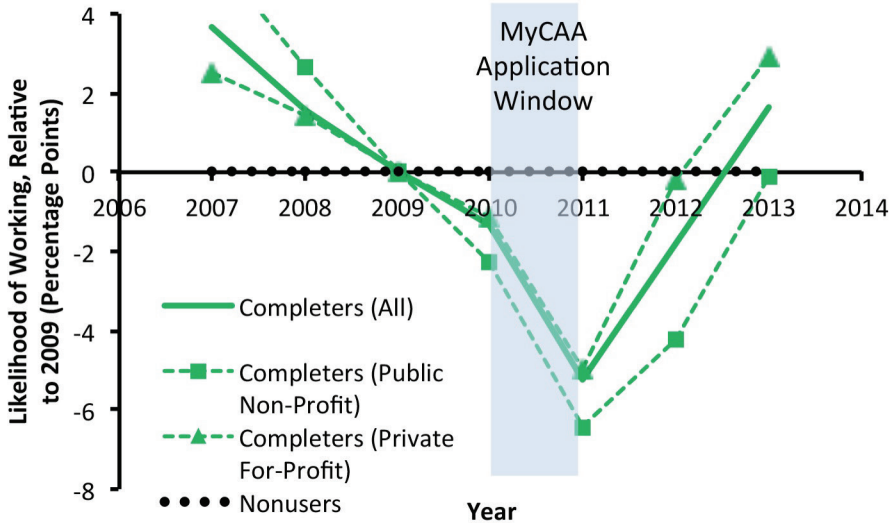
Employment and Earnings by MyCAA Plan School Type

In this section, we consider differences in employment and earnings by school type. In recent years, private for-profit schools have received substantial financial support from federal student loans and military education grants. As mentioned in Chapter Two, congressional leaders have questioned the value of DoD allocating MyCAA funds for the support of students attending for-profit schools, citing evidence that the majority of students who enroll in for-profit schools accumulate debt but do not complete their course of study (Harkin, 2010a), and suggesting that loan default and repayment patterns for graduates call into question whether degrees from for-profit schools lead to higher-paying jobs (Harkin, 2010b, p. 17). For-profit institutions have countered arguments such as these by claiming that their applicants have more challenging education and employment backgrounds, thereby suggesting that their students are a selected sample with lower academic and earnings prospects relative to students at nonprofit public institutions. If the differences in student characteristics by school type reflect permanent differences in the student populations, then our estimation strategy will produce trajectories purged of these permanent differences.

The main model is reestimated twice, first including only nonusers and users seeking a degree from public nonprofit schools, and second including only nonusers and users seeking a degree

from private for-profit schools.[17] Figure 5.10 presents the difference-in-differences estimates for known completers by school type relative to the overall sample. A lower proportion of known MyCAA completers works during the MyCAA application window relative to before the window, regardless of whether they used their scholarship to attend a public nonprofit or a private for-profit institution. Relative to 2011, the end of the MyCAA application window, a greater proportion of users attending either type of institution are working in 2013. Relative to 2009, before the MyCAA application window, a greater fraction of known completers attending for-profit institutions are working in 2013, whereas known completers attending nonprofit public institutions are working at about the same rate in 2013 as they are in 2009. For-profit graduates as a group experienced greater growth in employment by 2013 than graduates from public nonprofit institutions.

Figure 5.10. Change in Percentage of Military Spouses Working over Time, Difference-in-Differences Estimates Relative to 2009 and Nonusers

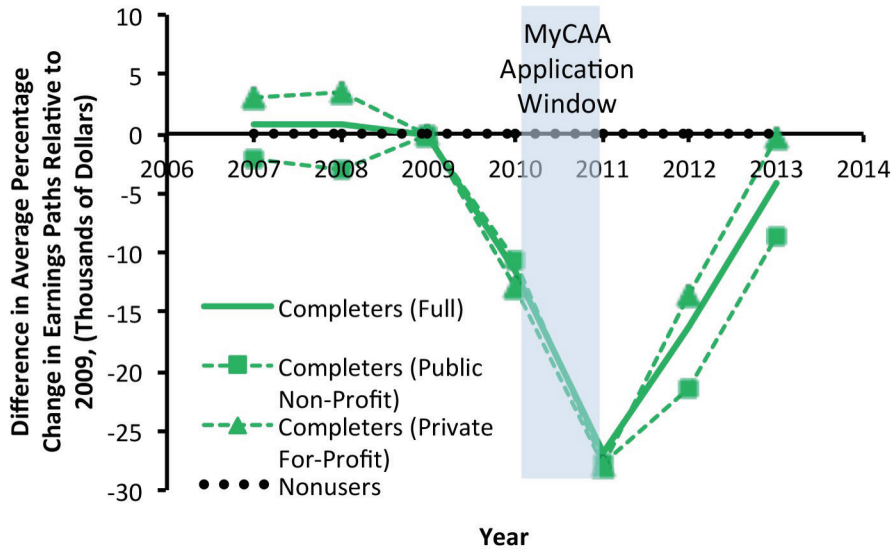


SAMPLE SIZE: 296,283 for the full sample; 276,639 for the public nonprofit/nonuser sample; 282,941 for the private for-profit/nonuser sample.
NOTES: Figure presents difference-in-differences estimates (see Equation 5.1 and explanation) of how the probability of a military spouse working is associated with MyCAA completion or use relative to 2009. These changes in the probability of work are estimated as part of a linear probability model (i.e., regression with a binary measure) of whether or not the spouse works (i.e., has earnings greater than zero) on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. The sample of all MyCAA-eligible military spouses described in Chapter Three is further restricted to military spouses that are married to active service members and have a successful SSA earnings record match for both the spouse and service member. This is referred to as the full sample. The public nonprofit sample was created by excluding from the full sample MyCAA users whose MyCAA plan was not with a public nonprofit institution. The private for-profit sample was created by excluding from the full sample MyCAA users whose MyCAA plan was not with a private for-profit institution.

[17] While conceptually these models could be jointly estimated, computational limitations at SSA required separate estimation.

Figure 5.11 presents the difference-in-differences estimates for the percentage change in average annual earnings for working spouses who are known completers, by school type. Between 2009 and 2011, working spouse earnings decline by 27 to 28 percent for known completers attending either school type. Earnings after the MyCAA application window grow faster for working completers that attended for-profit private institutions.

Figure 5.11. Percentage Change in Working Spouse Earnings, Difference-in-Differences Estimates Relative to 2009 and Nonusers



SAMPLE SIZE: 260,348 for the full sample; 242,566 for the public nonprofit /nonuser sample; 247,886 for the private for-profit/nonuser sample.
NOTES: Figure presents difference-in-differences estimates (see Equation 5.1 and explanation) of the percentage change in earnings associated with MyCAA completion or use relative to 2009. These percentage changes are estimated as part of a regression of the natural logarithm of earnings on the explanatory variables specified in Table 5.5, except the unemployment rate, where individual fixed effects are incorporated using within-individual differencing, and standard errors are clustered at the individual level. See the notes to Figure 5.10 for sample restrictions. Note that an additional restriction here is the spouse must be working.

The results presented in the section suggest that among spouses who are employed, known completers attending for-profit private institutions do not fare worse than known completers attending nonprofit public institutions. Indeed, at this early stage in the evaluation, from 2009 to 2013 there was a greater positive change in earnings for the for-profit graduates who were working than there was for the graduates from public nonprofit institutions who were working. The results for starters at these institutions yield qualitatively similar results. Degrees sought from nonprofit public institutions may differ from degrees sought from for-profit private institutions. Notably, a larger fraction of users attending for-profit private institutions are seeking certificates relative to users attending nonprofit public institutions. Certificate programs are shorter in intended duration, so students can enter or return to the workforce sooner. Additionally, as noted in Chapter Four, completion rates are slightly higher for spouses enrolled

in private for-profit programs. Therefore, we do not interpret these results to suggest that the outcomes of one institutional type are necessarily superior to another, but rather that at this point there is not systematic evidence that one schooling type yields persistently worse outcomes.

Summary

In this chapter, we linked our household data for the MyCAA-eligible population to the SSA's earnings records for both the service member and the spouse. Not all records in the MyCAA-eligible population were matched to earnings records from the SSA, but a large proportion did match, and a comparison of the sample before and after the match demonstrated that the characteristics of the sample were unchanged.

If MyCAA has its intended impact, it should improve spouses' opportunities to work. From Figure 5.1 we observe that a lower fraction of MyCAA users are working in 2011 compared to nonusers, but a greater fraction are more likely to be working in 2010 and 2013 (all MCAA-eligible spouses are less likely to be working in 2013 relative to 2010). Additionally, in Figure 5.4, we observe that the average annual earnings among working spouses who are MyCAA users are less than the earnings of working spouses who are nonusers. This difference exists both before and after the MyCAA Scholarship application window.

We model the difference in key measures of interest (i.e., fraction of military spouses working, earnings for working spouses, and percentage change in earnings for working spouses) by comparing differences before and after a common MyCAA eligibility and application window (October 2010–December 2011) and the difference between MyCAA users and nonusers. In order to interpret the model of MyCAA Scholarship use as causal (e.g., using a MyCAA Scholarship increases the likelihood of an individual working), it would need to be true that MyCAA users' trajectories are parallel to or no different than those of nonusers prior to the application window. This is not the case. Using the SSA earnings data, we find that before 2011 the probability of MyCAA users working declines relative to nonusers, even after controlling for observable differences in households using an individual fixed effect framework. It could be that the MyCAA Scholarship encouraged working MyCAA users to exit the workforce to return to school. It is also possible that spouses lost their jobs, perhaps because of PCS moves, and MyCAA offered them an opportunity to retrain and reenter the workforce. Regardless of the reasons why the fraction of MyCAA users working in 2011 is lower relative to previous years, we observe a greater fraction employed in 2013 compared to nonusers, confirming that the results observed from the data tabulations persist when accounting for differences in the sample composition. This increase in the fraction of MyCAA users working is observed despite a strong downward trend overall in fraction of MyCAA-eligible military spouses working that is associated with a household having children, as well as the service member's promotion, continued service, and deployments.

The fraction of military spouses working in 2013 varies by the type of degree sought by MyCAA users. Notably, the fraction of military spouses working is lower for MyCAA users who

did or will complete an associate's degree. This is likely because many of these individuals are still in school through 2013, the last year for which we have SSA earnings data. For the other types of MyCAA users, after controlling for general work trends in common with nonusers, the fraction of military spouses working is 7–8 percentage points greater in 2013 relative to 2011, and 2–5 percentage points greater in 2013 relative to 2009, before they applied to MyCAA.

Since MyCAA users are more likely to work in 2013 relative to 2011 and nonusers after controlling for individual characteristics, we would like to know if working spouses who are MyCAA users experienced greater earnings growth relative to working spouses who are nonusers. Tabulations from the SSA data suggest that working MyCAA users earned an average of $9,155 in 2011, compared to $16,536 for working nonusers. This difference persisted before 2011 as well. MyCAA focuses on associate's degrees, occupational certificates, and licenses. If MyCAA users have fewer years of higher education than the average MyCAA-eligible spouse, this could translate into lower wages or salaries and thus lower average annual earnings. Alternatively, the lower earnings could be explained by differences in the number of hours worked: MyCAA users may be disproportionately engaged in part-time or part-year work. Since SSA earnings data is based on total annual earnings, we cannot separate part-time work from low-earning full-time work. As such, we focus on the percentage change in earnings among working spouses, as it reveals the relative difference.

We find that in 2013 the earnings of MyCAA users who worked grew by 26–34 percent relative to 2011, except for working users who went on to complete an associate's degree (associate's degree seekers are likely still working toward their degree in 2013). Relative to 2009, these same MyCAA users' earnings were 0.5–2 percent higher on average. This modest increase was similar between working certificate seekers who completed their plan and working certificate seekers who started but did not appear to complete their plans. Additionally, known completers at private for-profit institutions are more likely to be working 2013 relative to 2009, while known completers at public nonprofit institutions are no more or less likely to be working in 2013 relative to 2009. For-profit graduates as a group experienced greater growth in employment by 2013 than graduates from public nonprofit institutions. This finding on employment could reflect longer educational programs on average in public nonprofit institutions, but, importantly, these early results do not suggest worse outcomes for those attending for-profit private institutions.

Our findings indicate that MyCAA users are more likely to work in the years after receiving their scholarship. Whether they work after starting a MyCAA plan because they intended to work and would have been able to regardless, or because the skills they developed in their plan led to a job (or a combination of the two), we find that military spouses who want or need to work are using MyCAA. At this point, we do not find strong evidence that earnings among working spouses are meaningfully greater after MyCAA relative to the one to two years preceding MyCAA application; however, what we do find suggests that they are no worse off than during the application window, and the literature suggests their earnings are likely to increase in the years following reentry into the workforce (Jepsen, Troske, and Coomes, 2014).

Thus, we might expect to see stronger earnings growth among MyCAA users who work after they complete their education and establish themselves in their portable career field. The decline in the fraction of MyCAA users working relative to nonusers prior to 2011 may be driven in part by job loss. Taken together, our results imply at the very least that MyCAA users who work are experiencing sufficiently rapid earnings growth on average such that their average earnings in 2013 are consistent with or just slightly below what they would have been had their earnings consistently grown since 2009 at the percentage change in earnings experienced by the nonusers. This is a particularly important result, given the challenges that a military lifestyle, with its frequent moves and deployments, can place on a young household. Continuing to track the earnings of working MyCAA users in later years would reveal whether stronger earnings growth appears.

6. Are Service Members Married to MyCAA Users More Likely to Remain on Active Duty Than Service Members Married to Nonusers?

Introduction

DoD designed the MyCAA Scholarship with several aims in mind, as illustrated in the logic model presented in Chapter One. Promoting spouse education and employment were the immediate goals of MyCAA, but longer-term outcomes of interest include increasing family financial stability, satisfaction with military life, retention of military personnel, and thus ultimately increasing overall readiness. Completion of the first term of service and reenlistment are a regular priority for the services. Completion and reenlistment rates vary by service. For example, from 1996 to 2007 first-term completion and reenlistment rates were 46 percent in the Army, 44 percent in the Navy, 24 percent in the Marine Corps, and 52 percent in the Air Force (Hosek and Martorell, 2009). In this chapter, we explore the relationship between the retention of military personnel and spouses' use of a MyCAA Scholarship. We ask: **Are service members whose spouses used MyCAA Scholarships more likely to remain in the military?**

Past research has found that spousal attitudes toward the military were linked with service member reenlistment intentions (Bourg and Segal, 1999; Lakhani, 1995; Lakhani and Fugita, 1993). Beyond service members' self-reported intentions, previous studies have also found that actual retention behavior was related to spousal support for continuing a military career (Rosen and Durand, 1995) and to spousal attitudes toward the military lifestyle (Bruce and Burch, 1989; Mohr, Holzbach, and Morrison, 1981; Orthner, 1980). Therefore, it seems likely that initiatives promoting spousal employment and satisfaction should have positive effects on retention. In the previous chapter we found that a spouse's using MyCAA was associated with their earnings. Here, we examine the association of MyCAA use with service member continuation in active-duty service.

Populations and Methodology

To answer this question, we begin with our basic analytical sample of MyCAA-eligible spouses and their sponsors (all sponsors were active-duty service members as of December 2011). We then determined which service members remained on active duty in the following years; our data allow us to determine this continuation (i.e., retention) through December 2014.

While the literature suggests a link between spousal attitudes and reenlistment, here we focus on continuation (without regard to whether the service member has passed a reenlistment point) for several reasons. First, due to the design of the scholarship many MyCAA users were married to service members who were serving in their first terms in the 2010–2011 MyCAA application

window. Some personnel may not have reached their first reenlistment point during the short window of time included in this study; however, some personnel leave military service prior to completing even their initial term (these personnel "attrit"). Attrition can be due to a number of factors, such as injury, personal decision, or "failure to adapt" (for a detailed summary of first-term attrition in the Army, see Buddin, 2005; for a cross-service comparison, see Wenger and Hodari, 2004). Thus, first-term continuation represents an important outcome; only personnel who complete their first terms are eligible to reenlist. Second, while reenlistment is a key decision, in many cases personnel who are nearing the end of their terms may choose instead to extend the term and postpone a reenlistment decision; like reenlistment, this decision results in productive and valuable time spent in the military. A related complication is that the length of first terms varies based on service, enlistment bonus, and military occupation, among other factors. In our dataset, we lack the specific information to determine exactly which service members reenlist and precisely when the contract is scheduled to end. For these reasons, determining first-term reenlistment is not straightforward, but reenlistment does not represent the only way to increase time served in the military.

We use a model of continuation that estimates the probability of continuing to serve in the active component until December 2014, conditional on the individual being in the active component of his or her service in December 2011.[1] This model has the advantage of clarity: The service member, sponsor, and household's characteristics enter directly into the reduced-form model. The main disadvantage to this model is that we cannot distinguish attrition from decisions to leave at the end of an enlistment term. Also, we cannot determine whether service members married to MyCAA users have a greater preference for military service than service members married to nonusers that is independent of MyCAA use. On a related note, we recognize that some spouses might not apply for or might not be approved for a MyCAA Scholarship because their service members are scheduled to leave the service before the spouses would have the opportunity to obtain their license, certificate, or degree. Still, given that attrition can be of a voluntary nature, the model will serve to help us determine if there is a correlation between MyCAA use and service member continuation.

[1] Studies of military personnel retention have recognized the importance of capturing both the short- and the long-term factors affecting military continuation (e.g., immediate civilian opportunities and eventual retirement benefits; see, e.g., Asch, Mattock, and Hosek, 2008). Models that capture both short- and longer-term concerns, such as the Dynamic Retention Model (DRM) or the Annualized Cost of Leaving (ACOL) model, are best used for assessing the impact of compensation reform or other factors that are likely to affect decisions over a long time horizon. In our early-evaluation context, where we are examining an expected impact of the MyCAA Scholarship that would be short in duration and intricately intertwined with the decisions of both household members, a complex model such as DRM or ACOL would require significant adjustments to make them applicable to this problem; researchers concerned with shorter-term concerns tend toward reenlistment or continuation models (see, e.g., Buddin, 2005).

This model compares continuation of the sponsors of MyCAA users and nonusers.[2] A separate model is estimated for each year of service. (As mentioned above, there is justifiable reason to expect that continuation at certain years of service is less likely, for example around contractual enlistment end dates.) This model is descriptive in nature, meaning that the estimates express correlations, but not necessarily causal relationships. Other unobservable factors such as motivation could also help to explain the estimated relationships. Therefore, multiple interpretations of the correlations are possible. We note potential interpretations as appropriate.

In keeping with the parameters used to understand application to MyCAA and completion of MyCAA plans in prior chapters, we estimate a probit model of whether or not the service member that was active duty in December 2011 was still in the active component as of December 2014. Specifically,

$$active_{2014} = \varphi_0 + \varphi_1 \cdot sponsor_{2011} + \varphi_2 \cdot spouse\&household_{2011} + \varphi_3 \cdot MyCAA + \varepsilon, \qquad (6.1)$$

where the dependent variable $active_{2014}$ is a binary variable of whether or not the MyCAA-eligible spouse's sponsor is in the military in 2014. We estimate the model in Equation 6.1 using the spouse's observed use of MyCAA, $MyCAA$, which takes a value of one for users.[3] The sign of the coefficient on $MyCAA$ will tell us whether MyCAA use is associated with continuation of the service member. Since this (Equation 6.1) is a nonlinear model, we transform the coefficient to calculate the average association between continuation to 2014 and MyCAA use (holding other spouse, sponsor, and household characteristics constant).

The sponsor covariates include the sponsor's service, AFQT being in the top 50th percentile (for enlisted personnel), age, gender, race/ethnicity, and for each year indicators for any PCS moves and any time deployed. Spouse and household covariates include indicators for the census division of the home, number of children under age six, number of children under age 18, age difference with spouses, and number of years married. All of these variables are measured as of December 2011 for households where the sponsor was in the active component at that time.

To the extent possible, we also examine whether continuation rates differ for subgroups of MyCAA users. In particular, we analyze the relationship between *completion* (where the spouse obtains the license, certificate, or degree pursued under the approved MyCAA plan) and continuation. Continuation decisions may be determined, to some extent, by the spouse's time line for completion and/or job prospects after completing the MyCAA plan, rather than simply

[2] Spouses who initially chose not to use MyCAA may have the option of using the benefit in the future (conditional on the service members' rank and decision to remain in the military). Indeed, the option to use MyCAA in the future could increase retention among service members of current nonusers; therefore, the associations we find should be viewed as lower bounds, meaning they could underestimate any potential impact of MyCAA.

[3] We define *users* as those who applied for a scholarship, received approval between October 2010 and December 2011, and used funds toward that approved course of study.

by using MyCAA funds for some education or training. It is also possible that spousal earnings are related to continuation—for example, income improvement could increase a household's willingness to support continued military service. We present these results after the results from our basic continuation model. But first we present a few descriptive statistics on continuation and usage.

Findings

Table 6.1 shows that in December of 2012, continuation rates from December 2011 range from 83 to 90 percent; most in the sample remain on active duty. In the later years, continuation rates are lower; as some service members leave the military (whether by choice or not). Comparing service members married to MyCAA users with service members married to nonusers, continuation is significantly greater (at the 5 percent level) for personnel married to MyCAA users.

Table 6.1. Percent of Service Members Remaining Active (Continuation Rates), Conditional on Being Active in December 2011, by Spouse's MyCAA Usage

Year	Married to Nonusers	Married to MyCAA Users	Married to Known MyCAA Plan Completers
2011	100%	100%	100%
2012	83%	87%	90%
2013	70%	72%	75%
2014	58%	60%	63%
Sample Size	304,143	33,548	11,454

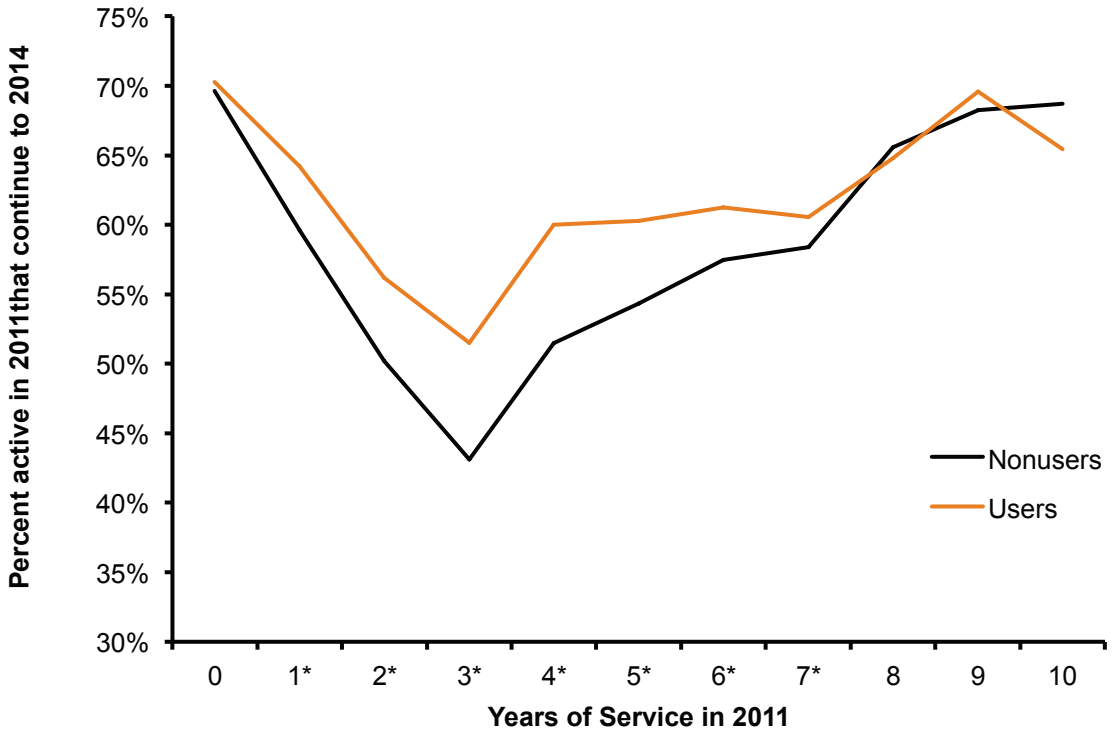
SOURCE: MyCAA data merged with DMDC data.
NOTES: Sample consists of service members active in December 2011 with a MyCAA-eligible spouse. Users consist only of individuals who apply for and use funds from a MyCAA Scholarship. Known completers are the subset of users for whom MyCAA has a record of their obtaining the license, certificate, or associate's degree named in their MyCAA-approved plan. Differences between users and nonusers and completers and nonusers are all statistically significant at the 5% level.

Continuation and MyCAA Use

SECO is more likely to have information about MyCAA plan completion for spouses of those who remained in the military than for spouses of those who did not. As noted previously in the analysis related to completion, as service members leave the military, their spouses who are no longer eligible for the scholarship have less motivation to record completion of their educational plans in the MyCAA database, and MyCAA would not have received reports from schools on courses that were not funded by the scholarship. To avoid this potential source of bias on information regarding completion, we focused our next analyses on comparing all users to nonusers.

Figure 6.1 presents continuation as of December 2014 for sponsors married to users and nonusers of MyCAA, broken down by years of service. Those with two to four years of service in 2011 had the lowest continuation rates as of 2014; this group most likely completed their first terms between December 2011 and December 2014. In the cases of these personnel, continuation generally indicated reenlistment (although some could have extended the initial term through December 2014). But the most pertinent aspect of Figure 6.1 is that usage was associated with higher levels of continuation for service members who had one to seven years of service in December 2011.[4]

Figure 6.1. Service Member Continuation Rates in 2014 by Spouse MyCAA Usage and Years of Service



SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZES: By year of service in 2011, for nonusers/users: 15,727/872 (0), 27,462/3,955 (1), 35,270/5,213 (2), 39,496/5,214 (3), 29,542/3,708 (4), 27,620/3,365 (5), 22,027/2,386 (6), 21,648/2,193 (7), 18,060/1,548 (8), 15,253/1,268 (9), 12,508/1,025 (10).
NOTE: An asterisk (*) indicates that a t-test of the difference between user and nonuser continuation to December 2014 is statistically significant at the 5% level.

[4] Sample sizes are increasing from zero years of service in 2011 (N = 16,599), to a maximum at three years of service in 2011 (N = 44,710), and then decrease until ten years of service in 2011 (N = 13,533). Percent of the population using MyCAA follows a similar pattern: 5.2 percent with zero years of service in 2011, peaking at 12.9 percent with two years of service in 2011, and decreasing to 7.6 percent with ten years of service in 2011.

A key target for recruitment and retention is "high-quality" individuals, defined as high school graduates in the top 50th percentile of AFQT scores. Scholarships were awarded without regard to sponsor education and AFQT scores. Service members whose spouses used a MyCAA Scholarship were less likely to have these credentials: 60 percent of users' sponsors were high quality compared to 61 percent for nonusers, which is a statistically significant difference at the 1-percent level. High-quality service members were more likely to continue in the service. Among personnel married to MyCAA nonusers, 60 percent of high-quality service members remained in the service as of December 2014, compared to 56 percent of the non-high-quality service members. Continuation rates for service members whose spouses were MyCAA users were uniformly higher and maintained the same relationship, with higher-quality service members being more likely to continue. Sixty-one percent of these high-quality service members remained in the service through December 2014 compared to 59 percent of the other service members. While these differences (in terms of the proportion who are high quality and the proportion who continue in service) are not large in absolute magnitude, such differences can have substantive importance. All services track the proportion of personnel that meet high-quality standards carefully; these service members qualify to serve in more technical occupations. The services also track continuation rates carefully; even a difference of a percentage point or two can have important consequences in terms of recruiting and retention budgets as such numbers generally refer to thousands of service members continuing versus leaving the military.

As discussed in Chapter Three, users and nonusers as well as their sponsors had important differences in terms of individual characteristics that were important to account for (age, AFQT score, etc.). In our regressions, we control for spouse, sponsor, and household characteristics, as well as MyCAA plan characteristics.

A first set of models focusing on comparing the sponsors of users and nonusers estimated the probability of continuing in service in 2014, conditional on whether the service member was in the active component in 2011. A total of eleven models were estimated: The control variables we used are presented in Table 6.2.

The association between spouse use of a MyCAA Scholarship and the probability of the service member continuing service in 2014 for each of the eleven subgroups of years of service is presented in Figure 6.2. Even while holding other characteristics constant, our regression results indicate that MyCAA usage was associated with a greater likelihood of continued active-duty service through December of 2014, relative to service members whose eligible spouses did not use MyCAA. If there were no difference, the *y*-axis value would be close to zero for each years of service in 2011 (i.e., *x* axis). As was the case for the descriptive statistics (above), the association was largest among those who were likely approaching the end of their initial term by 2014 (i.e., those with two to four years of service in 2011). The regression results are reported in Appendix C (available online). Sponsors of spouses who used MyCAA were as much as 8 percentage points more likely to remain on active duty than similar service members whose spouses did not use MyCAA.

Table 6.2. December 2011 Variables Used to Calculate Probability of Service Member Being Active in December 2014

Sponsor	Age. Race/ethnicity: White (not Hispanic), American Indian/Alaskan Native, Asian/Pacific Islander, Black (not Hispanic), Hispanic, other, unknown, missing. AFQT category: 1 (>90%), 2 (70–90%), 3A (50–70%), 3B (30–50%), less than 3B, and none. Pay grade: E-1, E-2, E-3, E-4, E-5, W-1 and W-2, O-1, O-2 Years of service. Service: Army, Navy, Marine Corps, Air Force. Education level: Less than high school diploma, high school, associate's degree, bachelor's degree, postbachelor's degree, and missing.
Spouse	Gender: Men, women. Age difference from sponsor.
Household	Spouse/sponsor number of years married as recorded in DEERS (0–1,1–2, 2+, no longer married in Dec. 2011). Number of children below age 18, categories: 0, 1, 2, 3, 4+. Number of children below age 6, categories: 0, 1, 2, 3, 4+. Any deployment in 2011 (during marriage). Any PCS moves in 2011 (during marriage). Home address census division. State unemployment rate.* Home address rural or urban: Metropolitan statistical area, micropolitan statistical area, small town, rural area, not classified area.*
MyCAA	User or nonuser. Plan: Associate's degree, non–associate's degree (certificate or license).*

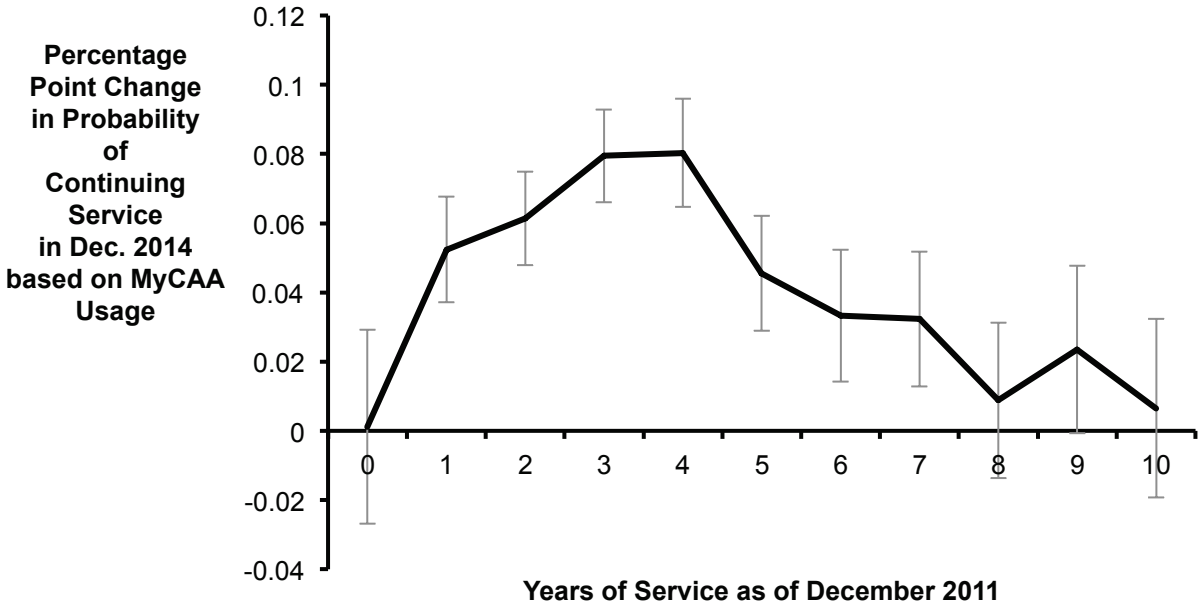
SOURCES: MyCAA data and DMDC data.
* Robustness checks only.

As mentioned above, various factors were likely to be associated with continuation. To learn more about some of these factors, we estimated our continuation models on several subsamples, considering officer/enlisted status, each service, and whether the spouse pursued an associate's degree or another MyCAA-approved credential.

First, we estimated models for officers and enlisted personnel separately. Reenlistment is a different process for officers versus enlisted personnel; officers generally have more varied points at which they can make continuation decisions. Our results indicated that MyCAA usage had a positive association with officer continuation—but only for those officers who had one or two years of service in December 2011. For other officers, the continuation rates were often estimated to be positive, but the differences were not statistically significant from zero (and thus could have occurred due to chance).[5] Since enlisted personnel comprise over 90 percent of the sample, the results for the model estimated on enlisted personnel were qualitatively similar to the results shown in Figure 6.2.

[5] Statistical significance is less likely to occur in small samples, and our sample of officers whose spouses use MyCAA is small because among officers, only spouses married to officers in pay grades O-1 and O-2 are eligible for the scholarship. Only 6.4 percent (21,612) of the MyCAA-eligible sample, and 3.7 percent (1,241) of the user sample, were officers' spouses in December 2011.

Figure 6.2. Service Member Change in Probability of Continued Service in 2014 (Regression Adjusted), When the Spouse Is a MyCAA User Rather Than Nonuser

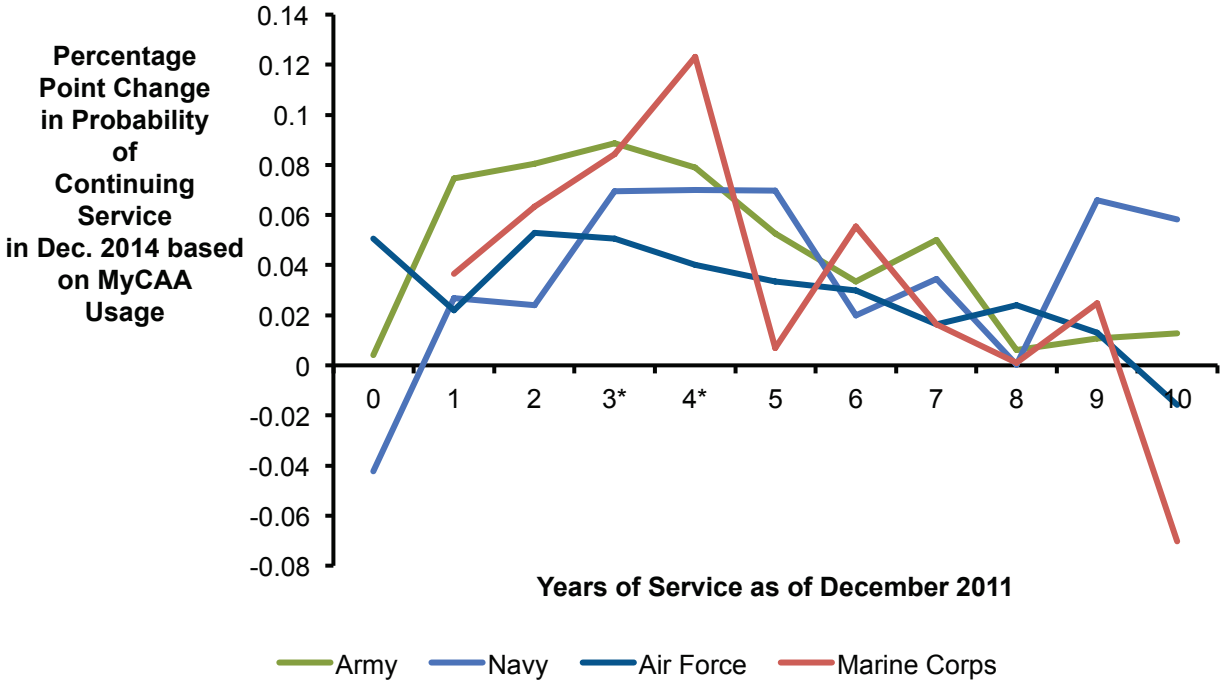


SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZES: By year of service in 2011: 16,589 (0), 31,406 (1), 40,474 (2), 44,704 (3), 33,242 (4), 30,981 (5), 24,408 (6), 23,839 (7), 19,582 (8), 16,516 (9), 13,529 (10).
NOTES: The errors bars represent a 95% confidence interval for the percentage point change in the probability of continuing service until December 2014, conditional on being active in December 2011. The percentage point change in the probability of continuing service is the average marginal effect calculated using the estimated probit model. The standard errors were computed using the delta method. Sample sizes are slightly smaller (no more than 0.15% of sample) than those in Figure 6.1 because of missing data in some explanatory variables. Tabular results are presented in Appendix C (available online).

We also estimated the correlation of spouse usage and continuation for each service separately (Figure 6.3). In general, results for sponsors with two to four years of service in 2011 were consistent across the services, in that spouse MyCAA usage was associated with greater likelihood of sponsor continuation, but results generally were larger for Army and Marine Corps sponsors. However, results were not significant for Navy members who had two years of service in 2011, and the correlations were generally smallest in the Air Force (perhaps related to the relatively high continuation rates of Air Force personnel overall).

Since we examined a relatively small window of time, we estimated separate correlations for MyCAA spouse users seeking an associate's degree compared to those seeking a different credential that is typically attainable in a shorter period of time (i.e., certificate or license). The expected amount of time to complete a postsecondary credential varies widely depending on the credential. A common measure is the percentage of students completing a specific type of credential within twice the intended length of time. Using a recent study with data from

Figure 6.3. Service Member Change in Probability of Continued Service in 2014 (Regression Adjusted), by Service, When the Spouse Is a MyCAA User Rather Than Nonuser



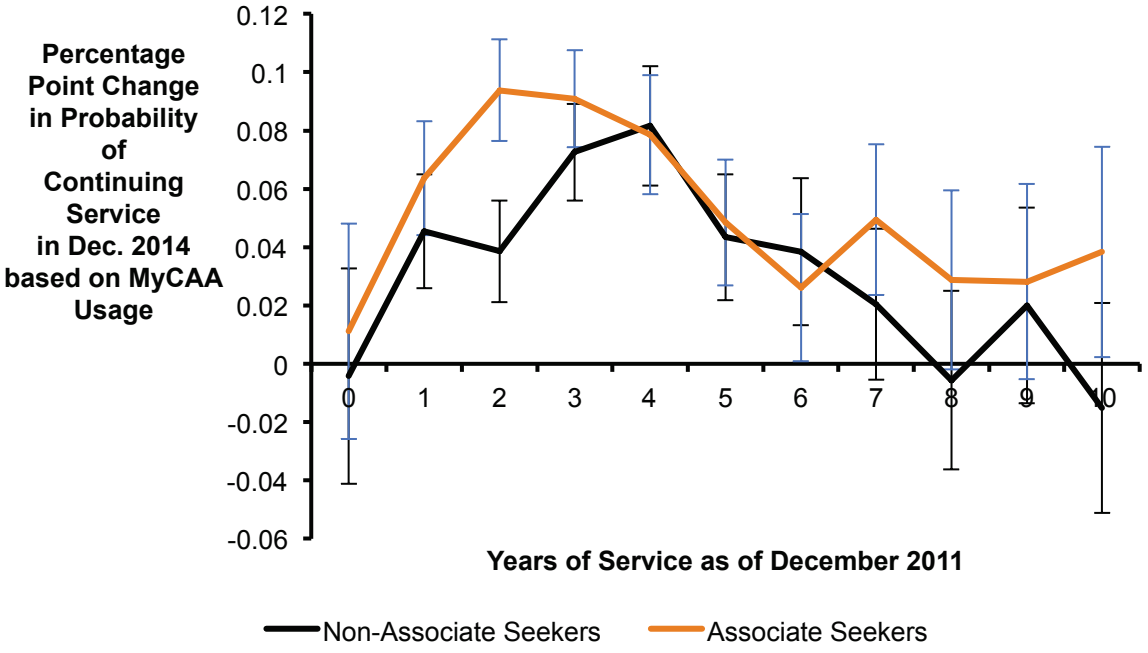
SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZES: By year of service in 2011, for Army/Navy/Air Force/Marine Corps: 9,503/ 2,672/ 3,469/—(0), 17,236/ 5,110/ 6,053/ 2,995 (1), 19,710/ 7,107/ 7,466/ 6,171 (2), 19,811/ 8,025/ 7,299/ 9,467 (3), 14,985/ 6,724/ 6,004/ 5,467 (4), 14,816/ 6,096/ 6,468/ 3,569 (5), 11,257/ 5,093/ 4,186/ 3,840 (6), 9,340/ 5,187/ 4,960/ 4,323 (7), 7,382/ 3,773/ 5,529/ 2,849 (8), 6,040/ 3,353/ 5,430/ 1,675 (9), 5,236/ 3,133/ 3,965/ 1,133 (10).
NOTES: An asterisk (*) Indicates that a statistical test that the association of MyCAA usage being equal to zero is rejected at the 5% level for all services. See the note for Figure 6.2 for how the percentage point change is calculated. Sample sizes are slightly smaller than in Figure 6.1 because of missing data in some explanatory variables. Marginal estimates for zero years of service for the Marine Corps were not calculated due to specific categorical missingness. Tabular results are presented in Appendix C (available online).

33 U.S. states, 28 percent of full-time students complete a one-year certificate within two years, and 19 percent of full-time students complete a two-year associate's degree within four years.[6]

As shown in Figure 6.4, the correlation between MyCAA use and service member continuation was generally larger for associate's seekers. However, the overall positive association between MyCAA use and the service member's continuation in the military was similar for associate's seekers and certificate/license seekers. Error bars in Figure 6.4 that do not

[6] The numbers are smaller for part-time students: 12 percent of one-year certificate seekers complete within two years, and 8 percent of two-year associate's seekers complete within four years. As a comparison, 61 percent of full-time students seeking a four-year bachelor's complete within eight years (24 percent for part-time students). These statistics come from 33 states that provided Complete College America/National Governors Association Common Completion Metrics (Complete College America, 2011).

Figure 6.4. Service Member Change in Probability of Continued Service in 2014 (Regression Adjusted), by MyCAA Plan Type, When the Spouse Is a MyCAA User Rather Than Nonuser



SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZES: By year of service in 2011: 16,589 (0), 31,406 (1), 40,474 (2), 44,704 (3), 33,242 (4), 30,981 (5), 24,408 (6), 23,839 (7), 19,582 (8), 16,516 (9), 13,529 (10).
NOTES: The errors bars represent a 95% confidence interval for the percentage point change in the probability of continuing service until December 2014, conditional on being active in December 2011. See the note for Figure 6.2 for how the percentage point change is calculated. Sample sizes are slightly smaller (no more than 0.15% of sample) than those in Figure 6.1 because of missing data in some explanatory variables. Tabular results are presented in Appendix C (available online).

overlap indicate differences in continuation probability that were statistically significant and thus unlikely to have occurred by chance. The difference between associate's degree seekers and those seeking other credentials was statistically significant for those with two years of service in 2011 (indicating it was unlikely to have occurred by chance). The consistency between degree types is not surprising. The design of the MyCAA Scholarship requires that the approved plan of study can be feasibly completed while the sponsor is on active duty. A spouse will not be approved for a MyCAA Scholarship to *begin* an associate's program if his or her sponsor is near the end of an enlistment term and has not yet reenlisted. If sufficient time is remaining, a spouse planning to ultimately pursue an associate's or bachelor's degree could instead potentially select to use a MyCAA Scholarship to pursue a certificate in their chosen career field.

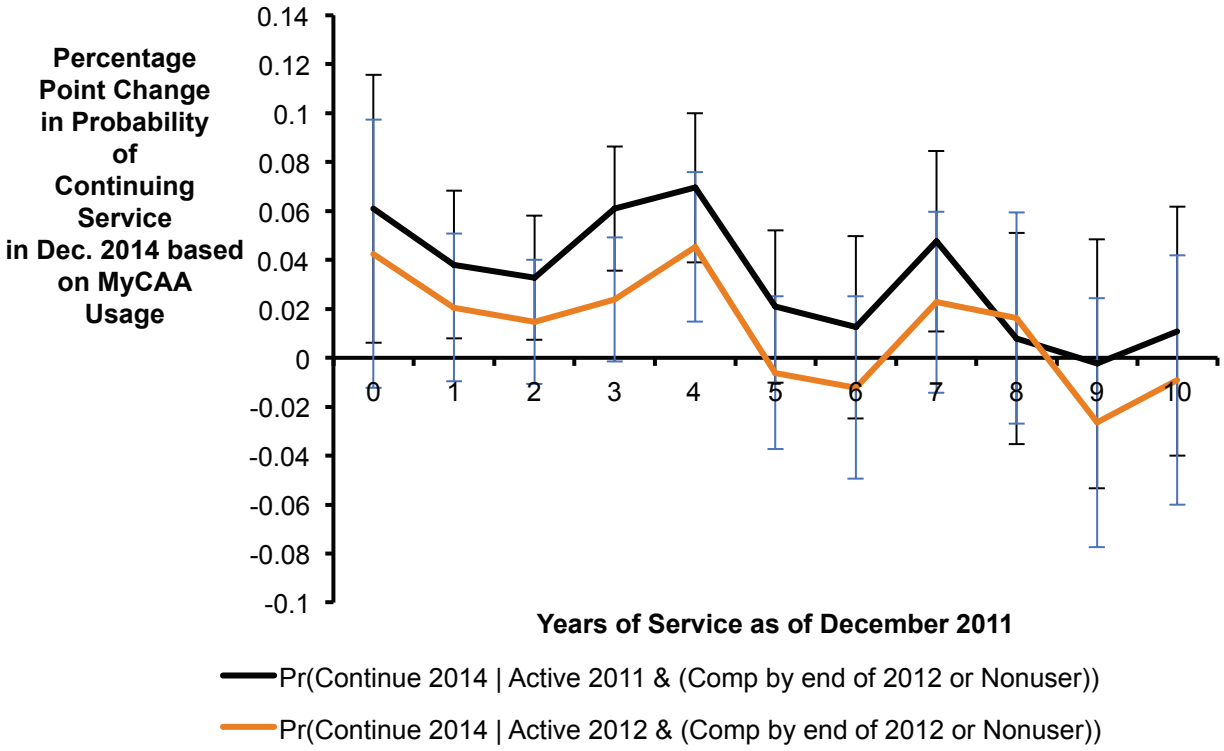
Continuation After Known MyCAA Plan Completion

We investigated whether service members were more likely to continue in the military by 2014 after their spouse completed a MyCAA plan. For these models, we excluded service

members whose spouses did not complete their MyCAA plan by the end of 2012. We are interested in service members whose spouses completed by the end of 2012 because the service member did not need to remain in active service beyond 2012 in order for their spouse to complete his or her plan. This model has the potential to capture suggestive evidence on whether there were any lasting associations of a spouse's use of MyCAA with the service member's retention. There are two ways of examining the association of known completion with service member continuation. First, we could limit the sample to service members who were in the active component in December 2011 and either married to nonusers or married to MyCAA users who completed their plans by the end of 2012. Alternatively, we could condition the sample on the service members of both nonusers and known completers still being active in 2012, implying they had continued for at least one year since baseline (the 2010/2011 application window used to define our cohort of MyCAA-eligible spouses). In this case, we would capture nonusers whose sponsor stayed without MyCAA serving as any possible sort of incentive, whereas users' sponsors may have been influenced to stay. Neither sample can identify whether the MyCAA Scholarship had a lasting relationship with continuation because the very act of using a scholarship created a selected sample (e.g., MyCAA users applied for the scholarship or were approved for it because their sponsors were not expected to immediately separate from the military; or the service members remained in the military because their spouses were receiving MyCAA funding for their education). Regardless, if both models reflect a strong probability of the service member remaining in the service until 2014, then it would suggest that the spouse's use of MyCAA was associated with persistent retention.

The model from Equation 6.1 is estimated on these two samples, and the results are presented in Figure 6.5. Conditional on service members being active in 2011, service members married to MyCAA users who completed their plans by the end of 2012 were significantly more likely to remain until 2014 than service members whose spouses were nonusers. However, conditioning on the service member still being active in December 2012 dampened the positive association with continuation. In this case spouse's completion of his or her plan by the end of 2012 was still positively associated with continuation to 2014 for four or fewer years of service in 2011, but the results were not statistically significant for most years of service. For spouses completing their plans by December 2012, it is possible that their scholarships helped motivate their service members to stay in the service while they were completing their plans. Conditional on remaining in the service to December 2012, however, we found only a weak positive association with continuation to December 2014. This is not to suggest that completion of a MyCAA Scholarship is not associated with service member continuation. Known completers could consist of individuals who would not have stayed in the service but for MyCAA. The weak positive association with continuation after we limited the sample to those still present in 2012 does suggest that the relationship between greater retention and MyCAA use occurs primarily while the spouse is using the MyCAA Scholarship (versus after the scholarship has been used).

Figure 6.5. Service Member Change in Probability of Continued Service in 2014 (Regression Adjusted), by MyCAA Credential, When the Spouse Is a MyCAA User Rather Than Nonuser



SOURCE: MyCAA data merged with DMDC data.
SAMPLE SIZES: By year of service in 2011 for group 1 (black line)/ group 2 (orange line): 15,892/ 14,791 (0), 28,360/ 26,308 (1), 36,589/ 30,951 (2), 40,785/ 27,797 (3), 30,402/ 23,606 (4), 28,479/ 23,266 (5), 22,607/ 19,598 (6), 22,190/ 18,069 (7), 18,427/ 15,847 (8), 15,528/ 13,621 (9), 12,739/ 11,125 (10).
NOTES: The error bars represent a 95% confidence interval for the percentage point change in the probability of continuing service until December 2014, conditional on being active in December 2011. See the note for Figure 6.2 for how the percentage point change is calculated. Tabular results are presented in Appendix C (available online).

We repeated this analysis for known completers finishing by the end of 2013. The results were qualitatively similar. In general, our results suggest that service members were more likely to stay in the active component if their spouses were MyCAA users. After completion of their spouse's MyCAA plan, more service members with fewer than five years of service in 2011 continued in the active component versus sponsors whose spouses were nonusers, but this difference was not statistically significant. MyCAA use was associated with increased service member continuation while the spouse was using the MyCAA Scholarship and remained positive (but not significant) after completion of their educational plan.

Summary

Taken together, our findings consistently indicate that active-duty service members with two to four years of service and whose spouses used a MyCAA Scholarship were 6.1 to

8.0 percentage points more likely than similar service members to remain in the active component three years later. This continuation difference holds when we analyze simple descriptive statistics, and when we conducted multivariate regressions, which held other potentially cofounding factors constant. The difference seemed to be driven by enlisted personnel, although officers' spouses were less likely to be eligible and to take part in MyCAA than spouses of enlisted personnel; therefore, our results for officers may have been confounded by the small sample size. The size of the correlation between MyCAA use and continuation generally was largest for sponsors who served in the Army or the Marine Corps. There is evidence that the relationship was strongest among those who had about three to four years of service at the end of December 2011. The difference persisted regardless of the type of degree the spouse pursued with their MyCAA Scholarship (whether associate's or a certificate or license), but the association is significantly larger among service members who had around two years of service married to spouses who were pursuing associate's degrees. This suggests that a spouse seeking a longer degree was associated with their sponsor lasting past the first reenlistment period.

Throughout this chapter, we have stressed the fact that our reduced-form model produces estimates of the relationship between spouse's MyCAA usage and their sponsor's continuation on active duty. We have no experimental framework or control group as would be necessary to prove causality between usage and continuation. As explained earlier in this report, the lack of control group stems from the ability of spouses to select into MyCAA, and such a selection could be associated with a higher preference for the military lifestyle and hence a higher probability of continuation. However, we found no evidence that MyCAA usage was associated with facilitating an exit from the service. Rather, MyCAA usage clearly was associated with increased levels of continuation, and the association was greatest in the years around the first reenlistment decision. To some extent, this relationship could reflect an increasing commitment to military service among personnel and spouses (perhaps partly linked to the availability of portable careers for spouses). However, the relationship could also reflect MyCAA supporting the spouses of service members with a greater preference for or compatibility with military service. We cannot separate these two, but either would be a desirable role for MyCAA.

The 2012 ADSS asked spouses questions about MyCAA, and about intentions and satisfaction with the military life. While stated intentions may not perfectly predict eventual behavior, the intentions and behavior are related (see, e.g., Bourg and Segal, 1999, and Rosen and Durand, 1995). In the 2012 ADSS, MyCAA users and nonusers were equally likely to favor remaining in the military, and to report overall satisfaction with military life. These figures held for all pay grades and years of service. But the results of the analyses presented in this chapter suggest that sponsors of MyCAA users do exhibit higher continuation rates.

Part IV: Conclusion

7. Highlights and Recommendations

Studies have repeatedly shown that military spouses earn less than their civilian counterparts even when education and other demographic characteristics are taken into account. The demands of military life, such as frequent PCS moves, can disrupt military spouse education and employment. MyCAA Scholarships aim to help spouses obtain associate's degrees and occupational licenses and certificates in high-demand portable career fields, in order to reduce military spouse unemployment, underemployment, and gaps in employment and income following PCS moves. MyCAA has not previously been systematically evaluated to determine whether DoD's investment is having the intended impact of reaching spouses in need and mitigating the demands of military life on spouses' employment and earnings. Ultimately Military Community and Family Policy's SECO initiatives such as MyCAA are intended to support broader goals such as improving military family financial well-being, spouse satisfaction with military life, and service member retention, which can contribute to military readiness. The longer-term impact for military spouses, if the scholarships are effective, would also include greater retirement preparedness.

This relatively early evaluation of MyCAA explored which spouses were likely to apply for a scholarship at the beginning of the current version of the MyCAA initiative, what accounts for known education and training plan completion among spouses who use any scholarship funds, what school and plan characteristics are associated with lack of recorded completion and course failure, whether MyCAA use was associated with spouse employment and earnings, and whether MyCAA use was associated with service member continuation in active-duty military service.

Results

MyCAA Application

MyCAA applicants were more likely than eligible nonapplicants to: (1) live in the South, (2) live in states with higher unemployment rates, (3) have two or more dependent minor children in the household, (4) be married to enlisted NCOs in the pay grade of E-5, (5) be married to Army personnel, (6) be married to personnel who had at least one PCS move since 2007 and during their marriage, and (7) be married to personnel who had been deployed since 2007 and during their marriage.

All eligible applicants whose study plans met the MyCAA criteria were approved for scholarships, although 19 percent did not end up using any funds due to loss of eligibility or other reasons not apparent from the data sources. MyCAA applicants in our cohort who were least likely to use their funds were Army spouses, spouses who are men, spouses whose sponsors had no PCS moves by December 2011, and spouses whose sponsors either were of lower enlisted

ranks (E-1 through E-3) or were promoted to E-6 (beyond the MyCAA eligibility window) by December 2011.

Known MyCAA Completion

MyCAA data indicate that at least 34 percent (11,756) of users in our 2010/2011 cohort completed their MyCAA plan by the end of their three-year scholarship window. The data also show that 44 percent of users (15,286 spouses) were no longer eligible for MyCAA by the end of the scholarship period, so it is possible that some of those students completed their plans for a degree or certificate on their own, after they were no longer using MyCAA funds, but their achievements were not reported to MyCAA. The remaining 22 percent of MyCAA fund users were eligible for additional funds throughout the scholarship period, but did not appear to have completed their plan by December 2014.

Many of the demographic and military service characteristics that mattered for application to MyCAA were not significantly or substantively associated with known plan completion. Controlling for other factors, number of children was not significantly associated with known completion. Still, spouses married to service members in entry-level pay grades were less likely to have documented plan completion. School, plan, and academic factors were associated with known completion. Spouses who were more likely to be known to complete a plan were more likely to be: living in areas with higher state unemployment rates; attending for-profit schools; pursuing certificates and licenses (rather than associate's degrees); preparing for medical careers such as medical billing, health administration, or dental hygiene; not failing any classes; taking classes at multiple schools/campuses; attending schools that offer classroom instruction; and attending schools with state, national, or regional accreditation.

MyCAA plan completion is one metric of MyCAA Scholarship success; however, we note that spouses who do not complete their plan may still gain valuable skills or a competitive edge from the classes they do take. For example, a spouse could learn a new software package or website design and be able to market and employ those skills at work. Indeed, the earnings findings are consistent with this possibility.

MyCAA Relationship with Spouse Employment

On average, MyCAA-eligible military spouses worked less over time (2007–2013). Known MyCAA plan completers were as likely as nonuser spouses to be working prior to 2011 but less likely to be working during the MyCAA application window selected for our study. By 2013, however, known MyCAA plan completers were more likely than nonusers to be employed. In 2013, 58 percent of known plan completers were working compared to 53 percent of nonusers, and that difference is statistically significant.

Although a spouse's use of a MyCAA Scholarship is associated with higher employment in 2013, these analyses do not permit us to conclude that MyCAA completion *caused* higher rates of employment. It could be that the MyCAA Scholarship users would have been more likely than their counterparts to be working in 2013 regardless, and MyCAA funds helped those spouses who had a greater need or desire to work. It is also possible that without MyCAA guidance and funds those scholarship recipients would not have worked at as high a rate in 2013. Our results are consistent with either interpretation. Still, our analyses have ruled out many other factors besides MyCAA use, such as geographic relocations or number of children, that could explain the differences in employment between known completers and nonusers.

MyCAA Relationship with Spouse Earnings

For working spouses in our cohort who were eligible for MyCAA but did not receive any scholarship funds, earnings grew steadily from 2009 to 2013. The average annual earnings of working MyCAA users, however, diverged below those of working nonusers in the years before they applied for the scholarship. Average earnings for working MyCAA users declined between 2009 and 2011. Our MyCAA user cohort applied to MyCAA any time from October 2010 through December 2011. From 2011 to 2013, our working MyCAA users' average annual earnings increased. Although slight, the earnings grew more rapidly for both MyCAA starters and known MyCAA plan completers after 2011 relative to nonusers. The relationship between a spouse's use of MyCAA and average annual earnings is a correlation, and should not be interpreted as causal. From the statistics, we cannot conclude that MyCAA use caused higher earnings relative to 2011, just that it is associated with higher earnings in 2013 relative to 2011. It could be that these spouses would have experienced the same earnings growth in 2013 even without the existence of MyCAA, or it could be that without MyCAA spouses who wanted or needed to work could not have received the training necessary to improve their earnings in 2013. The results are consistent with either interpretation. Our analyses have ruled out many other factors besides MyCAA use that could explain the differences between the average annual earnings of known MyCAA plan completers, MyCAA starters, and MyCAA nonusers who work.

MyCAA Relationship with Service Member Continuation on Active Duty

MyCAA usage is positively associated with service member continuation. For example, when we examine personnel who had three years of service in 2011, we see that 43 percent of service members whose spouses did not use MyCAA were still on active duty in 2014, while 52 percent of service members whose spouses did use MyCAA were still on active duty in 2014. For service members in each years-of-service category, the difference between those married to MyCAA users and those married to nonusers is statistically significant. Even after statistical models controlled for other factors that could explain differences between the two populations (such as age or pay-grade differences), service members married to MyCAA users were still more likely to be on active duty in 2014 than those married to nonusers.

The relationship between the service member continuing to serve and the spouse using MyCAA is a correlation, and should not be interpreted as causal. The findings could reflect some combination of MyCAA having a positive impact on spouses' and service members' preference to be in the military, as well as MyCAA supporting spouses of service members who already have a greater preference for or compatibility with military service.

Private For-Profit Schools

Congressional leaders have expressed concern over MyCAA funds being allocated to support spouse attendance at for-profit schools (Harkin, 2010a), so we examined MyCAA plan progress and outcomes by school type. MyCAA users in our cohort who were attending MyCAA-approved private for-profit schools were less likely to fail a course under their educational plan than were users attending a public nonprofit institution. Additionally, spouses' completion rates for these plans to obtain a license, certificate, or associate's degree were slightly higher among spouses who attended private for-profit schools.

In terms of employment patterns observed in this early evaluation of MyCAA, after controlling for the common decline in military spouses working, known plan completers studying at private for-profit institutions were more likely to be working in 2013 relative to 2009, while known completers at public nonprofit institutions were no more or less likely to be working in 2013 relative to 2009. For-profit plan completers as a group experienced greater growth in employment by 2013 than plan completers from public nonprofit institutions. Additionally, earnings after the MyCAA application window among known MyCAA plan completers grew faster for the spouses that attended for-profit private institutions than for known completers attending other institutions.

Degrees sought from nonprofit public institutions may differ from degrees sought from for-profit private institutions. Notably, a larger fraction of users attending for-profit private schools are seeking certificates relative to users attending nonprofit public schools. Certificate programs are shorter in intended duration, so students can enter or return to the workforce sooner. Thus, our interpretation is not that the outcomes of one school type are necessarily superior to those of another, but rather that at this point there is not systematic evidence that MyCAA-approved private for-profit schools yield persistently worse outcomes.

Limitations

Here we highlight the main limitations of this study to help avoid misinterpretation of the results.

- Our evaluation of MyCAA included the population of spouses of active-duty service members eligible for the MyCAA Scholarship between October 2010 and December 2011. The patterns for new cohorts may differ.
- Not all potentially relevant factors related to desirable scholarship outcomes were observable. For example, the datasets do not include indicators of this cohort's education,

academic aptitude, or motivation, life events that could disrupt education or employment, other sources of funding for higher education or job training, number of hours or months worked, wage or salary, type of jobs held, and reasons for not working.

- The MyCAA Scholarship data likely underestimate student plan completion. Sixty-six percent of spouses who used funds but are not recorded as having completed their plans may simply have no longer been interacting with MyCAA because they lost their eligibility for further funds. Eligibility could have been lost because the spouse is no longer married to an eligible service member, the spouse enters active-component military service, the service member is promoted beyond eligibility, or the spouse had already used the maximum amount of MyCAA funds. In these cases, MyCAA users have little incentive to update their MyCAA profile to record subsequent educational achievements.
- Some of the completion results may be driven by very low completion rates at a few schools.
- Spouse employment and earnings data available for this study extended only through December 2013. Since spouses have three years to complete their MyCAA plan, spouses in our cohort receiving initial approval for their program of study in December 2011 would have until December 2014 to complete their plan. Thus, employment and earnings trajectories do not yet extend beyond the scholarship window. Consequently, we refer to our evaluation as an early evaluation, as ideally these data would extend far enough to allow all students to have completed their study, obtained a job in their chosen career field, and/or experienced a PCS move.
- Our data use agreement with SSA required that they maintain possession of their data (rather than transfer it) and execute our analytical programs on the linked SSA and DMDC dataset. SSA conducts a privacy review of the aggregated output before providing it to us. Due to SSA's computational limitations and other competing mandatory obligations, we were not able to evaluate all potential robustness checks of our models within the agreement's time frame. Fortunately, the analyses we were able to conduct revealed consistent results, which we report in Chapter Five. Additionally, we were unable to follow up on the earnings results to narrow the relevant comparison group to spouses with similar pre-MyCAA labor market experiences. Thus, at this stage our analysis was not able to suggest whether the associations with MyCAA were likely due to selection and/or causal mechanisms.
- We cannot speak specifically to service member reenlistment decisions because we did not have reenlistment dates in our dataset. Instead, we evaluated service member continuation on active-duty service between December 2011 and 2014. Again, we note that the findings for more recent cohorts may differ from our results, as factors such as changes in the U.S. economy and military retention goals could influence the observable patterns.
- The statistical model estimates express correlations, but not necessarily causal relationships.

Implications

- The results of RAND's early evaluation of MyCAA are consistent with MyCAA supporting the intended population: early-career spouses who want or need to work, spouses that may be more vulnerable economically.

- The results of RAND's early evaluation of MyCAA are also consistent with MyCAA having the desired effect on spouse education, employment, and earnings. They cannot confirm causation, but they also do not refute it. Additionally, MyCAA use is associated with service member continuation. Although not all possible factors are represented in the dataset (e.g., spouse motivation), our models have ruled out many competing factors that could otherwise explain differences between user and nonuser groups, such as differences in age, pay grade, deployments, number of children, and PCS moves.

Recommendations

- Ensure that spouses across the services are aware of the MyCAA Scholarship. Service differences associated with spouses' application to MyCAA could reflect unevenness in desire or need for assistance, but it could also suggest unevenness in awareness of the scholarship.
- As known completion rates are lower among spouses of new enlistees, consider targeted outreach or a minimum service requirement for spouses of new military personnel. New families may be adjusting to military life and a new installation, and new enlistees are at greater risk for attrition: Both may contribute to lower MyCAA plan completion rates.
  - If adopting a minimum service requirement, permit waivers on a case-by-case basis (e.g., if the spouse has already been successfully pursuing an associate's degree).
- Where feasible, help students look for alternatives to industry accredited schools and schools that offer only online instruction.
- Develop a process for withdrawing approval for schools with high course failure and plan noncompletion rates. Ensure, however, that schools are not penalized for attracting disadvantaged or higher-risk students—only for providing a poor-quality education.
- Develop benchmarks for midpoint plan reviews to help identify spouses that may need additional support or guidance from a career counselor.
- Make career counselors aware of courses of study with high course failure or plan noncompletion rates so they can take care to ensure that spouses understand what is involved. Routinely monitor these metrics through MyCAA data.
- Actively encourage MyCAA users who are dropping classes to do so officially, so DoD receives a refund and the school does not record the classes as "failed."
- Initiate contact with students who failed a course, to understand context (e.g., poor school-student fit, competing obligations, particularly challenging courses), and to offer them help to figure out how to address what happened.
- Recognize that MyCAA completion metrics likely underestimate completion, as some spouses likely complete their course of study after they are no longer eligible for MyCAA funds, and thus that completion would not typically be reported to MyCAA.

Suggestions for Future Research

- Additional years of employment and earnings data would reveal the longer-term relationship with MyCAA use as more young spouses complete their education, move into the workforce, and experience PCS moves.

- Defining the nonuser comparison group so that its pre 2010/2011 trajectory looks like the MyCAA user group would allow the model to better assess whether the data support or refute a causal relationship argument.
- If MyCAA were to collect information about spouses' education intentions (e.g., first post-secondary training/education, change of career field, expand or enhance existing skills) then future research could examine associations between intention and outcomes. The results might reveal differences that could have implications for the design and implementation of the scholarship, including outreach and tailored support.
- Conduct further analyses to understand differences in outcomes by career goals to help evaluate the list of approved portable careers for MyCAA Scholarships.

Concluding Remarks

This early evaluation of the MyCAA Scholarship initiative finds results that are consistent with MyCAA supporting the intended population of early-career spouses who want or need to work. Additionally, use of the MyCAA Scholarship by an eligible spouse is associated with near-term higher rates of employment for that spouse and greater service member continuation.

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Past research has shown that compared to spouses of U.S. civilians, spouses of U.S. military personnel tend to earn less and are more likely to be unemployed or underemployed, even when they have more years of education or more work experience. To mitigate the impact of the demands of military life, in 2007 the Department of Defense established a portfolio of initiatives that provide career development and employment assistance for military spouses. One such initiative is the My Career Advancement Account (MyCAA) Scholarship, which targets spouses whose service member is early in his or her career. The scholarship provides up to $4,000 in financial assistance for spouses pursuing associate's degrees, occupational certificates, or licenses in portable career fields.

This report examines characteristics associated with MyCAA Scholarship application and use, scholarship plan completion, spouse employment and earnings, and service continuation of personnel married to MyCAA-eligible spouses. RAND examined the 2007–2013 employment and earnings data of spouses who were eligible for MyCAA when the current version of the scholarship began (between October 2010 and December 2011). The results show that MyCAA Scholarships are reaching the intended population; that MyCAA is associated with employment and higher earnings (although the relationship is not necessarily causal); and that service members of MyCAA Scholarship users are more likely than similar married service members to be on active duty three years after the spouse is awarded the scholarship.

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