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A Quantitative Analysis of the Relationship among Sources of Aid and Predictors of Student Veteran Graduate and Persistence

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Abstract

This study uses multinomial logistic regression models to identify significant predictors of graduation and persistence for veteran and military-affiliated students ($n=1,141$) at one veteran-friendly, not-for-profit institution. Several statistically significant predictors of graduation and persistence for veteran and military-affiliated students are unique when compared to the literature on the general student population, such as the positive effect of part-time enrollment and the negative effect of continuous enrollment. In addition, comparisons are made among subgroups of the students based on the source of their financial aid (e.g., government, institutional, no veteran or military aid). Distinct policies designed to assist veteran and military-affiliated students are suggested as well as individual policies to support subgroups of these students. Unique institutional policies that may have a positive impact on the subgroups of students include encouragement for part time enrollment for veteran and military-affiliated students who are not using government funded veteran and military aid and assistance with stop outs (temporary withdrawals from higher education) and returns for those using government funded veteran and military aid. Federal policy implications, such as the impact of the 36-month limit on Post 9/11 GI Bill funding, are discussed.

Keywords: Veteran, Military, Student, Financial Aid, Success

Introduction

The Federal Government spent approximately \$14 billion in 2015 on Veterans Administration educational benefits (Department of Veteran Department of Veterans Affairs, 2017) and approximately \$540 million on Department of Defense education benefits (United States Government Accountability Office, 2014). Approximately 55 percent of military undergraduates and 42 percent of military graduate students received veteran benefits in 2011–2012 (Radford, Bentz, Dekker, & Paslov, 2016). However, the federal government did not historically track student veteran persistence or graduation rates (Mikelson & Saunders, 2013).

Individual higher education institutions add to the total invested in veteran or military aid by participating in the Yellow Ribbon Program, not charging veterans out-of-state tuition, and providing direct institutional grants to veterans, active duty military students, and their dependents. Given the sizeable investment of public and institutional resources in veteran and military education benefits, understanding the unique factors related to retention and graduation of veteran and military-affiliated students is crucial. In addition, the factors related to graduation and persistence for students who use each form of aid (government versus institutional versus no military-related aid) may differ. This information is critical to enhancing the success of students and ensuring that continued investment of funds is accompanied by appropriate support for the significant predictors of success.

This study tested the relationship between the sources of financial aid (government, institutional, no military-related aid) used by a group of 1,141 veteran and military-affiliated students and their graduation and persistence behaviors over the first 18 semesters of enrollment. The

students were enrolled any time between Fall 2006 and Spring 2016. Of the students in the study, 350 used government veteran or military aid, 387 used institutional veteran or military aid, and 404 used no veteran or military forms of aid.

The study setting is a veteran-friendly, not-for-profit institution in New York state that has been recognized on a national level for its service to veterans, military, and dependents. This college participates in the Yellow Ribbon Program and offers institutional aid and discounts to veterans, active duty military, guardsmen, reservists, and dependents, even if Veterans Affairs (VA) or Department of Defense (DOD) benefits are not available. Programs of study include undergraduate, graduate, and doctoral programs in healthcare, business, and education.

There are several government-funded veteran and military aid programs in use (Caspers & Ackerman, 2013). Eligibility depends on dates of service, disability status, and reserve status. Many of these programs are referred to by chapter number.

- Chapter 30 - The Montgomery GI Bill - for active duty service members
- Chapter 31 - Vocational Rehabilitation and Employment - for veterans with service-connected disabilities
- Chapter 33 - Post 9/11 GI Bill - for veterans and service members who served after September 10, 2001. These benefits may be transferred to a spouse or dependent.
- Chapter 35 - Fry Scholarship or the Survivors and Dependents' Educational Assistance Program - spouses and dependents of service members who died in the line of duty or who are permanently and totally disabled due to a service-related condition
- Chapter 1606 - Montgomery GI Bill-Selected Reserve – for reservists
- Chapter 1607 - Reserve Educational Assistance Program - for reservists who were called or ordered to active duty in response to a war or national emergency declared by the President or Congress
- Additional benefits are available for those participating in a direct commissioning program or on active duty through the military tuition assistance program.

Institutions may choose to enter into a Yellow Ribbon Agreement with the Veterans Administration. These institutions decide how much additional funding to provide to the student in addition to their GI Bill benefits. Whatever amount the institution provides in additional funds is matched by the VA; and the funding is provided directly to the institution. In this study, participants using Yellow Ribbon Funding, in addition to government funded aid, were classified as using “government funded aid.” Some institutions, including the one in this study, also provide substantial tuition discounts to veterans and their dependents when no government funded aid is available. People using these discounts were classified as using “institutionally provided aid.”

In this study, some veteran or military-affiliated students did not use any veteran or military financial aid. This is often the case when a more generous institutional or private scholarship was available to the student, which necessitated a choice to decline veteran or military related aid.

This study incorporated multinomial logistic regression models to determine significant predictors of graduation and persistence for veteran and military-affiliated students (n=1,141). This study is unique in that it focuses on the sources of financial aid of veterans and military-affiliated students. Some of the predictors of success for this population are different than the factors in the literature on the general student population, including the positive impact of part time enrollment and stop outs (e.g., a break in enrollment of two or more consecutive semesters exclusive of summers) on

persistence and graduation, and the effect of remedial¹ coursework. This study's findings include that there is a statistically significant difference in the likelihood of graduation and persistence based on source of aid used, and that the predictors of graduation and persistence were different by source of aid used. Specific policies are suggested to support positive outcomes of veteran and military-affiliated students. The results provide a critical starting point for theories considering whether veterans and military-affiliated students who use different sources of aid may benefit from different policies and supports. This information is essential for deliberate policy decisions at the federal and institutional levels where individual aid programs could be enhanced with specific policies designed to encourage the best possible retention and graduation outcomes of the recipients

Literature Review

This study builds on the work of many authors, including those who study student veterans, success factors in the general student population, and the relationship between financial aid and student success. The relative paucity of literature and data on which to base comprehensive studies of student veterans led to the use of the extensive literature on the general student population. An important outcome of this process is that it allowed for this study to test whether the predictors of success in the general student population were consistent with the predictors of success of the veteran and military-affiliated students in this study.

Student Veteran Studies

Many studies of student veterans and their success have focused on describing the experiences of veterans on college campuses and the environmental factors such as services that institutions provide (Ackerman & DiRamio, 2009; Cook & Kim, 2009; Sponsler et al., 2013; Rumann & Hamrick, 2010; Vacchi, 2012). None to date have specifically focused on the differences in the success factors of students using veteran or military financial aid based on the funding source of the aid.

In a Rand report prepared for the Office of the Secretary of Defense that recommends priorities for future research, Martorell and Bergman (2013) suggested how veterans' benefits affect retention and educational outcomes of veterans be studied. Cate (2014a) claimed that further research is needed into the relationship between individual traits and completion rates of student veterans; however, a study prepared for the leading student affairs professional organization, NASPA, concluded that "few institutions are disaggregating retention and completion data in ways that allow for unique tracking of active duty and student veteran populations ... a factor hindering assessment of the effectiveness of student supports designed to reduce stop-out and dropout among these student groups" (Sponsler et al., 2013, p. 4). This makes it difficult to produce studies involving the factors related to outcomes of retention and graduation of this group of students.

Vacchi (2012) argued that colleges can help student veterans succeed by making small adjustments to policies that respond to specific needs of groups of veterans. He suggested focusing on correcting potential obstacles with policy changes and services designed with veterans in mind. For example, payments under the GI Bill may not be received by a college until several weeks after the start of a semester. Many colleges send out delinquent payment notices and some colleges forcibly

¹ The term remedial coursework refers to courses required for students who are considered to be underprepared to complete college level course work in a particular field, usually reading, writing or math skills. Although some readers may find the term to be derogatory, this is the generally accepted term used within educational publications.

withdraw students who have outstanding balances after the first week or two of classes. Accommodating veterans with a policy that recognizes the typical payment timeframe of the government may be appropriate.

Durdella and Kim (2012) studied the impact of student veteran characteristics on the outcomes of GPA and a sense of belonging, since these variables are related to the general student populations' intentions to persist. In their sample of 163 veterans across nine campuses, they found that both GPA and the measure of a sense of belonging were both lower amongst veterans as compared to nonveterans and that the relationship between GPA and veteran status was statistically significant, which they conjecture may have been related to the majors selected by the veterans.

A concerted effort to fill the gap in information pertaining to student veterans was undertaken as a joint effort by the Student Veterans of America, the National Student Clearinghouse, and the US Department of Veterans Affairs Veterans Benefits Administration. The Million Records Project analysis included approximately 800,000 randomly selected student veterans who used Montgomery and Post 9/11 GI Bill benefits initially between 2002 and 2010 (Cate, 2014b). This was approximately 22% of the veterans who used these benefits during this time period. By combining data from multiple sources, outcomes of these students were measured for the first time. In this study, approximately 51% of those in the sample completed a degree or certificate. This study also included a comparison of the student veterans who used exclusively Montgomery GI Bill benefits versus those who used Montgomery GI Bill and Post 9/11 GI Bill benefits in combination. Those who used a combination had a slightly higher completion rate and a slightly higher percentage of science and engineering degrees. Exclusive use of Post 9/11 GI Bill benefits was not included in this study due to the limited time between its start date and the end of the study period. However, this study was limited exclusively to student veterans, and specifically, to those using these two benefit programs. Dependents, spouses, surviving spouses, active duty service members, and veterans using other forms of benefits were excluded from this study.

A follow-up report by the same organizations claimed that veterans and active duty military members who used Post 9/11 GI Bill benefits between August 2009 and December 2013 are more likely to graduate than other students (Cate, Lyon, Schmeling, & Bogue, 2017). This study included the entire population of 853,111 veterans and active duty military students who used their Post 9/11 GI Bill benefits during the study time frame, but excluded dependents to whom benefits were transferred. This study included measures of persistence, attrition, and full-time versus part-time enrollment in addition to completion data. The authors found that 71.6% of their population either graduated (53.6%) or was still enrolled in the last semester of the study (18%). A majority, or 54.2% of the population, withdrew before the end of a term at least once, but a majority of those who withdrew (52.3%) also eventually completed their degree or certificate. Only 12.6% of the population were enrolled full time every semester. In addition, the authors found increased full-time enrollments when students were using Post 9/11 GI Bill benefits compared to Montgomery GI Bill benefits. In the report, the authors suggested the need for further studies that include dependents and other forms of veteran and active duty education benefits to test whether the findings of this study remain consistent for dependents and veterans using other chapters of benefits.

The Cate et al. (2017) study is the most relevant to this research project, not only because the authors suggested including dependents and all forms of veteran aid, but also because they addressed the same outcomes as this study: students who graduated or are still enrolled. In addition, they considered the influence of withdrawals before the end of the semester, and they studied part time and full-time enrollments. Several of these success factors have been studied in the general student population as well. The next section will introduce several studies of student success factors related to graduation and persistence.

Student Success Factors

There is an extensive body of literature related to the significant predictors of college student persistence and graduation in the general student population. Several of these factors are used in this study to determine if they are predictive of veteran and military-affiliated student graduation and persistence behaviors and whether there are differences among the predictors for groups based on the source of financial aid used by the student.

These traditional attributes include academic progress/success factors as identified by Adelman (2006) and Serra Hagedorn (2012). Adelman (2006) studied students who attended a college that awards bachelor's degrees or above, within eight years after graduating from high school, with a focus on the factors related to eventually completing a bachelor's degree. He concluded that completing college level math credits by the end of the second year of enrollment, greatly increased the odds of the student eventually completing a bachelor's degree. Completion of more than four credit hours in summer semesters also had a positive relationship with degree completion. Continuous enrollment, defined as not stopping out for two or more consecutive semesters (exclusive of summers), dramatically increased the odds of degree completion. However, completing less than 20 credit hours by the end of the first year of enrollment, and part-time enrollment, both reduced the odds of bachelor's degree completion. Completion of remedial courses did not have a statistically significant effect in Adelman's study.

Serra Hagedorn (2012) suggested the use of the successful course completion (SCCR) ratio as a measure of a student progress toward his or her goals. This measure is calculated by dividing the total number of courses with a passing grade by the number of courses attempted. This measure is meant to help understand the retention rates of colleges and persistence behaviors of students. A higher SCCR was indicative of a higher persistence rate.

Student Financial Aid

Financial aid is the focus of many studies related to the general student population, as well as historical studies of veterans. Lovenheim and Owens (2014) found that loss of eligibility for federal financial aid by an individual due to drug-related crime convictions negatively impacts enrollment decisions. However, when considering a loss of eligibility for federal aid by the institution, Darolia (2013) found that institutions that lost eligibility for participation in Title IV aid programs had lower new student enrollments but the change did not seem to influence the persistence behaviors of current students.

Dynarski and Scott-Clayton (2013) suggested that the study of financial aid programs traditionally asked if the aid program increased enrollments of students. Policy makers are now more interested in a broad range of outcomes of student aid programs including persistence, performance, and completion. They noted that several recent studies suggest that financial aid can increase persistence and graduation rates of those who are eligible, although grant aid with performance requirements for continuation seemed to have an effect, while those without did not.

Many studies of the outcomes of persistence and graduation related to financial aid focus on specific groups of students based on income levels or ethnicity. Goldrick-Rab, Kelchen, Harris, and Benson (2016) found that additional grant aid increased bachelor's degree completion rates for low-income students. Gross, Torres, and Zerquera (2013) focused their study of the impact of financial aid on Latino students and found that need based state grants, encouraged persistence among Latino students, more so than peers from other racial/ethnic groups. No significant, direct relationship was found between graduation and federal grants and loans for Latino students. In other words, the source of the financial aid proved important in studying its effect on student behavior. And amongst

California Community College students, those who had multiple sources of aid had higher success rates related to graduation and transfer outcomes (Campbell, Cochrane, Love, & Bruecker, 2017).

Studies of the impact of veteran education benefits include several historical studies including one that used the 1987 survey of veterans' data. Angrist (1993) found that veteran educational benefits from the Korean GI Bill and the Veteran Educational Assistance Program (VEAP) increased schooling completed post service by 1.4 years. Bound and Turner (1999) also found that GI Bill benefits modestly increased schooling completed by World War II veterans.

However, all of the studies to date have been limited to government funded veteran financial aid and focused specifically on veterans, without including all of the other categories of military affiliated students. This study will address both of these gaps in the literature.

Research Questions and Methodology

This study tested the relationship between the sources of financial aid (government, institutional, no-military related aid) used by a group of 1,141 veteran and military-affiliated students and their graduation and persistence behaviors over the first 18 semesters of enrollment using longitudinal data. The students were enrolled at one private, liberal arts institution in New York state anytime between Fall 2006 and Spring 2016. Of the students in the study, 350 used government veteran or military financial aid, 387 used institutional veteran or military financial aid, and 404 used no veteran or military forms of financial aid.

Data on up to 18 semesters of enrollment were collected for each student identified as part of the study sample. Variables included in the study were:

1. enrollment characteristics: level of enrollment defined as undergraduate or graduate; number of semesters enrolled; part-time status; continuous enrollment; remedial coursework; completing 20 or more credit hours during the first year; withdrawing from greater than 20% of courses attempted; successful course completion ratio; and completing at least one math course by the end of the second year and
2. veteran/military financial aid information: number of semesters of benefits used; chapter/type of benefits used

Two research questions were addressed in this study. The first is related to whether the source of aid is related to graduation, persistence, and stop-out behaviors. The second focuses on the statistically significant predictors of graduation and persistence for this sample of students. Below are the two questions explored in this study and a brief description of the methodology used to answer these questions.

Research Question 1

The first question addressed in this study focuses on the various sources of aid and whether there is a relationship between source of aid and enrollment behaviors. Question 1: Are graduation, persistence, and stop out behaviors statistically related to the source of aid that a veteran or military-affiliated student uses? A chi-square test of independence was conducted to determine if the variable of type of aid used (government veteran or military aid, institutional veteran or military aid, or no veteran or military aid used) was statistically independent of current status (graduated, stilled enrolled, not currently enrolled).

Research Question 2

The second question addressed whether graduation and persistence can be predicted by variables for this group of students. Question 2: What are the statistically significant predictors of graduation and persistence for veteran and military-affiliated students? A multinomial logistic

regression model was created using a combination of predictors from the literature on student success.

$$Y_i = \beta_0 + \beta_1(SCCR) + \beta_2(PT_i) + \beta_3(math_i) + \beta_4(20\ credits_i) + \beta_5(continuous\ enrollment_i) + \beta_6(remedial_i) + \beta_7(summer_i) + \beta_8(Govt\ aid_i) + \beta_9(Inst\ aid_i) + \epsilon_i.$$

Where:

- $Y_i =$ 1 = graduated
 2 = enrolled in last semester of the study
 3 = not enrolled in last semester of the study and has not graduated
- $SCCR_i =$ Successful Course Completion Ratio
- $PT_i =$ Number of semesters of part time enrollment
- $Math_i = 0 =$ No math credits earned by the end of the 6th semester
 1 = Math credits earned by end of 6th semester
- $20\ credits_i =$ 0 = Did not complete 20 credits by the end of the 3rd term
 1 = Completed 20 credits by the end of the 3rd term
- $Continuous\ enrollment_i =$
 0 = break greater than one consecutive semesters (exclusive of summers)
 1 = continuously enrolled
- $Remedial_i =$ 0 = no remedial course work
 1 = enrolled in remedial coursework
- $Summer_i =$ 0 = less than four summer credit hours completed
 1 = four or more summer credit hours completed
- $Govt\ Aid_i =$ Used Government veteran or military aid (omitted in aid specific models)
- $Inst\ Aid_i =$ Used institutional veteran or military aid (omitted in aid specific models)

The first model included all students in the study to determine statistically significant predictors of graduation and persistence (defined as being enrolled in the last semester of data collection). The data were then segmented by type of aid used and the model was used to analyze each group to determine the statistically significant predictors of graduation and persistence.

Results

Are graduation, persistence, and stop out behaviors statistically related to the source of financial aid that a veteran or military-affiliated student uses? The result of the chi-square test was statistically significant at the .001 level, $\chi^2(4, N=1,141) = 317.289, p = .000$ suggesting that there is a statistically significant difference in outcomes based on the type of financial aid used. Table 1 below includes the distribution of student status by type of aid used.

Table 1

Cross tabulation source of aid by status

	Used Government Veteran/Military aid	Used institutional veteran or military aid	Used neither form of aid	TOTAL
Graduated	130	178	44	352
Currently enrolled	92	68	303	463
Not currently enrolled	128	141	57	326
TOTAL	350	387	404	1141

Follow-up analyses were conducted to determine the statistically significant predictors by source of aid. First, the predictors of graduation and persistence amongst all students were determined. Next, predictors were determined for each subgroup by source of aid used. Table 2

presents the beta values and statistical significance of the variables for each of the four models when predicting graduation and Table 3 provides the output for each of the four models when predicting persistence as compared to those not currently enrolled.

Table 2
Factors Related to Graduation (referent group: not currently enrolled)

	All students β	Gov't aid β	Institutional aid β	No veteran or military aid β	***p <.00 0 **p <.01 *p <.05
Intercept	-9.141***	-6.827***	-15.075***	-10.519*	
Successful course completion ratio	.101***	.084***	.160***	.086*	
Number of semesters of part time study	.278***	.163	.394***	.736***	
Earned math credits by end of 6 th semester	-.223	-.693	.245	-.012	
Completed 20 or more credits by end of 3rd semester	1.298***	.865	.969	4.350***	
Continuous enrollment	-1.802**	-2.001*	-1.369	-1.762	
Completed remedial coursework	-.283	.100	-.142	-1.680**	
Completed more than 4 summer credit hours	1.491***	1.713***	1.157**	1.721*	
Used government aid	.145	-	-	-	
Used institutional aid	.056	-	-	-	
Model correctly predicts	68.8%	66.6%	68.4%	78.9%	

Table 3
Factors Related to Persistence (referent group: not currently enrolled)

	All students β	Gov't aid β	Institutional aid β	No veteran or military aid β
Intercept	-1.564*	-3.261**	-11.597***	-1.033
Successful course completion ratio	.045***	.049***	.123***	.024**
Number of semesters of part-time study	.169**	-.010	.451***	.395*
Earned math credits by end of 6 th semester	.231	-.455	1.535**	.185
Completed 20 or more credits by end of 3rd semester	.627*	-.070	1.111	2.007***
Continuous enrollment	-1.025	-.789	-2.665*	-.312
Completed remedial coursework	-.350	.092	-.444	-1.057*
Completed more than 4 summer credit hours	-.277	.150	-.270	-.496
Used government aid	-	-	-	-
Used institutional aid	1.805***	-	-	-
Model correctly predicts	68.8%	66.6%	68.4%	78.9%

***p<.000 **p <.01 *p <.05

Key findings of this study that differ from the general student success literature, include the impact of part-time enrollment, continuous enrollment, and remedial coursework. In this study, veteran and military-affiliated students increased their odds of graduating and persisting in a

statistically significantly manner, by increasing the number of semesters of part-time study and taking a break in enrollment of two or more consecutive semesters exclusive of summers. In addition, completing remedial coursework had a statistically significant negative effect on the probability of persistence and graduation in the group that used no veteran or military financial aid. Further study is encouraged to determine the reason for this finding. Possible reasons include the fact that remedial courses delay enrollment in college level courses and therefore extend the time and money necessary to graduate, making graduation less likely, or that these students were truly unprepared for college level work and were not successful in their pursuits. Additional research on this topic is encouraged to determine the nuanced reasons for this finding.

Additional differences were found; however, they were not statistically significant predictors in several of the models in this study. Further research is needed to test the statistical significance of these variables in other samples of this population. An important note is that only 37 students in the study took a break of more than one consecutive semester exclusive of summers and were coded as not continuously enrolled. Several findings in this study related to not being continuously enrolled were statistically significant, but further research with larger sample sizes is encouraged.

Specific results of each model for each subgroup are summarized below. The results are presented by student group to facilitate use of the results by policy makers.

All Veteran and Military-Affiliated Students

The results in table 2 (above) show that for all veteran and military-affiliated students included in the study, statistically significant predictors of graduation relative to not being enrolled include higher SCCR, a larger number of semesters of part time study, completing more than 20 credit hours by the end of the third semester, and completing more than four summer credit hours. The odds of graduating were statistically significantly decreased by being continuously enrolled (not stopping out, defined as not being enrolled for greater than one consecutive semester exclusive of summer terms).

Persistence for all veterans and military-affiliated students is statistically significantly related to higher SCCR, a larger number of semesters of part time study, and completing more than 20 credit hours by the end of the 3rd semester. Using government aid and using institutional aid statistically significantly decreased the odds of being enrolled in the last semester of data collection for the study.

Students using Government Funded Veteran or Military Aid

The second column of table 2 (above) includes just those students who used government funded veteran or military aid. For this group, having a higher SCCR and completing more than four summer credit hours were statistically significantly related to increased odds of graduating. However, being continuously enrolled (not stopping out for greater than one consecutive semester exclusive of summer terms) statistically significantly predicted decreased odds of graduating. The odds of being currently enrolled in the last semester of the study was statistically significantly related to having a higher SCCR.

Students using Institutionally Funded Veteran or Military Aid

Of the students who used institutionally-funded veteran or military financial aid, it was found that the following variables statistically significantly predicted increased odds of graduating as compared to not being currently enrolled: a higher SCCR, a larger number of semesters of part time study, and completing more than four summer credit hours.

Increased odds of persistence were statistically significantly related to having a higher SCCR, a larger number of semesters of part-time study, and earning math credits by the end of the sixth

semester. A decrease in the odds of persistence was related to being continuously enrolled (not stopping out for greater than one consecutive semester exclusive of summer terms) for this group of students.

Students using no Veteran or Military Aid

Students who used no veteran or military aid showed a statistically significant increase in odds of graduating related to higher SCCR, a larger number of semesters of part time study, completing more than 20 credit hours by the end of the third semester, and completing more than four summer credit hours. However, completing remedial coursework statistically significantly predicted decreased odds of graduating.

Increased odds of persistence for this group was statistically significantly related to higher SCCR, a larger number of semesters of part time study, and completing at least 20 credits by the end of the third semester. Completing remedial coursework statistically significantly predicted decreased odds of being enrolled in the last semester of the study.

Discussion

The findings of this study suggest that while there are many similarities between the general student population and the veteran and military-affiliated population, there are some differences which may be best served by unique institutional and federal policies designed to encourage persistence and graduation. In addition, the subgroups by source of aid have some unique predictors which suggest that distinct policies by subgroup may also be beneficial. In addition, federal policies and aid programs should be designed to support the persistence and graduation goals of veteran and military-affiliated students.

The following is a list of institutional policy and practice suggestions based on the findings of this study.

1. Create supportive leave and return policies that will allow veteran and military-affiliated students to stop out and return² (most important for those using government provided veteran and military aid and institutional aid).
2. Assist veteran and military-affiliated students who desire to enroll part time for one or more semesters through supportive policies related to financial aid and program deceleration if necessary² (not necessarily true for those using government veteran and military aid).
3. Create aid and scheduling policies that encourage completion of four or more summer credit hours.
4. Create scheduling and advisement options that encourage completion of 20 credit hours in the first calendar year of enrollment (particularly important for those using no veteran or military aid).
5. Measure and track SCCR and provide appropriate support services for veteran and military-affiliated students with low scores.
6. For veteran and military-affiliated students who are using institutional aid, encourage completion of math credits by the sixth semester of enrollment.

² These suggestions and policies may be unique to a veteran and military-affiliated population as these findings are not consistent with the literature on the general student population.

7. For veteran or military-affiliated students who are not using veteran or military-affiliated aid, provide additional support and resources for those who complete remedial courses to encourage persistence and graduation.

In some cases, the findings in this study of veteran and military-affiliated students are consistent with the research related to the general student population including that SCCR is predictive of persistence, and completing more than four summer credit hours, and 20 or more credit hours by the end of the third semester, are predictive of graduation. However, other findings of this study support the creation of separate and distinct institutional policies for veteran and military-affiliated students consistent with the recommendation of Vacchi (2012).

The findings of this study challenge the widely held belief that stop-out behaviors are to be prevented or discouraged. The NASPA study cited earlier in this paper (Sponsler et al., 2013) specifically suggested that institutions are challenged by the lack of data specific to student veterans and active duty military students and therefore cannot track and measure the effectiveness of programs designed to decrease stop-out behaviors. The present study suggests that the policy issue is not whether these programs are effectively preventing stop outs. But in fact, that we may need policies designed to support stop outs and subsequent returns for certain populations of students, particularly veteran and military-affiliated students.

The same can be said of part-time enrollment. Based on the results of this study, part time enrollment should be encouraged amongst groups using institutional or no veteran or military related financial aid since the number of semesters of part time enrollment was statistically, positively related to graduation and persistence behaviors in this group. Veteran and military-affiliated students using government funded aid were the only group that did not have a statistically significant relationship between the number of semesters of part time study and the odds of graduating or persisting. In the Cate et al. (2017) study of veterans and active duty military students using government funded aid, they found that only 12.6% of their study population were enrolled full time every semester and increased fulltime enrollments were found among students who were using Post 9/11 GI Bill as compared to Montgomery GI Bill funding. Further study on this phenomenon is suggested. Federal policy implications of this will be discussed later in this paper.

Another factor included in both this study and the Cate et al. (2017) study had to do with successful completion of courses. SCCR or successful course completion ratios were found to be positively related to persistence and graduation in all models in this study. Cate et al. (2017) found that 54.2% of their study population withdrew before the end of a semester at least once. This suggests that withdrawal behaviors may be fairly common amongst student veterans, but that this can negatively influence persistence and graduation rates. Institutional policies should discourage withdrawals when there are controllable reasons, while ensuring that student veterans, active duty students, reservists, guardsmen, dependents, and spouses are provided with supportive policies when withdrawal is caused by uncontrollable circumstances such as a deployment, a relocation, or a call to active duty. In those cases, specific policies meant to ease the burden of a withdrawal and facilitate a smooth return may mitigate the negative effects of mid-semester withdrawals.

The differences detected among subgroups of veteran and military-affiliated students based on the source of financial aid supports the idea that there are differences within the group defined as veteran and military-affiliated. This study suggests that separate and distinct institutional policies to support persistence and graduation may be appropriate. This would include providing support related to remedial course enrollment to veteran and military-affiliated students who are not using veteran and military aid to encourage graduation. More strikingly, the subgroup who used federally funded veteran and military aid may need several separate and distinct policies to encourage

persistence, since the beta signs were all opposite of those in the other subgroups' predictive models of persistence.

Federal policy implications are that further studies such as those being undertaken by the Student Veterans of America (Cate, 2014b; Cate et al., 2017) are critical to understanding the needs of veteran and military-affiliated people using federally funded aid. These further studies should be inclusive of all recipients including veterans, dependents, spouses, survivors, active duty military, reservists, and guardsmen, as well as all federally funded aid programs to increase our understanding of the appropriate federal policies to encourage persistence and graduation.

Federal policy makers should encourage institutions to enact separate policies for veteran and military-affiliated students using federally funded aid. In addition, federal policies related to these programs should use evidence such as this study to design aid policies that will be most conducive to persistence and graduation. For example, the Post 9/11 GI Bill, which was used by 197 of the people using federally funded veteran and military aid in this study, provides 36 months of benefits. The finding that the veteran and military-affiliated students using federally funded aid are distinct from other subgroups in this study in that the number of semesters of part time study is not a significant predictor of graduation or persistence may be a result of this 36-month limit. This is also suggested in the findings by Cate et al. (2017). Further study may support an equivalence formula that would allow for a longer period of benefits if a student enrolls part-time. Conversely, institutions may choose to place a limit on their institutional aid programs to encourage full time enrollments. While the findings related to the subgroup using institutional aid support encouraging part time study to increase graduation and persistence, these same differences between subgroups require further study to determine the causes of these differences. Are the differences related to individual factors such as veteran status and other identity factors, or are policies of the aid programs, such as the 36-month limit, encouraging different behaviors?

Whatever the cause of the differences, this study is the first to compare the predictors of persistence and graduation of veteran and military-affiliated students by source of aid and therefore to support the creation of separate and distinct policies, not just for veteran and military-affiliated students, but for specific subgroups within this larger group. Further study will provide institutional and federal policy makers with the information necessary to create appropriate policies to ensure that veteran and military-affiliated students have the support needed to be successful in their pursuit of higher education.

Limitations of this study include that it was conducted at one institution. Further study is suggested using data from a wide range of types and sizes of institutions to determine the appropriate level of generalization of the findings. In addition, there may be moderating variables related to eligibility for different forms of aid that are related to the outcomes of graduation and persistence. For example, a veteran may be more likely to use government provided aid and may also be more likely to be older. Further tests of these potential relationships between other variables and these outcomes are encouraged. The number of students who were not continuously enrolled (37) suggests that further study is needed with larger groups of students.

Conclusion

Understanding the factors related to retention and graduation is critical given the notable investment of public and institutional money in veteran education benefits. Policy makers require more information to guide their actions related to this group of students because student success and persistence theories based on general student populations are insufficient to explain the outcomes of student veterans and military-affiliated students. Federal policy makers and institutional

administrators will benefit by understanding which combination of student characteristics, educational enrollment patterns, and financial aid benefits are most likely to result in persistence and graduation. Federal and institutional policy makers should craft targeted policies for groups and subgroups of veteran and military-affiliated students based on studies such as this one. These policies will create an environment conducive to veteran and military-affiliated student success.

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