

Diversifying Graduate Education: The Need to First Understand What Contributes to Graduate
Degree Aspiration Changes During College

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Abstract

Historically, graduate aspirations have been treated as fixed constructs, which neglects to consider that while students may begin college with or without a graduate degree aspiration, they may change their plan when progress through college years. Using data from the 2012/14 Beginning Postsecondary Students Longitudinal Study, this study looks at how college students change their graduate degree aspirations between freshman year and junior year and what shapes students' decisions in graduate degree aspirations. The results reveal racial differences in graduate degree aspiration changes during college years and indicate community colleges may serve an equal function as four-year institutions to help students keep up with their graduate degree plans. Findings have implications for campus leaders and administrators who seek to create and maintain environments that support college students' development and their graduate degree goals.

Keywords: graduate degree aspiration, race/ethnicity, community college, undergraduate debt

Introduction

Students today enter college thinking not just about earning their bachelor's degree but also their master's and doctoral degrees (Eagan, Stolzenberg, Ramirez, Aragon, Suchard, & Hurtado, 2014). Statistics suggest that moving through the educational pipeline, from completing high school through earning a graduate degree, is a crucial factor in achieving higher earning potential, better occupational opportunities, and higher socio-economic status (Institute of Higher Education Policy, 2005; US Bureau of Labor Statistics, 2015). Though many college freshmen expect they will eventually earn a graduate degree, researchers suggest that educational aspirations change over time, especially during the course of adolescence to college years (Eccles, Barber, Stone, & Hunt, 2003; Gottfredson, 1981). Scholars also show that students on average significantly lower their plans to obtain a graduate degree after three years in college (Carter, 1999; Jagesic, 2015; Pascarella, Wolniak, & Pierson, 2003; Pascarella, Wolniak, Pierson, & Flowers, 2004). However, little is known about what shapes college students' aspirations and particularly graduate degree aspirations.

Historically, graduate degree aspirations have been treated as fixed constructs, which neglects to consider that while students may begin college with or without a graduate degree aspiration, institutional environments can have strong effects on students (Astin, 1993). To address this gap in the literature, this study looks at how college students change their graduate degree aspirations between freshman year and junior year to examine what shapes students' decisions in graduate degree aspirations. This research extends existing theoretical frameworks to take into account changes in graduate degree aspirations.

This research is of national importance and timeliness for several reasons. First, understanding college students' development of graduate degree aspirations can potentially

increase the number of diverse students who pursue graduate degrees. Diversity of graduate education is key to improving the quality of graduate education and industry because diverse researchers and professionals can increase the possibilities for greater innovation and technological advancement (National Academy of Science, 2011). Though African American and Hispanic college students report a higher rate of graduate degree aspirations than White students (Carter, 1999; Hanson, Paulsen, & Pascarella, 2016; Pascarella et al., 2004), they are more underrepresented in graduate school than in college (Allum & Okahana, 2015).

Kao and Tienda's (1998) study suggests that students of color might struggle to keep up with their graduate degree plans. They found that African American and Hispanic high school students tend to aspire to go to graduate school more than White students, but are less likely to maintain their degree aspirations throughout high school years. Their study is important in understanding why students' decisions to maintain or change degree aspirations can influence their future educational attainment, but their study is limited to high school students. This study focuses on undergraduates who change or maintain graduate degree aspirations in order to understand the pathway that lead undergraduate students to graduate education. Findings have implications for campus leaders and administrators who are committed to college students' pursuit of post-baccalaureate degrees to create and maintain environments that are supportive of students of color's academic development and their graduate degree goals.

Second, some scholars suggest two-year institutions are the places to promote more graduate students (American Association of Community Colleges, 2015; Mooney & Foley, 2011), yet most of the work in graduate degree aspirations focus on the four-year level. This study addresses the timely issue of access to graduate/professional education by incorporating students who begin in two-year institutions as well as four-year institutions. Indeed, if

community college students can be provided with the support and resources they need to persist with their graduate degree aspirations, they will be more likely to move through the educational pipeline, from completing bachelor's degree through earning a graduate degree.

Third, this study informs an understanding of college students' affordability of graduate school by examining their undergraduate debt. Scholars suggest that undergraduate debt has a negative effect on graduate school aspirations and enrollment (Carter, 1999; Heller, 2001; Malcom & Dowd, 2012; Weiler, 1991, 1994). However, we don't know whether debt have a similar impact on students' decisions to change or maintain their graduate degree aspirations. In summary, this research will inform our understanding of racial/ethnic differences and community college students' changes in graduate degree aspirations. This work is a first study attempts to model the relationship between what happened during undergraduate years (e.g. debt and engagement experiences) and students' degree aspirations changes. The findings of this investigation can lead to creating and implementing interventions to help keep students, and particularly underrepresented students, on track to pursue graduate education.

Purpose of the Study

Guided by the theoretical framework and previous research in graduate degree aspirations, this study seeks to answer the following questions:

Q1. What is the profile of college students and graduate degree changes between freshman year and junior year?

Q1a. What is the profile of African American, Asian, Hispanic, and White college students in graduate degree changes?

Q1b. What is the profile of students enrolled in two-year and four-year institutions in graduate degree changes?

Q1c. What is the profile of students' debt in graduate degree changes?

Q2. What is the influence of race/ethnicity, gender, college experiences, undergraduate debt, and institutional characteristics on graduate aspirations changes during the college years?

Q2a. What is the influence of race/ethnicity on graduate aspirations changes when controlling all other influences?

Q2b. What is the influence of institutional level on graduate aspirations changes when controlling all other influences?

Q2c. What is the influence of debt on graduate aspirations changes when controlling all other influences?

Background Literature

Some scholars have suggested that educational aspirations change over time, especially during the course of adolescence (Eccles, Barber, Stone, & Hunt, 2003; Gottfredson, 1981; Kao & Tienda, 1998). However, most of these studies are lacking empirical support, or fail to investigate the reasons for changes in degree aspirations. Though more than half of the first-year college students expect to complete a graduate degree, they are not able to keep on track of their plans over the college years. For example, according to the most recent Beginning Postsecondary Students Longitudinal Study (BPS:12/14), when surveyed in the freshman year, half of the sample students expected to earn a master's degree or a doctorate or first professional

degree; however, three years after college entry, only 64% of those students who initially aspired to pursue graduate school continued to have such plans. In another longitudinal study tracking students from 18 four-year colleges, Pascarella et al. (2004) also found that respondents significantly lowered their plans to obtain a graduate degree after three years of college. Such decreases in educational plans during college are not unique to these samples (e.g., Carter, 1999; Jagesic, 2015; Pascarella et al., 2003) but little is known about what caused students to maintain or give up their graduate degree aspirations.

What we know so far about the graduate degree aspiration changes is limited to background differences. Kao and Tienda (1998) found that African American and Hispanic high school students tend to aspire to go to graduate school more than White students, but that they are less likely to maintain their high aspirations throughout their high school years. The decline of educational aspirations by African American males was especially dramatic. However, we don't know whether this applies to college students.

Among other background factors, there is also ample evidence of persisting gender differences in educational aspirations. In general, women are less likely to have post-baccalaureate degree aspirations (Hearn 1987; Pascarella et al., 2004; Rocconi et al., 2015). However, it was not discussed in the previous literature as to whether females just don't have graduate degree plans or they tend to lower their plans when progress through college years.

Furthermore, when looking at students' changes in aspirations at the college level, it is also important to know what colleges and universities can do to facilitate the desired changes. College impact models (e.g., Astin, 1993; Pascarella & Tarenzini, 2005) highlight the importance of institutional factors such as size, type, and control to understand how college affects students. Many empirical studies have found that students who attend two-year

colleges were less likely to aspire to attend graduate school than students who attend four-year institutions (Dougherty, 1987; Velez, 1985; Carter, 1999). The “cooling-out” function of community colleges suggested by Clark (1960) might provide some insight as to students’ future educational plans. Community colleges offer ambitious but poor, minority, and limited academic performance students access to lower-quality institutions and cool out students from pursuing higher degree goals (Clark, 1960). Therefore, it is possible that community college students initial graduate degree plans are easily cooled out in such an environment.

Research has also explored the influences of academic factors in graduate degree aspirations. Academic ability measured as college grade point average maintains a strong, independent effect on graduate degree aspirations (Davis, Amelink, Hirt, & Miyazaki, 2012; Mullen et al., 2003). Academic selfconfidence also has a positive effect on educational aspirations (Carter, 1999). Engagement experiences such as participation in undergraduate research (Hathaway, Nagda, & Gregerman, 2002; Strayhorn, 2010), interactions with faculty (Arredondo, 1995; Kim & Sax, 2009), and interactions with peers (Davis et al., 2012; Horvat & Lewis, 2003) are important predictors to graduate degree aspirations. Many studies have also looked into academic college majors influence on graduate degree plans (Bedard & Herman, 2008; Heller, 2001; Mullen et al., 2003; Rocconi et al., 2015; Sax, 2001; Zhang, 2005) and found students majoring in some fields of study are more likely to aspire to graduate schools.

Debt and financial aids are also critical to students’ graduate degree plan. Studies suggested that there is negative effect of debt on graduate school aspirations and enrollment (Heller, 2001; Malcom & Dowd, 2012; Weiler, 1991, 1994). And receiving an institutional grant or work-study has a positive effect on graduate degree aspirations, because students feel supported from their institutions (Carter, 1999; Hanson et al., 2016).

However, we do not know in regards to all these institutional characteristics, college experiences, and financial issue, what factors keep students on track to maintain their graduate degree aspirations and what lead to later changes regarding graduate degree aspirations. Therefore, this study will include several of these factors, identified by previous research, seeking to identify whether and which ones might influence college students' decisions to maintain or change their graduate degree aspirations.

Theoretical Framework

The conceptual model for this study is adapted from Carter's (2001) and Pascarella's (1984) empirical model. This study includes two and four-year college students with a focus on the influences of race/ethnicity and debt. I advance the existing models on graduate degree aspirations by taking into account the changing status of graduate degree aspirations. Instead of looking at graduate degree aspirations as a fixed construct, I looked at degree aspirations as the status between two time points. The outcome of the proposed conceptual model has four categories, which are measured at a students' first year and third year of college. I define the outcome of the study in four categories and each student will fit into each of the following four categories: a) having no graduate degree aspiration at either freshman and junior year, b) not aspiring to a graduate degree at freshman but aspiring to a graduate degree at junior year, c) aspiring to a graduate degree at freshman year but no longer aspiring to a graduate degree at junior year, d) having a graduate degree aspiration at both freshman and junior year. The conceptual model includes the following influences in graduate degree aspiration changes: background characteristics, college experience, debt, and institutional characteristics.

Method

Data

This study employs data from the 2012-14 Beginning Postsecondary Students Longitudinal Study (BPS:12/14), a survey sponsored by the National Center for Education Statistics (NCES) that tracked students enrolling in postsecondary education for the first time.

Students were initially surveyed at the end of their first academic year (2011-12) and then participated in follow-up surveys at the end of their third academic year (2013-14) after entry in to postsecondary education. The BPS surveys collect data on students' persistence in postsecondary education programs, their demographic characteristics, and changes over time in their goals, income, and debt, among other indicators, which make it possible to study student changes and development during college years. Sampling weights were used to compensate for response bias and sampling bias.

The sample includes college students who began their postsecondary education at two-year and four-year institutions in 2012 and remained enrolled in 2014. For the purpose of this study, students who have ever enrolled in for-profit colleges and universities were excluded for analysis. A total of 7,422 students are included in the analysis. Among them, 46% constantly had a graduate degree aspiration at both freshman and junior year and 25% of the students did not have graduate degree aspirations at either freshmen or junior year. Twelve percent of the college students had no graduate degree aspiration at freshman year but became aspired to graduate degree at junior year; 16% had a graduate degree aspiration at freshman year but didn't aspire to graduate degree at junior year.

Outcome Measure

For the purpose of this study, I define the outcome variable into four categories. These four categories define a student's graduate aspiration status between freshman year and junior year from the same question on each of the BPS 2012 survey and the 2014 follow-up survey: "What is the highest degree you expect to attain?" A student can fit into one of the four Categories: a) maintained no graduate degree aspirations, b) raised initial aspirations to a graduate degree, c) decreased initial graduate degree aspirations, and d) maintained graduate degree aspirations. This study used Category d) maintained graduate degree aspirations as the reference group because it is the most desirable of the outcome. A complete list of the variables in the study is presented in Table 1.

Analyses

Descriptive analysis was conducted to answer the research question 1 by examining whether graduate degree aspirations changes differ across racial/ethnic groups and across students enrolled in different levels of higher education institutions (two-year and four-year), and whether debt situations are different across groups. This phase of the analytic provides a general understanding of group differences and informs the interpretation of results from the final regression model.

To answer the research question 2, I estimated multinomial logistic models to regress the dependent variable, *Changes in Graduate Degree Aspirations*, on the proposed independent variable. Multinomial logistic estimation is a variant of the log-linear model and is appropriate when the dependent variable represents a set of discrete categories. Because the dependent variable is categorical, multinomial logistic models estimated the risk or odds of being in each category (decreased initial graduate degree aspirations, raised initial aspirations to a graduate

degree, maintained no graduate degree aspirations) relative to one base category (maintained graduate degree aspirations). I calculated relative risk ratios for the multinomial logistic models by exponentiating the estimated coefficients.

Results

To answer research question 1, an analysis was conducted to show the descriptive statistics of race/ethnicity, student's enrolling institutional level, and debt regarding to graduate degree aspiration changes. Regarding to race/ethnicity and graduate degree aspiration changes, 27% of Hispanic students maintained no graduate degree aspirations followed by White (26%), African American (20%), and Asian (20%). Fourteen percent of Hispanic students raised initial aspirations to a graduate degree aspiration, followed by African American (12%), White (12%) and Asian (9%). Twenty-one percent of Asian students decreased graduate degree aspirations, followed by African American (19%), White (16%) and Hispanic (16%). Fifty percent of Asian students maintained graduate degree aspirations, followed by African American (48%), White (46%) and Hispanic (43%).

Among students who began postsecondary education at a two-year institution, 25% of them maintained graduate degree aspirations, 16% decreased initial graduate degree aspirations, 14% raised initial aspirations to a graduate degree, and 45% maintained no graduate degree aspirations. Among students who began postsecondary education at a four-year institution, 53% of them maintained graduate degree aspirations, 17% decreased initial graduate degree aspirations, 12% raised initial aspirations to a graduate degree, and 19% maintained no graduate degree aspirations. In terms of student debt difference among students have different graduate degree aspiration changes, on average, students who maintained graduate degree aspiration at

both freshman and junior year were among the highest in cumulative loans ($M = 15,946$, $SD = 24,021$), followed by students who decreased initial graduate degree aspirations ($M = 15,196$, $SD = 23,863$), students who raised initial aspirations to a graduate degree ($M = 14,199$, $SD = 21,608$), and students who maintained no graduate degree aspirations ($M = 11,511$, $SD = 19,445$).

Multinomial Logistic Models

Race/ethnicity

Table 3 presents odds ratios for the independent variables when comparing each group of students to the group of students who maintained graduate degree aspirations throughout college years. The results suggest that being an African American and Hispanic (comparing to White) are less likely to lower their graduate degree aspirations after three years of college. Asian, African American, and Hispanic students were less likely than their Whiter peers to begin college without a graduate degree aspiration.

Institutional Level

This study finds no effect of beginning postsecondary education at a community college between maintaining graduate degree aspirations and decreasing initial graduate degree aspiration.

The effects of beginning postsecondary education at a community college are found between the group of students who maintained graduate degree aspirations and who maintained no graduate degree aspirations, and between the group of students who maintained graduate degree aspirations and who raised graduate degree aspirations. The effects can be explained as students starting at a four-year college as compared to starting in a community college are more

likely to enter college with graduate degree aspiration and maintain those graduate degree aspirations than start college with aspirations lower than a graduate degree.

Undergraduate Debt

This study also finds no effect of cumulated loans through 2012 to 2014 on graduate degree aspiration changes.

Other Factors

The analysis also reveals other important variables contributing to graduate degree aspiration changes. First-generation college students were less likely to maintain a graduate degree aspiration throughout college years. Academic confidence was positively related with the probability of maintaining a graduate degree aspiration. College majors significantly predict graduate degree aspiration maintenance probabilities, with students who majored in natural science being more likely to maintain a graduate degree aspiration. Students who enrolled in a private, large, and/or very selective institution were more likely to maintain their initial graduate degree aspirations throughout college years.

Discussion and Conclusion

Given the data summarized above, race/ethnicity played a role in student decisions to maintain graduate degree aspirations but the effects were not equal across different racial groups. African American and Hispanic students were more likely than their White counterparts to enter college with graduate degree aspirations and three years later still aspired to graduate degrees. The result might support the recent rapid growth of graduate school enrollment among Hispanic students. Between Fall 2016 and Fall 2017, first-time enrollment increased 5.6% among Hispanic/Latinos, followed by Asian and Pacific Islanders (4.5%), African Americans (2.2%),

and White (-0.2%). (Okahana & Zhou, 2018). Although African American and Hispanic students have a higher probability to maintain their graduate degree aspirations and have increased their representation in graduate schools, it is still important to point out that they are still grossly underrepresented in several graduate fields. Take African American for example. They constitute 12.6% of first-time graduate students enrolled in Fall 2017; however, they accounted for only 3.3% of physical and earth sciences, followed by engineering (5.7%), arts and humanities (5.8%), and biological and agricultural sciences (6.0%) (Okahana & Zhou, 2018). A further look at graduate degree aspirations and aspiration changes by field of study might uncover other barriers African American students or other underrepresented students encounter.

In terms of the effect of beginning postsecondary education at a community college on graduate degree aspiration changes, the study finds that attending two-year colleges has no effect on student's maintenance of their graduate degree aspirations. That is to say, students who have an initial graduate degree aspiration beginning their postsecondary education at a two-year college will be as likely as their counterparts who beginning at a four-year institution to keep up with their graduate degree aspirations after three years of college. The result supports previous research suggesting that two-year institutions are the places to promote more graduate students (American Association of Community Colleges, 2015; Mooney & Foley, 2011; Wang, Lee, & Wickersham, 2019).

Though beginning postsecondary education at a community college has no effect on student's decision to maintain or give up their graduate degree aspirations three years after first enrolling in a college, it is important to point out that in our sample and in general, students who begin postsecondary education at a community college are less likely to begin college with a graduate degree aspiration. However, this study suggests that for those who begin college with a

graduate degree aspiration, community colleges are not an environment which might “cool-out” their graduate degree plans. That is, community colleges serve an equal function as four-year institutions to help students keep up with their graduate degree plans.

This study also finds no effect of debt on any categories of graduate degree aspiration changes. The result is aligned with prior studies stating loans have minimal to no effect on degree aspirations (Carter, 1999; Heller, 2001). The result might imply that though debt can reflect as a pressure to one’s decision for investing in further education, it has minimal impact compared to other factors such as college major, grade point average, and attending specific types of higher education institutions.

In conclusion, this analysis explored college student changes in graduate degree aspirations and factors that were associated with student changes within the broad context of equity and diversity of graduate education. The findings suggested that it is not equal when comes to decisions to go to graduate schools and maintain those decisions in a long period of time. The findings can help policy makers and higher education leader to identify students who need most support to succeed in their future goals and to target efforts and resources to improve equity in graduate school access and diversity in graduate education. As more longitudinal data resources become available, future longitudinal studies can take a step further to examine the relationship between changes in graduate degree aspirations and actual graduate degree attainment.

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Table 1. List of Variables

Variable	Options	Unweighted (N=7,422)	Weighted (N= 1,676,273)	
		% / Mean	% / Mean	
Graduate Degree Aspiration Changes	a. Maintained No Graduate Degree Aspirations	25.13	25.17	
	b. Raised Initial Aspirations to a Graduate Degree	12.18	12.00	
	c. Decreased Initial Graduate Degree Aspirations	16.41	16.81	
	d. <i>Maintained Graduate Degree Aspirations</i>	46.28	45.77	
Race/Ethnicity	<i>White</i>	61.25	61.1	
	African American	10.27	9.29	
	Hispanic	16.14	16.68	
	Asian	7.55	8.08	
	Other/Multiple	4.8	4.84	
Level	2-year	24.85	25.14	
	4-year	75.15	74.86	
Undergraduate Debt	Cumulative loan	16538.7	14444.2	
	<i>Sex</i>			
Sex	Men	41.61	43.19	
	Women	58.39	56.81	
Age	Age over 25	1.6	1.74	
	<i>Age 25 or below</i>	98.4	98.26	
First-Gen Status	Yes	43.79	43.2	
	<i>No</i>	56.21	56.8	
Low-Income	Yes	24.45	24.48	
	<i>No</i>	75.55	75.52	
Pre-college Performance	High School GPA (scale 1-7)	5.85	5.85	
	Confidence 2012 (scale 1-5)	4.47	4.46	
Academic Confidence	Yes	17.5	17.14	
	<i>No</i>	82.5	82.86	
Confidence Declined from 2012	Yes	17.74	14.33	
	<i>No</i>	82.26	85.67	
Work-Study	Yes	39.73	40.35	
	<i>No</i>	60.27	59.65	
Ever Change Major	Undecided	5.75	5.62	
	Computer	2.59	2.74	
Major	Engineering	7.25	7.85	
	Science	12.45	12.11	
	General Studies	6.94	8.83	
	Social Science	9.47	9.68	
	Humanities	8.02	7.71	
	Health Care	13.64	13.13	
	<i>Business</i>	12.56	12.25	
	Education	7.11	6.28	
	Other Applied	14.23	13.81	
	Undergraduate GPA	GPA 2012 (scale 0-4)	3.04	3.05
		GPA 2014 (scale 1-7)	5.41	5.39
	Undergraduate Engagement	Engagement 2012 (scale 1-5)	4.19	4.19
		Engagement 2014 (scale 1-5)	4.21	4.21
	Control	<i>Public</i>	61.9	73.18
Private		38.1	26.82	
Research Institution	Yes	32.03	36.62	
	<i>No</i>	67.97	63.38	
Size	Large (>10,000 FTE)	41.51	48.66	
	<i>Other</i>	58.49	51.34	
HBCU	Yes	2.09	2.19	
	<i>No</i>	97.91	97.81	
Selectivity	Very selective	29.04	26.87	
	Moderately selective	36.03	37.05	
	<i>Minimally selective/open admission/not 4-year institution</i>	34.94	36.07	

Note. The reference category is italicized.

Table 2. Descriptive Information: Race, Institutional Level, Debt and Graduate Degree Aspiration Changes

	Total n	Total % / Mean	Category a: Maintained No Graduate Degree Aspirations % / Mean	Category b: Raised Initial Aspirations to a Graduate Degree % / Mean	Category c: Decreased Initial Graduate Degree Aspirations % / Mean	Category d: Maintained Graduate Degree Aspirations % / Mean
Total n	7,422		1,865	904	1,218	3,435
%		100%	25.1	12.2	16.4	46.3
Race/Ethnicity						
White	4,546	100%	26.2	11.9	16.2	45.7
African American	762	100%	20.1	12.3	19.2	48.4
Hispanic	1,198	100%	26.7	14.1	16.0	43.2
Asian	560	100%	20.0	9.0	21.0	50.0
Other/Multiple	356	100%	25.5	15.4	16.2	42.9
Level						
2-year	1,844	100%	45.0	13.8	16.3	24.9
4-year	5,578	100%	18.5	11.7	17.0	52.8
Undergraduate Debt						
Cumulative Loans	7,422	14444.20	11510.81	15196.30	14198.93	15946.17

Table 3. Multinomial Logistic Regression Results

Reference Group: Maintaining no graduate degree aspirations	Maintained No Graduate Degree Aspirations	Raising Initial Aspirations to a Graduate Degree Aspirations	Decreasing Initial Graduate Degree Aspirations
	<i>Odds Ratio</i>	<i>Odds Ratio</i>	<i>Odds Ratio</i>
<i>Race/ethnicity (White)</i>			
African American	0.48 ***	0.74	0.69 *
Hispanic	0.55 ***	0.92	0.68 *
Asian	0.69 *	0.71	1.14
Other race	0.88	1.29	0.91
<i>Financial Situation</i>			
Cumulated loans through 2014	1.00	1.00	1.00
<i>Institutional Level</i>			
Began postsecondary education at a community college (No)	2.43 ***	1.87 **	1.19
<i>Background Characteristics</i>			
Age (≤ 25)	1.79	0.57	1.40
Female (Male)	0.97	1.00	0.89
First-gen college student (Not)	1.52 ***	1.26 *	1.23 *
Low income student (Not)	0.96	0.99	1.09
High school GPA	0.83 ***	0.91	0.98
<i>College Experiences</i>			
Engagement 2012	1.07	1.07	0.92
Engagement 2014	1.04	1.05	1.00
Academic Confidence 2012	0.66 ***	0.73 ***	0.87 *
Academic Confidence Decline (No)	1.27	0.84	1.11
Ever change major (No)	0.93	1.14	1.01
GPA 2012	0.85 *	0.79 **	0.75
Average GPA through 2014	0.79 ***	0.92	0.77
Receive work-study (No)	0.73 *	0.83	0.97
<i>College Major (Business)</i>			
Computer	1.43	1.12	1.57
Engineer	0.81	0.89	1.15
Science	0.23 ***	0.38 ***	0.63 **
General	0.94	1.01	1.24
Social	0.24 ***	0.37 ***	0.71
Humanity	1.14	1.01	1.09
Health	0.59 ***	0.64 *	0.74
Education	0.58 **	0.89	0.71
Other major	1.57 **	0.99	1.56 *
Undecided major	0.91	0.93	1.20
<i>Institutional Variables</i>			
Private institution (Public)	0.77 *	0.77	0.74 *
Research institution (Not)	0.92	0.74 *	1.13
Large institution ($\leq 10,000$ FTE)	0.83	0.88	0.75 *
(Began at a Minimally selective/open admission/not 4-year institution)			
Began at a very selective institution	0.58 **	1.00	0.66 *
Began at a moderately selective institution	1.00	1.33	0.86
Began at a HBCU (No)	0.31 ***	0.69	0.98

Note. The reference category is in parentheses.

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$