1-2019

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Recommended Citation

Dong, Suhua. "The Effects of First-Generation Status on Student Engagement and Outcomes at Liberal Arts Colleges." *Journal of College Student Development* 60, no.1 (2019): 17-34.

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Keywords

First-generation College Students, Engagement, Outcomes, Liberal Arts Colleges

Disciplines

Academic Advising | Educational Assessment, Evaluation, and Research | Higher Education | Liberal Studies

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Promoting the success of disadvantaged students remains an important goal of colleges and universities and a prominent theme in national dialogues on higher education. One important segment of this population—first-generation college students—tends to face many significant challenges. Compared with their peers, they are more likely to come from low-income families, to be constrained by the cost of attending college (thereby college choice), to report major concerns about financing college, to receive less familial financial support to cover college expenses (DeAngelo, 2010; Eagan et al., 2017; Nunez & Cuccaro-Alamin, 1998; Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007), and to accumulate

debt upon graduation (Chen & Wiederspan, 2014). Pascarella, Pierson, Wolniak, and Terenzini (2004) also approached the potential effects of first-generation status on college experiences through the lenses of cultural capital and social capital; theoretical perspectives suggest that compared to their peers, first-generation students are more likely to be “handicapped in accessing and understanding information and attitudes relevant to making beneficial decisions” (p. 252) about college choice and how to get the most out of college. In turn, this may translate into smaller gains in terms of growth and outcomes.

In recent years first-generation students have remained a sizable proportion of the undergraduate population: nationally, of the Fall 2005 first-year cohorts enrolled at 4-year institutions, 20.1% identified themselves as *first-generation students*, defined as students with neither parent having attended college (Eagan et al., 2016); for Fall 2017, 18.8% (Eagan et al., 2017). Although the proportion of first-generation students overall has remained relatively stable or slightly declined during some years (Eagan et al., 2016), the profile of this group has evolved substantially, with growing overrepresentation among historically underrepresented racial/ethnic groups (Eagan et al., 2016; Saenz et al., 2007), groups which tend to be associated with lower household income (Proctor, Semega, & Kollar, 2016) and lower academic preparation (Eagan et al., 2016). Furthermore, for the past 15 years, first-generation students as a group have experienced the biggest drop in the level of family resources to help pay for college (Eagan et al., 2016). With the projected continued growth of Students of Color (Bransberger & Michelau, 2016), the socioeconomic profile of first-generation students will continue to evolve (i.e., increasing overrepresentation of lower-income households), and concern for their success in college will remain high.

Private, nonsectarian baccalaureate colleges, most of which are liberal arts colleges, enroll a disproportionately large number of first-generation students: 2.4% of the undergraduates at all 4-year colleges and universities (Integrated Postsecondary Education Data System [IPEDS], 2017); however, of the Fall 2016 first-year cohorts at 4-year institutions, 16.4% of first-generation students were enrolled at this type of institutions, compared to 14.8% enrolled at universities (Eagan et al., 2017). Private liberal arts colleges tend to charge higher tuition and enroll more students from affluent households. One would hypothesize that this could pose more challenges for first-generation students who are typically associated with lower socioeconomic backgrounds; therefore it is of particular importance to obtain empirical evidence of their success (or lack of success) within this distinctive institutional context. Despite the many studies on first-generation students, there seems to be a shortage of empirical research systematically addressing the differences and similarities on engagement and outcomes between first-generation students and their peers attending this type of institution. This study adds to the conversation by focusing on first-generation students at private liberal arts colleges.

Literature Review

A great deal of research has been conducted on first-generation students' attrition. They have faced significant challenges in transitioning to college and have been less likely to graduate (e.g., Choy, 2001; DeAngelo, Franke, Hurtado, Pryor, & Tran, 2011; Ishitani, 2006; Lohfink & Paulsen, 2005; Yue & Fu, 2017). Quite a bit of research on college students' experiences and learning has also been produced that draws on national samples of students from different class levels and institutional types. Summarized below is the

recent work most relevant to the focus of this study: comparisons of engagement and outcomes by first-generation status.

Differences on Levels of Engagement by First-Generation Status

The predominant evidence from prior research suggests that first-generation students overall tend to be less engaged than their peers. Research using a student sample combining all four academic class levels has demonstrated that membership in the first-generation group had negative effects on social involvement and academic engagement (Lundberg, Schreiner, Hovaguimian, & Miller, 2007; Pike, Kuh, & Gonyea, 2003), and first-generation students reported lower ratings for sense of belonging on campus (Stebbleton, Soria, & Huesman, 2014). Researchers whose studies were based on a single class level reached largely similar conclusions, indicating that first-generation students compared unfavorably with their peers on academic and social involvement and engagement. During their first year of college, they were disadvantaged, perceiving a less supportive institutional environment and reporting overall lower levels of engagement on various indicators (e.g., interactions with faculty and peers, active and collaborative learning; Pike & Kuh, 2005; Pike, Kuh, & McCormick, 2011; Pike, Kuh, McCormick, Ethington, & Smart, 2011; Porter, 2006; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996).

Gaps persisted when first-generation students progressed to higher class levels. They reported less extracurricular involvement in the second year of college and fewer interactions unrelated to courses with other students in the third year of college (Pascarella et al., 2004). More recently, Pike, Kuh, & McCormick (2011) identified negative links between being a first-generation senior and 4 out of 6 National Survey of Student

Engagement (NSSE) benchmarks: coursework emphasis on higher-order thinking (measure of academic challenge), interactions with faculty, diversity experiences, and active and collaborative learning; no relationship was found with academic effort (another measure of academic challenge) or perceived supportiveness of institutional environments. Likewise, Pike, Kuh, McCormick, et al. (2011) concluded that being a first-generation senior was negatively related to 2 out of 5 NSSE benchmarks: interactions with faculty and enriching educational experience (high-impact practices [HIPs] and diversity experiences); no significance difference was found on academic challenge, active and collaborative learning, or perceived supportiveness of institutional environments. The most recent NSSE results (NSSE, 2017) further revealed that first-generation seniors were less likely to participate in 5 out of 6 HIPs: study abroad, research with faculty, internships, capstone experience, and learning community; the only exception was service-learning. Furthermore, although seniors (both first-generation and continuing-generation) at baccalaureate colleges (liberal arts colleges and baccalaureate colleges with diverse fields combined) participated in HIPs at higher rates than their respective peers at doctoral and master's institutions, first-generation seniors at baccalaureate colleges still lagged behind their continuing-generation peers.

Despite the substantial amount of evidence suggesting unfavorable comparisons on engagement between first-generation students and their peers, some inconsistencies exist with regard to particular engagement indicators, most notably for seniors. Franke, Ruiz, Sharkness, DeAngelo, and Pryor (2010) concluded that first-generation seniors did not seem to differ from their peers with regard to interactions with faculty; they were actually more likely to be satisfied with their overall college experience and reported a stronger

sense of belonging to their campus community. Such similarity on seniors' interactions with faculty, however, was markedly inconsistent with the unfavorable discoveries by Pike, Kuh, & McCormick (2011) and Pike, Kuh, McCormick, et al. (2011). On other specific NSSE benchmarks for seniors (e.g., active and collaborative learning) comparisons among studies reveal additional contradictions.

Differences on Outcomes by First-Generation Status

Previous research on outcomes of first-generation students seems to be inconclusive, regardless of class level and institutional type of the samples. Some scholars reported that first-generation students compared unfavorably with their peers on learning and personal development, such as standardized measures of reading comprehension and science reasoning (Terenzini et al., 1996), self-reported levels of intellectual development (Pike & Kuh, 2005), intercultural effectiveness (openness to diversity) and psychological well-being (Padgett, Johnson, & Pascarella, 2012), and self-reported gains in general education, communications, interpersonal skills, and intellectual skills (Pike et al., 2003). Some, however, found that being a first-generation student was positively related to cognitive and noncognitive gains (Pike, Kuh, McCormick, et al., 2011), interpersonal skills and tolerance/awareness (Toutkoushian & Smart, 2001), and academic learning such as analytical thinking and writing (Lundberg et al., 2007). Meanwhile others (Pascarella et al., 2004) discovered that these two groups seemed to be largely similar based on standardized measures of critical thinking and writing skills.

Despite the significant amount of research on first-generation students' engagement and outcomes, the issues of inconsistencies and inconclusiveness indicate that additional

studies are needed to replicate, extend, or revise previous findings. The issue of inconclusiveness could partly be due to the fact that the definition of a *first-generation student* often varied (i.e., one whose parents never attended college vs. one whose parents did not obtain a bachelor's degree). Furthermore, previous researchers did not explore the interaction effects, an approach potentially masking the varying effects of first-generation status by race/ethnicity. Additionally, few studies examined career-related gains, which have become increasingly important expected college outcomes. Lastly, although some of the studies included baccalaureate colleges as part of their samples, few systematically analyzed differential effects by institutional type, and none exclusively focused on liberal arts colleges. I sought to fill these gaps by providing an expanded and nuanced understanding of first-generation seniors' experiences by investigating both the main effects of first-generation status and its interaction with gender and race/ethnicity at private liberal arts colleges. Results from the study may help institutions of this type identify their successes and areas in need of improvement in supporting first-generation students.

Conceptual Framework

This study was informed by Astin's (1993) conceptual framework for assessing college impact: the input–environment–outcome (I-E-O) model, which posits that the characteristics of a student at the point of college entry (inputs) can influence that student's college experiences (environment), which can subsequently influence gains from college (outcomes). Knowing that the parental level of education—one of the inputs—may have an effect on students' experiences, we can expect that first-generation students will

likely experience college environments differently than their continuing-generation peers in terms of engagement in and out of the classroom and satisfaction with campus services, and hence may report different outcomes. Prior research shows the negative direction of the differences in engagement; however, given the mixed evidence, the direction of differences in outcomes remains unclear. Astin argued that to construct as accurate a picture as possible of the net effects of college on students, researchers should identify and account for as many relevant student input differences as feasible. In addition to parental level of education, other inputs, such as a student's gender and race/ethnicity, have also been shown to correlate with environmental experiences and collegiate gains (Pascarella & Terenzini, 2005). Institutional characteristics, such as size and selectivity, constitute part of the college environments to which students are exposed and can affect student engagement and outcomes as well (Porter, 2006; Toutkoushian & Smart, 2001); it is therefore important to control for these influences while investigating the effects of first-generation status.

Method

The primary focus of this study was to answer the following research questions:

1. Do first-generation students differ from their continuing-generation peers on select demographic characteristics (gender, race/ethnicity, major, and loan debt status)?
2. Are there significant differences for self-reported levels of engagement, satisfaction, and outcomes between first-generation and continuing-generation students, after controlling for characteristics at the student level (gender, race/ethnicity, and major) and institution level (rank, size, institutional wealth, and selectivity)?

3. Does first-generation status interact with gender or race/ethnicity in its effects on self-reported levels of engagement, satisfaction, and outcomes?

Data Source, Variables, and Sample

My findings were based on analysis of a subset of an existing national dataset collected through a consortium survey: the HEDS Senior Survey (hereafter HSS) administered annually in May to graduating seniors. The design of the HSS instrument was informed by findings from the Wabash National Study of Liberal Arts Education on effective teaching practices and by the Association of American Colleges & Universities (AAC&U) Liberal Education and America's Promise (LEAP) Essential Learning Outcomes (HEDS, 2016). Upon receiving the standard dataset compiled by the HEDS staff from three graduating classes—2014, 2015, and 2016—with response rates ranging from 21% to 96%, I performed procedures to generate the final sample for this study. The HSS includes the question: What is the highest level of education completed by either of your parents or the person/people who raised you? Response options include 1 (*did not complete high school*), 2 (*high school diploma*), 3 (*postsecondary school other than college*), 4 (*some college or associate's degree*), 5 (*bachelor's degree*), 6 (*graduate school*). For the purpose of this study, students who checked response option 1, 2, or 3 were defined as first-generation students; those who checked 4, 5, or 6, were defined as continuing-generation students.

I used a student's first-generation status as the primary input (independent) variable, with two other input variables (gender, race/ethnicity) and academic major as controls. In keeping with previous research, four institution-level control variables were added to the standard dataset: rank (based on a school's 2016 *U.S. News Best Colleges*

Rankings for the national liberal arts category), size, endowment per student (as a proxy for institutional wealth), and selectivity (based on acceptance rate); the last three were created based on schools' most recent IPEDS data. Dependent variables included both environmental and outcome variables. Environmental variables covered two dimensions of college experiences: self-reported levels of engagement in academic and enriching educational experiences and satisfaction with select student support services. Outcome variables focused on students' self-reported gains as a result of their undergraduate education. The construct of outcomes was represented by a broad set of indicators addressing the cognitive, psychosocial, career-related, and personal development dimensions. See Table 1 for a list of variables.

Insert Table 1 here.

Prior to analysis, cases of missing data ($n=19$) for any of the four demographic variables (parental level of education, race/ethnicity, gender, major) were deleted. Except for the four variables measuring gains from HIPs and from leadership experiences (i.e., participation in student and campus government) (as students not participating in an activity were not asked to indicate gains from that activity), and the satisfaction variables (as the HSS included a response option *not relevant*), cases with missing values (7.00% of the total preliminary sample of 8,184 students) on any of the remaining engagement and outcome measures were deleted (range of missing cases by variable: 35–192 or 0.43–2.35%; average number of missing cases by variable: 71 or 0.87%). These missing cases were compared with other students on first-generation status, gender, race/ethnicity, and each of the aforementioned engagement and outcome variables, which indicated no

systematic difference, except for a slightly higher proportion of men among missing cases (44.33%) versus women (39.73%), and a slightly higher percentage of missing cases among those participating in leadership experiences (37.94%) versus those who did not (32.70%). The final sample included 7,611 students, 800 (10.51%) of whom were first-generation students. The sample represented 16 private liberal arts colleges varying in location, rank, size, endowment per student, and selectivity. Of the students in the sample 5,091 (66.89%) were attending 7 schools ranked among the top 50 (2 of which were ranked between 15th and 25th, and 5 between 26th and 50th); 1,550 (20.37%) were attending schools ranked 51st to 100th (5 schools).

Data Validity and Reliability

This study was based on student self-reported data for analyses. For decades, self-reports have been widely used in studies of college student experience. Many researchers (e.g., Anaya, 1999; Pike, 2011) have generally agreed on the credibility of self-reports. Researchers (e.g., Kuh, 2002) generally agree that self-reports are likely to be valid when the respondents understand the information being requested on the survey and think that the questions are worded clearly, cover recent activities, deserve a thoughtful and honest response, and do not explore socially undesirable, embarrassing, or personally sensitive behaviors. Taken as a whole, the HSS fulfilled these conditions. The fact that the learning outcome items on the HSS were informed by the AAC&U LEAP outcomes further adds to the content validity. Regarding construct validity, the measures for the engagement and outcome constructs in this study reflect multiple dimensions and key features identified in the literature. Construct validity was also evidenced by the strong empirical relationships

found between the measures of the constructs as indicated by factor analysis showing common conceptual structures. Lastly, reliability analysis by the HEDS staff as well as my own testing yielded strong evidence of internal consistency of the scale measures representing engagement and outcome.

Data Analysis

To address research question 1, chi-square tests (and post hoc z tests for variables with more than two categories) were performed to identify significant association between first-generation status and a select demographic variable. For research question 2, binary logistic regression (SAS Institute Inc., 2017) was used to investigate whether first-generation status significantly predicted the likelihood of participating in each of the three HIPs (study abroad, faculty-mentored research, internships), and leadership experiences. For the remaining dependent variables examined in research questions 2 and 3, multilevel regression modeling (linear mixed models using restricted maximum likelihood estimation with Kenward-Roger adjustment) was used to determine the fixed effects of first-generation status (Albright & Marinova, 2010; Alnosai, 2007; McNeish & Stapleton, 2014; O'Dwyer & Parker, 2014; Singer, 1998); this method was warranted given the use of both student-level and institution-level variables and the need to account for potential random effects resulting from nesting or data clustering (i.e., students attending the same institution could be correlated, thus violating the assumption of independent errors). If a factor interaction between first-generation status and gender or race/ethnicity was not significant, the main effect of first-generation status was then interpreted; in the presence of a significant factor interaction, the main effect of first-generation status was not

interpreted, given that it worked together with gender or race/ethnicity to affect the dependent variable; instead, follow-up analyses (i.e., tests of simple effects based on least squares means) were performed to identify which first-generation subgroup by gender or race/ethnicity differed from its respective continuing-generation peer subgroup.

Assumptions for multilevel modeling were checked prior to the final regression analysis. First, multicollinearity among independent variables was diagnosed: all variables (not involved in any interaction terms) had tolerance value exceeding .10 (Mertler & Vannatta, 2002). Next, examinations of empty models indicated significant but low intraclass correlation coefficients (ranging from .01 to .06), suggesting cause for minor concerns for the random effects of nested data. After the student-level and institution-level predictors were entered into the multilevel models, the random effects on most variables remained significant, confirming the appropriateness of using multilevel modelling. Assumptions of normality, linearity, and homoscedasticity were then assessed through histograms of residuals as well as residuals plots (residuals vs. predicted values). For most variables, the distribution of residuals exhibited some deviation from normality; residuals plots seemed to indicate roughly constant variance of errors (Quinn & Keough, 2002). There was, however, a modest violation of normality of errors on a few variables (development of effective speaking; gains from study abroad, faculty-mentored research, internships, and leadership experiences; satisfaction with major advising). Two remedial measures were performed: data transformation (e.g., Box-Cox) and removal of students with an absolute studentized residual exceeding 2.5 (outliers), neither of which led to notable improvement in normality. Models were refitted following each measure, which did not change the conclusions regarding the presence or absence of the significant effects of

first-generation status. The final analysis used the dataset without the removal of these outliers.

Limitations

Despite their widespread use, some scholars have raised issues about the validity of self-reports regarding engagement behaviors and gains (e.g., Bowman, 2010; Campbell & Cabrera, 2011; McCormick & McClenney, 2012; Porter, 2011, 2013). Additionally, on a few dependent variables (indicated above), the model assumption for normality was not met, potentially weakening the results related to those variables. Another limitation was that first-generation students in this study may not mirror the profile of those attending other types of 4-year institutions. Despite the use of school rank as a statistical control, students from top-50 private liberal arts colleges were overrepresented; therefore, caution should be taken in generalizing the results. Lastly, given that graduating seniors were included in the sample, the potentially different attrition patterns of the two groups prior to the senior year could lead to a biased sample.

Results

Significant Differences on Select Demographic Characteristics

Compared with their continuing-generation peers, first-generation students were more likely to come from each of the following three historically underrepresented groups: Asian, African American / Black, and Hispanic/Latino; they were less likely to be White students. Additionally, the first-generation student group had a higher percentage of education majors (though the percentage was very small). Last, first-generation students

and their families were more likely to accumulate loan debt to finance their college education. See Table 2.

Insert Table 2 here.

Significant Differences on Self-Reported Levels of Engagement and Satisfaction

For levels of academic challenge (i.e., faculty and peer challenge in the classroom and frequency of undertaking challenging exams and assignments emphasizing higher-order thinking skills), the two-way interaction First-Generation Status $\times$ Gender was significant, $F(1, 7,567)=7.11, p=.008$; specifically, compared with their continuing-generation peers, first-generation men, as a whole, reported lower levels of academic challenge. Membership in the first-generation group yielded a significant, positive main effect on interactions with diversity (i.e., frequencies of conversations with other students and faculty/staff with different political, social, or religious opinions and conversations on intergroup relations and different lifestyles or customs), $F(1, 7,572)=6.38, p=.012$. See Table 3.

Insert Tables 3 & 4 here.

Regarding the three HIPs and leadership experiences, first-generation status did not predict the likelihood of study abroad, working with faculty on research, internships, or leadership experiences. See Table 4. Regarding gains from these four activities, the three-way interaction First-Generation Status $\times$ Gender $\times$ Race/Ethnicity was significant on gains from study abroad, $F(8, 4,559)=3.67, p<.001$; specifically, first-generation Asian men and Hispanic/Latino women both reported smaller gains from this activity than their respective

continuing-generation peers. Additionally, first-generation status interacted with race/ethnicity in its effect on gains from faculty-mentored research, $F(4, 4,270)=2.67$, $p=.03$, with first-generation African American / Black students and multiracial students both reporting significantly larger gains from this activity than their respective continuing-generation peers. See Table 3.

For the three satisfaction variables, membership in the first-generation group produced a significant, positive main effect on satisfaction with career services, $F(1, 6,980)=11.03$, $p<.001$. The two-way interaction First-Generation Status $\times$ Race/Ethnicity was significant on satisfaction with sense of community on campus, $F(4, 7,320)=5.29$, $p<.001$, with first-generation multiracial and Hispanic students both reporting a lower level of satisfaction than their respective continuing-generation peers. See Table 3.

Significant Differences on Self-Reported Outcomes

A significant main effect was found for first-generation status on institutional preparation for career path, $F(1, 7,574)=4.15$, $p=.042$, with first-generation students reporting larger gains on this outcome. The two-way interaction First-Generation Status $\times$ Gender was significant, $F(1, 7,567)=4.25$, $p=.039$, and the three-way interaction First-Generation Status $\times$ Gender $\times$ Race/Ethnicity, $F(8, 7,570)=2.36$, $p=.016$, was significant on gains in development of effective speaking; specifically, compared with their respective continuing-generation peers: (a) first-generation women, overall, reported larger gains on this outcome, (b) first-generation African American / Black men, too, compared favorably, (c) however, a difference of the opposite direction was found on first-generation multiracial men on this outcome. See Table 5.

Insert Table 5 here.

Given the significant main effect of first-generation status on career path preparation, follow-up analysis on an additional related environmental variable: frequency of on-campus employment, was conducted. First-generation students reported significantly higher frequencies of on-campus employment; furthermore, when on-campus employment was added as a predictor for career path preparation, being a first-generation student no longer had a significant, positive main effect on this outcome; instead, on-campus employment produced a significant, positive main effect.

Discussion

This study extends recent evidence concerning the effects of first-generation status on students' college experiences and contributes new knowledge by uncovering differences by first-generation status as moderated by gender and race/ethnicity. It provides new insights on first-generation students' participation in and gains from select HIPs and leadership experiences, satisfaction with select support services, and career-related gains, variables infrequently addressed in prior research. Additionally, it provides a reference point to compare first-generation college students' experiences across institutional types.

Profile of First-Generation Students

I found that first-generation and continuing-generation student groups are similar on gender composition, a finding contrary to research showing that the first-generation group had a disproportionately large number of men (Saenz et al., 2007; Pike & Kuh, 2005) or women (Terenzini et al., 1996). Consistent with previous research (e.g., Pike & Kuh,

2005), I found that the first-generation group has a disproportionately large number of Students of Color and students who take out loans to finance college. Expanding prior understanding, this further elucidates that not only the Hispanic/Latino group has a disproportionate number of first-generation students as already manifested by previous research, so does the Asian group and the African American / Black group.

Main Effects on Engagement and Outcomes

After controlling for select student and institutional characteristics, I found first-generation status had no effect on most of the engagement and outcome variables. Compared with their continuing-generation peers, first-generation students in this study seem to have had similar perceptions regarding faculty interest in and concern for students, relationships with faculty, and availability of faculty, and seem to have experienced similar frequencies of high-quality, impactful nonclassroom interactions with faculty and to be similarly satisfied with major advising; they are also just as likely to have studied abroad or participated in faculty-mentored research, internships, and leadership experiences, and appear to have benefited equally from internships and leadership experiences. On interactions with diversity and satisfaction with career services, first-generation status appears to have a unique effect, actually affording first-generation students an advantage. Regarding outcomes, this study demonstrates that first-generation and continuing-generation students seem to have benefited equally from college experiences in terms of overall gains in intellectual development, development of problem solving, development of social and civic engagement, institutional preparation for graduate school, and interpersonal relationships and family living; first-generation status affected

only one outcome—institutional preparation for career path—for which first-generation students actually reported larger gains.

In terms of institutional preparation for graduate school, findings from this study are consistent with Toutkoushian and Smart (2001). Contrary to Pike, Kuh, and McCormick (2011) and Pike, Kuh, McCormick, et al. (2011), the positive link between being a first-generation student and frequencies of interactions with diversity is intriguing. Perhaps it is related to the overrepresentation of Students of Color among first-generation students. Research (e.g., Pike, Kuh, & McCormick, 2011), including this study, has shown a positive association between racially minoritized group membership and diverse interactions. It may also be due to first-generation students' propensities and traits which aid them in relating to diversity. The positive effects of first-generation status on satisfaction with career services and career path preparation are particularly encouraging. This finding may be related to the college-going motivations of first-generation students, who, compared with their peers, tend to be more practically minded and to place higher levels of importance on career-oriented objectives (Saenz et al., 2007; Nunez & Cuccaro-Alamin, 1998; Overton-Healy, 2010). The majority of the students in this study started college in 2010, 2011, and 2012, during a period of recovery from the recession, an economic reality perhaps leading to the first-generation students' heightened pragmatism and awareness of the challenges facing disadvantaged groups in employment search. This, coupled with the likely lack of career-related guidance from their parents, probably motivated them to seek out career services more than their continuing-generation peers. Additionally, first-generation students in this study reported having worked more frequently on campus, which may have enabled them to receive more career mentoring from college staff and

enhanced workplace-relevant skills, thus contributing to their larger gains in career path preparation. Indeed, when on-campus employment was added as a predictor for career path preparation, the effects of first-generation status on this outcome disappeared; their higher level of career path preparation seems linked not so much to their first-generation status, as to their frequency of on-campus employment, which is positively associated with being first-generation.

Similarities and favorable comparisons between first-generation and continuing-generation students identified in this study contrast with the unfavorable differences discovered in prior research, such as on interactions with faculty (Pike, Kuh, & McCormick, 2011; Pike, Kuh, McCormick, et al., 2011). Contrary to previous research showing a lower likelihood of participation in HIPs (e.g., NSSE, 2017), first-generation students in this study participated in three HIPs (study abroad, faculty-mentored research, and internships) at rates similar to continuing-generation peers. Research has found that those participating in HIPs are most likely to be retained and engaged (Kilgo, Sheets, & Pascarella, 2014). This study adds to the significant amount of research showing that engaging in HIPs can serve to mitigate the challenges associated with being first-generation and membership in other less advantaged groups. Inconsistencies with previous research could be attributed to institution type and overrepresentation of students attending schools ranked among the top 50. Samples for most previous studies came from 4-year institutions varying in control (public and private) and Carnegie Classification (doctoral/research, master's, baccalaureate including liberal arts colleges and baccalaureate colleges with diverse fields). Pike and Kuh (2005) determined that much of the unfavorable differences between first-generation students and their peers were due to off-campus residence. Compared with

first-generation students at other types of institutions, especially public institutions, it is very likely that a higher proportion of first-generation students at private liberal arts colleges live on campus, which, along with the college's smaller enrollment, provides them more opportunities for interactions with faculty and diverse others. It is also possible that first-generation students choosing to attend private liberal arts colleges possess certain distinct precollege characteristics, predisposing them to higher levels of engagement. Last, the fact that few significant differences were found could be explained by a limitation inherent in the use of graduating seniors in sample selection. Prior research shows that first-generation students were less likely to graduate. Based on the most recent 3-year average of 6-year graduation rates in IPEDS, although about three quarters of the students included in this study were attending colleges with high graduation rates (9 colleges ranging from 79.67% to 90.67%), the rest of them were attending schools with comparatively low graduation rates (7 ranging from 50.33% to 79.00%). It was possible that by the time the HSS was conducted, compared with the continuing-education group, a significantly higher proportion of students in the first-generation group had dropped out; those who departed could have reported lower levels of engagement and less gains, thus mitigating the initial disadvantages of the first-generation group and even giving the remainder of the group a comparative advantage at time of measurement.

Interaction Effects

On very few variables, whether first-generation status affects student engagement and outcomes depends on the gender or race/ethnicity of that student; however, these effects occur in isolated areas, and their direction is not uniform. Overall, this study

suggests that no particular first-generation subgroup by gender or race/ethnicity appears to be systematically or substantially disadvantaged or advantaged relative to their continuing-generation peers. Again, this could be due to the potentially different attrition patterns as mentioned earlier.

Implications for Practice

As hypothesized by Astin's I-E-O model, this study demonstrates that the input of parental level of education affects students' experience of the college environments and outcomes; in a few areas, first-generation students and their continuing-generation peers experience college differently, but the direction of the differences is predominantly positive. Taken as a whole, they appear to be taking advantage of the college experience equally. This study attests to their resiliency in overcoming financial and other barriers and their making the most of career development opportunities.

This study contributes a considerable amount of empirical evidence affirming the multiple successes of private liberal arts colleges in supporting their first-generation students. The institutional accomplishments appear to be particularly impressive in promoting these students' interactions with diversity, in providing them high-quality career services (e.g., understanding the links between liberal arts majors and employment, career interests, and goals clarification), in their career path preparation, and in promoting their participation in HIPs. This study seems to suggest that for first-generation students, although it may cost more to attend a private liberal arts college, the benefits may counter the additional cost, in particular given their expectations for career preparation. The fact that—among a host of control variables—membership in the first-generation group is the

sole variable to produce a positive effect on satisfaction with career services speaks volumes about the effectiveness of career development resources and programs in meeting the needs of these students. The positive impact of on-campus employment on students' career path preparation is also noteworthy, indicating that liberal arts colleges should continue to support their work-study programs. Additionally, the association of first-generation status and membership in the racially minoritized group clearly suggests that programs for first-generation students are likely to yield more impact when integrated with those for Students of Color. Last, the factor interactions between first-generation status and gender or race/ethnicity, although occurring in a few isolated areas, may indicate the need to pay attention to the unique areas of low engagement or dissatisfaction of certain subgroups, such as enhancing sense of community on campus for first-generation multiracial and Hispanic students.

Directions for Future Research

First, future research could incorporate direct measures, such as standardized (criterion-referenced) measures for critical thinking, to more accurately gauge outcomes, which may provide evidence different from that gathered from self-reports. Second, given the persistent inconsistencies among studies, further research is needed to examine how first-generation students differ from their continuing-generation peers based on institutional type (e.g., private liberal arts colleges vs. 4-year public institutions). Third, other important input variables, such as precollege motivations, were absent from this study. As implied by Astin's I-E-O model, research incorporating additional inputs could more accurately determine the net effects of first-generation status. Last, this study

captured first-generation students' career-related gains weeks before graduation when many were still in the process of job searching. Future research could expand knowledge on outcomes by comparing their career placement rates one year after graduation.

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Table 1. Variables Used in the Study

Variable		Description ^a
<i>Independent (Inputs)</i>		
Student-Level Primary		
	First-Generation (FG) Student	yes/no
Student-Level Control		
	Race/Ethnicity ^b	categorical
	Gender	categorical
	Major	categorical
	FG Status × Gender	interaction variable
	FG Status × Race/Ethnicity	interaction variable
	FG Status × Gender × Race/Ethnicity	interaction variable
Institution-Level Control		
	Rank	ranked among top 50, 51st to 100th, and below 100th
	Size ^c	based on the 12-month full-time equivalent (FTE) of undergraduate enrollment: small= FTE below 2K; large=FTE above 2K
	Endowment per Student ^c	small (<100K), medium (<200K), and large (>200K)
	Selectivity ^c	more selective (below 50%), and less selective (above 50%)
<i>Dependent</i>		
Engagement		
	Perceptions of Faculty Interest in and Concern for Students (FINTERES)	$\alpha=.83$; 1 (<i>strongly disagree</i>), 2(<i>disagree</i>), 3 (<i>neither agree nor disagree</i>), 4 (<i>agree</i>), 5 (<i>strongly agree</i>)
	High-Quality Nonclassroom Interactions With Faculty (FINTER)	$\alpha=.87$; 1 (<i>strongly disagree</i>), 2(<i>disagree</i>), 3 (<i>neither agree nor disagree</i>), 4 (<i>agree</i>), 5 (<i>strongly agree</i>)
	Level of Academic Challenge (CHALLENGE)	$\alpha=.88$; 1 (<i>never</i>), 2 (<i>rarely</i>), 3 (<i>sometimes</i>), 4 (<i>often</i>), 5 (<i>very often</i>)
	Interactions With Diversity (DIVERSI)	$\alpha=.86$; 1 (<i>never</i>), 2 (<i>rarely</i>), 3 (<i>sometimes</i>), 4 (<i>often</i>), 5 (<i>very often</i>)
	Participated in: Study Abroad (PABROAD), Internships	yes/no

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	(PINTERN), Faculty-Mentored Research (PRESEAR), Leadership Experiences (PLEAD)	
	Gains From: Study Abroad (GABROAD), Faculty-Mentored Research (GRESEAR), Internships (GINTERN), Leadership Experiences (GLEAD)	1 (<i>very little</i>), 2 (<i>some</i>), 3 (<i>quite a bit</i>), 4 (<i>very much</i>)
	Satisfaction With: Major Advising (MAJADV), Career Services (CASERV), Sense of Community (COMMU)	1 (<i>very dissatisfied</i>), 2 (<i>generally dissatisfied</i>), 3 (<i>generally satisfied</i>), 4 (<i>very satisfied</i>)
Outcomes		1 (<i>very little</i>), 2 (<i>some</i>), 3 (<i>quite a bit</i>), 4 (<i>very much</i>)
	Gains in Intellectual Development (INTEDEV)	$\alpha=.84$; scale measures for Outcome: careful reading, critical thinking, creative thinking, information literacy, and effective writing
	Gains in Development of Problem Solving (SOLV)	$\alpha=.73$; scale measures for Outcome: quantitative literary, teamwork, and problem solving
	Gains in Development of Social and Civic Engagement (CIVIC)	$\alpha=.80$; scale measures for Outcome: civic engagement, intercultural knowledge and competence, and ethical reasoning
	Gains in Development of Effective Speaking (SPEAK)	
	Institutional Preparation for Career Path (PREPCA), Graduate/Professional School (PREPGS), Interpersonal Relationships (PREPINT)	

^a Except for the variables indicated with Cronbach alphas (scale measures derived from components based on my factor analysis of single items), all the other dependent variables were based on single survey items.

^b Despite the fact that race and ethnicity are regarded as two different concepts, I used the preexisting HEDS coding which combined race and ethnicity data in accordance with the IPED reporting categories: race data reflected the racial group(s) of all the non-Hispanics; ethnicity data were for those Hispanic students of any race.

^c I created the categories for these three variables with attention to the median and spread of the sample as well as cell size.

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Table 2. Frequency Distributions of Students by Select Demographic Characteristics
(N=7,611)

Characteristic	Percentage (%)		Sig. Difference	
	First-Generation (n=800)	Continuing- Generation (n=6,811)	χ^2	<i>p</i>
Gender			2.79	.095
Men	37.00	40.05		
Women	63.00	59.95		
Race/Ethnicity ^a			578.28	<.001
Asian or PI ^b	7.63	2.41		
African American / Black	10.38	2.95		
Hispanic/Latino	20.88	4.38		
Multiracial	5.13	3.39		
White	56.00	86.87		
Major			38.56	<.001
Biological Sciences (BIO)	11.38	12.66		
Business and Management (BUSI)	7.13	6.03		
Communications (COM)	2.25	1.64		
Education (EDU)	1.88	0.57		
Engineering (ENGN)	1.38	1.22		
Fine and Performing Arts (ARTS)	4.75	3.46		
Health Sciences (HS)	3.63	2.53		
Humanities (HUM)	9.38	11.23		
Physical Sciences, Math, and Computer Science (PSMCS)	5.25	6.92		
Social Sciences (SS)	27.13	25.55		
Other (OTH)	4.00	3.07		
Double Major (DM)	21.88	25.12		
No Accumulated Loan Debt to Finance Undergraduate Education			270.94	<.001
Accumulated Loan Debt to Finance Undergraduate Education	87.11	56.97		

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^a International students and students who marked “American Indian or Alaska Native” were excluded, given that the former often came from a different secondary school system, and given the small number of the latter.

^b PI=Native Hawaiian and Pacific Islander. Respondents marking PI were combined with the Asian group because of the small number in the PI group.

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Table 3. *F* Values from Tests of Fixed Effects of First-Generation Status on Engagement and Satisfaction (Results from Multilevel Modelling)

Independent Variable	FINTERES	FINTER	CHALLEN	DIVERSI	GABROAD	GRESEAR	GINTERN	GLEAD	MAJADV	CASERV	COMMU
<i>Student-Level Primary</i>											
FG Status	0.21	1.26	0.32	6.38*	0.48	2.86	0.04	1.58	1.78	11.03***	8.60
<i>Student-Level Control^a</i>											
Race/Ethnicity	3.29*	2.34	3.86**	17.64***	1.97	1.18	1.21	1.80	1.57	1.76	18.20
Gender	10.02**	8.48**	26.44	1.60	21.74	5.04*	12.14***	0.02	0.03	1.35	0.79
FG Status × Gender	0.05	1.28	7.11**	1.89	2.77	0.61	0.30	0.01	3.04	0.29	1.66
FG Status × Race/Ethnicity	1.75	0.18	0.96	0.72	0.76	2.67*	0.33	0.19	1.75	1.22	5.29***
FG Status × Gender × Race/Ethnicity	1.84	1.43	1.78	1.04	3.67***	0.62	1.52	1.04	1.34	1.05	1.09
Major	7.69***	12.3***	14.08***	16.08***	3.17***	22.08***	1.58	3.76***	5.13***	1.51	1.70
<i>Institution-Level Control</i>											
Rank ^b	0.14	0.04	0.89	2.44	9.78**	0.81	1.43	1.01	0.85	0.90	1.54
Size ^b	1.36	0.92	0.25	0.88	0.25	0.08	0.13	0.32	0.12	0.03	14.22**
Endowment per Student	0.29	1.62	0.96	0.81	0.09	0.12	0.36	0.47	0.46	1.34	2.58
Selectivity ^b	0.76	0.19	2.70	2.17	0.97	0.02	0.06	0.72	0.00	0.00	8.54*

Note. In the presence of a significant factor interaction, the main effect was not interpreted or specified.

^a Highlights of control variables positively (P) or negatively (N) associated with engagement: Being a woman: FINTERES (P), FINTER (P), GRESEAR (P), and GINTERN (P). Being multiracial: CHALLEN (N). Being a minority student: DIVERSI (P). BIO: DIVERSI (N) and GRESEAR (P). BUSI: FINTER (N), GRESEAR (N), and MAJADV (N). ENGN: DIVERSI (N). HS: DIVERSI (N).

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HUM: CHALLEN (P) and DIVERSI (P). PSMCS: CHALLEN (N), DIVERSI (N) and GRESEAR (P). SS: DIVERSI (P). DM: CHALLEN (P) and DIVERSI (P).

^b Ranked above 100th: GABROAD (P). Small or more selective schools: COMMU (P).

* $p < .05$. ** $p < .01$. *** $p < .001$.

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Table 4. Wald Chi-Square Values From Joint Tests of Effects of First-Generation Status on Participation in HIPs and Leadership Experiences (Results from Binary Logistic Regression)

Independent Variable	PABROAD	PRESEAR	PINTERN	PLEAD
<i>Student-Level Primary</i>				
FG Status	1.26	0.05	1.02	0.09
<i>Student-Level Control^a</i>				
Race/Ethnicity	8.89	5.00	4.35	21.54***
Gender	55.91***	0.68	0.84	21.37***
FG Status × Gender	0.99	0.33	0.23	0.13
FG Status × Race/Ethnicity	7.73	3.03	7.51	4.39
FG Status × Gender × Race/Ethnicity	5.00	3.73	7.35	5.40
Major	138.83***	396.30***	117.02***	42.09***
<i>Institution-Level Control^a</i>				
Rank	339.65***	0.20	31.67***	29.58***
Size	12.62***	<0.01	0.02	2.35
Endowment per Student	8.60*	17.26***	5.43	44.42***
Selectivity	68.08***	9.60**	11.46***	26.65***

Note. In the presence of a significant factor interaction, the main effect was not interpreted or specified.

^a Highlights of control variables positively (P) or negatively (N) associated with an activity: PABROAD: being a woman (P), HS (N), HUM (P), PSMCS (N), ranked among top 50 (P), large schools (P), small endowment (P). PRESEAR: BIO (P), ENGN (P), PSMCS (P), HUM (N), medium endowment (P). PINTERN: BUSI (P), HS (P), HUM (N), PSMCS (N), schools ranked below 100th (N). PLEAD: being a man (P), being an African-American (P), schools ranked 51st to 100th (P), medium endowment (P).

* $p < .05$. ** $p < .01$. *** $p < .001$.

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Table 5. *F* Values from Tests of Fixed Effects of First-Generation Status on Outcomes (Results from Multilevel Modelling)

Independent Variable	INTEDEV	SOLV	CIVIC	SPEAK	PREPCA	PREPGS	PREPINT
Student-Level Primary							
FG Status	1.71	2.59	0.83	0.72	4.15*	0.10	0.02
Control ^a							
Race/Ethnicity	4.61**	2.94*	5.48***	2.37	2.39*	5.77***	2.69*
Gender	23.23***	5.56*	10.68**	4.43	1.22	7.26**	0.69
FG Status × Gender	1.48	1.26	0.69	4.25*	1.05	1.30	0.32
FG Status × Race/Ethnicity	1.18	0.96	0.73	1.30	1.35	0.59	0.32
FG Status × Gender × Race/Ethnicity	1.19	0.50	0.89	2.36*	1.26	1.23	1.07
Major	22.46***	29.36***	17.40***	5.50***	4.08***	11.95***	4.80***
Institution-Level Control ^b							
Rank	1.43	2.77	2.72	2.14	0.88	1.07	8.33**
Size	5.16	0.28	0.54	0.78	0.11	1.93	0.61
Endowment Per Student	1.03	4.62*	2.35	2.68	3.13	0.29	5.05*
Selectivity	0.01	0.05	0.74	0.44	0.01	0.04	1.70

Note. In the presence of a significant factor interaction, the main effect was not interpreted or specified.

^a Highlights of control variables positively (P) or negatively (N) associated with outcomes: being a woman: INTEDEV (P), SOLV (P), CIVIC (P), and PREPGS (P). Being an Asian: INTEDEV (N), PREPCA (N), and PREPGS (N). Being an African-American: CIVIC (P). Being a Hispanic: INTEDEV (P), SOLV (P), and CIVIC (P). ARTS: SOLV (N). BIO: SOLV (P), PREPGS (P), and CIVIC (N). BUSI:

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PREPGS (N). ENGN: SOLV (P). HS: PREPGS (P). HUM: INTEDEV (P) and SOLV (N). PSMCS: INTEDEV (N), SOLV (P), CIVIC (N) and SPEAK (N). DM: PREPGS (P).

^b Ranked among Top 50 or small endowment: PREPINT (P); small endowment: SOLV (P).

* $p < .05$. ** $p < .01$. *** $p < .001$.