First-term Postsecondary Outcomes of First-Generation College Students in Tennessee

First-generation students are less likely to have enough information and resources about college-going from parents to support their transition to college.¹ In contrast, degree-holding parents are better positioned to pass on information and resources to support their children’s college enrollment.² This brief explores differences in first-generation and non-first-generation students’ first-term college outcomes. The brief also examines how differences vary depending on the number of degree-holding parents a student has as well as how first-generation students are defined.

Summary of Results

First-generation students attempted and earned fewer credits in their first term compared to their non-first-generation peers after accounting for student demographic, academic, financial, and institutional characteristics. First-generation students with one degree-holding parent performed slightly better than first-generation students without a degree-holding parent. While the magnitude of differences was small, differences were significant. Findings showcase how the magnitude of differences between first-generation and non-first-generation students can vary depending on how terms are defined. Differences in outcomes may appear larger or smaller depending on which students are included or excluded from the definition. Findings underscore the importance of providing first-generation students informational supports early—not only when applying to college, but also once enrolled. Attention should also be paid to how the term “first-generation” is defined.

Prior Work

Recent work emphasizes the importance of comparing alternate definitions of first-generation status.³ To the extent that definitions vary across policies and programs, understanding how gaps in first-generation college students’ outcomes differ across definitions is of policy relevance. Existing work typically examines long-term outcomes such as graduation.⁴ However, few studies have analyzed students’ short-term outcomes leading to graduation.

Data

This analysis uses Tennessee administrative data obtained through the Tennessee Postsecondary Evaluation and Analysis Research Lab (TN-PEARL), a research-practice partnership between Vanderbilt University’s Peabody College of Education, University of Tennessee's Boyd Center for Business and Economic Research, and the Tennessee Higher Education Commission (THEC). The data are collected by THEC and the Tennessee Student Assistance Corporation (TSAC) and maintained by the state's P-20 data repository. The sample includes eight cohorts of first-time, first-year students enrolled in state community or four-year colleges in the 2010-11 through 2017-18 school years. The sample contains 189,358 students in their first term of enrollment who have filed for federal financial aid, are Tennessee residents, are dependents between ages 17-24, and have complete information on the variables in the larger study (Joshi, 2020).⁵ See Appendix for complete list of variables in study, including variables for students’ demographic characteristics, academic preparedness, and financial resources. Descriptive data from the sample are available in a previous brief (Joshi & Heinrich, 2021).⁶

Identifying First-Generation Students
Using data from the Free Application for Financial Aid (FAF-SA), three definitions of first-generation students are examined with respect to their first-term outcomes:

1. Definition 1: First-generation students defined as students without a degree-holding parent.
2. Definition 2: First-generation students defined as either students without a degree-holding parent and/or students with exactly one degree-holding parent.
3. Definition 3: Compare first-generation students without a degree-holding parent (FG0) to those with one degree-holding parent (FG1).

See Appendix for more information on how these definitions were constructed.

Analysis

We used regression analysis to show adjusted differences for three first-term postsecondary outcomes: (1) credits attempted, (2) credits earned after adjusting for credits attempted, and (3) GPA. In presenting differences between first-generation and non-first-generation students, the analysis controlled for differences in students’ demographic characteristics, academic preparedness, access to financial resources, institutional characteristics, and also controlled for differences across school years (see Appendix for variables). Figures present predicted outcomes.

When defined as students without a degree-holding parent as shown in Figure 1, first-generation students attempted 0.04 fewer credits compared to non-first-generation students (Figure 2). This difference was statistically significant. This translated into the average non-first-generation student attempting about 13.83 credits, and the average first-generation student attempting about 13.79 credits.

In terms of credits earned, first-generation students were predicted to earn 0.14 fewer credits in their first term compared to their non-first-generation peers. After adjusting for the number of credits attempted, first-generation students earned 0.11 fewer credits than their peers (Figure 3).

These differences were statistically significant. This means the average non-first-generation student earned about 11.69 credits and the average first-generation student earned about 11.58.

First-generation students also earned GPAs 0.04 points lower.

Findings - Definition 1

Figure 1: Illustration of Definition

Note: The figure shows how parents’ degree-holding status was used to construct the definition of first-generation and non-first-generation students as students without a degree-holding parent.
than those of their non-first-generation peers (Figure 4) and were predicted to earn an average GPA of 2.57, compared to an average GPA of 2.61 earned by their non-first-generation peers. This difference was statistically significant.

Findings - Definition 2

Figure 4: Predicted First-Term GPA, by First-Generation Status

In contrast with definition 1, definition 2 counts students with one degree-holding parent as first-generation students. When including students with one degree-holding parent in the definition of first-generation, differences between first-generation and non-first-generation appear larger. However, this seemingly larger difference is driven by a change in the students counted as non-first-generation. Students with two degree-holding parents earned more credits and had higher GPAs than students with one or no degree-holding parents, so much so that a more expansive definition of first-generation students widens the gap in these outcomes. Table 1 compares the predicted difference in outcomes across the two definitions of first-generation status.

Findings - Definition 3

To further parse out the differences in outcomes between students with one degree-holding parent and students with two degree-holding parents, the definition of non-first-generation students was revised to include students with one degree-holding parent. This change in the definition of non-first-generation students resulted in a narrower gap between first-generation and non-first-generation students. Table 1 displays how many fewer credits and GPA points first-generation students were predicted to attempt or earn according to definition 1, and column 2 shows the parallel statistics for definition 2. When students with one degree-holding parent were included in the definition of first-generation students (definition 2), first-generation students were predicted to attempt and earn even fewer credits and had even lower GPAs than their non-first-generation peers.

**Table 1: Comparison of Differences in First-Generation and Non-Generation Students’ Outcomes, by Definition**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Definition 1</th>
<th>Definition 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits Attempted</td>
<td>-0.04</td>
<td>-0.05</td>
</tr>
<tr>
<td>Credits Earned</td>
<td>-0.11</td>
<td>-0.18</td>
</tr>
<tr>
<td>GPA</td>
<td>-0.04</td>
<td>-0.07</td>
</tr>
</tbody>
</table>

Note: The figure shows how many fewer credits or GPA points (as indicated by the downwards red arrows) first-generation students were predicted to earn compared to their non-first-generation peers. Column 1 shows differences using definition 1 of first-generation student, while column 2 shows differences using definition 2. Differences adjust for student demographics, academic preparedness, financial resources, institutional characteristics, and school year.

This difference in estimates can be explained by a change in the definition of non-first-generation students. As shown below, students with one degree-holding parent performed slightly better than students without a degree-holding parent and slightly worse than students with two degree-holding parents. When the definition of non-first-generation students no longer included students with one degree-holding parent who are lower performing, the difference between the two groups appears larger.
dents without a degree-holding parent and students with exactly one degree-holding parent, results are presented comparing these two groups of students. In this instance, non-first-generation students are those with two degree-holding parents, as illustrated in Figure 6. As above, predicted values for the average student are displayed. As seen in Figure 7 and Figure 8, compared to non-first-generation students, first-generation students without a degree-holding parent were predicted to attempt 0.06 fewer credits and earn 0.19 fewer credits in their first term. These differences were statistically significant.

First-generation students with one degree-holding parent fared slightly better, attempting and earning more credits than first-generation students without a degree-holding parent. Compared to non-first-generation students, first-generation students with one degree-holding parent were predicted to attempt 0.04 fewer credits and earn 0.16 fewer credits in their first term. A test of coefficient equivalence shows that the difference in credits attempted was statistically significant between the two groups. The difference in credits earned between the two groups was not statistically significant.

A similar pattern was seen with respect to GPA (Figure 9). Both first-generation students without a degree-holding parent and those with one degree-holding parent earned GPAs about 0.06 points lower than that of their non-first-generation peers. These differences were statistically significant. Specifically, students without a degree-holding parent were predicted to earn an average first-term GPA of 2.57, compared to an average GPA of 2.64 earned by their non-first-generation peers. The difference in GPA between the two groups was not statistically significant.

**Conclusion**

Results from this brief show that similarly resourced first-generation students attempted and earned fewer credits than their non-first-generations peers in their first term and had lower GPAs. While small in magnitude, differences were statistically significant.
These findings are consistent with prior work. First-generation students with some access to parental knowledge around college-going via one degree-holding parent performed slightly better than first-generation students without a degree-holding parent.

Moreover, findings showcase how the magnitude of differences between first-generation and non-first-generation students can vary depending on how each is defined. Differences in outcomes may appear larger or smaller depending which students are included or excluded from the definition.

Taken together, findings have three key implications.

(1) Access to Parental Knowledge Around College-Going Makes a Difference in Student Outcomes. First, this analysis underscores findings from prior work, namely that access to parental knowledge around college-going matters for students’ postsecondary outcomes. First-generation students’ first-term outcomes improved slightly when students had one degree-holding parent. Nevertheless, students with one degree-holding parent continued to perform significantly lower than students with two degree-holding parents.

(2) First-Generation Students Need Support Early. Interventions are needed sooner for first-generation students. Even for similarly positioned students, differences are observed as early as students’ first term of enrollment. Prior work notes that first-generation students may benefit from greater access to academic and information supports to help them navigate the transition to college. First-generation students may also benefit from added supports once enrolled, specifically, supports that build students’ knowledge around college-going.

(3) How First-Generation Students are Defined Matters. When the definition of first-generation includes students with one degree-holding parent, the gap between first-generation and non-first-generation students appeared larger. However, this difference was driven by a change in the composition of students in the two groups.

Furthermore, both first-generation students without a degree-holding parent and one degree-holding parent had significantly lower first-term outcomes than students with two degree-holding parents, suggesting that students with one degree-holding parent need assistance in their transition to college as well.

To the extent that definitions of first-generation vary across programs and policies, consideration of which students are included and excluded by a definition of first-generation students is important.

References


Defining First-Generation College Students: The Free Application for Federal Student Aid (FAFSA) form asks families to provide the highest level of schooling completed by parents. Families select from the following: (1) Middle school/Jr. High, (2) High School, (3) College or beyond, or (4) Other/unknown (treated as non-college-going). A degree-holding parent was defined as one whose highest level of schooling was "college or beyond". Since a goal of this study was to compare varying definitions of first-generation college students, the study examines several definitions. TDOE defines first-generation students as students without a degree-holding parent (Definition 1). There were approximately equivalent numbers of students in each group. Of the 189,358 students in the sample, 68,717 did not have a degree-holding parent, 54,239 had exactly one degree-holding parent, and 66,402 had two degree-holding parents.

Demographic Characteristics: Student race is a categorical variable describing whether a student is recorded as Black, White, Hispanic, Asian, or other race/ethnicity in postsecondary administrative data. Student sex is a binary indicator equaling 1 when a student is recorded as female and 0 if recorded as male.

Academic Preparedness: Students’ academic preparedness describes the academic skills students may have when navigating college and completing collegiate work. ACT composite score is a continuous variable ranging from 1 to 36. Dual enrollment is a binary indicator equal to 1 if a student ever dual enrolled in college coursework during high school and 0 otherwise. Earning Advanced Placement (AP) credits is an indicator equaling one if a student earned any AP credits during high school, as available in the data. Age of first enrollment includes two binary indicators for whether a student enrolls at age 17, or between age 19-24.

Financial Resources: Students’ access to financial resources was measured using data from the Free Application for Federal Student Aid (FAFSA) form, which provides information about students’ access to family resources and their eligibility for various federal and state awards and scholarships. Expected family contributions (EFC) towards postsecondary education is calculated using a formula revised annually by the U.S. federal government (see here for the most recent EFC formula guide). Parental adjusted gross income (AGI) is reported using information from federal tax forms and includes wages, alimony, Social Security, and business income. Binary indicators for students’ eligibility for frequently accessed federal- and state-level scholarships and grants were also included. These include measures for whether a student was eligible for the Pell grant, a state needs-based grant (TSAA), the Tennessee HOPE scholarship, the HOPE Access grant, the Tennessee HOPE Aspire award, and the General Assembly Merit (GAM) scholarship. These indicators denote eligibility, and not necessarily take-up, of the award. For more information on grants and awards, visit the following sites: Pell, TSAA, HOPE, Aspire, Access, GAM.

Institutional Characteristics: To control for differences in student performance, professional goals, and other institution-related factors that may affect student outcomes, variables accounting for students’ institution of enrollment, enrollment type, and major are included. Students’ institution is the public institution of enrollment in their first term, excluding terms when they were dual enrolled in college and high school. Students in the sample attended 1 of 22 Tennessee public two- or four-year institutions in their first term. Students’ major is a categorical variable of students’ major in their first term of enrollment. This variable was created by categorizing over 280 major codes into 7 common areas of study using CIP codes. Additionally, an indicator was included for seamless enrollment, defined as enrolling in the fall immediately following high school graduation. Finally, an indicator was included for full time enrollment, equaling one when a student attempted at least 12 credits during a term. Indicators were also included for school year.