



The AIR Professional File

Spring 2023 Volume

Supporting quality data and
decisions for higher education.



ASSOCIATION
FOR INSTITUTIONAL
RESEARCH

**FEATURING THREE ARTICLES FROM
NCES DATA INSTITUTE TEAMS**

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LETTER FROM AIR'S EXECUTIVE DIRECTOR

I am pleased to introduce three outstanding articles for the Spring 2023 issue of the *AIR Professional File*. Each of these papers explore different facets of the important and complex interdependencies among students, institutions, and disciplines. All three articles use federal datasets and are based on research projects started as part of the National Center for Education Statistics (NCES) Data Institute. The NCES Data Institute (Institute) is a long-standing partnership between NCES and AIR to provide an intensive introduction to federal educational datasets and research methodology. The training is supported by NCES and is developed and operated by AIR.

For over two decades, the Institute has provided opportunities for IR/IE professionals, graduate students, faculty, and other researchers to learn more about the rich array of information within the NCES datasets as well as methodologies and tools to use the datasets effectively. The research that has emerged from this learning and exploration has fueled a multitude of studies that, in turn, have increased our understanding on topics such as student enrollment and graduation patterns; the impact of institutional actions and support; and much, much more. Research partnerships have been forged and lasting connections and friendships have developed among participants.

The Institute has also been the catalyst for journal articles, dissertations, conference presentations, and policy papers that have supported and advanced the career journeys of the participants themselves. The

successful completion of my own dissertation was supported by the knowledge, skills, and connections I gained through participation in one of the early Institutes. Thus, I personally attest to its value and impact.

The three papers in this volume add to the impressive record of Institute participants contributing new and meaningful insights to higher education research through the use of federal datasets.

Andrea Chambers, Hollie Daniels, John Dooris, Arlyn Y. Moreno Luna, and Sean Riordan use the Beginning Postsecondary Students Longitudinal Study (BPS) to explore the question of whether adult students who begin their postsecondary education at a 2-year institution are more or less likely to attain a bachelor's degree as compared to adult students who begin at a 4-year public or 4-year private nonprofit institution. They found no differences in the likelihood of persistence to a bachelor's degree across the various institution types - after controlling for common predictors of persistence such as high school GPA, receipt of Pell Grants, and other demographic data. They also found no differences in persistence for adult students when examining different levels of enrollment intensity (full time and part time).

Sooji Kim, Sarah Parsons, Kimberly Y. Franklin, and Alyse Gray Parker use IPEDS data and a conceptual framework of "servingness" to study the extent to which Hispanic-Serving Institutions (HSIs) serve

LETTER FROM AIR'S EXECUTIVE DIRECTOR

Latinx students as measured by 6-year graduation rates. Their findings suggest that the 6-year graduation rates for Latinx students are lower at HSIs as compared to non-HSIs, even when taking into account the proportion of Latinx students and Latinx faculty. They also found that increased institutional spending on research, academic support, and institutional support are positively associated with graduation rates.

Trang C. Tran, Jon Williams, Kyndra V. Middleton, Angela Clark-Taylor, and Christen Priddie use the High School Longitudinal Study (HLS) to examine the influences that gender, math identity, science identity, career expectations at age 30, and high school STEM credit completion have on Black, Indigenous and People of Color (BIPOC) students' postsecondary major (STEM or non-STEM). The results of their study indicate that gender, science identity, career expectations at age 30, and high school STEM credit completion significantly predict the odds of postsecondary enrollment in a STEM major.

I hope your understanding is expanded and your curiosity sparked by these excellent papers.

Sincerely,
Christine M Keller

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ISSN 2155-7535

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Does the Starting Point Matter? Analyzing Bachelor's Degree Attainment for Adult Students by Institutional Type

Andrea Chambers, Hollie Daniels, John Dooris, Arlyn Y. Moreno Luna, and Sean Riordan

About the Authors

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Abstract

Using the National Center for Education Statistics (NCES) 2012/17 Beginning Postsecondary Students Longitudinal Study (BPS:12/17), this research study explores the persistence to bachelor's degree attainment of adult students. Specifically, this study looks at adult students who expected to earn a bachelor's degree or higher, and analyzes whether those students who begin their postsecondary education at a 2-year public or private nonprofit institution are more or less likely to attain a bachelor's degree compared to adult students who begin at a 4-year public or 4-year private nonprofit institution. Our findings indicate that, after controlling for common predictors of persistence such as high school GPA, receipt of Pell Grants, and other demographic data, adult students who begin at a 2-year public or private nonprofit institution are no less likely to attain a bachelor's degree compared to adult students who start at a 4-year public institution. In addition, full-time enrollment intensity does not increase the odds of persistence compared to mixed enrollment intensity for adult students.

The AIR Professional File, Spring 2023

Article 158

<https://doi.org/10.34315/apf1582023>

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Keywords: adult students, academic outcomes, community college, persistence, retention

Note

This material is based on work supported by the Association for Institutional Research and the National Center for Education Statistics. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Association for Institutional Research and the National Center for Education Statistics.

INTRODUCTION

Adult students age 25 or older are a major component of higher education in the United States, comprising approximately 25% of all undergraduate students in U.S. colleges and universities, with the majority of adult students beginning college at 2-year institutions.¹ In 2019, approximately one in three students at 2-year institutions was age 25 and older, and approximately one in five undergraduate students at 4-year institutions was age 25 and older (National Center for Education Statistics [NCES], 2021). Despite the large population of adult students, there has been a strong focus on traditional-age students in research on student retention and graduation. Degree completion rates for adult students have been increasing in recent years, but those rates are still significantly lower than those of traditional-age students, with 50.5% of adult students graduating within 6 years compared to 64.1% of traditional-age students (Causey et al., 2022). Taniguchi and Kaufman (2005) found that various factors commonly associated with adult students, such as being enrolled only part time and parenting young children, significantly deterred college completion. There is also a pattern of disparities in completion rates by race/ethnicity for adult students, with the rate for Asian adult students completing a degree within 6 years at 66.6%, the rate for White adult students at 43.8%, the rate for Hispanic adult students at 37.7%, and the rate for Black adult students at 37.6% (Causey et al., 2022). While women have outpaced men in college completion rates over the past few decades, completion rates among adult students have been

higher for male students, beginning with the 2011 cohort of first-time students. The most recent 6-year completion rate for adult male students was 50.7%, while the most recent 6-year completion rate for adult female students was 48.2% (Causey et al., 2022).

This study analyzes how beginning postsecondary education at a 2-year institution influences the persistence of adult students compared to beginning at a 4-year institution. More specifically, our research question asks, for adult students who expected to earn a bachelor's degree or higher, how does beginning at a public or private nonprofit 2-year institution influence bachelor's degree attainment compared to beginning at a 4-year public or 4-year private nonprofit institution? In the following sections, we detail influential determinants of adult degree attainment, including institutional starting point; academic advising; institutional context; and environmental factors and academic momentum. We then detail our theoretical framework, and suggest that common academic persistence and degree attainment frameworks fail to consider adult students. We then describe our methodology, present our results, discuss the impact of institutional level and enrollment intensity on adult student degree completion, and, finally, analyze limitations of our research and suggest avenues for future research.

LITERATURE REVIEW

Previous research suggests that adult students and traditional-age students navigate higher education

1. Authors' calculations using NCES PowerStats, BPS:2012/17 data.

differently; these differences can present unique challenges to persistence in students' degree programs.

Institutional Starting Point

Each year, community colleges provide a critical point of entry to higher education for millions of students, particularly for adult students. About one third of undergraduate students in the United States are enrolled in community colleges, and approximately one third of community college students are age 25 and older (NCES, 2021). A major function of U.S. community colleges is their role in providing transfer opportunities to students who may wish to continue their postsecondary education beyond the community college level. Although the vast majority of community college students aspire to earn a bachelor's degree, 6 years after first enrolling fewer than 16% of students who had enrolled in community college expecting to earn a bachelor's degree or higher had done so.² Transfer likelihood differs by socioeconomic status, age, race/ethnicity, educational background, and parental educational attainment; older students, students of color, low-income students, and first-generation students all have lower probabilities of upward transfer than other students (Bailey et al., 2005; Bowen et al., 2009; Dougherty & Kienzl, 2006; Gross & Goldhaber 2009; Wang, 2009; Wood et al., 2011). Other risk factors that have been associated with lower transfer probability include working a full-time job, being a single parent, being enrolled part time, and lacking a high school diploma (Adelman, 2006).

Academic Advising

The field of academic advising emerged in the late 19th century, and has continued to grow throughout the 20th and 21st centuries, particularly as the population of students entering colleges and universities has become more diverse, with varying student needs and degree aspirations (Thelin, 2011). While a large body of research on academic advising focuses on student satisfaction, engagement, and advising's relationship to graduation rates at 4-year institutions (Kuh et al., 2011; Lan & Williams, 2005), a smaller portion of research has evaluated students who begin at a 2-year institution with hopes of transferring to a 4-year institution. In one such study, Bahr (2008) found higher success rates in remedial or developmental coursework, as well as greater odds of transferring to 4-year institutions, for those who received academic advising. Further studies have demonstrated the importance and influence of advisors' relationships with students in successfully transferring to 4-year institutions (Packard & Jeffers, 2013), as well as greater satisfaction with advising among students who successfully transferred (Allen et al., 2014).

Institutional Context

Some of the barriers that adult students face in persisting in their programs and attaining a degree are at the institutional level. Policies, procedures, and attitudes toward adult students create an institutional culture that adult students may see as either welcoming or threatening (Schwehm, 2011).

2. Authors' calculations using NCES PowerStats, BPS:2012/17 data.

Askham (2008) explored these possibilities, identifying both a positive and a negative context within higher education that shaped the adult student's experience. The positive context, or learning community, represented the social support that adult students experienced through assistance from the institution, family, and friends. The negative context, or alien culture, manifested itself as a culture of confusion in higher education, including policies, procedures, and other issues that are intimidating to the adult student. In essence, the community college mirrored the learning community while the university exemplified the alien culture. Adult transfer students, in particular, have to adapt to two separate institutional cultures to be successful. It is the responsibility of the institution to help adult students navigate these differing cultures, minimizing the negative elements of the alien culture while providing an opportunity for the adult student to thrive as part of the learning community.

Using survey data from 32 2-year institutions, Hawley and Harris (2005) found that the characteristics impacting persistence can be classified into three categories: (a) barriers, (b) motivations and aspirations, and (c) expectations. *Barriers* included the amount of developmental coursework a student would have to take, as well as other characteristics such as English proficiency. *Motivations and aspirations* included whether they planned to transfer to a 4-year institution and how focused they were on obtaining their degree. *Expectations* included how long they planned to stay at the institution, as well as other areas such as family and job responsibilities, which could also be seen as barriers. Each of these three categories was found to contain significant predictors of attrition.

External Environmental Factors and Academic Momentum

Other important predictors of persistence among adult students are external environmental factors that could influence enrollment (Bean & Metzner, 1985; Bergman et al., 2014; Braxton et al., 2004; Hagedorn et al., 2008), since many adult students are balancing work, family, and school. Research suggests that family responsibilities can have a direct negative influence on adult student college success (Berkner et al., 2000; Horn & Carroll, 1996; Tinto, 1993). For many adult students who have family obligations, part-time enrollment can provide more-flexible course schedules and lower per semester costs, which might be beneficial to their persistence (Chen, 2007).

In a 2018 article on Complete College America's (CCA) website, Sarah Ancel acknowledged that adult students face unique challenges that traditional-age students are less likely to face, such as the need to work and/or to find child care. In response to these challenges, Ancel promoted compressed course schedules—schedules in which adult students take courses year-round in compressed schedules of one or two courses at a time in 4- to 8-week sessions—as a promising approach to help adult students maintain a 30-credit-hour load per year and so increase graduation rates (Ancel, 2018). While the article cited several case studies with promising results, it nonetheless continued to promote full-time enrollment for greater persistence, even for adult students. The author suggested that adult students who attend less than full time face a lower likelihood of graduating, writing that the traditional academic calendar “leaves these adult students with a difficult tradeoff: make life-altering sacrifices

to attend college full-time or go part-time with significantly greater long term costs and a lower likelihood of reaching graduation” (Ancel, 2018, para. 5).

CCA encourages states and institutions to adopt “15 to Finish” policy initiatives with the belief that academic momentum can help students overcome some of the barriers to completion. These initiatives typically include publicity campaigns encouraging students to enroll in at least 15 credit hours per semester, including an offer of financial aid incentives to do so. More than 25 states and more than 200 institutions are currently engaged in 15 to Finish campaigns (CCA, 2022). CCA cites descriptive statistics from the Beginning Postsecondary Students Longitudinal Study 2004/2009 (BPS:04/09) showing that students, regardless of work schedule, race, gender, or socioeconomic status, were more likely to graduate if they enrolled in more credit hours (CCA, 2013). In critiquing the 15 to Finish campaign, however, Goldrick-Rab (2016) noted, “It may not be that it’s the pace of their momentum that causes improved outcomes—students who move faster vs. slower are often different people who are destined to finish college at different rates independent of their pace” (para. 3).

There are often financial obstacles that prevent students from enrolling in more courses. According to the 2014 National Student Financial Wellness Study, a large-scale survey of student financial wellness, 32% of community college students indicated that the primary reason they were taking extra time to complete a degree was because they had to take fewer classes in order to work more, while just 16% of students at 4-year public institutions responded similarly (National Student

Financial Wellness Study, 2014). Tod Massa, director of policy research and data warehousing for the State Council of Higher Education for Virginia, has noted, “For some students, credit load is a function of overall affordability, particularly of their flexible or indirect costs such as textbooks and commuting costs” (Fain, 2016, para. 31).

While there is some evidence that initially attempting 15 versus 12 credit hours per semester improves degree completion, even after controlling for academic and socioeconomic status variables (Attewell & Monaghan, 2016), the same research noted that undergraduates who work 30 or more hours per week did not benefit from a higher course load. Chan (2020) used a difference-in-differences method to examine the impact of Indiana’s implementation of a 30-credit hour minimum annual completion policy for their promise program, the 21st Century Scholars Program. Chan (2020) found that the requirement of a minimum of 30 credit hours did not have an effect on degree completion at the two institutions under examination: (a) Indiana University–Bloomington and (b) Indiana University–Purdue University Indianapolis.

THEORETICAL FRAMEWORK

Theoretical models surrounding student retention have long been present in higher education literature. For example, Tinto’s (1993) theory of student departure identifies academic difficulties, the inability of individuals to resolve their educational and occupational goals, and individuals’ failure to remain incorporated in the intellectual and social life of an institution as major contributors to

student attrition. Other retention models include Astin's (1977, 1991, 1993) inputs-environment-outputs framework, and Bean and Eaton's (2016) psychological model of student departure. However, these models have often been applied to full-time, traditional-age residential college students and might not have identified the factors that are critical for understanding adult undergraduate student persistence.

Adult student retention models seek to incorporate elements related to adult students' college experiences. The theory of adult learner persistence in degree completion programs model by Bergman et al. (2014) includes (a) student entry characteristics, (b) external environmental characteristics, and (c) internal campus environmental characteristics. Of the three, internal campus characteristics were found to have the greatest effect on persistence. Additionally, their study found that persistence rates were lower among students who believed that their work and their academics conflicted to a great extent. Financial aid and the ability to pay for their degree were also significant factors (Bergman et al., 2014).

Bean and Metzner's (1985) conceptual model of undergraduate nontraditional student attrition found patterns in student departure among adult students that differed from patterns among traditional-age students, specifically that the former students were more affected than the latter by factors that were external to the college environment. Social integration variables existed both internally and externally to the college, but the internal variables had little impact on retention, while the external variables were more predictive. The process of attrition was expected to be similar regardless of the type of institution.

METHODOLOGY

We analyzed data from BPS:12/17, conducted by the NCES at the U.S. Department of Education. The BPS is a large, nationally representative sample survey of first-time beginning undergraduate students in the United States, and collects data on a variety of topics, including persistence, transfer, degree attainment, demographic characteristics, and workforce entry. Data were collected from student surveys and administrative data sources, such as academic transcripts and financial aid records. BPS data include students who are not direct entrants to college from high school, which allows researchers to analyze adult students' degree attainment.

We created a logistic regression model to determine if control and level of institution (2-year public or private nonprofit, 4-year public, 4-year private nonprofit) were associated with bachelor's degree attainment rates for adult students who expected to earn a bachelor's degree or higher. Using the theory of adult learner persistence in degree completion programs (Bergman et al., 2014) and the conceptual model of undergraduate nontraditional student attrition (Bean & Metzner, 1985) as theoretical frameworks, we used a stepwise regression approach, starting with no control variables and adding variables to test model fit. Variables that substantively improved the model fit were included, whereas those that did not were excluded. Our model included the following control variables:

- *High school GPA* included three groups: (a) below 3.0 (reference group), (b) 3.0 or higher, and (c) skipped/not applicable.
- *Gender* included two groups: (a) male (reference group); and (b) female.
- *Race/ethnicity* included two groups:

(a) White or Asian (reference group); and (b) underrepresented minority (URM) or more than one race.

- *First-generation status* indicated whether a parent of the student (a) had completed a bachelor's degree or higher (reference group), or (b) had not completed a bachelor's degree or higher.
- *Enrollment intensity* indicated whether the student's first enrollment spell was (a) full time, (b) part time, or (c) a mix of full time and part time (reference group). Note that the term "enrollment spell" is defined in BPS as a period of enrollment without a break of more than 4 months (NCES, 2022; definition at SENUM6Y). The "enrollment intensity" variable in BPS is derived from student interviews (NCES, 2022; definition at ENINPT3Y). The guideline of 12 semester or quarter hours per term was used regarding full-time status at the undergraduate level (NCES, 2022).
- *Work intensity* was grouped into whether an enrolled student in 2011–2012 had (a) full-time job, (b) part-time job, or (c) no job (reference group).
- *Academic advising* indicated whether a student in 2011–2012 (a) used academic advising services or (b) did not use academic advising services (reference group).
- *Pell recipient* indicated whether a student in 2011–2012 (a) received a Pell Grant, or (b) did not receive a Pell Grant (reference group).
- *Dependents* indicated whether a student in 2011–2012 had (a) a dependent(s), or (b) no dependent(s) (reference group).
- *Academic confidence* denoted the student's answer on a 1 (Strongly Disagree) to 5 (Strongly

Agree) Likert scale to the statement, "After having been at my first institution for a while, I am confident that I have the ability to succeed there as a student." Two groups were created: (a) "Strongly Agree," and (b) all other responses less than "Strongly Agree" (reference group).

In addition to these control variables, we included the control and level of the first institution as our primary independent variable of interest. The three groups of institutions are (a) 2-year public or private nonprofit (reference group), (b) 4-year public, (c) 4-year private nonprofit. The dependent variable was a dichotomous variable indicating whether the student had attained a bachelor's degree.

While the details of BPS survey weighting are outside the scope of this paper, it is important to note that the BPS:12/17 sample is a subset of the 2011–2012 National Postsecondary Student Aid Study (NPSAS:12), which is itself a sample survey of undergraduate and graduate students. Because we did not obtain a restricted-use data license for BPS:12/17, we conducted our analysis through the NCES online application PowerStats, in which appropriate survey weightings are applied to the underlying BPS sample data to compute population estimates and standard errors. For this study in PowerStats, the final cross-sectional student weight (WTA000) was used for both the logistic regression and all descriptive statistics. Details of weighting and variance estimation can be found in the BPS:12/17 data file documentation (Bryan et al., 2019). There were more than 22,000 respondents in BPS:12/17, but because we limited our analysis to adult students who reported an expectation to earn a bachelor's degree or higher, our sample size was approximately 700 students.³

3. Note that, per NCES standards, exact sample sizes are modified in PowerStats to minimize disclosure risks of individual responses.

RESULTS

Descriptive Statistics

Using the BPS:12/17 data set, descriptive statistics were first calculated to characterize the sample (see Table 1 in the appendix). Overall, the sample population of adult students included a mostly even split between males (50.95%) and females (49.04%), with 4-year institutions having slightly more females (53.86%) than males (46.13%) and 2-year institutions having slightly more males (52.24%) than females (47.75%). There were more White or Asian students (61.92%) than URM students or students of more than one race (38.07%). Also, 20.59% of students reported a high school GPA below 3.0, while 22.30% reported a GPA of 3.0 or higher (an additional 57.10% did not respond). The majority of students were first-generation (84.35%); 2-year institutions had a higher percentage of first-generation students (85.98%) in comparison to 4-year institutions (78.27%). More than half of the sample strongly agreed that they had academic confidence (54.72%), received Pell Grants (66.58%), and had dependents while in school (58.95%). Overall, the most common enrollment intensity was mixed (43.66%), and most students had no job while in school (50.76%). Tables 2 and 3 in the appendix show the bachelor's degree attainment rates among students who began at a 2-year institution (Table 2) compared to students who began at a 4-year institution (Table 3).

Logistic Regression

While odds ratios for the control variables generally aligned with prior theory and empirical studies (e.g., students with higher GPAs in high school were more likely to graduate than students with lower GPAs), the only statistically significant predictor of

bachelor's degree attainment was control and level of first institution (see Table 4 in the appendix).

Part-time enrollment intensity during the first enrollment spell (i.e., the first period of enrollment without a break of more than 4 months), decreased the odds of a student obtaining a bachelor's degree to essentially zero (0.00 odds ratio) in comparison to mixed enrollment intensity (a mix of full-time and part-time enrollment). Given the extremely large standard error and thus confidence interval, and also based on descriptive statistics on degree attainment rates in Tables 2 and 3, it is likely that no or almost no part-time students in the sample graduated within 6 years; thus, part-time enrollment predicted the outcome variable perfectly or almost perfectly, preventing a maximum likelihood estimate for part-time enrollment. This phenomenon is known as complete or quasi-complete separation. This finding is not surprising because it is nearly impossible for a student enrolled entirely part time to graduate with a bachelor's degree in the 6-year time frame used to measure degree attainment in BPS. However, full-time enrollment intensity did not lead to a statistically significant difference in the odds of a student obtaining a bachelor's degree compared to mixed enrollment intensity.

The odds of obtaining a bachelor's degree were 4.63 times greater for students whose first institution was a 4-year private nonprofit institution compared to students whose first institution was a 2-year public or private nonprofit institution. However, there was no statistically significant difference in the odds of a student whose first institution was a 4-year public institution obtaining a bachelor's degree compared to a student whose first institution was a 2-year institution. While previous research has indicated that bachelor's degree completion rates for students who start at 2-year institutions

are much lower than those rates at 4-year public institutions, once we controlled for demographic, socioeconomic, and academic characteristics, we found that adult students were just as likely to attain their goal of earning a bachelor's degree when they started at 2-year institutions as when they started at 4-year public institutions. This finding is important because most adult students hoping to earn a bachelor's degree start at 2-year institutions, which are often the most accessible and affordable option in higher education; approximately 76.6% of adult students start at a 2-year institution, 15.9% start at a 4-year public institution, and 7.6% start at a 4-year private nonprofit institution.⁴ The 2-year institutions provided adult students with a steppingstone to 4-year institutions without compromising their bachelor's degree attainment rate.

DISCUSSION

Two-year institutions play an important role in making higher education accessible for students, particularly adult students (Kolbe & Baker, 2019). In the 2020–2021 academic year, more than 7 million undergraduates attended 2-year public institutions (Community College Research Center, n.d.), and most adult students begin their higher education pathway at 2-year institutions.⁵ Although there is a growing body of literature on transfer students, our study contributes to the literature by focusing on adult student degree attainment by institutional type and by enrollment intensity.

Building from previous research in this area, this study presents two major findings. First, our study indicates that beginning at a 2-year public

or private nonprofit institution does not have a negative influence on bachelor's degree attainment compared to starting at a 4-year public institution for adult students whose goal is to earn a bachelor's degree. This is an important finding and contribution to the literature since previous research, often not controlling for students' degree attainment goals, demographic, socioeconomic, and academic characteristics, has shown that degree attainment is lower for students who begin at 2-year institutions in comparison to those who begin at 4-year institutions (Dowd et al., 2020). This is good news since most adult students begin their higher education path at 2-year institutions where admissions are typically open to all students; in addition, 2-year institutions are typically more economical and more geographically accessible to students (Grubb, 2009).

Finally, when examining enrollment intensity, full-time enrollment intensity does not increase the odds of persistence compared to mixed enrollment (full time and part time) intensity for adult students. This finding is important because it suggests that the message of college completion advocacy groups, such as CCA and its 15 to Finish campaign (CCA, 2022), might not be appropriate for adult students.

LIMITATIONS AND FUTURE RESEARCH

A limitation of this study was the small sample size. After filtering the BPS data set to address our research question, the sample was approximately 700 students. This small sample size presented some analysis problems in PowerStats. We had to combine certain categorical variables, such as

4. Authors' calculations using NCES PowerStats, BPS:2012/17 data.

5. Authors' calculations using NCES PowerStats, BPS:2012/17 data.

URMs, instead of modeling outcomes for individual minority categories, when PowerStats returned error messages regarding an insufficient number of observations in a predictor variable. Given the small sample size, this analysis is likely underpowered—meaning there could be differences in attainment that we could not detect—for example, by Pell Grant status or GPA. We also might see differences in attainment by public 4-year and 2-year institutions if we had a larger sample. The underpower issue is also causing large variance of estimates. Even though we detected a significant effect for 4-year private nonprofit institutions, the 95% confidence interval for the odds ratio ranged from 1.2 to 17.7. This range is likely too large to inform public policy decisions.

Another limitation was the 6-year time frame of the BPS study. A longer time frame would be better to understand attainment rates for part-time students. This restriction-of-range problem might also be affecting the odds ratios for mixed enrollment intensity. Similar to part-time students, some mixed enrollment intensity students likely take longer than 6 years to earn a bachelor's degree. If the BPS time frame were extended, we might detect a higher level of bachelor's degree attainment for both part-time and mixed enrollment intensity students.

Finally, the finding that full-time enrollment intensity did not lead to a statistically significant difference in the odds of a student obtaining a bachelor's degree compared to mixed enrollment intensity should be considered with caution. The probability of a student enrolling with mixed intensity (full time and part time) likely increases as the number of terms a student is enrolled increases (e.g., a student enrolled full time for one term and part time the next term). In other words, the number of terms enrolled may be positively related to mixed enrollment intensity,

and the number of terms enrolled is certainly positively related to graduation (e.g., a first-time undergraduate student enrolled for only one or two terms will not graduate, while a student enrolled for eight terms has potentially earned enough credit hours to graduate). Future studies may want to explore controlling for months of enrollment.

Future research would also benefit from conducting a deeper analysis that incorporates additional explanatory variables, such as institutional selectivity and interaction terms. We conducted our analysis through the NCES online application PowerStats due to COVID-19 social distancing restrictions that prevented us from applying for a restricted-use data license. Such restricted-use data would be necessary to model interaction terms. We suspect that there are potential interaction effects, such as enrollment intensity and level of institution, as well as enrollment intensity and work intensity. For example, descriptive statistics revealed that students at 2-year institutions were more likely to graduate when they enrolled with mixed intensity than when they enrolled with full-time intensity, but that students at 4-year institutions were less likely to graduate when they enrolled with mixed intensity than with full-time intensity. We also hypothesize that work intensity could moderate the effect of enrollment intensity on bachelor's degree attainment.

We suggest that researchers continue to explore the realities of higher education for adult students and that future data collection and research consider more nuanced predictors of degree attainment beyond those typical for traditional-age students. This large and growing population of students warrants greater attention if we truly seek to accept educational responsibility for all students.

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APPENDIX

Table 1. Descriptive Frequencies: Demographic Characteristics, Socioeconomic Indicators, and Academic Markers

| Variable | Percent | Percent | Percent |
|--|-----------------------|----------------------------------|----------------|
| GPA in High School | Less than 3.0 | 3.0 or Higher | Skipped |
| 2-Year Public or Private Nonprofit | 23.47% | 19.70% | 56.82% |
| 4-Year Public, and 4-Year Private Nonprofit | 9.86% | 31.99% | 58.13% |
| Total | 20.59% | 22.30% | 57.10% |
| Gender | Male | Female | Total |
| 2-Year Public or Private Nonprofit | 52.24% | 47.75% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 46.13% | 53.86% | 100% |
| Total | 50.95% | 49.04% | 100% |
| Race/Ethnicity | White or Asian | URM or More Than One Race | Total |
| 2-Year Public or Private Nonprofit | 61.34% | 38.65% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 64.06% | 35.93% | 100% |
| Total | 61.92% | 38.07% | 100% |
| First-Generation Student | Yes | No | Total |
| 2-Year Public or Private Nonprofit | 85.98% | 14.01% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 78.27% | 21.72% | 100% |
| Total | 84.35% | 15.64% | 100% |
| Academic Confidence in 2011–2012 | Strongly Agree | Do Not Agree | Total |
| 2-Year Public or Private Nonprofit | 56.30% | 43.69% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 48.82% | 51.17% | 100% |
| Total | 54.72% | 45.27% | 100% |
| Pell Grant in 2011–2012 | No Pell | Pell | Total |
| 2-Year Public or Private Nonprofit | 34.88% | 65.12% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 27.96% | 72.03% | 100% |
| Total | 33.42% | 66.58% | 100% |
| Dependents in 2011–2012 | No Dependents | Yes Dependents | Total |
| 2-Year Public or Private Nonprofit | 40.88% | 59.11% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 41.65% | 58.35% | 100% |
| Total | 41.04% | 58.95% | 100% |
| Enrollment Spell (First): Intensity through June 2017 | Full Time | Part Time | Mixed |
| 2-Year Public or Private Nonprofit | 20.64% | 36.40% | 42.95% |
| 4-Year Public, and 4-Year Private Nonprofit | 38.63% | 15.07% ! | 46.29% |
| Total | 24.45% | 31.89% | 43.66% |

| Work Intensity While Enrolled in 2011–2012 | No Job | Part Time | Full Time |
|---|---------------|------------------|------------------|
| 2-Year Public or Private Nonprofit | 51.26% | 12.79% | 35.94% |
| 4-Year Public, and 4-Year Private Nonprofit | 48.95% | 23.57% | 27.47% |
| Total | 50.76% | 15.15% | 34.09% |

| Academic Advising Used in 2011–2012 | No | Yes | Total |
|---|---------------|------------|--------------|
| 2-Year Public or Private Nonprofit | 40.72% | 59.28% | 100% |
| 4-Year Public, and 4-Year Private Nonprofit | 48.74% | 51.26% | 100% |
| Total | 46.99% | 53% | 100% |

Table 2. Bachelor's Degree Attainment Rates for Students that Began at 2-Year Public or Private Nonprofit Institutions

| Variable | Attained Bachelor's Degree | Did Not Attain Bachelor's Degree |
|--|-----------------------------------|---|
| GPA in High School | | |
| Less than 3.0 | 2.93% !! | 97.07% |
| 3.0 or Higher | 11.82% ! | 88.18% |
| Skipped | 9.27% | 90.73% |
| Gender | | |
| Male | 9.34% | 90.66% |
| Female | 7.12% ! | 92.88% |
| Race/Ethnicity | | |
| White or Asian | 10.13% | 89.87% |
| URM or More Than One Race | 5.35% | 94.65% |
| First-Generation Status | | |
| First-Generation Student | 8.04% | 91.96% |
| Not First-Generation Student | ‡ | 90.26% |
| Academic Confidence in 2011-2012 | | |
| Strongly Agree | 11.89% | 88.10% |
| Do Not Strongly Agree | 3.62% ! | 96.37% |
| Pell Grant in 2011-2012 | | |
| Pell Recipient | 6.50% ! | 93.50% |
| No Pell Recipient | 11.60% ! | 88.39% |
| Dependents in 2011-2012 | | |
| Dependents | 8.21% | 91.62% |
| No Dependents | 8.28% | 91.62% |
| Enrollment Spell (First): Intensity Through June 2017 | | |
| Full Time | 4.13% ! | 95.87% |
| Part Time | ‡ | 100% |
| Mixed | 17.29% | 82.70% |
| Work Intensity While Enrolled in 2011-2012 | | |
| No Job | 7.64% ! | 92.35% |
| Part Time | 14.06% ! | 85.93% |
| Full Time | 8.89% ! | 91.11% |
| Academic Advising Used in 2011-2012 | | |
| Yes | 5.36% ! | 94.64% |
| No | 12.29% | 87.70% |
| Total | 8.28% | 91.72% |

Note:

! Interpret data with caution. Estimate is unstable because the standard error represents more than 30% of the estimate.

!! Interpret data with caution. Estimate is unstable because the standard error represents more than 50% of the estimate.

‡ Reporting standards are not met.

Table 3. Bachelor's Degree Attainment Rates for Students That Began at 4-Year Public or Private Nonprofit Institutions

| Variable | Attained Bachelor's Degree | Did Not Attain Bachelor's Degree |
|--|-----------------------------------|---|
| GPA in High School | | |
| Less than 3.0 | ‡ | ‡ |
| 3.0 or Higher | 10.51% !! | 89.49 |
| Skipped | 18.56% ! | 81.44 |
| Gender | | |
| Male | 9.96% !! | 90.03% |
| Female | 19% ! | 80.99% |
| Race/Ethnicity | | |
| White or Asian | 16.42% | 83.58% |
| URM or More Than One Race | 11.99% | 88% |
| First-Generation Status | | |
| First-Generation Student | 14.24% | 85.76% |
| Not First-Generation Student | 16.95% | 85.05% |
| Academic Confidence in 2011–2012 | | |
| Strongly Agree | 11.89% | 88.10% |
| Do Not Strongly Agree | 3.62% ! | 96.37% |
| Pell Grant in 2011–2012 | | |
| Pell Recipient | 17.92% | 82.08% |
| No Pell Recipient | 6.88% !! | 93.11% |
| Dependents in 2011–2012 | | |
| Dependents | 12.29% !! | 87.70% |
| No Dependents | 18.38% ! | 81.62% |
| Enrollment Spell (First): Intensity Through June 2017 | | |
| Full Time | 18.09% !! | 81.90% |
| Part Time | ‡ | 99.91% |
| Mixed | 16.90% | 83.09% |
| Work Intensity While Enrolled in 2011–2012 | | |
| No Job | 12.82% ! | 87.18% |
| Part Time | ‡ | ‡ |
| Full Time | 5.22% !! | 94.78% |
| Academic Advising Used in 2011–2012 | | |
| Yes | 21.68% ! | 78.32% |
| No | 11.67% !! | 88.33% |
| Total | 14.83% ! | 85.17% |

Note:

! Interpret data with caution. Estimate is unstable because the standard error represents more than 30% of the estimate.

!! Interpret data with caution. Estimate is unstable because the standard error represents more than 50% of the estimate.

‡ Reporting standards not met.

Table 4. Logistic Regression Analysis Predicting Adult Student Attainment of a Bachelor's Degree

| Predictor | β | e ^{β} (odds ratio) | p-value | Odds Ratio 95% Confidence Interval | |
|---|---------|--|---------|------------------------------------|--------------|
| | | | | Lower | Upper |
| Intercept | -2.63 | 0.07 | 0.41 | 0 | 38.94 |
| GPA in High School (Reference Group ≤ 2.9) | | | | | |
| ≥ 3.0 | 1.03 | 2.81 | 0.61 | 0.05 | 145.13 |
| Skipped | 1.12 | 3.06 | 0.56 | 0.07 | 127.51 |
| Female (reference group: male) | -0.27 | 0.77 | 0.68 | 0.21 | 2.75 |
| URM or More Than One Race (reference group: White or Asian) | -0.99 | 0.37 | 0.2 | 0.08 | 1.66 |
| First-Generation Status (reference group: not first-generation) | -0.22 | 0.8 | 0.92 | 0.01 | 48.52 |
| Academic Confidence in 2011–2012: strongly agree (reference group: responses less than “strongly agree”) | 0.67 | 1.95 | 0.36 | 0.47 | 8.05 |
| Pell Grant in 2011–2012 (reference group: no Pell Grant) | -0.78 | 0.46 | 0.25 | 0.12 | 1.72 |
| Dependents in 2011–2012 (reference group: no dependents) | -0.03 | 0.96 | 0.95 | 0.31 | 2.98 |
| Enrollment Spell (First): Intensity through June 2017 (reference group: mixed enrollment) | | | | | |
| Full time | -0.62 | 0.54 | 0.31 | 0.16 | 1.78 |
| Part time | -7.77 | 0 | 0.54 | 0 | 22.5 million |
| Work Intensity While Enrolled in 2011–2012 (reference group: no job) | | | | | |
| Part time | 1.28 | 3.6 | 0.1 | 0.78 | 16.68 |
| Full time | 0.36 | 1.43 | 0.63 | 0.34 | 6.05 |
| Used Academic Advising in 2011–2012 (reference group: did not use) | 0.59 | 1.8 | 0.44 | 0.41 | 7.84 |
| Control and Level of First Institution (reference group: 2-Year Public or Private Nonprofit Institution) | | | | | |
| 4-Year Public | -0.29 | 0.75 | 0.91 | 0 | 117.51 |
| 4-Year Private Nonprofit | 1.53* | 4.63* | 0.03 | 1.21 | 17.68 |

* $p < 0.05$

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