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Los Angeles

Diverging Pathways:

An Examination of the Effects of Initial Post-Secondary Enrollment  
on Early Adult Outcomes

A dissertation submitted in partial satisfaction of the  
requirements for the degree Doctor of Philosophy  
in Sociology

by

Caitlin E. Ahearn

2023

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## ABSTRACT OF THE DISSERTATION

Diverging Pathways:

An Examination of the Effects of Initial Post-Secondary Enrollment  
on Early Adult Outcomes

by

Caitlin E. Ahearn

Doctor of Philosophy in Sociology

University of California, Los Angeles, 2023

Professor Jennie Elizabeth Brand, Chair

There are numerous widely recognized advantages to pursuing post-secondary education. Yet colleges offer students different resources and educational experiences, which may introduce inequality in the returns to college enrollment. This dissertation uses nationally representative data from the Educational Longitudinal Study (ELS:2002) and the 1997 cohort of the National Longitudinal Survey of Youth (NLSY97) to examine the effects of initial post-secondary enrollment decisions on three early adult outcomes: bachelor's degree completion, economic disadvantage, and marriage. In Chapter 2, I use the ELS to ask how enrolling in broad-access four-year colleges, which have minimally or non-selective admissions policies, affects students' likelihood of degree completion relative to community college or more selective options. I find that attending a broad-access four-year college instead of a community college or a more selective college alters a student's chances of completing their degree in the expected direction

and that mid-SES, Black, and Hispanic students face particularly large degree completion losses from attending a broad-access four-year college rather than a more selective four-year college. Chapter 3 uses NLSY97 data to investigate whether enrollment in a broad-access college offers more protection against economic disadvantage relative to community college or non-college options, or less protection relative to more-selective college enrollment. I find that, conditional on college enrollment, institutional variation has modest effects on poverty and low-wage work via differential bachelor's degree completion. In contrast, I find more substantial effects relative to no college, demonstrating the importance of any college entry in preventing economic hardship and the pivotal role of bachelor's degree completion. In Chapter 4, I examine the relationship between an individual's initial college enrollment, their overall likelihood of marriage, and the education of their spouse. I find that the bachelor's degree advantages that accrue to college-goers who first enroll in more selective institutions lead to higher rates of marriage for men and a higher likelihood of marrying college-educated spouses for men and women. Thus, institutional stratification introduces heterogeneity in marriage outcomes in early adulthood. Overall, my findings emphasize the importance of supporting degree completion at all colleges in addition to equalizing access to more selective institutions.

The dissertation of Caitlin E. Ahearn is approved.

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- 2017      Rosenbaum, James E., **Caitlin E. Ahearn**, and Janet Rosenbaum. *Bridging the Gaps: College Pathways to Career Success*. New York, NY: The Russell Sage Foundation.

**PEER-REVIEWED JOURNAL ARTICLES**

---

- 2023      Quadlin, Natasha, Tom VanHeuvelen, and **Caitlin E. Ahearn**. 2023. “Higher Education and High-Wage Gender Inequality.” *Social Science Research* 112. doi: [10.1016/j.ssresearch.2023.102873](https://doi.org/10.1016/j.ssresearch.2023.102873).
- 2022      **Ahearn, Caitlin E.**, Jennie Brand, and Xiang Zhou. 2022. “How, and for whom, does higher education increase voting?”. *Research in Higher Education*. <https://doi.org/10.1007/s11162-022-09717-4>

- 2021 **Ahearn, Caitlin E.** “Planning for college and careers: How families and schools shape the alignment of postsecondary expectations”. 2021 *Sociology of Education* 94(4): 271-293. <https://doi.org/10.1177/00380407211039272>
- 2020 Salganik, Matthew, Ian Lundberg, Alexander T. Kindel, et al. 2020 “Measuring the predictability of life outcomes with a scientific mass collaboration”. *Proceedings of the National Academy of Sciences* 117(15):8998-8403. <http://doi.org/10.1073/pnas.1915006117>
- 2019 **Ahearn, Caitlin E.** and Jennie E. Brand. 2019. “Predicting Job Loss Among Fragile Families.” *Socius* 5: 1-8. <https://doi.org/10.1177/2378023118809757>
- 2016 Rosenbaum, James E., **Caitlin E. Ahearn**, Janet Rosenbaum, and Kelly Becker. “Beyond earnings and social reproduction: Can college lead to good jobs without reproducing social inequalities?” *The Russell Sage Foundation Journal of the Social Sciences* 2(1): 90-110. <https://doi.org/10.7758/rsf.2016.2.1.05>
- 2016 Rosenbaum, James E., **Caitlin E. Ahearn**, Jiffy Lansing, and Claudia Castillo. “How does college for all provide ways to education attainment? Individual strategies, institutional procedures, and shaping direction in working class successes.” *Handbook of the Sociology of Education in the 21st Century*. eds. B. Schneider and G.K. Saw. New York, NY: Springer.
- 2015 Rosenbaum, James E., **Caitlin E. Ahearn**, Kelly Iwanaga Becker, and Janet Rosenbaum. *The New Forgotten Half and Research Directions to Support Them*. Discussion Paper on Inequality. New York City: W.T. Grant Foundation. <https://files.eric.ed.gov/fulltext/ED565750.pdf>

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## Chapter 1: Introduction

The benefits of post-secondary education are undeniable. College-educated individuals have higher earnings, more wealth, less unemployment, better health, and more stable marriages (Brand 2023; Hout 2012; Oreopoulos and Petronijevic 2013; Oreopoulos and Salvanes 2011). These known returns prompt the vast majority of high school graduates to eventually choose to enroll in some form of postsecondary education (Rosenbaum et al. 2016). However, while more privileged college applicants prioritize attending the most selective schools, others are just trying to get in the door. Students with lower achievement and less economic privilege typically attend far less selective four-year institutions or community colleges (Carnevale and Strohl 2013; Fry 2004; Fry and Cilluffo 2019), which are associated with lower bachelor's degree attainment (Mcfarland et al. 2019). As Voss, Hout, and George (2022:19) write, the U.S. higher education system “sort[s] disadvantaged students into less selective, poorly resourced institutions with low graduation rates and sieve[s] students from advantaged backgrounds into well-resourced, highly selective colleges with high graduation rates.” There is thus considerable concern that the sorting of students into different college options contributes to inequality of outcomes, stemming in part from the effect of institutions on four-year graduation rates.

In this dissertation, I contribute to the literature on the returns to college sector and selectivity by examining how initial post-secondary enrollment decisions shape three critical early adult outcomes: degree completion, economic disadvantage, and marriage, with a focus on broad-access four-year colleges. By understanding the benefits and costs of attending these institutions, this dissertation provides critical and timely evidence on the effects of differential college enrollment across the full range of post-secondary options. My findings provide insight into the implications of college attendance for students on the margin of four-year enrollment

and the ways higher educational stratification contributes to unequal outcomes and pathways of social reproduction.

This dissertation contributes to existing research on institutional stratification in four ways. First, it provides focused attention on broad-access four-year colleges. Previous research has shown that attending a highly selective college provides degree completion and economic benefits (Alon and Tienda 2005; Black and Smith 2004; Bowen and Bok 1998; Brand and Halaby 2006; Dale and Krueger 2002; Long 2010; Melguizo 2008; Quadlin, Cohen, and VanHeuvelen 2021), especially for students from disadvantaged backgrounds (Brand 2023; Brand et al. 2021; Brand and Xie 2010; Chetty et al. 2017; Dale and Krueger 2011). In contrast, broad-access four-year colleges, which admit the widest range of four-year hopefuls but have fewer resources, commuter populations, and lower academic requirements (Burrus et al. 2013; Porter 2006; Scott, Bailey, and Kienzl 2006), have not received the same level of attention. Second, this dissertation explores the full range of post-secondary options, looking at how the outcomes of those who enroll in broad-access four-year colleges compare to the outcomes of those who pursued more selective, four-year, and non-college pathways after high school. Third, by examining institutional variation in economic disadvantage and marriage outcomes, it offers a more expansive view of how college stratification may impact different outcomes in early adulthood. Finally, it takes a life course approach by demonstrating how educational decisions made during late adolescence set high school graduates on divergent pathways into adulthood and highlighting the critical role of degree completion in those pathways.

To measure institutional selectivity, I use ratings from the Barron's College Competitiveness Index, which categorizes four-year institutions as non-competitive, less-competitive, competitive, very competitive, highly competitive, or most competitive on the basis

of factors including acceptance rate, admissions test scores, class rank, and GPA (Barron's 2004). Chapters 2 and 3 specifically focus on the effects of enrollment in broad-access four-year colleges, defined as less-competitive and non-competitive colleges according to Barron's. Some examples of broad-access four-year colleges in 2004 are California State University-Chico, Bethune Cookman College in Florida, CUNY College of Staten Island, and The University of Texas at El Paso. Appendix A provides more details on the Barron's rankings, including specific criteria used to identify college competitiveness in 2004, descriptive statistics comparing colleges across the Barron's College Competitiveness Index with community colleges, and additional examples of broad-access four-year institutions. While there are other approaches to understanding the effects of institutional heterogeneity, such as continuous measures of resources or SAT scores (Long 2008), the Barron's rankings offer a composite measure of college selectivity that aligns with common conceptual understandings of institutional differences.<sup>1</sup>

## Overview of Chapters

### *Chapter 2*

In Chapter 2, I revisit a previously asked question regarding post-secondary stratification: how does institutional variation affect students' likelihood of degree completion? Given the importance of bachelor's degree attainment for later life outcomes, this is a critical first step to assessing the consequences of enrolling in broad-access four-year colleges. Research has

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<sup>1</sup> As students apply to more colleges, the competitiveness of institutions listed in the Barron's rankings has increased (Hess and Hochleitner, 2012). Consequently, colleges that were less- or non-competitive in 2004 may no longer be considered broad-access today using the same definition. By evaluating the long-term effects of enrolling in the least selective four-year colleges, this dissertation demonstrates the implications of attending colleges with limited resources that admit students with relatively low pre-college achievement. However, due to changes in the selectivity of colleges, the estimates may not necessarily reflect the effects of attending a college in the lowest two tiers of the Barron's rankings in more recent years.

frequently found that more selective colleges increase students' chances of bachelor's degree completion (Alon and Tienda 2005; Goodman, Hurwitz, and Smith 2014; Heil, Reisel, and Attewell 2014; Long 2008; Long and Kurlaender 2009; Melguizo 2008; Smith 2013) while enrolling in a community college restricts those chances compared to a four-year college (see Schudde and Brown 2019 for a review). However, methodological variation and an emphasis on elite college enrollment in older cohorts have led to varying estimates of the effect of college selectivity on degree completion. Using data from the Educational Longitudinal Study (2002-2012), I ask how enrollment in a broad-access four-year college rather than a community college or a more-selective four-year college affects a student's likelihood of degree completion. In light of prior research that finds that relatively disadvantaged and Black and Hispanic students have the highest returns to college selectivity (Alon and Tienda 2005; Bleemer 2022; Bowen and Bok 1998; Long 2010; Melguizo 2008), I ask whether this pattern of heterogeneity is apparent in the effects of broad-access four-year enrollment on degree completion, relative to their more-selective or community college alternatives.

My findings show positive effects of broad-access four-year college enrollment relative to community college enrollment, and negative effects relative to more-selective college enrollment. However, my estimates for both comparisons are in line with more modest estimates of the effects of college sector selectivity. I also find evidence that attending broad-access rather than a more selective four-year college has larger negative effects on degree completion for middle SES students as well as Black and Hispanic students. These results emphasize the importance of clarifying the counterfactual group when considering the returns to college selectivity as well as the need to address structural inequalities in college access and degree completion to reduce disparities in educational attainment.

### *Chapter 3*

As the availability of high-quality jobs for less-educated workers has diminished, college is seen as the surest way to avoid adverse socioeconomic outcomes (Autor 2014; Goldin and Katz 2008). In Chapter 3, I use data from the NLSY 1997 cohort to extend recent research on college and economic disadvantage (Brand 2023; Brand et al. 2021). I ask whether broad-access four-year college enrollment offers protection against three forms of economic disadvantage: poverty, low-wage work, unemployment, and debt outcomes. I then apply a causal mediation analysis to examine how institutional differences in bachelor's degree completion contribute to differences in economic disadvantage in early adulthood.

Prior research has produced inconsistent evidence that attending a more selective college increases earnings (Black and Smith 2004, 2006; Dale and Krueger 2002, 2011; Long 2008, 2010; Mountjoy and Hickman 2021; Quadlin et al. 2021; Witteveen and Attewell 2017). The limited research on the economic returns of enrolling in a four-year college rather than a two-year college has found similarly mixed results (Lockwood Reynolds 2012; Xu, Solanki, and Harlow 2020). In line with findings of limited effects of sector and selectivity on earnings, I show that institutional differences in bachelor's degree completion have modest indirect effects on economic disadvantage via college completion. In contrast, not enrolling in any college is associated with greater economic disadvantage compared to broad-access four-year college enrollment. My findings emphasize the importance of any college entry for preventing economic disadvantage and the pivotal role of bachelor's degree completion in accessing the economic benefits of attending college.

## *Chapter 4*

College-educated men and women are more likely to get married and marry a college-educated spouse (McClendon 2018; Smock and Schwartz 2020). In Chapter 4, I extend research on the educational gradient in marriage to examine how time to marriage and assortative mating differ by college sector and selectivity. Social stratification research has emphasized that marital homogamy among the highly educated contributes to the intergenerational transmission of status, wealth, and socioeconomic attainment (Attewell et al. 2007; Choi, Chung, and Breen 2020; McLanahan 2004; Rauscher 2019; Western, Percheski, and Bloome 2008). As socioeconomic expectations for entry into marriage have risen for both men and women, those with less education are less likely to marry and to marry highly-educated spouses (Cherlin 2004; McLanahan 2004). Differential educational and labor market outcomes by institutional characteristics suggest that where students attend college is also likely to affect their marriage outcomes, but research that has explored this possibility has only examined older and non-US populations (Arum, Roksa, and Budig 2008; Feng 2022).

I use data from the NLSY 1997 cohort to describe the relationship between initial post-secondary enrollment, marriage rates, and assortative mating. I also explore the extent to which institutional differences in four-year degree completion explain institutional differences in marriage outcomes. My findings suggest that post-secondary stratification introduces consequential heterogeneity in the distribution of access to marriage and highly-educated spouses, in part through institutional differences in degree completion. I thus argue that the unequal sorting of students into different post-secondary pathways contributes to disparities in marital outcomes, which may have important implications for intergenerational status transmission.

In sum, this dissertation provides a critical examination of the implications of college decisions made during late adolescence. I demonstrate that attending a broad-access four-year college rather than an alternative post-secondary option can alter a student's chances of bachelor's degree completion, but those effects may be smaller than are sometimes assumed. Moreover, bachelor's degree attainment is a critical predictor of economic disadvantage for all college-goers, and policies that aim to reduce poverty and low-wage work through educational attainment should focus on supporting marginal four-year students through degree completion. Still, my final chapter shows that completing a degree does not guarantee meeting and marrying a similarly-educated spouse, which is more likely for elite college graduates than for graduates who began at moderately selective or broad-access four-year institutions. Thus, higher educational stratification has important implications for the life outcomes of college students, and policymakers should continue to focus on supporting degree completion at all colleges while also continuing to equalize access to more selective institutions.

## Chapter 2: Revisiting the College Opportunity Structure: Assessing Heterogeneity in the Effects of Broad-Access College Enrollment on Bachelor's Degree Completion

### Introduction

Although U.S. educational policy encourages students to attend college, bachelor's degree completion remains uncertain for many four-year entrants. The overall 6-year completion rate at four-year colleges has remained around 60 percent, but this number masks high variation across institutions (Voss et al. 2022). The lowest bachelor's degree attainment rates are found in broad-access four-year institutions, which offer admission to the majority of applicants but where less than half of students graduate on average (Mcfarland et al. 2019). Despite their low odds of degree completion, this set of colleges enrolls roughly 14 percent of traditional-aged first-time four-year college students.<sup>2</sup> Because of the relatively low barriers to enrollment, broad-access four-year colleges serve diverse students. Some may have the academic records to attend a more selective college but do not due to financial, social, or informational constraints. Others may have alternatively chosen a lower-cost and more accessible community college. Thus, broad-access four-year institutions take up a unique place in the college opportunity structure by providing access to marginal four-year college students while limiting degree access to students with higher academic potential.

Research has frequently found that more selective colleges increase students' chances of bachelor's degree completion (Alon and Tienda 2005; Goodman et al. 2014; Heil et al. 2014; Long 2008; Long and Kurlaender 2009; Melguizo 2008; Smith 2013) and enrolling in a

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<sup>2</sup> Based on the author's calculations from the NCES Educational Longitudinal Study (2002/2012).



community college restricts those chances (see Schudde and Brown 2019 for a review). Still, three factors motivate furthering this line of inquiry by focusing specifically on broad-access four-year colleges. First, because they serve as an alternative to community colleges and more-selective four-year colleges, examining enrollment in a broad-access four-year college invites a joint analysis of vertical and horizontal stratification in higher education (Gerber and Cheung 2008). This approach has rarely been taken in higher educational research (see Brand, Pfeffer, and Goldrick-Rab 2014 for an exception), despite an extensive focus on returns to highly selective colleges (Gerber and Cheung 2008) and community colleges (Schudde and Brown 2019). Examining the effect of broad-access four-year colleges relative to both alternatives acknowledges that students on the margin of four-year college enrollment often consider a range of post-secondary options.

Second, compared to more selective four-year colleges, broad-access institutions disproportionately serve under-represented minority students and those from relatively disadvantaged backgrounds (Carnevale and Strohl 2013; Fry 2004; Fry and Cilluffo 2019). By granting four-year college access to historically under-represented populations, broad-access institutions play a crucial role in expanding and democratizing higher education. Nevertheless, due to their relatively low degree completion rates, unequal enrollment in these colleges may contribute to the reproduction of existing inequalities (Ciocca Eller and DiPrete 2018; Voss et al. 2022). Contention over affirmative action policies and an interest in understanding who benefits from college have led scholars to assess socioeconomic and racial heterogeneity in the returns to selectivity (Alon and Tienda 2005; Brand and Halaby 2006; Dale and Krueger 2002; Light and Strayer 2000; Long 2010). Others have attempted to understand how community college enrollment differentially diverts these populations away from bachelor's degree attainment

(Brand et al. 2014; Long and Kurlaender 2009; Xu et al. 2020). This study furthers this line of inquiry by examining heterogeneity in the effects of broad-access four-year college enrollment, how those patterns differ depending on the post-secondary alternative, and considering what this means for the role of these institutions in social stratification processes.

Third, previous research on institutional selectivity has often emphasized treatment effects over the population of all college-goers (i.e., the ATE) (Doyle 2009; Heil et al. 2014; Hu, Ortagus, and Kramer 2018; Long 2008, 2010; Xu et al. 2020). Other scholars have examined effects among samples that are the least likely to attend selective colleges or community colleges (i.e., the ATC or low-propensity groups) (Brand and Halaby 2006; Brand et al. 2014; Cohodes and Goodman 2014; Goodman et al. 2014; Heil et al. 2014). Although the latter approach offers important information about the implications of college democratization and expansion, it provides less insight into the benefits or consequences of broad-access four-year college enrollment for individuals who attend these institutions. This study contributes to research on college selectivity by examining how effects differ for subpopulations who are likely to enroll in broad-access colleges (i.e., marginal four-year college students) compared to those who are more strongly predicted to enroll in a community college or more-selective four-year college.

In this paper, I use data from the Educational Longitudinal Study (2002-2012) to examine the relationship between broad-access four-year college enrollment and odds of degree completion relative to community college and more-selective four-year college enrollment. I further test hypotheses that effects differ by socioeconomic background and racial identity, and I compare results from different estimation strategies. The results indicate that after accounting for selection into college sector and selectivity, enrolling in a broad-access four-year college rather than a community college increases bachelor's degree completion, while enrolling in a broad-

access four-year college rather than a more-selective four-year college reduces bachelor's degree completion. While I find weak evidence that middle-SES and Black students have the largest losses from broad access rather than more-selective four-year college enrollment, I do not identify any corresponding heterogeneity for the community college alternative. Finally, I find that students most likely to enroll in broad-access four-year colleges, i.e., marginal four-year college students, have relatively low odds of completing a bachelor's degree across the two-year and four-year institutional spectrum. Overall, my findings support previous arguments that structural inequalities in access to more-selective universities contribute to disparities in educational attainment. My findings further highlight the importance of focusing policy efforts on addressing degree completion rates across the college opportunity structure.

## Background

### *Four-Year College Stratification and Degree Completion*

Scholars theorize that institutions influence degree completion by offering academic, social, and financial support that fosters successful integration into academic and social aspects of campus life (Gerber and Cheung 2008; Tinto 1993, 2010). For example, students with access to higher quality and more accessible academic advising and counseling are better positioned to select majors and coursework and stay on track to graduate (Armstrong and Hamilton 2013; Rosenbaum, Deil-Amen, and Person 2006; Tinto 2010). Academic support through smaller class sizes, greater attention from faculty, and services to assist with the transition to college can also encourage persistence to completion (Beattie and Thiele 2016; DeWine et al. 2017; Tinto 2010). More affordable and available housing on campus and attention to students' social and emotional well-being can encourage student engagement (Braxton, Hirschy, and McClendon. 2004; Tinto

2010). Sociologists have also demonstrated the importance of financial support for improving persistence, especially for students from low-income backgrounds (Goldrick-Rab 2016; Pascarella and Terenzini 2005). Finally, higher-achieving students attend more selective colleges, and some scholars have proposed that this increased peer achievement further improves student outcomes (Hoxby 2009; Witteveen and Attewell 2017).

Given that selective institutions tend to have more resources and higher-achieving students (see Appendix A), an extensive body of research has sought to understand whether attending a more selective four-year college increases bachelor's degree completion (Alon and Tienda 2005; Black and Smith 2004; Bowen and Bok 1998; Brand and Halaby 2006; Dale and Krueger 2002; Long 2010; Melguizo 2008). Scholars have taken various methodological approaches to answer this question and have produced diverse estimates of the effect of college selectivity on bachelor's degree attainment. First, researchers have used different treatment and counterfactual groups to study selectivity. Some have assessed the effect of enrolling in an elite college compared to all other college options (Brand and Halaby 2006), whereas others have evaluated high rather than low institutional selectivity (Black and Smith 2004; Long 2008; Melguizo 2008), high rather than moderate selectivity (Alon and Tienda 2005; Cohodes and Goodman 2014; Heil et al. 2014; Long 2008), or continuous measures of selectivity (Heil et al. 2014; Long 2008, 2010; Smith 2013; Smith and Stange 2016).

Estimates from these studies have understandably varied. The largest estimates of college selectivity come from comparing enrollment in the least selective colleges (either broad-access colleges or those with the lowest quartile of SAT scores) to enrollment in the most selective colleges (Black and Smith 2004; Long 2010; Melguizo 2008). Estimates of continuous measures and smaller increments in selectivity have found more modest effects (Alon and Tienda 2005;

Heil et al. 2014; Long 2008; Melguizo 2008; Smith and Stange 2016). In this study, I estimate the effect of enrolling in a broad-access four-year college by identifying realistic counterfactual populations in more-selective four-year colleges. I therefore expect that my estimates will be more modest than those that identify effects across the entire college selectivity spectrum, and will be closer to estimates of effects from incremental increases in institutional competitiveness.

Second, some researchers have examined differences in outcomes between college-goers with identical application or acceptance portfolios to adjust for student and college selection factors (Dale and Krueger 2002; Long 2008; Mountjoy and Hickman 2021; Smith 2013). This approach has identified the smallest effects of enrolling in a more-selective college on bachelor's degree completion, regardless of the comparison group. In this study, I run models that approximate this approach, which I expect to produce smaller effects of enrolling in a broad-access rather than a selective four-year college.

Third, researchers have moved beyond regression adjustment to account for student selection into more competitive colleges. Approaches have included propensity score matching (Brand and Halaby 2006; Heil et al. 2014), twin fixed effects models (Smith 2013), instrumental variables (Long 2008), and regression discontinuity designs (Cohodes and Goodman 2014). Studies that effects use instrumental variables or examine the effect among unlikely elite college-goers (Brand and Halaby 2006; Cohodes and Goodman 2014) tend to find larger effects of enrolling in highly selective colleges. This suggests that students on the margin of highly-selective enrollment, i.e., those with lower socioeconomic origins, experience greater effects of enrolling in a more selective college, which I discuss in more detail below.

### *Institutional Sector and Degree Completion*

While the literature on college quality and selectivity has emphasized stratification across four-year colleges, the same institutional characteristics may contribute to persistence in community colleges. Community colleges tend to have lower student financial support, translating into larger student-faculty ratios, lower quality academic counseling, and reduced course availability (Long and Kurlaender 2009; Rosenbaum, Ahearn, and Rosenbaum 2019; Rosenbaum et al. 2006). Some have also argued that the lower achievement of peers in community colleges dampens degree completion (Goodman et al. 2014; Smith and Stange 2016). Students attending community colleges complete fewer credits, work more hours, and take more remedial courses than similar students who attend four-year colleges (Monaghan and Attewell 2014; Xu et al. 2020). Perhaps the biggest challenge, especially for marginal college students, is the frequently opaque and complex transfer process that students must navigate to complete a four-year degree (Dougherty and Kienzl 2006; Goldrick-Rab 2006, 2016).

Reflecting the barriers to high-quality services, credit accrual, and four-year transfer at community colleges, research has generally found substantial diversionary effects of enrolling in a community college rather than a four-year college (Brand et al. 2014; Doyle 2009; Goodman et al. 2014; Long and Kurlaender 2009; Monaghan and Attewell 2014; Schudde and Brown 2019; Stephan, Rosenbaum, and Person 2009). In their meta-analysis of studies covering college-going cohorts from the 1970s through the early 2000s, Schudde and Brown (2019) find that community college enrollment reduces bachelor's degree completion by roughly 23 percent.

Given the large differences in academic preparation between two- and four-year college students (Stephan et al. 2009), scholars have paid careful attention to such selection mechanisms, frequently through propensity score matching (Brand et al. 2014; Doyle 2009; Xu et al. 2020).

However, another point of consideration is which subpopulation of four-year students serves as the most appropriate comparison. Research in this area often examines the full set of community and four-year college students in their estimation samples. Recognizing that a selective college is not a realistic alternative for most community college-goers, some have used broad-access four-year colleges as a comparison group (Brand et al. 2014; Long and Kurlaender 2009; Monaghan and Attewell 2014). These studies tend to estimate smaller diversionary effects of 15-20%, but Brand et al. (2014) found an even lower effect of 5%. Additionally, the largest estimates are often derived from analyses that adjust for a smaller set of covariates and thus may only partially account for selection into a college sector (Doyle 2009; Hu et al. 2018; Lockwood Reynolds 2012). Existing research does not, therefore, provide a clear indication of the expected increase in bachelor's degree completion from enrolling in a broad-access four-year college rather than a community college.

#### *For Whom Does College Stratification Matter?*

There is general agreement in the above literature that pursuing higher education at a four-year rather than a two-year college improves a student's likelihood of four-year degree completion, and attending a more selective college provides an additional boost. Yet, broad-access four-year institutions serve an academically, socioeconomically, and racially diverse set of students. Previous research has suggested that college-goers experience unequal responses to increases or decreases in college sector and selectivity, depending on their socioeconomic status and racial or ethnic identity (Bowen and Bok 1998; Brand and Halaby 2006; Ciocca Eller and DiPrete 2018; Dale and Krueger 2002, 2011; Goodman et al. 2014; Long and Kurlaender 2009).

Relatively disadvantaged college-goers may benefit more than their higher-income peers

from the increased financial support and services offered by more selective, higher-resourced institutions. Indeed, a growing body of work has shown that students from relatively low socioeconomic backgrounds have the largest gains in bachelor's degree completion and economic outcomes from attending a more selective four-year college (Brand and Halaby 2006; Chetty et al. 2017; Dale and Krueger 2002, 2011; Long 2010). These findings have been primarily concentrated in studies of the effects of enrollment in an elite college. Still, some studies of the diversionary effects of community college rather than four-year college enrollment have found a similar pattern of heterogeneity, wherein the least advantaged students have the largest negative effects (Goodman et al. 2014; Long and Kurlaender 2009).

Seeking to understand the implications of affirmative action policies on the degree completion rates of Black students, another line of work has assessed how the effect of college selectivity differs by student racial and ethnic identity. Studies have found that Black and Hispanic students, who are historically underrepresented at selective four-year colleges, have larger returns to enrolling in a selective four-year college than their White peers (Alon and Tienda 2005; Bleemer 2022; Bowen and Bok 1998; Long 2010; Melguizo 2008). Similar to the research on heterogeneity by social origins, much of these effects have been concentrated in elite four-year colleges. Some scholars have also examined racial heterogeneity in the diversionary effects of community college rather than four-year college enrollment. While there is some evidence of larger diversionary effects of community college enrollment for Black students (Long and Kurlaender 2009), other work has found no differences by racial identity (Goodman et al. 2014).

In light of existing research that finds larger effects of institutional selectivity for economically disadvantaged and racial minority students, I hypothesize that: (1) Enrolling in a



broad-access four-year college rather than a community college increases the degree completion of relatively low-SES students and under-represented minority students more than their more advantaged and White peers, and (2) Students from relatively low socioeconomic backgrounds and who identify as Black or Hispanic have larger negative effects on bachelor's degree completion than their higher-status and White peers from attending a broad-access four-year college rather than a selective four-year college.

This study expands research on the effects of institutional sector and selectivity on bachelor's degree completion by assessing the effect of broad-access four-year college enrollment relative to two-year and four-year college alternatives in a recent cohort of high school graduates. I examine how estimates vary using different estimation strategies and assess differences across student socioeconomic background and racial and ethnic identity. I therefore provide an understanding of how the most open-access four-year colleges differentially promote or restrict degree completion for marginal four-year college students.

## Data and Methods

### *Data and Measures*

I use data from the Educational Longitudinal Study (ELS: 2002-2012). Developed and collected by the Institute for Education Sciences (IES) and the National Center for Education Statistics (NCES), the ELS follows a nationally representative sample of the 2002 10th-grade cohort over 10 years. The restricted-use ELS files allow for the inclusion of a rich set of pre-college covariates, including measures of sociodemographic background, academic achievement, high school course taking, and commitment to and expectations around schooling. They also provide detailed information on the higher education institutions attended by respondents and

whether they graduated with a bachelor's degree. I restrict my sample to on-time high school graduates ( $n=13,720$ ) who are not missing data on their highest degree completed as of 2012 ( $n=11,530$ ). Limiting the sample to high school graduates (or those with a GED) allows me to estimate the treatment effect for the population most likely to enroll in college.

My outcome is a dichotomous indicator of whether respondents graduated from college with a bachelor's degree by 2012, eight years after on-time high school completion. I identify four-year college selectivity using Barron's College Competitiveness Index ratings, acquired through the NCES restricted data license. Appendix A offers more details on the Barron's Index. I define broad-access colleges as those in the lowest two categories of Barron's selectivity: non-competitive and less-competitive.<sup>3</sup> In the ELS data, roughly 14% of respondents who enroll in a four-year college within one year of high school graduation fall into this category. More-selective colleges are categorized as competitive, very competitive, highly competitive, and most competitive on the Barron's Selectivity Ratings. I identify community colleges as public two-year colleges using the Integrated Postsecondary Data System (IPEDS). I restrict my sample to those who enrolled in a community college, a broad-access four-year college, or a more-selective four-year college within one year of high school graduation (June of 2005), excluding private 2-year or for-profit college enrollees ( $n=7,570$ ).

I use a comprehensive set of pre-college covariates to account for selection into broad-access four-year colleges: family background, academic achievement, high school course-taking, academic attachment, educational expectations, college admissions tests, and high school characteristics. I use the socioeconomic composite of parents' income, educational attainment,

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<sup>3</sup> I exclude colleges that are missing data on college selectivity and those that are categorized as "Special" by Barron's.

and occupation, developed by the ELS, to measure socioeconomic background. To measure test scores, I use the standardized mean of the student's math test score, reading test score, and SAT score, where available. I also make a composite measure for students' academic attachment, comprised of variables created by the NCES: math efficacy, reading efficacy, expectations for academic success, educational motivation, and effort and persistence.

Scholars have argued that because students select into colleges based on unobserved factors, adjusting for student characteristics does not sufficiently account for selection into college quality (Dale and Krueger 2002, 2011; Mountjoy and Hickman 2021; Smith 2013). These studies have addressed this issue by assuming that students reveal their academic potential through their application behaviors and then comparing the outcomes of students with similar college application and acceptance portfolios. However, inequalities in college application behavior (Hoxby and Turner 2015; Manski and Wise 1983; Roderick, Coca, and Nagaoka 2011) mean that students with lower resources and less access to college counseling are not always as aware of their potential. Therefore, including application portfolios may overcorrect and downwardly bias estimates. Moreover, my analyses are focused on broad-access college-goers and include community college-goers, many of whom apply to and are accepted at fewer than two four-year colleges (see Table 2.1). To understand the implications of excluding application behavior from my models, I run analyses with and without adjusting for the number and selectivity of four-year college applications.

### *Analytic strategy*

This study examines whether enrolling in a broad-access four-year college affects bachelor's degree attainment relative to alternative college options. Assessing this causal effect

requires careful consideration of the selection mechanisms that lead to an individual enrolling in a particular college. Higher achieving, more motivated students from more advantaged social backgrounds are more likely to enroll in a four-year college than a community college. They are also more likely to enroll in more selective colleges. The result is an unequal distribution of the treatment across the population of high school graduates. In this study, I take a selection on observables approach, assuming that my pre-college covariates fully explain this selection into college type and selectivity. Figure 2.1 presents the Directed Acyclic Graph (DAG) I use to build my causal effect models. Following Pearl (Pearl 2009), I interpret this graph as a non-parametric model with independent errors. According to this DAG, the covariate set X1 blocks all backdoor paths between college enrollment and bachelor's degree completion. However, because the ignorability assumption is untestable and these covariates are subject to measurement error, I also present models that include covariates from set X2 (college application activities) to account for students' understanding of their academic promise.

– FIGURE 2.1 HERE –

Although a correctly specified regression model may account for selection bias (Morgan and Winship 2007), linear regression has limitations. Most importantly, a standard regression model extrapolates the linear effect across the total sample, even when treated cases have no or few comparable controls. Balancing weights, which aim to statistically equalize the treatment and control groups on all observed covariates, offer an alternative strategy. The primary benefit of these models over standard regression adjustment using the propensity score is to account for insufficient overlap between the treatment and control group across portions of the sample (Stuart 2010). In addition, they can be easily combined with regression covariate adjustment to account for any remaining imbalance across the treatment and control groups.

I begin by estimating an individual's propensity to enroll in a broad-access four-year college rather than each of the alternative post-secondary options:

$$e_i = P(D_i = 1|X_i),$$

where  $D$  is the treatment (broad-access four-year college), and  $X$  is the complete set of pre-college covariates (see Table 2.1). I developed my propensity score using a binomial generalized linear model (logistic regression).<sup>4</sup>

The most common approach to balancing weights is to estimate the average treatment effect (ATE) using inverse probability weighting (IPW). IPW uses the inverse of the propensity score (i.e., the probability of experiencing the treatment) to adjust for differences between treated and control cases (Austin and Stuart 2015). IPW weights are calculated as follows:

$$\begin{aligned} \frac{1}{e_i} & \quad \text{for } D_i = 1, \text{ and} \\ \frac{1}{1-e_i} & \quad \text{for } D_i = 0 \end{aligned}$$

Standard IPW targets the entire sample of treated and control groups. However, when examining the impact of broad-access four-year college enrollment, the overlap in the propensity score between the treated and control groups may be small due to selection bias (Monaghan and Attewell 2014; Smith and Stange 2016). To address this issue, one approach is to estimate the ATO (average treatment effect in the overlap) (Li, Lock Morgan, and Zaslavsky 2018). Overlap weights are used to identify effects in the area with the most overlap between the treated and control groups. This helps to ensure that the comparison between the two groups is based on

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<sup>4</sup> Scholars have proposed alternative strategies that may lead to an improved propensity score model and a less biased treatment effect estimate. These include the covariate balance propensity score (Imai and Ratkovic 2013) and generalized boosted model propensity scores (McCaffrey, Ridgeway, and Morral 2004), which may be better suited to estimating more complex relationships across covariates. I tested models using these alternatives to generalized linear models, and the results were consistent across approaches.

similar individuals, resulting in better balancing properties and less biased estimates. ATO weights are calculated as the probability of receiving the alternative treatment option:

$$\begin{aligned} 1 - e_i & \quad \text{for } D_i = 1, \text{ and} \\ e_i & \quad \text{for } D_i = 0 \end{aligned}$$

Thus, overlap weights identify the effect in the sub-population of treated and control units who look most like the treated units (Li et al. 2018).<sup>5,6</sup> Taking the more-selective four-year college comparison as an example, ATE weights estimate the effect of broad-access four-year college enrollment among the entire population of four-year college students. Alternatively, ATO weights estimate the effect of broad-access four-year college enrollment on the subpopulation of four-year college students that more closely resembles broad-access four-year college students. These subpopulations are similar when there is a substantial overlap of treated and control units. Appendix Figures A.1 and A.2 present the distribution of propensity scores before and after adjusting for ATE and ATO weights. In this case, the weighted populations are different, despite some overlap. I present results from both ATE and ATO weights to better understand the implications of results using these alternative approaches.

Figures 2.2 and 2.3 present the covariate balancing properties after adjusting with the ATE and ATO weights for the community college and more-selective college comparisons, respectively. Balance is generally achieved on all covariates for both treatments. Whereas overlap weights achieve near-perfect balance across all covariates, there is remaining imbalance

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<sup>5</sup> Alternatives to modeling-based weighting aim to directly balance treatment and control groups, without developing an intermediate propensity score. One such method is entropy balancing (Hainmueller 2011). By design, entropy balancing produces weights that achieve perfect balance across treatment and control groups. I tested models using entropy balancing, and results were generally consistent with the ATE estimates using GLM propensity score models.

<sup>6</sup> I estimate my balancing weights using the `weightit` package in R (Greifer 2020).

on some variables after adjusting for the ATE weights.

– FIGURE 2.2 HERE –

To estimate the total effect of broad-access four-year college enrollment, I run a logistic regression predicting bachelor's degree completion, weighted by the ATE and ATO balancing weights. Where applicable, I include additional covariates that did not reach the balance threshold of .05. To estimate whether these effects differ across student achievement or socioeconomic status, I interact the indicator of broad-access four-year college enrollment with socioeconomic status terciles and racial and ethnic identity categories. I then estimate each group's marginal effect of broad-access four-year college enrollment. I run marginal contrasts to test the difference in marginal effects across subgroups (following Mize 2019).

– FIGURE 2.3 HERE –

## Results

### *Descriptive Statistics*

I begin by using data from the 2004 Integrated Postsecondary Education Data System (IPEDS) to describe institutional differences across the set of community colleges, broad-access four-year colleges, and more-selective four-year colleges in my analytic sample. The school characteristics in Appendix A, Table A.2 roughly correspond to potential explanations for the effect of institutional variation on bachelor's degree completion. These include measures of standardized test scores and faculty support (student-faculty ratio and faculty salary), institutional expenditures on student services, and whether schools require first-time students to live on campus. As expected, higher competitiveness corresponds to higher test scores, lower student-faculty ratios, increased likelihood of being private, and requiring first-year students to live on campus. As college selectivity increases, colleges tend to charge higher tuition, pay their

faculties higher salaries, and pay more for student services. Broad-access four-year colleges are also more likely to be designated as HBCUs, reflecting the lower admissions scores of students who attend these colleges (Gasman 2013). Students in the competitive or non-competitive colleges have less access to faculty and school resources than students in competitive, very competitive, or most competitive colleges. Students in community colleges also have less access to full-time faculty and lower institutional support for academic and student services.

Table 2.1 provides the weighted means and standard deviations of student-level covariates across community colleges, broad-access four-year colleges, and more-selective four-year colleges. Differences align with existing understanding of college stratification: as the level and selectivity of college enrollment increase, the socioeconomic background, academic achievement, test scores, school motivation, and college preparatory activities of enrolled students also increase. For example, just 5 percent of students in more-selective colleges have low test scores, compared to 23 percent and 34 percent in broad-access and community colleges. Likewise, 61 percent of students in more-selective colleges have high SES, compared to 30 percent and 36 percent in broad-access four-year and community colleges. Finally, Black students are overrepresented in broad-access four-year colleges, possibly because these colleges are more likely to be designated as HBCU institutions. In contrast, Hispanic students are overrepresented in community colleges. Table 2.1 also presents the eight-year BA completion rates across college sector and selectivity. Three-fourths of students in more-selective four-year colleges complete a bachelor's degree within eight years, just under half in broad-access four-year colleges, and only one-quarter of students in community colleges.

– TABLE 2.1 HERE –



### *Overall Effects of Broad-Access Four-Year College Enrollment*

I now turn to weighted regressions to assess the institutional effects of broad-access enrollment rather than more-selective or community college enrollment on bachelor's degree completion. Table 2.2 presents the overall marginal effects of broad-access four-year college enrollment relative to each alternative, using ATE and ATO weights. I present results with and without adjusting for application data for each weight-treatment combination.<sup>7</sup> The marginal effects indicate the adjusted percentage point change in expected bachelor's degree completion given enrolling in a broad-access four-year college rather than the alternative college option. Overall, the estimates from the ATO and ATE weights are similar.

The estimates in Table 2.2 indicate that enrolling in a broad-access four-year college rather than a community college increases degree completion by roughly 11-12 percentage points, which reduces to 8-10 percentage points after adjusting for the number of college applications. While this suggests that students who enroll in the least-selective four-year colleges experience a sizable increase in bachelor's degree completion, it also highlights the importance of considering heterogeneity in four-year colleges when estimating the community college diversionary effect. In their review of the literature on community college diversionary effects, Schudde and Brown (2019) find an average effect of about 23 percentage points. This is more than double my estimate, and reflects the larger effects of enrolling in a more selective rather than a community college, which is a more unlikely scenario (Ovink et al. 2018).

– TABLE 2.2 HERE –

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<sup>7</sup> For the community college comparison, I include the number of four-year college applications submitted. For the more-selective college comparison, I include the number of four-year applications submitted as well as whether the student applied to a highly selective four-year college.

The right panel of Table 2.2 shows that relative to more-selective four-year college enrollment, broad-access four-year college enrollment is associated with a 7-8 percentage point reduction in the probability of completing a bachelor's degree in 8 years. The estimate is further reduced to roughly 5 percentage points after adjusting for application measures. Adjusting for student sorting into four-year selectivity thus accounts for approximately 2/3 to 4/5 of the raw 26 percentage point difference in bachelor's degree completion. These results suggest that the most realistic alternative college options for students who enroll in broad-access four-year colleges are likely to be moderately more selective colleges rather than highly selective colleges. These findings are in line with studies that estimate a more modest increase in bachelor's degree completion, which have typically been those that identify the effect of a smaller increase in selectivity and/or use a more robust set of covariates (Heil et al. 2014; Long 2010; Smith 2013). In contrast, estimates of the effect of enrolling in the most selective rather than the least selective colleges (see Black and Smith 2004, Long 2008, and Melguizo 2008 for some examples of this approach) tend to identify larger effects, and may overstate the expected returns to college selectivity for students making post-secondary enrollment decisions.

– FIGURE 2.4 HERE –

Although the estimated effects are similar for the ATO and ATE approaches, adjusted predicted probabilities of bachelor's degree completion from the two models demonstrate how these strategies differ in their targeted sub-populations. Figure 2.4 presents the predicted bachelor's degree completion probabilities for the community college comparison. The ATO estimates in Figure 2.4 indicate that students most likely to enroll in either a broad-access four-year college or a community college have a 37-48 percent chance of completing a bachelor's degree, depending on the institution. In contrast, the ATE estimates in Figure 2.4 suggest that

students more similar to the overall community college population have a smaller probability (26-38 percent) of completing a bachelor's degree.

In the predicted probabilities presented in Figure 2.5, among broad-access and more-selective four-year college populations who share similar characteristics (the ATO results), roughly 55-63 percent complete a bachelor's degree. Students who more closely resemble more-selective four-year college students (the ATE results) have a 68-73 percent chance of attaining a bachelor's degree, depending on the institution. Thus, the populations of students at community colleges and more-selective four-year colleges that most resemble broad-access four-year college students tend to have middling chances of degree completion, even if they were to have attended more-selective four-year colleges (63 percent chance).

– FIGURE 2.5 HERE –

*Heterogeneity in the Effect of Broad-Access Four-Year Rather than Community College and More-Selective College Enrollment*

Next, I assess how the marginal effect of broad-access four-year college enrollment on bachelor's degree completion differs by socioeconomic background and racial/ethnic identity. Table 2.3 presents the results for broad access rather than community college enrollment. The top panel shows the marginal effects derived from the interaction of the treatment with socioeconomic status tertiles. Results from both the ATE and ATO weights suggest that the effects are largest and most precise for the highest-SES students. The lower panel of Table 2.3 presents the results for heterogeneity by racial and ethnic identity. Results from both sets of weights and across both covariate adjustment strategies suggest somewhat larger and more precise estimates for White students than for Black and Hispanic students. However, the differences in estimated effects across groups are not statistically significant, so I cannot reject

the null hypothesis that students from all socioeconomic backgrounds and racial groups benefit equally. Regardless, there is no evidence in Table 2.3 that the lowest-resourced or most under-represented minority students benefit more from attending a broad-access four-year college rather than a community college than their more advantaged peers. Instead, the results in Table 2.3 suggest that the students who benefit most from attending a four-year college rather than a community college, and thus from facing fewer institutional barriers to degree completion, are more advantaged students.

– TABLE 2.3 HERE –

Table 2.4 presents the equivalent results for heterogeneity in the effect of broad-access four-year college relative to more-selective four-year college enrollment. The top panel indicates that middle-SES students have the largest reductions in degree completion. The bottom panel suggests that Black and Hispanic students may have the largest reductions, although the estimates for Hispanic students are imprecise. Estimates are smaller and even more imprecise after accounting for the number and selectivity of college applications, but the patterns of heterogeneity generally remain. Additionally, the ATE estimates for the Black and Hispanic student populations are higher than the ATO results. This suggests that higher-achieving Black and Hispanic students who more closely resemble more-selective college-goers have particularly negative effects of instead enrolling in a broad-access four-year college. Despite the suggestive evidence that enrolling in a broad-access four-year college rather than a more-selective alternative reduces the probability of degree completion most for middle-SES and under-represented minority students, differences across groups are not statistically significant.

– TABLE 2.4 HERE –

Figures 2.6 and 2.7 present the predicted probability of bachelor's degree completion for both weighting strategies for the community college and selective college comparison, respectively. For both comparisons, students from high socioeconomic origins have the highest probability of bachelor's degree attainment after both ATO and ATE covariate adjustment. More privileged college entrants thus have a degree completion advantage across the college opportunity structure.

– FIGURE 2.6 HERE –

There are slightly different patterns by race. For both the community college and more-selective comparisons, there are more apparent differences in four-year degree completion across racial categories using the ATO weights, with White students having higher predicted odds at all post-secondary options. In contrast, the ATE weights indicate more similar predicted probabilities for Black, Hispanic, and White students. This suggests that conditional on pre-college covariates, racial identity is more predictive of degree completion in the overlap sample than in the subpopulations that more closely resemble those in community colleges or more-selective colleges.

## Discussion

My results indicate that broad-access four-year college enrollment increases bachelor's degree completion relative to community college enrollment and reduces completion compared to more-selective four-year enrollment. Compared to otherwise similar students who attend a community college, those who enroll in a broad-access four-year college can expect a roughly 12 percentage point increase in their likelihood of completing a bachelor's degree. On the other hand, relative to otherwise similar students in a more-selective four-year college, broad-access

four-year college students can expect a roughly 8 percentage point decrease in their likelihood of completing a bachelor's degree. These are relatively modest effects compared to some estimates from previous research on the returns to the college sector and selectivity. These findings underscore the importance of clarifying the counterfactual in research on institutional effects and identifying realistic alternatives for students attending broad-access two- and four-year colleges. Attending a highly selective college rather than a broad-access four-year college or a community college does not generally reflect this reality (Ovink et al. 2018), and estimates of those comparisons should be understood as upward bounds of institutional effects. Still, my results reinforce previous findings that students attending broad- and open-access two- and four-year colleges face degree completion disadvantages relative to those in more selective institutions.

Heterogeneity analyses offer some suggestive evidence of differences in effects across socioeconomic status and race. The negative relationship between enrolling in a broad-access four-year college rather than a more-selective four-year college is larger for middle SES students, Black students, and Hispanic students who are under-represented at more-selective four-year colleges. These results support the hypothesis that relatively marginal students benefit more from attending four-year colleges with increased resources. This set of findings aligns with the argument that structural inequalities in access to selective and highly-resourced universities lead students with relatively low-socioeconomic origins and underrepresented minority students to disproportionately lose out on bachelor's degree completion opportunities (Ciocca Eller and DiPrete 2018; Voss et al. 2022).

I also compare estimates of the treatment effect in the overlap (ATO) with the average treatment effect (ATE). The ATO estimates provide insight into the expected degree completion outcomes among the marginal population of four-year college students who attend broad-access

four-year colleges. Compared to students in more-selective four-year colleges, they have middling achievement and expectations and are more likely to be from low to middle socioeconomic backgrounds. They also have a middling predicted likelihood of completing a bachelor's degree across all college levels, topping out at 63 percent at selective four-year colleges. These relatively low odds of bachelor's degree attainment persist despite the broader returns to institutional selectivity and four-year degree access. In contrast, those with a higher propensity for a more-selective college tend to have higher degree completion rates at any four-year institution. My results further emphasize that having a high-SES background is quite protective of educational attainment at every level of the college opportunity structure, especially for the subset of students who resemble those in broad-access four-year colleges.

This study provides important insight into bachelor's degree completion at broad-access four-year colleges, but it has a few limitations. First, small sample sizes of student subgroups in broad-access four-year colleges limit my ability to draw conclusions about effect heterogeneity. My findings align with prior work on heterogeneity in the returns to college selectivity, but more work is needed to clarify the disparate results for the community college enrollment comparison. Second, unobserved confounders may bias the effects of broad-access four-year college enrollment. While my estimates adjust for a broader range of pre-college covariates than most previous studies, there may be remaining student-, school-, or community-level characteristics that predict college enrollment and degree completion that I have not accounted for in my models. For example, family challenges or personal health issues may lead a student to pick a local community college that offers more flexible enrollment options and may also reduce their odds of completing a bachelor's degree. Moreover, while I account for a measure of attachment to schooling, there may be unobserved personality traits and non-cognitive skills that are

positively associated with enrollment in a more selective college and bachelor's degree completion. Future iterations will run sensitivity analyses to assess potential bias due to unobserved confounding. Finally, I focused on understanding the implications of enrolling in a four-year college that offers admissions to the broadest range of students. However, by operationalizing selectivity using a categorical measure, this study ignores much of the variation across colleges at four-year and two-year institutions. Future work would benefit from a closer examination of why selectivity matters. For instance, research points to the importance of financial investments in explaining the returns to college selectivity (Mountjoy and Hickman 2021). Still, evidence on whether such investments can improve degree completion for students at less-selective colleges is lacking.

There are a few critical policy implications of this study. First, my results suggest that marginal four-year college students (those most likely to attend a broad-access college) require increased degree completion support across all four-year institutions, not just the least selective ones. This group's likelihood of bachelor's degree completion is lower than that of students with a higher propensity to enroll in a more-selective four-year college, who have higher achievement, test scores, motivation, and expectations. Educators and policymakers who are interested in improving equality in degree completion rates should implement targeted interventions to address the needs of these more marginal students. Such interventions might emphasize academic counseling and advising (Armstrong and Hamilton 2013; Rosenbaum, Ahearn, and Rosenbaum 2019), academic services such as tutoring or summer bridge programs (Kuh et al. 2010; Tinto 2010; Wathington, Pretlow, and Barnett 2016), offering childcare and other basic needs (Goldrick-Rab, Richardson, and Hernandez 2017; Kuh et al. 2010), or direct financial transfers in the form of grant aid (Nguyen, Kramer, and Evans 2019).



Second, student pre-college characteristics account for much of the raw differences in degree completion. The largest differences across four-year colleges are in academic achievement and high school context. Targeting inequality in college preparation will further support improving equity in degree completion at four-year institutions. Third, my findings demonstrate the significant and known barriers to bachelor's degree completion faced by students who enroll in community colleges. Three-fourths of community college entrants in my sample expect at least a bachelor's degree, but only one-fourth achieve that goal. Enrolling in the least selective four-year colleges increases degree completion by over 10 percentage points, even after adjusting for many pre-college covariates. These numbers point to the challenging context of bachelor's degree attainment in two-year colleges. Educators and policymakers should continue to develop systems to support students through the transfer process and consider expanding opportunities to complete bachelor's degrees through community colleges.

Broad-access four-year colleges provide critical access to bachelor's degrees for more disadvantaged students but do not guarantee degree completion. Improving persistence to degree completion for four-year college students requires increased attention to the needs of students in these colleges, similar students in more selective colleges, and college hopefuls who are unlikely to gain admission to selective four-year colleges. My findings suggest that without addressing low rates of bachelor's degree completion, nearly half of broad-access four-year college entrants – more at community colleges – will leave without completing a four-year degree.

## Chapter 3: The Power of a Degree: Examining the Direct and Indirect Effects of Broad-Access College Enrollment on Economic Disadvantage

### Introduction

The financial benefits of college attendance and completion are widely understood, and the promise of economic prosperity leads the majority of high school graduates to pursue higher education (Fry and Parker 2012). However, as college enrollment has expanded, some have questioned whether all college experiences promote socioeconomic attainment equally. In particular, the least selective four-year colleges – broad-access four-year colleges – have earned a negative reputation. Concern over these colleges is rooted in their students' low graduation rates and high debt. By disproportionately serving lower-income and under-represented minority populations, broad-access four-year colleges may contribute to social inequality by restricting their students' degree completion and economic opportunities (Carnevale and Strohl 2013; Fry and Cilluffo 2019). However, compared to non-four-year-college options (i.e., community colleges and no college enrollment), broad-access four-year colleges provide access to college hopefuls who would otherwise have fewer pathways to avoid economic disadvantage (Chetty et al. 2017). In this study, I contribute to research on the returns to institutional stratification by examining the degree to which enrolling in a broad-access four-year college rather than other post-secondary options prevents economic disadvantage through early adulthood.

Scholars have made considerable efforts to understand whether more selective colleges, with higher achieving student bodies and more resources, lead to better economic outcomes (Gerber and Cheung 2008). This body of work has identified inconsistent but often positive effects of college selectivity on earnings in adulthood (e.g., Black and Smith 2004, 2006; Witteveen and Attewell 2017), but it has focused on the effects of elite college attendance (Black

and Smith 2004; Brand and Halaby 2006; Dale and Krueger 2002, 2011). This emphasis on the earnings returns to elite college enrollment ignores a critical function of college expansion: preventing socioeconomic disadvantage (Brand 2023). The growing divide between the high-quality employment opportunities available to the college-educated and the lower-wage, lower-quality jobs for the non-college-educated (Goldin and Katz 2008; Kalleberg 2013) has meant that college entrants seek not just to earn more but also to avoid low-wage work and poverty (Nielsen 2015). However, research has not typically considered this purpose of education, which may be of particular concern for the relatively underprivileged populations in broad-access four-year colleges.

A key factor in the relationship between college selectivity and economic disadvantage is bachelor's degree completion, given that the financial outcomes for college-goers without degree completion are often only moderately better than those of non-college-goers (Hout 2012; Oreopoulos and Petronijevic 2013). This concern is especially acute for broad-access college attendees because of their relatively low rates of degree completion, which hover around 50 percent (Mcfarland et al. 2019). Following recent research that examines how bachelor's degree completion mediates the effect of college enrollment (Ahearn, Brand, and Zhou 2022; Zhou 2022; Zhou and Pan 2022), this study considers the total effect of broad-access four-year college enrollment as well as the indirect pathway of differential degree attainment.

I use data from the 1997 cohort of the NLSY to examine how enrollment in a broad-access college rather than alternative college options affects economic disadvantage and educational debt outcomes up to 20 years after initial college enrollment. I define broad-access four-year colleges as open-access or minimally selective institutions that offer admission to students with a range of academic preparation. Specifically, I ask (1) What is the effect of

enrolling in a broad-access four-year college rather than no college, a community college, or a more-selective four-year college on poverty, low-wage work, and unemployment through early adulthood? (2) What is the effect of enrolling in a broad-access four-year college rather than no college, a community college, or a more-selective four-year college on holding debt while experiencing poverty, low-wage work, or unemployment at age 35? (3) How does bachelor's degree completion mediate the effects of enrolling in a broad-access four-year college on economic disadvantage and debt while experiencing disadvantage?

This study makes four contributions to existing literature. First, it fills an important gap in research on the effects of institutional selectivity by focusing on how the most accessible four-year colleges prevent economic disadvantage or contribute to potentially unmanageable debt. Second, modest and non-statistically significant increases in poverty or low-wage work from enrolling in a broad-access rather than a more-selective four-year college support findings that, on average, four-year college selectivity has limited effects on early economic outcomes (Dale and Krueger 2002, 2011; Mountjoy and Hickman 2021). Instead, raw differences in these socioeconomic outcomes across four-year college selectivity categories are small and can be explained by pre-college differences in student characteristics. Third, broad-access four-year college enrollment does appear to prevent economic disadvantage relative to no college enrollment. Fourth, mediation results demonstrate the importance of degree completion for preventing economic disadvantage and support the hypothesis that institutional heterogeneity matters for these outcomes primarily insofar as it increases degree completion. Thus, while enrollment at a broad-access four-year college appears to reduce poverty and low-wage work relative to not enrolling in college at all, low degree completion rates remain a critical barrier to enjoying college's protective benefit.

## Background

### *The Economic Returns to College*

Research on the returns to college has unequivocally shown that higher education is a good investment. Students who enroll in and graduate from four-year colleges earn considerably more over their lifetimes, even after accounting for selection into college (Hout 2012; Oreopoulos and Petronijevic 2013). Individuals with no more than a high school degree are more likely to live in poverty, experience unemployment, work low-skilled jobs, and earn low wages than those with a college education (Brand 2023; Ma, Pender, and Welch 2019). The economic disparities between the college and non-college educated have grown over time, driven in part by decreasing labor market opportunities for those with a high school diploma (Torche and Johnson 2019).

Social scientists have proposed several theories to explain why college increases earnings. According to the human capital perspective, a college education increases individuals' skills, abilities, and knowledge, which are highly valued and rewarded in the labor market through well-paying and high-status jobs (Becker 1962). Some have raised doubts about how much higher education fosters skills, arguing that college signals desired worker qualities without evidence of their existence (Araki 2020; Arum and Roksa 2010; Collins 1979; Spence 1973). Still, research on the returns to college generally suggests that they reflect the actual acquisition of human capital attainment (Liu, Belfield, and Trimble 2015; Oreopoulos and Petronijevic 2013). In addition to developing skills and knowledge, college attendance enables the development of robust and high-status social networks (Huang, Maassen van den Brink, and Groot 2009). Individuals can then leverage these social connections to secure more favorable labor market outcomes (Granovetter 1974; Lin 1999).

### *The Economic Returns to Selective Four-Year Colleges*

The human capital and social network perspectives that explain the returns to college also provide insight into the potential mechanisms through which college selectivity improves socioeconomic outcomes. Most importantly, higher college selectivity corresponds to more institutional resources (Hoxby 2009). Appendix A Table A.2 shows how college characteristics and spending differ for community colleges and across the Barron's Competitiveness Index. Broad-access four-year colleges, which admit most applicants, typically invest fewer resources per student than moderately- and highly-selective institutions. Scholars have argued that financially advantaged schools improve students' labor market outcomes through better-funded educational experiences, increased access to services, and higher-paid faculty (Black and Smith 2006). Some have additionally suggested that higher-achieving and more ambitious peers can improve educational and economic outcomes by motivating students in the classroom (Smith and Stange 2016) and influencing their choice of majors toward higher-status occupations (Binder, Davis, and Bloom 2016).

Differences in school resources and peer characteristics can also contribute to the development of social capital. For example, smaller student-to-faculty ratios may facilitate closer and more meaningful relationships with faculty, ultimately improving chances of graduate school enrollment and leading to better labor market outcomes. Robust peer and alumni networks with connections to various high-status occupations may also assist students in finding and securing job opportunities (Huang et al. 2009; Lin 1999). In schools with lower proportions of commuter students, typically more selective institutions, peer social networks may be more robust than in colleges with a higher percentage of students who live off-campus (Braxton et al. 2004). Moreover, comprehensive academic and career counseling departments can help students stay on

track to graduate by guiding major and coursework selection and can aid graduating students in the transition to employment by facilitating networking connections and job search skills (Armstrong and Hamilton 2013; Rosenbaum et al. 2006).

Finally, attending highly selective four-year colleges may offer students additional advantages through the perceived status of their institution. For example, in an audit study by Gaddis (2015), applicants who attended elite colleges with a high degree of name recognition were 1.7 times more likely to receive a callback than identical applicants who attended a regional state university. This indicates that status signaled from attending a more prestigious institution confers labor market benefits beyond the direct resources and peer influences received in school. Other work has also found that high-status labor markets reward elite pedigrees by signaling elite cultural capital (Rivera 2012). Thus, students benefit from the perception of higher-status upbringing, cultural knowledge, degree, and labor market value from their selective institutions.

Despite the considerable differences in resources and peer achievement across four-year institutions, there is inconsistent evidence that college selectivity improves earnings. Because more selective colleges recruit and admit high-achieving and highly-motivated students, there are significant challenges to estimating the effects of college selectivity. Indeed, some scholars have demonstrated that observed average differences in earnings by college selectivity are due to selection bias (Dale and Krueger 2002, 2011; Mountjoy and Hickman 2021). For example, a recent study by Mountjoy and Hickman (2021) shows that adjusting for selection into different colleges eliminates the positive relationship between college selectivity and earnings among students who attend public four-year colleges in Texas. Still, others have found that attending a more selective college does increase earnings, using a variety of statistical approaches to dealing with selection bias (Black and Smith 2004, 2006; Long 2008, 2010; Quadlin et al. 2021;

Witteveen and Attewell 2017)

Much of the research in this area has examined the returns to highly selective or elite colleges (e.g., Black and Smith 2004; Brand and Halaby 2006; Dale and Krueger 2002, 2011; Michael Gaddis 2015; Quadlin et al. 2021). Thus, existing evidence of college selectivity primarily speaks to the effect of colleges attended by the most successful students, leaving a gap in understanding the effects of selectivity on labor market outcomes for students on the margin of college enrollment, with lower grades and test scores and fewer socioeconomic advantages. This study aims to fill this gap by examining the effects of enrolling in a broad-access four-year college compared to a more realistic group of more-selective enrollees, contributing to the understanding of the economic implications of attending less-selective institutions.

Overall, the weight of the evidence on returns to selectivity suggests a financial gain from enrolling in the most selective institutions. Thus, I hypothesize that enrolling in the least selective four-year colleges offers less protection against socioeconomic disadvantage in adulthood than enrolling in a more selective, resource-rich institution. Considering existing evidence on the returns to college over a high school diploma, I contend that enrolling in a broad-access four-year college has protective benefits over not attending college. I expect these benefits despite the lower resources provided by these institutions relative to other four-year colleges, and their higher costs compared to opting out of higher education entirely.

### *The Economic Returns to College Sector: Two-Year Versus Four-Year Colleges*

While many students in broad-access four-year colleges may have otherwise enrolled in a more selective four-year college, two-year colleges offer another common alternative for students on the margins of post-secondary enrollment. Studies have extensively documented



decreased bachelor's degree completion and earnings for students who choose community colleges over four-year colleges (see Schudde and Brown 2019 for a review). Community colleges are often excluded from scholarly discourse on the returns to institutional resources, which has almost exclusively examined heterogeneity in the four-year sector. Nevertheless, as shown in Appendix A, Table A.2, students in community colleges have access to fewer resources, take fewer classes with tenured faculty, and are less likely to live on campus than students in all four-year college selectivity groups. Therefore, the factors driving the economic returns to institutional selectivity at the four-year level may also apply to the transition from a two-year to a four-year college. Students in community colleges also face well-known administrative and bureaucratic barriers to four-year transfer. Scholars studying community colleges have demonstrated that such barriers substantially diminish bachelor's degree completion and subsequent economic outcomes (Goldrick-Rab 2016; Schudde and Brown 2019; Xu et al. 2020).

Studies on the effect of enrolling in a community college rather than a four-year college have mainly focused on diversion from bachelor's degrees rather than labor market outcomes. The limited research that has examined the economic returns of enrolling in a four-year college rather than a two-year college has produced mixed results. For example, Lockwood Reynolds (2012) finds a small negative effect on earnings of initially enrolling in a two-year rather than any four-year college. However, the effects shrink and become non-statistically significant after removing selective four-year college entrants from the sample. This finding aligns with prior research showing that the bachelor's degree gains from enrolling in a four-year rather than a community college decline as the selectivity of the four-year alternative declines (Brand, Pfeffer, and Goldrick-Rab 2014). Similarly, Xu, Solanki, and Harwell (2020) find adverse effects of

community college rather than four-year college enrollment on earnings, which disappear after applying propensity score matching techniques. Others have found no evidence of a reduction in earnings from beginning college at a two-year compared to a four-year college (Whitaker and Pascarella 1994). The limited evidence on the economic returns to four-year rather than two-year college enrollment does not provide much guidance on whether broad-access four-year college enrollment helps circumvent adverse economic outcomes compared to community college enrollment. Still, due to strong evidence of increases in degree completion (Schudde and Brown 2019), I expect that enrolling in a broad-access four-year college rather than a community college offers modest protection against economic disadvantage.

#### *The Mediating Effects of Four-Year Degree Completion*

Bachelor's degree completion has been shown to mediate the effects of four-year college enrollment on economic outcomes (Hout 2012; Oreopoulos and Petronijevic 2013). Theoretical explanations for the earnings returns to selective colleges also apply to the bachelor's degree returns. Academic, financial, and peer support can all help increase degree completion rates, and research has shown that more selective four-year colleges have higher bachelor's degree attainment rates (Brand and Halaby 2006; Heil et al. 2014; Long 2008; Smith 2013). Research has likewise shown that enrolling in a four-year college rather than a two-year college enrollment increases the probability of degree completion (Brand et al. 2014; Schudde and Brown 2019)

Credentialing and signaling theories would suggest that college selectivity is only relevant for reducing poor economic outcomes insofar as it impacts differential degree completion (Collins 1979; Spence 1973). Indeed, the earnings of individuals who complete "some college" without a degree tend to be closer to those who never attended college (Kim and

Tamborini 2019; Webber 2016). However, studies have shown that completing credits without receiving a degree from a community college (Belfield and Bailey 2011) or a four-year college (Hout 2012; Oreopoulos and Petronijevic 2013) confers economic benefits. Therefore, while I expect that degree completion mediates most of the total effect of broad-access four-year college enrollment on economic disadvantage, I allow for the possibility that institutional differences directly impact economic outcomes.

### *Expanding The Outcome Set: Economic Disadvantage and Debt*

Previous research has assessed earnings and, to a lesser degree, occupational returns to selectivity. While college is also assumed to provide a way out of poverty and disadvantage, and this is a basic expectation of many college students (Brand et al. 2021; Brand 2023), scholarship has not examined whether different institutional options offer different levels of such protection. Additionally, as shown in Appendix A Table A.2, broad-access four-year college students take on debt at similar rates as those in moderately and highly selective colleges, despite lower rates of degree completion. By serving disproportionately lower-income students who are often reliant on student loans (Fry and Cilluffo 2019) while also limiting the odds of bachelor's degree attainment, these schools may increase the risk of precarious or unmanageable debt relative to college options that lead to less debt or to higher rates of degree completion.

Yet, research has shown that even accounting for the uncertainty of completing a bachelor's degree and typical college costs, enrolling in college yields higher earnings than not enrolling in college (Webber 2016). However, these returns to college cumulate over the life course, and Webber (2016) shows that there are fewer expected returns to "some college" in the shorter run. This suggests that college non-completers may face greater economic insecurity and

financial challenges in paying off debt through early adulthood, despite potentially higher expected returns over the life course. By investigating the effects of college type on economic disadvantage and by focusing on the implications of enrolling in relatively under-resourced colleges with low completion rates, this study provides important insight into how college helps circumvent adverse economic outcomes.

## Data and Methods

### *Data and Measures*

This study uses data from the 1997 Cohort of the National Longitudinal Survey of Youth (NLSY97), a nationally-representative sample of around 9,000 adolescents born between 1980-1984, collected by the United States Bureau of Labor Statistics (BLS). Using a stratified multistage probability design, the initial sample was selected to identify a representative cross-section of households with American youth, including an oversample of Black and Hispanic youth. Data collection began in 1997 when respondents were aged 12-17. Adolescents and one parent per household were interviewed in the first round, and youth respondents were interviewed annually through 2012 and biennially after that. The 19th round of interviews was conducted by the BLS in 2018-19 when respondents were in their mid-late 30s.

The NLSY97 data set is well-suited for this study as it includes extensive pre- and post-college measures, which enable the adjustment for selection into different college options. Additionally, the restricted-use files provide detailed information on the colleges that respondents attended, allowing me to construct a measure of the selectivity of the first college

attended.<sup>8</sup> The NLSY97 also follows respondents into adulthood, giving college entrants, particularly those who began at a community college, more time to graduate and enter the labor market than comparable data sets.

First, I determine whether a high school graduate enrolled in college within two years of graduation. Among those who do enroll, I classify students based on the category of college in which they initially attended (i.e., a community college, a broad-access four-year college, or a more selective four-year college). I then use this information to create three treatment variables, each considering enrollment in a broad-access four-year college as the treatment group. The counterfactual groups for these three variables consist of the three post-secondary alternatives to enrolling in a broad-access four-year college: 1) no college enrollment, 2) community college enrollment, and 3) more-selective four-year college enrollment. To understand the long-term implications of post-secondary decisions made during late adolescence, I analyze the effect of the sector and selectivity of the respondents' first college.

Following previous studies that examined the effects of college selectivity categories (Brand and Halaby 2006; Quadlin et al. 2021; Witteveen and Attewell 2017), I measure college selectivity using the 2004 Barron's College Competitiveness Index. I define broad-access college-goers as those who enroll in the lowest two categories – non-competitive or less-competitive four-year colleges. More-selective colleges are those categorized by Barron's as competitive, very competitive, highly competitive, and most competitive. Thus, I examine the effects of enrolling in the four-year colleges that provide access to the largest group of college hopefuls. Appendix A provides more information on the definitions of Barron's competitiveness

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<sup>8</sup> This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. The views expressed here do not necessarily reflect the views of the BLS.

categories and the characteristics of the schools in these categories during the study period.

Briefly, broad-access four-year colleges offer admission to 85% of applicants, including those with a C-average GPA and an SAT score of 1000 or lower.

My mediating variable is bachelor's degree completion at age 28. Allowing respondents up to 10 years to complete their bachelor's degree provides additional time for community college entrants to transfer to a four-year institution and complete their degrees. My first three outcomes measure economic disadvantage from age 30 through the end of the survey (aged 35-39).<sup>9</sup> I operationalize economic disadvantage as three measures: the proportion of survey years spent experiencing 1) household poverty (i.e., household income is less than 100% of the poverty line for household size); 2) earning low wages (i.e., earning less than 2/3 of the median wage in the United States in that year (Grimshaw 2011)); and 3) unemployed (i.e., unemployed for 10% or more of the year).<sup>10</sup> I use the proportion of time rather than one-time survey measures because snap-shot indicators of economic outcomes may be susceptible to measurement error due to yearly fluctuations (Duncan 1961; Hout 2015). My final outcome is having non-mortgage debt while in poverty, low-wage work, or unemployment at age 35. With this outcome, I aim to understand the rates at which college and non-college-goers hold potentially unmanageable debt, thus signaling an additional indicator of economic hardship that may be exacerbated by attending but not completing college.

My pre-college covariates include measures that account for selection into college type

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<sup>9</sup> Some college-goers will either still be enrolled in college or will enroll in graduate school. To avoid counting years working towards educational attainment as periods of economic disadvantage, I exclude years in which individuals were enrolled in a degree-granting program from the outcome measures.

<sup>10</sup> I chose this measure of unemployment to align with the other measures of disadvantage, that is, the proportion of survey years between 30 and 39 in which the respondent experienced this indicator of disadvantage. I chose a 10% cutoff for unemployment to reflect just over 1 month spent unemployed.

and selectivity. While previous scholars have argued that information on college applications is necessary for isolating the effects of college sector and selectivity (Dale and Krueger 2002, 2011; Schudde and Brown 2019; Smith 2013), I did not include these measures in my analyses for several reasons. First, the NLSY97 did not ask the entire sample about their college applications, so these measures are not available for all respondents. Second, even if the NLSY97 did provide this information, previous studies that emphasized the importance of application portfolios focused on four-year college students who applied to at least two colleges (Dale and Krueger 2002, 2011; Long 2008). However, because my study focuses on students who attend broad-access four-year colleges, a significant portion of my sample likely applied to only one college, or in the case of community college or non-college-goers, may not have applied to any colleges at all. Including these measures would limit the estimation of the effects of broad-access four-year colleges to a higher-achieving population than typically attends these schools, which would not accurately reflect the population of interest. Therefore, I opted not to include these measures in my analyses. Instead, I rely on measures of family background, academic achievement, cognitive ability, college preparation, and high school characteristics. I restrict my sample to respondents who graduated high school by age 19 ( $n=6,830$ ) and are not missing data on the treatment, outcomes, or the mediator ( $n=5,217$ ).

### *Analytic Strategy*

I take a selection on observables approach to estimate the effect of college enrollment sector and selectivity on economic disadvantage. I assume that my observed covariates fully account for selection bias resulting from the unequal distribution of the treatment across the population of high school graduates (Morgan and Winship 2007). Figure 3.1 presents the Directed Acyclic

Graph (DAG) for the total, direct, and mediating effects of enrolling in a broad-access four-year college on economic disadvantage. Following Pearl (2009), I interpret this graph as a non-parametric model with independent errors. Thus, I assume that there is 1) no treatment-outcome confounding (i.e., no unobserved factors that affect both enrollment and economic disadvantage), 2) no treatment-mediator confounding (i.e., no unobserved factors that affect both enrollment and bachelor's degree completion), and 3) no mediator-outcome confounding (i.e., no unobserved factors that affect both bachelor's degree completion and economic disadvantage).

– FIGURE 3.1 HERE –

I begin with the total effects of enrollment in a broad-access four-year institution on economic disadvantage relative to the three post-secondary alternatives. I use a propensity score balancing weight strategy to statistically equalize the treatment and control groups on all observed covariates (Rosenbaum and Rubin 1983). The primary benefit of these models over standard regression adjustment is to account for insufficient overlap between the treatment and control groups across portions of the sample (Stuart 2010). I begin by estimating an individual's propensity to enroll in a broad-access four-year college rather than each of the alternative post-secondary options:

$$e_i = P(D_i = 1|X_i),$$

where  $D$  is the treatment (broad-access four-year college), and  $X$  is the full set of pre-college covariates (see Table 3.1). I developed my propensity score using a binomial generalized linear model (logistic regression).<sup>11</sup> I then create stabilized balancing weights from the propensity

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<sup>11</sup> Standard logit regression models require the researcher to develop a parametric model for the treatment, which can introduce bias if interaction terms are misspecified. To address this issue, I tested models using generalized boosted models (GBM). This alternative non-parametric strategy may lead to an improved propensity score model and a less biased treatment effect estimate (Ridgeway 2019). GBM predicts the outcome using a series of regression trees and minimizes loss according to the balance in the covariates. However, the GBM models were less successful



score. The most common approach to balancing weights is to estimate the average treatment effect (ATE) using inverse probability weighting (IPW). IPW uses the inverse of the propensity score (i.e., the probability of experiencing the treatment) to adjust for differences between treated and control cases (Austin and Stuart 2015). IPW weights are calculated as follows:

$$\frac{1}{e_i} \quad \text{for } D_i = 1, \text{ and}$$

$$\frac{1}{1-e_i} \quad \text{for } D_i = 0$$

For standard IPW, the target population is the entire population of treated and control groups.

However, when examining the impact of broad-access four-year college enrollment, the overlap in the propensity score between the treated and control groups may be small. To address this issue, one approach is to estimate the ATO (average treatment effect in the overlap) (Li, Morgan, and Zaslavsky 2018). In this case, overlap weights are used to identify effects in the area with the most overlap between the treated and control groups. This helps to ensure that the comparison between the two groups is based on similar individuals, resulting in improved balancing properties and less bias in the treatment effect estimates. ATO weights are calculated as the probability of receiving the alternative treatment option:

$$1 - e_i \quad \text{for } D_i = 1, \text{ and}$$

$$e_i \quad \text{for } D_i = 0$$

The ATO identifies the effect of enrolling in a broad-access four-year college for individuals for whom this is a realistic option. ATO estimates provide insight into the degree to which college enrollment might prevent economic disadvantages for individuals considering

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at balancing treatment and control groups, so the presented analyses use logistic regression models to predict the propensity score.

different college options. Identifying the overlap between treated and control groups is particularly relevant for those who enroll in no college, many of whom may not see a broad-access four-year college as a viable alternative. By providing estimates based on more realistic counterfactual groups, ATO estimates can help inform policy decisions that guide students' postsecondary choices.

Appendix C shows the IPW and ATO-adjusted propensity scores distribution for the no-college, community college, and more-selective four-year college comparisons. The distribution with the least overlap is the no-college enrollment comparison (Figure C.1), indicating that those who do not enroll in college are quite different from those who enroll in the least selective four-year colleges. In contrast, the distributions for the more selective (Figure C.3) and community college (Figure C.2) comparisons have somewhat greater overlap, indicating more similarities across these groups. Given these differences, I expect the ATO weights to differ more from the IPW weights for the no-college comparison than the other post-secondary alternatives. I present both sets of results to examine the impact of alternative weighting strategies.<sup>12</sup>

I run simple weighted regression models to estimate total effects. I run linear models for my outcomes measuring the proportion of time spent in economic disadvantage and logistic regression models for my outcome of holding non-mortgage debt while experiencing economic disadvantage. All results are presented as percentage point increases in the outcome due to enrolling in a broad-access four-year college rather than the alternative post-secondary option.

Next, I use a causal mediation approach to investigate whether the effects of broad-access four-year college enrollment on economic disadvantage are due to differences in the likelihood

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<sup>12</sup> I estimate my balancing weights using the `weightit` package in R (Greifer 2020).

of obtaining a bachelor's degree. Specifically, I examine whether enrolling in a broad-access four-year college reduces disadvantage by increasing the odds of degree completion compared to community college or no college or whether it increases disadvantage by reducing the odds of degree completion compared to a more selective college. I estimate the natural indirect effect (NIE) and the natural direct effect (NDE) of college enrollment on economic outcomes. This allows me to decompose the total effect into two components: the direct effect of college enrollment type and selectivity, and the part of the total effect attributable to the mediator, college completion (VanderWeele 2016).

To estimate the direct and mediating effects, I use the *mediation* package in R (Tingley et al. 2019). This package implements the algorithms developed by Imai, Keele, and Tingley (2010), which extend the linear structural equation method popularized by Baron and Kenny (1986) by accommodating non-linear estimation, such as when the mediator is binary. The *mediation* package estimates the average direct effect (ADE), which is the direct effect of the treatment on the outcome, averaged over the distribution of the mediator, as well as the average causal mediation effect (ACME), which is the effect of the treatment that operates through the mediator (Imai, Keele, and Tingley 2010; Tingley et al. 2019). These are conceptually similar to the natural indirect effect (NIE) and the natural direct effect (NDE) of college enrollment on economic outcomes but extended to a causal inference framework.

My mediation analysis involves estimating two models for each treatment-outcome combination. First, I run a logistic regression model predicting the mediator with the treatment, weighted with my balancing weights. This is my mediator model. Second, I run a weighted linear model predicting the outcome with the treatment and the mediator, weighted by the balancing weights. I then apply the algorithms described above (Imai et al. 2010, using the *mediation*

package in R) to estimate two path-specific effects: the direct effect (*college enrollment* → *economic disadvantage*) and the mediating (indirect) effect (*college enrollment* → *bachelor's degree completion* → *economic disadvantage*).

## Results

### *Descriptive Statistics*

Table 3.1 summarizes pre-college characteristics and bachelor's degree completion in the overall analytic sample and by initial post-secondary enrollment. Student-level differences across college enrollment and college type follow the expected patterns. The socioeconomic background, GPA, math course taking, and test scores of students who attend broad-access four-year colleges fall in the middle of those in community colleges and more selective four-year colleges. Non-college-goers are the least socioeconomically advantaged and have the lowest academic achievement and ability scores. Almost all (92 percent) broad-access four-year college students took the SAT or ACT, compared to 70 percent of community college students and 39 percent of non-college-goers. Although broad-access four-year colleges offer access to more students with test scores in the lowest tertile than selective four-year colleges (11 percent compared to 4 percent), community college students and non-college-goers are considerably more likely to have low test scores (20 percent and 33 percent).

These descriptive differences across college-going and college types highlight the socioeconomic and racial inequalities in college attendance and the college opportunity structure (Carnevale and Strohl 2013; Fry 2004; Fry and Cilluffo 2019). More privileged and White students are overrepresented at more selective four-year colleges, while less privileged, Black, and Hispanic students are overrepresented among broad-access four-year and community

college-goers as well as among non-college-goers.

The last row of Table 3.1 presents the bachelor's degree completion rates across college-going and college selectivity, which follow expected patterns.<sup>13</sup> Community college entrants are 30 percentage points less likely to complete a bachelor's degree by age 28 than broad-access four-year college students. More selective four-year college goers are 20 percentage points more likely to complete a degree than broad-access four-year college entrants.

- TABLE 3.1 HERE -

Table 3.2 presents the weighted averages of my outcomes by first college type and degree attainment. The top panel of this table shows that differences across college selectivity and type are minimal overall. For example, broad-access four-year and community college entrants spent about 6 percent of their late 30s in poverty. Four-year college entrants spent roughly 15-19 percent of this period in a low-wage job, regardless of their college's selectivity. Community college entrants spent more time earning low wages (25 percent). The largest differences are between those who did and did not enroll in college, however. Non-college-goers spend considerably more time in poverty, low-wage jobs, and unemployment than community college and four-year college entrants.

Table 3.2 also shows two debt indicators at age 35: holding non-mortgage debt and holding debt while experiencing poverty, low-wage work, or unemployment. While only the last is included as an outcome in my models, the other measure indicates how common it is for individuals to hold debt at age 35, regardless of their post-secondary status. Those who enrolled in college within two years after high school graduation have more debt, partly attributable to

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<sup>13</sup> Because I measure college-going by age 19, 3 percent of my non-college group enroll in college and complete a bachelor's degree in the next eight years.

their higher rates of educational debt. Although non-college-goers are less likely to hold debt, they are similarly likely as community college entrants to hold debt in the context of economic disadvantage. Because they have overall lower rates of poverty, low-wage work, and unemployment, those who enrolled in any four-year college are the least likely to hold debt while experiencing disadvantage.

The bottom panel of Table 3.2 shows stark differences in economic disadvantage by degree attainment within each category of first college type. Bachelor's degree recipients are uniformly less likely to be in poverty, low-wage work, or unemployment, regardless of which sector or selectivity of the college they first enrolled in. Still, those who started in a community college are slightly more likely to work in a low-wage job. Also of note is that the probability of holding debt while experiencing disadvantage is similar among non-completers, regardless of where or whether they began college. That being said, even a bachelor's degree from a selective college does not guarantee the avoidance of all economic disadvantages. This population spent about 15% percent of their late 30s earning low wages, about 3% of this time in poverty, and about 5% with unemployment.

- TABLE 3.2 HERE -

#### *Total Effects of Broad-Access Institutions on Socioeconomic Disadvantage*

The descriptive statistics offer some insight into how college relates to economic disadvantage, but understanding the role of institutions requires adjusting for the differences described in Table 3.1. I now turn to my balancing-weight-adjusted estimates of the effects of broad-access four-year college enrollment on economic disadvantage. Table 3.3 presents the total effects of broad-access four-year college enrollment on each outcome relative to no college enrollment, community college enrollment, and more-selective college enrollment. The largest

total effects are relative to no college enrollment. Compared to those who don't enroll in any college in the years following high school, students who attend broad-access four-year colleges spend roughly 5 percent less time in poverty and 8 percent less time in low-wage work. They have similar rates of unemployment and holding debt while experiencing economic disadvantage.

While the estimates for the effect of enrolling in a broad-access rather than a community college on poverty and low-wage work are negative, they are small and not statistically significant. On the other hand, the estimates for the effect of enrolling in a broad-access rather than a selective four-year college are all positive. Only the effect on unemployment reaches statistical significance, with an estimated 2 percent more time spent unemployed. This suggests that conditional on attending college, enrolling in a broad-access four-year rather than two-year or a more-selective option does not impact the incidence of poverty or low-wage work through early adulthood, and only modestly affects time spent unemployed.

Overall, the total effect estimates indicate a strong protective effect of college enrollment. Despite the lower resources in broad-access four-year colleges, students who enroll in these schools may see a reduction in economic disadvantage up to two decades later if their alternative was not attending college. Additionally, these results do not support the notion that conditional on college attendance, choosing a broad-access four-year college rather than a community or more-selective college substantially alters the chances of experiencing these measures of economic disadvantage.

### *Mediating Effects of Bachelor's Degree Completion*

Much of the speculation that broad-access four-year colleges are a poor choice for

students comes from their low degree completion rates, as demonstrated in Table 2. I now turn to my mediation analyses, which assess whether broad-access four-year college enrollment indirectly affects economic disadvantage due to differential degree completion. These results are presented in Figures 3.2 through 3.5. Figure 3.2 shows the direct and indirect effects of broad-access four-year college enrollment on poverty. The direct and mediating effects add to the total effect presented in Table 3. The results suggest that over half of the total effect on poverty of enrolling in a broad-access four-year college rather than no college is due to their higher bachelor's degree completion rates. Additionally, there is a small (1.5 percentage point) but statistically significant indirect effect when the alternative is community college enrollment. The indirect effect relative to more-selective college enrollment is statistically significant but is less than 1 percentage point.

- FIGURE 3.2 HERE -

Figure 3.3 presents broad-access four-year college enrollment's direct and indirect effects on low-wage work. Most of the total effect on low-wage work of enrolling in a broad-access four-year college rather than no college is due to the indirect effect of degree completion, which reduces the proportion of time in low-wage work by roughly 7 percentage points. As with poverty, there is a smaller (3 percentage point) but statistically significant indirect effect relative to community college enrollment and an even smaller (1 percentage point) indirect effect relative to more-selective four-year college enrollment. For both of these, the direct effect is not statistically significant. The results in Figures 3.2 and 3.3 suggest that institutional differences in degree completion play a modest role in the disparities of disadvantage among college-goers. However, not enrolling in any college leads to missed opportunities for preventing poverty and low-wage work through early adulthood, primarily due to reduced chances of completing a



degree.

- FIGURE 3.3 HERE –

The direct and indirect effects of broad-access four-year college enrollment on unemployment are presented in Figure 3.4. Here, the results differ slightly. The direct effects move opposite from the indirect effects for the community college and no college comparisons. Yet there are statistically significant and negative indirect effects due to the higher bachelor's degree completion among broad-access four-year college attendees. Relative to more selective four-year college enrollment, broad-access four-year college enrollment also has a positive but small and not statistically significant direct effect on unemployment. Although they are not statistically significant, the direct effect results in Figure 3.4 suggest that students who enroll in broad-access four-year colleges but do not complete degrees may struggle to maintain consistent employment.

- FIGURE 3.4 HERE –

Finally, Figure 3.5 presents the direct and indirect effects of broad-access four-year college enrollment on holding debt while experiencing economic disadvantage at age 35. For the non-college and community college comparisons, the direct and indirect effects again move in opposite directions. Non-statistically significant positive direct effects suggest that enrolling in a broad-access four-year college may increase the likelihood of holding debt while experiencing economic disadvantage. This is likely due to lower rates of educational debt among populations that do not initially enroll in four-year colleges. Still, larger and statistically significant negative indirect effects due to the higher likelihood of degree completion among broad-access four-year college-goers entirely offset the positive direct effect. There are no apparent direct or mediating effects for the more-selective four-year college comparison.

- FIGURE 3.5 HERE -

These mediation results suggest that higher degree completion rates in broad-access rather than community colleges offer some modest protective effect against poverty, low-wage work, and unemployment. Likewise, the lower degree completion rates in broad-access rather than more selective colleges minimally reduce the protective effect of initially attending a four-year college. The direct effects of broad-access four-year college enrollment on these outcomes tend to be smaller and not statistically significant. The exception is the direct effect on unemployment for the more-selective four-year college comparison. On the other hand, when the alternative is not enrolling in any college, enrolling in a broad-access four-year college appears to reduce poverty, low-wage work, and unemployment through increased chances of degree completion. Results suggest that this protection subsequently reduces the likelihood of holding debt while experiencing economic precarity, despite higher rates of overall debt among college-goers.

#### *Comparing ATE and ATO Results*

The results thus far have used the estimates from weights identifying the average treatment in the overlap (ATO). Tables 3.4 and 3.5 present the total, direct, and indirect results for the ATO and the ATE (IPW) weights. Generally, the results are similar, with one exception. For the non-college comparison, the direct effects of broad-access four-year college enrollment on poverty and holding debt while experiencing disadvantage are larger in the ATE results than in the ATO results. The indirect effects on these outcomes are likewise smaller. Given that the population of students represented by the ATE results is likely to be lower achieving (see Appendix C and Table 1), this larger direct effect may be due to lower degree completion rates in

the re-weighted population of broad-access college-goers (see also Zhou 2022). Because the population prioritized by the ATE weights has lower odds of degree completion, their indirect effects may be smaller. However, this pattern does not hold for low-wage work or unemployment, which do not show substantial direct effects in the ATE results.

## Discussion

It is often taken for granted that enrolling in college and attaining degrees will prevent socioeconomic disadvantage through more stable employment, higher wages, and circumvention of poverty. But low degree completion rates mean that many college entrants will leave college without realizing their educational goals or gaining this protective benefit of higher education. In this study, I use the NLSY97 to examine how enrollment in a four-year college with broad-access admissions policies rather than alternative post-secondary options affects economic disadvantage through early adulthood. Given concerns over debt, especially from student loans, I also examine the effect of broad-access four-year college enrollment on the likelihood that college-goers hold debt while experiencing economic disadvantage at age 35. I then estimate the extent to which those effects are mediated by differential rates of degree completion across institutions.

Results suggest that relative to comparable students who attend a community college or a more-selective four-year college, those who enroll in a broad-access four-year college have substantively similar rates of poverty, low-wage work, and unemployment through their 30s. These findings do not, overall, support the hypothesis that attending a broad-access four-year college increases disadvantage when the alternative is a more selective college. Nor do they support the hypothesis that enrolling in a broad-access four-year institution will substantially

reduce disadvantages when the alternative is a community college. Still, given the strong relationship between bachelor's degree completion and labor market outcomes, institutional differences in completion rates lead to modest indirect effects of broad-access four-year college enrollment on poverty, low-wage work, and unemployment. Nonetheless, when the alternative is no college enrollment, those who enroll in a broad-access four-year college experience a sizeable reduction in poverty and low-wage work. Although much of this total effect can be attributed to bachelor's degree graduates, the results suggest the possibility of a small direct effect as well.

The results from analyses predicting overall debt in the context of economic disadvantage expand on the above findings, demonstrating that the reduction in disadvantage also leads to a decrease in potentially unmanageable debt. Although attending a broad-access four-year college, as opposed to a community college or no college, increases the likelihood that students will incur educational debt, completing a bachelor's degree reduces the likelihood of holding debt while facing poverty, low-wage work, or unemployment.

My findings suggest that efforts to utilize higher education to prevent economic disadvantage would be best focused on increasing college access rather than increasing the selectivity of the school a student attends. However, my findings further indicate that increasing access to education without supporting students through degree completion is not sufficient for preventing poverty and low-wage jobs in early adulthood. Since non-college-graduates from all institutions have higher rates of economic disadvantage, such support must extend to community colleges, broad-access four-year colleges, and more-selective colleges.

The results of this study hinge on the assumption that there is no pre-treatment-treatment confounding. That is, it assumes that there is no unmeasured pre-college student characteristic that affects selection into broad-access institutions and that also affects either degree completion,

economic disadvantage, or both (Imai, Keele, and Yamamoto 2010; Tingley et al. 2019). For example, occupational motivation likely increases both enrolling in a broad-access four-year college relative to no college and reduces the odds of economic disadvantage. Failing to account for this measure in my models may positively bias my estimate of the effect of broad-access four-year college enrollment on poverty and low-wage work. Causal mediation analyses further assume that there is no unmeasured mediator-outcome confounder (sequential ignorability), meaning no unmeasured characteristic affects both bachelor's degree completion and the outcomes. For example, strong local labor markets for jobs that do not require a college degree might reduce a student's likelihood of completing their bachelor's degree and would also reduce their economic disadvantage. Not adjusting for neighborhood opportunity may consequently upwardly bias my estimated mediating effects. These are both strong and untestable assumptions, and future iterations of this study will include sensitivity analyses to assess how susceptible the results are to such unmeasured confounders.

A growing body of evidence suggests that more disadvantaged students on the margin of college enrollment have the greatest socioeconomic gains from a college education generally (Brand et al. 2021; Brand 2023; Brand and Xie 2010; Card 2001; Heckman, Humphries, and Veramendi 2018; Long and Kurlaender 2009), and more selective colleges specifically (Brand and Halaby 2006; Dale and Krueger 2011). Due to the small number of students in broad-access four-year colleges in the NLSY97 sample, this study does not assess how the effect of broad-access four-year college enrollment differs by socioeconomic or racial categories. Future research would benefit from attending to such heterogeneity in the effect of enrollment in a broad-access four-year college in order to clarify whether more marginal groups have experienced larger effects of college sector and selectivity on economic disadvantage. Another

set of studies has likewise found variation in the returns to college and college selectivity by field of study (e.g., Ma 2009; Quadlin et al. 2021). Future research should thus explore potential heterogeneity in the effects of broad-access four-year college enrollment on economic disadvantage by majors and, more broadly, seek to understand the role major selection plays in how institutions mitigate adverse economic outcomes.

This study fills an important gap by assessing whether and relative to which alternatives broad-access four-year institutions circumvent adverse economic outcomes. By highlighting that any college enrollment can help prevent economic disadvantage, it reinforces the importance of providing students with access to higher education. These results do not, however, suggest that inequality in where students attend college should not be addressed. That higher educational institutions appear to similarly prevent adverse economic outcomes after adjusting for selection bias does not mean that college stratification does not contribute to socioeconomic inequality for other dimensions of socioeconomic success. Just as policies must push for equality in access to the most selective institutions, which allow students entry to the highest-status occupations, they must also promote degree attainment in the least-selective institutions.

## Chapter 4: Post-Secondary Enrollment, Degree Completion, and Marital Outcomes

### Introduction

Conversations about the benefits of attending college are often focused on expected occupational outcomes and earnings. But higher education also sets students on differential pathways toward family formation: college-educated men and women are more likely to marry and to marry a college-educated spouse (McClendon 2018; Smock and Schwartz 2020). Social stratification research has emphasized that marital homogamy among the highly educated contributes to the intergenerational transmission of status, wealth, and socioeconomic attainment (Attewell et al. 2007; Choi et al. 2020; McLanahan 2004; Rauscher 2019; Western et al. 2008). Because college-educated workers have lower unemployment, earn a higher income, and have more human capital (Hout 2012), pooling resources among highly-educated spouses leads to improved opportunities and outcomes for their children (Bloome, Dyer, and Zhou 2018). As socioeconomic expectations for entry into marriage have risen for both men and women, those with less education are left behind in overall marriage and in landing highly-educated spouses (Cherlin 2004; McLanahan 2004).

However, post-secondary education is highly stratified. College-goers who enter community colleges or non-selective four-year colleges have a vastly different experience from those who enter highly selective or elite schools (Gerber and Cheung 2008). Prior research has suggested that enrolling in a four-year rather than a two-year college and attending a more-selective four-year college increases degree completion, earnings, and access to elite employment opportunities (Gaddis 2015; Heil et al. 2014; Long 2008; Quadlin et al. 2021; Rivera 2012). In light of the importance of potential partners' socioeconomic promise for

marriage decisions (Edin and Reed 2005; Sassler and Lichter 2020; Smock and Schwartz 2020; Sweeney and Cancian 2004), students who attend higher-resourced, more selective institutions are likely at an advantage in the modern marriage market. While sociological research has provided some evidence that students who graduate from more competitive institutions marry higher-status spouses (Arum et al. 2008; Feng 2022), these findings are based on older and non-US populations. As education continues to expand and labor markets become increasingly stratified by educational attainment, it is important to examine how heterogeneity within the education system shapes family formation in the contemporary context.

In this study, I use data from the 1997 cohort of the National Longitudinal Survey of Youth to describe the relationship between initial post-secondary enrollment and marriage outcomes. I first ask how time to marriage and eventual marriage differ by not only whether high school graduates continue their education but also the sector and selectivity of their first institution. Next, I ask how a student's first college predicts their likelihood of marrying a spouse with a bachelor's degree. Finally, I explore how institutional differences in four-year degree completion explain institutional differences in marriage and marrying a spouse with a bachelor's degree.

This paper contributes to prior research on inequalities in marriage and assortative mating in four ways. First, I provide evidence on how the type of college that a student attends complicates the education-marriage gradient, thus adding nuance to current understandings of educational inequalities in marriage outcomes. Second, I focus on marriage outcomes by the initial college of enrollment and therefore demonstrate how early educational decisions shape family formation pathways through early adulthood. Third, I contribute to recent research on the increase in hypogamy – when a woman marries a spouse with less education than herself –



among college-educated women (Esteve et al. 2016) by assessing the relationship between institutional variation and the probability of marrying a spouse without a bachelor's degree for women. Fourth, prior research has identified a bachelor's degree as a critical stratifying line in marriage and marrying a college-educated spouse (Lamidi 2015; McClendon 2018). By investigating how much of the relationship between an individual's first college and their marriage outcomes is explained by institutional differences in degree completion, I provide insight into the mechanisms by which college sector and selectivity may contribute to family formation patterns.

My results reveal distinct patterns of marriage based on an individual's first post-secondary decision. First, men who attend selective and elite institutions have a higher likelihood of marriage by their late 30s, whereas those who attend less-selective four-year and community colleges have similar likelihoods of marrying as those who do not attend college. Second, the likelihood of marrying a college-educated spouse increases with the selectivity of an individual's first post-secondary institution. In contrast to male college graduates, who frequently marry similarly-educated spouses, female college graduates from non-elite institutions are typically more likely to marry non-college-educated spouses than they are to marry college-educated spouses. Finally, degree completion explains most institutional differences in the likelihood of overall marriage and marrying a college-educated spouse. However, my findings indicate that there are remaining unexplained advantages in marital homogamy for selective and highly selective college-goers. Taken together, these results suggest that institutional stratification introduces consequential heterogeneity in the distribution of access to marriage and highly-educated spouses. Thus, the unequal sorting of students into different post-secondary pathways

contributes to disparities in marital outcomes that may have important implications for intergenerational status transmission.

## Background

### *The Educational Gradient in Marriage*

Relationship transitions in the United States are highly stratified by educational attainment. The decline in marriage among those with a high school diploma has led to a dramatic reversal in the educational marriage gradient, resulting in higher marriage rates among college-educated men and women than among those with lower levels of educational attainment (Lamidi 2015; Smock and Schwartz 2020). This reversal is characterized by an increasingly delayed timing of marriage, with the median age at first marriage now over 28 for college-educated individuals (BGSU 2022; Fry 2010).

Scholars have often explained this changing relationship as reflecting the increasing pressure to have a solid socioeconomic foundation before marriage (Edin and Kefalas 2005; Edin and Reed 2005; Schneider and Hastings 2015; Sweeney and Cancian 2004), a goal that can feel out of reach for those without a college degree. The polarization of the labor market and the reduction in high-paying blue-collar employment opportunities have limited the viable pathways to socioeconomic stability for non-college-educated men (Autor 2014; Goldin and Katz 2008). This population has lower lifetime earnings, higher unemployment, greater economic insecurity, and fewer non-pecuniary benefits (Hout 2012; Kalleberg 2013; Oreopoulos and Salvanes 2011). Because better jobs, fringe benefits, and jobs that require more education are associated with entry into marriage (McClendon, Kuo, and Raley 2014; Schneider, Harknett, and Stimpson 2019), economic instability is a crucial barrier for couples seeking to transition into marriage

(Sassler and Lichter 2020). Consequently, men and women now perceive marriage as a destination reserved for those who have achieved a high enough status to make it worth pursuing (Cherlin 2004; Smock and Schwartz 2020).

Moreover, increasing educational attainment and labor market participation among women have combined with reduced labor market opportunities for men to normalize dual-earning households (Goldscheider, Bernhardt, and Lappegård 2015). Just as women have historically emphasized potential partners' earnings (Xie et al. 2003), men have increased their preferences for college-educated women with high earnings potential (Raley and Bratter 2004; Sweeney and Cancian 2004). Overall, this research suggests that a primary reason for the reversal in the gender gap in marriage is one of preferences: men and women seek to marry spouses who will offer economic stability. Recent work has shown that the educational gradient in marriage remains larger for men (King 2021), supporting the notion that the most "marriageable" men are those with the highest earnings potential, who are increasingly those with a college degree.

### *Education and Assortative Mating*

Research has also found that one's level of educational attainment is closely linked to that of their spouse (McClendon 2018; Schwartz 2013; Schwartz and Mare 2005), indicating a growing educational disparity in marriage. The rise in post-secondary attainment, coupled with the high value placed on potential partners' economic promise, has contributed to increasing rates of marital homogamy among the college-educated (Blossfeld 2009; Schwartz 2013; Schwartz and Mare 2005). Thus, increases in marital homogamy can be explained by changes in both the demand for college-educated partners as well as the supply of such potential partners

(Blossfeld 2009). On the demand side, preferences for highly-educated spouses are discussed above. College-educated individuals' higher expected wealth and income improve their chances of attracting a highly educated, and thus desirable, partner. Sociologists have also argued that cultural preferences for finding partners with similar characteristics, including educational attainment, contribute to marital homogamy (Arum et al. 2008; Kalmijn 1998).

On the supply side, colleges are social environments that facilitate romantic connections with like-minded peers who are also likely to be highly educated (Mare 1991; Schwartz 2013). Enrolling in higher education thus shifts a student's pool of potential marriage partners towards those who are more likely to attain a college degree. Furthermore, social and occupational networks in adulthood tend to remain stratified by socioeconomic status (McPherson, Smith-Lovin, and Cook 2001; Reardon and Bischoff 2011), which can increase the likelihood of college-goers meeting and marrying a college-educated partner. Indeed, recent research has found that college graduates frequently marry spouses who attended the same institution (Ford 2020). In sum, the demand- and supply-side arguments explaining marital homogamy suggest that enrolling in college raises the odds of marrying a college-educated partner by increasing their likelihood of obtaining a high-value degree and exposing them to a pool of potential partners who exhibit economic promise and share similar educational values.

### *The Role of Institutional Heterogeneity in The Education-Marriage Gradient*

It stands to reason that overall marriage rates and assortative mating will also vary according to educational pathways. First, enrolling in a four-year college rather than a two-year college increases degree completion rates (Schudde and Brown 2019), as does enrolling in a more-selective four-year college (Heil et al. 2014; Long 2008; Smith and Stange 2016).

Attending an elite college also signals a higher cultural and socioeconomic status in the labor market (Gaddis 2015; Rivera 2012), which may positively impact early adult earnings (Gerber and Cheung 2008; Long 2008, 2010; Witteveen and Attewell 2017). Both degree completion and higher earnings are expected to increase an individual's desirability to potential partners.

Institutional sector and selectivity are also expected to impact the supply of potential partners. Because community college students and those in less-selective four-year colleges are less likely to graduate (Mcfarland et al. 2019), social connections formed at these schools may favor non-college graduates relative to those formed at more-selective colleges. Additionally, selective four-year colleges may generally lead to more robust school-based social networks, given that students are less likely to be commuters and tend to be more engaged on campus (Burrus et al. 2013; Porter 2006; Scott et al. 2006). Commuter students may also have stronger ties to their home environments. Because community colleges and less-selective four-year colleges may disproportionately serve first-generation college students (Fry and Cilluffo 2019), their social networks may therefore include fewer potential college-educated partners (Armstrong and Hamilton 2013; Musick, Brand, and Davis 2012). These differences in student populations and experiences likely alter the marriage market and social network development at different institutions, leading to inequalities in assortative mating not only by degree but also by institutional characteristics.

Given previous scholarship on the returns to college selectivity and the advantages enjoyed by bachelor's degree graduates in high-status marriage markets, I hypothesize the following:

- H1:** Marriage rates vary according to college enrollment, sector, and selectivity, such that college-goers are generally more likely to marry by their late-30s, and the likelihood increases for students who enroll in more competitive institutions.
- H2:** The probability of marrying a spouse with a bachelor's degree increases with college competitiveness, while the probability of marrying a spouse without a bachelor's degree decreases with college competitiveness.
- H3:** Differences in bachelor's degree completion across institutional contexts partially explain observed differences in marriage outcomes by initial college enrollment.

#### *Gender Differences in The Relationship Between Education and Marriage*

The above research suggests that an individual's marital desirability increases with college selectivity. However, scholarship on the marriage outcomes of college graduates does not support the notion that college selectivity increases marriage for men and women equally. Both Long (2010) and Ge, Isaac, and Miller (2022) find that in older cohorts, graduating from a more selective college reduces the probability of marrying among women but not men. These findings suggest that differences in degree completion may explain observed differences in marriage by initial college enrollment for men but that the effect of selective college enrollment on women's marriage prospects may be more complex.

Research has also shown that college selectivity is positively associated with educational homogamy among bachelor's degree graduates (Arum et al. 2008; Feng 2022; Ge et al. 2022). As with overall rates of marriage, there are differences by gender. While Arum, Roksa, and Budig (2008) found that women are less likely than men to "marry down" in education, their study population attended college when most college graduates were male (in the 1940s to

1970s). Since the 1990s, female educational attainment has overtaken male educational attainment (Buchmann, DiPrete, and McDaniel 2008). This reversal in the gender-education gap has led to what Esteve and colleagues have called the “end of hypergamy” (2016) and an increase in hypogamy, when women who have higher educational attainment than their spouses (see also Van Bavel, Schwartz, and Esteve 2018). Due to differences in perceived status, economic returns, and partner availability across post-secondary institutions, hypogamy may also be patterned by the sector and selectivity of the college where a student first enrolls.

I hypothesize the following about gender differences in the relationship between the selectivity of the first college of enrollment and marriage outcomes:

**H4:** Women who attend elite colleges are less likely to marry by their mid-30s compared to otherwise similar women who enroll in less-competitive or non-college options.<sup>14</sup>

**H5:** Female college graduates are more likely to marry a spouse without a college degree than male graduates from similar institutions.

## Data and Methods

### *Data and Measures*

I used data from the 1997 Cohort of the National Longitudinal Survey of Youth (NLSY97), a nationally-representative sample of roughly 9,000 adolescents born between 1980-1984 that is collected by the United States Bureau of Labor Statistics (BLS).<sup>15</sup> Using a stratified

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<sup>14</sup> It is possible that women who attend elite colleges and remain unmarried through their 30s are simply delaying marriage. Because prior research on the marriage outcomes of women who attend elite colleges has not observed women beyond age 40 (Ge et al. 2022; Long 2010), it is not clear whether these women are delaying marriage or foregoing it altogether.

<sup>15</sup> This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. The views expressed here do not necessarily reflect the views of the BLS.

multistage probability design, the initial sample was selected to identify a representative cross-section of households with American adolescents. It also included an oversample of Black and Hispanic youth. Data collection began in 1997 when respondents were 12-17, when adolescents and one parent per household were interviewed. Youth respondents were interviewed annually through 2012 and biennially after that. The latest (19<sup>th</sup>) full round of interviews was conducted in 2018-19 when respondents were in their mid-late 30s. The NLSY97 includes extensive pre-college measures that enable adjustment for observed selection into college sector and selectivity, as well as detailed relationship history to study marriage outcomes into middle adulthood. I use the restricted-use files to identify the sector and selectivity of the first college a respondent attended.

I examine two outcomes related to marriage and assortative mating. To understand differences in time to marriage and overall marriage rates, I use the event history variables in the NLSY97 to identify the month a respondent transitioned into marriage or was censored in the survey. Those who transitioned into marriage are coded as 1, and those who did not are coded as 0. To test my hypotheses about the relationship between initial post-secondary enrollment and assortative mating, I create a variable with three categories indicating the education level of the respondents' first spouse at the time of their initial cohabitation: the first spouse has a bachelor's degree or higher, the first spouse has less than a bachelor's degree, or the respondent never married.

My primary independent variable of interest is a categorical measure of post-secondary enrollment within two years of high school graduation. I identify four-year college selectivity using the Barron's College Competitiveness Index (see Appendix A for more details on the Barron's Index). I group four-year colleges into three categories: elite, moderately selective, and



broad-access. Elite colleges are those that are rated as “highly competitive” or “most competitive” on the Barron’s Index, moderately-selective colleges as those that are rated “very competitive” or “competitive,” and broad-access four-year colleges as those that are rated “less competitive” or “non-competitive.”<sup>16</sup> I identify community college entrants by matching the first college of enrollment with the Integrated Postsecondary Data System (IPEDS), which indicates the sector and control of each institution. I identify non-college-goers as those who did not complete any years of college within two years of high school graduation. Thus, I examine marriage and assortative mating across five post-secondary enrollment categories, which capture the range of options upon high school graduation.

My pre-college covariates include measures that account for selection into college type and selectivity. Following previous research on the relationship between education and family formation (King 2021; McClendon 2018; Musick et al. 2012), I control for an array of sociodemographic factors (i.e., race, US-born, age, region, rurality, family structure, mother’s age at the birth of her first child, number of younger siblings, parents’ religion, parents’ education, parents’ household income).<sup>17</sup> Because post-secondary enrollment and bachelor’s degree completion are also highly related to pre-college achievement, I further account for pre-college academic factors (i.e., educational expectations, GPA, and ability- as measured by the ASVAB). Accounting for pre-college achievement is a departure from studies of institutional stratification that only account for sociodemographic factors (e.g., Arum, Roksa, and Budig 2008). However, improving understanding of the role of differential post-secondary enrollment

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<sup>16</sup> I exclude students who attend for-profit institutions and institutions categorized as “Special” in Barron’s rating index.

<sup>17</sup> All models are stratified by gender, so it is not included as a covariate.

requires that more attention is paid to the academic factors that dictate selection into college (Ge et al. 2022; Long 2010; Musick et al. 2012).

I restrict my sample to respondents who graduated from high school by age 19 and for whom I have information about whether and where they attended college [ $n=6,614$ ]. I further restrict my sample to respondents who did not marry before high school graduation [ $n = 6,200$ ]. I use mean imputation with a missing dummy to impute information on family income, parents' education, ASVAB score, GPA, and educational expectations. Finally, I drop cases that are missing data on the remaining control variables [ $n = 6,065$ ]. Because my questions on assortative mating do not use methods that adjust for censorship and thus are subject to attrition bias, I further restrict this sample to respondents of the final round of the survey [ $n = 4,847$ ].

### *Analytic Strategy*

To estimate time to first marriage, I use Cox proportional hazard models, which allows me to include pre-college controls in my analysis of censored survivor data (Cox 1972). However, the proportional hazard assumption implies that the relationship between initial post-secondary enrollment and time to marriage is constant across time. Previous research has shown a well-known interaction between education and time to marriage (Sassler 2010), and tests confirm that this assumption is violated in my data. I apply a workaround using the `survsplit` function in R (Therneau 2023). I first split the data into four periods that align key age spans: 0-4 years, 4-7 years, 7-12 years, and 12 or more years after high school graduation (roughly ages 18-22, 22-25, 25-30, and 30+). I then allow the association between initial post-secondary enrollment and marriage to vary by age period, thus estimating the relationship between college enrollment and the risk of marriage within each period.

To examine assortative mating, I run multinomial regression models predicting the three-category assortative mating outcome with initial post-secondary enrollment. For both of my outcomes, I run three nested regression models. The first does not adjust for selection into college and provides baseline differences across initial post-secondary enrollment categories. The second model accounts for pre-college characteristics, and the third model adjusts for eventual bachelor's degree completion.<sup>18</sup> The final two models provide insight into how pre-college differences and unequal educational attainment explain the link between initial post-secondary enrollment and marriage outcomes. These models, therefore, offer preliminary evidence of how initial college sector and selectivity may influence marriage and marital homogamy outcomes through and beyond their role in shaping differential degree completion.

## Results

### *Descriptive Statistics*

Table 4.1 presents the means of all the variables used in my analyses for the overall sample and by post-secondary enrollment. Appendix D provides these statistics for men and women. There is substantial racial and socioeconomic stratification in initial college sector and selectivity. Black and Hispanic respondents are over-represented in the non-college population and in broad-access and community colleges. Compared to those who did not attend college and those in broad-access four-year and community colleges, individuals who attended moderately

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<sup>18</sup> 20% of married bachelor's degree recipients in the NLSY97 complete their degrees after their first marriage. Using eventual degree completion, therefore, does not guarantee that bachelor's degrees are attained before marriage and reduces my ability to make causal statements about the role of educational attainment. However, using time-varying degree completion is methodologically complex. Also, it makes interpretation difficult, given that individuals in school who are on track to graduate might have different marriage patterns than those who have dropped out (King 2021). Still, future sensitivity analyses will examine bachelor's degree completion as a time-varying covariate.

selective or elite colleges were more likely to live with both biological parents, had more educated parents, higher family income, and mothers who delayed childbirth. These groups also had higher GPAs, educational expectations, and test scores. As expected, marriage outcomes are also stratified by college enrollment, college sector, and college selectivity, which will be discussed further in the results below.

– TABLE 4.1 HERE –

*Time to Marriage and Cohabitation by Post-Secondary Enrollment*

Figure 4.1 displays the predicted risk of marriage since high school graduation, derived from split-sample Cox proportional hazard models that do not adjust for pre-college covariates. The results show that individuals who do not enroll in college have a higher risk of early marriage compared to all college entrants. However, this relationship reverses by their late 30s. Among college-goers, men who attend moderately selective or elite colleges have the highest risk of eventual marriage compared to those who attend broad-access four-year colleges, community colleges, or no college. In contrast to men, women who attend moderately selective colleges have the highest risk of later marriage, whereas elite college women show similar eventual marriage rates as those who attend broad-access four-year and community colleges. Thus, while there is an educational gradient in the eventual risk of marriage through the mid to late 30s for both genders, there is a more distinct delineation between men who attended moderately or highly selective colleges and all other high school graduates.

– FIGURE 4.1 HERE –

Tables 4.2 and 4.3 present the hazard ratios and standard errors obtained from the three Cox proportional hazard models for men and women, using non-college enrollment as the reference group. Table 4.2 indicates that a gradient in early marriage persists across the three

models, particularly for men who attend moderately selective and elite colleges. Differences in marriage are less pronounced between ages 22 and 25 and, after adjusting for controls, between 25 and 30. Beyond age 30, men who attend elite and moderately selective colleges have a higher risk of marriage than non-college goers, contributing to their higher overall eventual rates of marriage. The hazard ratio estimates decrease by 25 percent and 50 percent after accounting for differences in pre-college characteristics (Model 2) and bachelor's degree completion (Model 3), respectively.

– TABLE 4.2 HERE –

Table 4.3 presents the results for women, which reveal a pattern similar to that of men. The hazard ratios indicate that women who do not enroll in college are more likely to marry early, and these differences persist even after accounting for selection into college. The results for the two periods after age 25 show that women with any post-secondary enrollment catch up in marriage during their late 20s, as they have a higher risk of marriage compared to non-college-goers between ages 25 and 30. After accounting for sociodemographic characteristics and pre-college academic performance, this relationship remains for all groups except for elite college-goers. After adjusting for eventual bachelor's degree completion, the increased risk of marriage at later ages disappears for women attending elite and moderately selective colleges. Still, it remains for women attending broad-access four-year or community colleges. After age 30, only women who attend moderately selective colleges have higher rates of marriage than those who did not attend college, which is again explained by pre-college characteristics and eventual degree completion. In sum, Table 4.3 shows that the higher rates of marriage after age 25 among men and women who attend moderately selective and elite institutions relative to those who

attend other college options or do not attend college are largely explained by their pre-college characteristics and higher rates of bachelor's degree completion.

– TABLE 4.3 HERE –

Figure 4.2 displays the predicted cumulative probability of marriage by ages 20, 25, 30, and 35, derived from Model 2 (which adjusts for pre-college characteristics only). These results provide insight into how enrolling in different institutions may alter expected marriage rates in early adulthood. The left panel shows that, after accounting for pre-college differences, men who attend elite and moderately selective colleges still have a somewhat higher likelihood of marrying by age 35. This suggests that attending a more selective college may increase the likelihood of overall marriage for men compared to other post-secondary options. As indicated in Table 4.2, this increase appears to be due to higher rates of degree completion in these institutions.

The right panel of Figure 4.2 displays the predicted probabilities of marriage for women, showing somewhat different patterns. After accounting for selection into college, women who attended elite colleges are less likely to marry by age 35 than women who chose other post-secondary paths. This suggests that, among women who were similar in observed pre-college characteristics upon high school graduation, their likelihood of marriage by age 35 declines somewhat if they attend the most selective colleges. Additionally, the marital advantage by age 35 for women who attend moderately selective colleges identified in Figure 4.1 disappears after adjusting for their demographic characteristics, social backgrounds, and pre-college achievement.

– FIGURE 4.2 HERE –

*Assortative Mating by Post-Secondary Enrollment and BA Completion*

I now present results that compare assortative mating patterns by initial postsecondary enrollment. The top panel of Table 4.4 shows the likelihood for men and women of three different assortative mating outcomes: marrying a spouse with a bachelor's degree, marrying a spouse without a bachelor's degree, and never marrying. Men and women who initially enroll in elite colleges are most likely to marry a spouse with a bachelor's degree, at 54 percent and 47 percent, respectively. As the selectivity of initial college enrollment decreases, the likelihood of marrying a spouse with at least a bachelor's degree decreases for both genders. Individuals who never enrolled in college have less than a 10 percent probability of marrying a spouse with a bachelor's degree. Overall, women are less likely than men to marry a spouse with a bachelor's degree and are more likely than men to marry a spouse with less than a bachelor's degree.

– TABLE 4.4 HERE –

Figure 4.3 presents probabilities of different assortative mating outcomes for college-educated men by their bachelor's degree completion status. The top panel shows that as the selectivity of the college where men initially enrolled increases, so does their likelihood of marrying a spouse with a bachelor's degree. This trend holds for both those who have completed a bachelor's degree and those who have not, although the latter group is much less likely to marry a spouse with a bachelor's degree overall. Moreover, among men who have completed a bachelor's degree, marrying a college-educated spouse is the most probable outcome for all except those who started at a community college. On the other hand, men who do not complete a bachelor's degree are generally likelier never to marry or to marry a spouse without a bachelor's degree than a spouse with one. In sum, completing a bachelor's degree is associated with a higher

likelihood of marrying a college-educated spouse, although this advantage declines as college selectivity decreases.

– FIGURE 4.3 HERE –

The patterns in the lower panel of Figure 4.3 show that women are more likely than men to marry a spouse without a bachelor's degree across all college levels, regardless of their degree completion status. Only female college graduates who first enrolled in an elite college and completed their degree are more likely to marry a college-educated spouse than to marry a non-college-educated spouse or not to marry. Those first enrolled at a moderately selective, broad-access, or community college have roughly similar higher likelihoods of marrying a spouse with less than a bachelor's degree and marrying a spouse with a college degree. Women who first enrolled in a community college and eventually completed a four-year degree are most likely to marry a spouse without a bachelor's degree. Thus, except for those who initially attended an elite four-year college, female college graduates are more likely than their male counterparts to marry a spouse without a bachelor's degree, regardless of their initial institution.

Table 4.5 presents the results from multinomial logistic regressions that predict assortative mating by initial post-secondary enrollment. The odds ratios for marrying a spouse without a bachelor's degree or never marrying are presented as relative to marrying a spouse with a bachelor's degree. Elite college students serve as the reference group because they are most likely to marry a spouse with a bachelor's degree. The top two panels show results for men, and the bottom two panels show results for women. Men who pursue any non-elite post-secondary path have higher odds of marrying a spouse without a bachelor's degree than a spouse with a bachelor's degree, relative to those who attend elite institutions. Although accounting for pre-college characteristics and eventual bachelor's degree attainment explains a substantial



proportion of these differences, they remain statistically significant for all comparisons except the broad-access four-year college group. Non-selective college-going men and non-college-going men also have higher odds of never marrying rather than marrying a spouse with a bachelor's degree, but these differences are mostly explained by pre-college characteristics and eventual bachelor's degree attainment.

– TABLE 4.5 HERE –

The results in Table 4.5 further indicate that, compared to women who start college at an elite institution, those who do not attend college or attend a less competitive option have higher odds of marrying a spouse without a bachelor's degree than marrying a spouse with a bachelor's degree. Adjusting for pre-college characteristics and eventual bachelor's degree completion does not fully account for these differences. The bottom panel indicates that women who attend elite colleges have similar odds as all other college entrants of never marrying rather than marrying a spouse with a bachelor's degree. In contrast, those who do not enroll in college are considerably more likely not to marry than to marry a spouse without a bachelor's degree. Overall, the findings presented in Table 5 suggest that four-year college enrollment, particularly elite college enrollment for women, is associated with increased odds of marrying a spouse with a bachelor's degree. This advantage is only partially explained by higher bachelor's degree completion rates among elite college entrants, indicating that other factors related to college students' marital desirability or their access to highly-educated potential partners also influence their assortative mating patterns.

## Discussion

Differential marriage outcomes across levels of educational attainment have been shown

to contribute to social reproduction by improving the socioeconomic and other life outcomes of highly-educated married couples and their children (Attewell et al. 2007; Rauscher 2019; Western et al. 2008). However, college experiences vary dramatically, with some students enrolling in open-access and less-selective two- and four-year colleges and others enrolling in elite and highly selective universities. By increasing the likelihood of bachelor's degree attainment, earnings, and perceived status, enrolling in a more selective college may lead to higher rates of marriage and higher odds of marrying a college-educated spouse (Heil et al. 2014; Long 2008; Quadlin et al. 2021; Rivera 2012). This study expands research on education and marriage by examining how marriage rates and assortative mating in early adulthood vary by the sector and selectivity of the first college of enrollment and by exploring the contribution of college differences in bachelor's degree completion.

My results reveal variation in marriage rates and time to marriage across college enrollment and institutional sector and selectivity. Individuals who do not enroll in college immediately after high school graduation are less likely to marry than those who attend any post-secondary institution. My results also suggest that institutional differences in bachelor's degree completion contribute to higher marriage rates for men attending moderately selective and elite institutions. In contrast, attending and graduating from an elite institution appears to reduce the likelihood of marriage for women, a finding that is supported by previous studies (Ge, Isaac, and Miller 2022; Long 2010).

Building on these findings, I show distinct patterns in assortative mating based on initial post-secondary enrollment. Although non-college-goers are highly unlikely to marry a college-educated spouse, the probability of marrying a college-educated spouse increases with the selectivity of their initial college. Furthermore, while male graduates who first enrolled in the

least selective colleges still have reasonable odds of marrying a college-educated spouse, female college graduates who did not attend an elite college are more likely to marry a spouse with less than a bachelor's degree. Multivariate regression results confirm that an elite-college advantage in marrying a college-educated spouse persists after accounting for selection into college and bachelor's degree completion.

In sum, my findings demonstrate the significant role of post-secondary stratification in shaping marriage and marital homogamy among college-goers. The bachelor's degree and status attainment advantages that accrue to college-goers who first enroll in the most selective institutions lead to higher rates of marriage for men and a higher likelihood of marrying college-educated spouses for men and women. These results add important nuance to existing understanding of how educational attainment shapes marriage patterns.

A key insight from this study is that differential degree attainment does not fully account for the higher likelihood of marrying a college-educated spouse among selective and elite college-goers. Several potential explanations can account for this result. First, by their mid-30s, elite college-goers may already experience economic gains from their more selective degrees (Long 2008, 2010; Witteveen and Attewell 2017), which could help them attract a similarly-educated spouse. Second, the cultural status signaled by an elite degree may provide these individuals an additional advantage relative to other college graduates, especially for potential partners who also went to elite colleges (Feng 2022; Ford 2020). Third, if institutional-based social networks are relevant for finding a spouse, enrolling in a college that is less likely to lead to a degree may similarly reduce the chances of meeting a spouse who completes their degree.

Additional research is also needed to understand which sub-populations of college-goers experience marital gains from selective and elite institutions. Previous studies have shown

socioeconomic heterogeneity in the marriage returns to college (Armstrong and Hamilton 2013; King 2021; Musick et al. 2012). These scholars have argued that female college graduates from lower-socioeconomic origins have less success finding highly-educated partners than their peers from more advantaged backgrounds. Others have shown similar divergence in marriage among college graduates by race (Raley, Sweeney, and Wondra 2015). Given that more than half of selective female college graduates in my sample do not marry a college-educated spouse by their mid-late 30s, it is highly plausible that racial and socioeconomic inequalities exist regarding which college graduates experience marital homogamy, hypogamy, or never marry. Future work in this area should investigate this possibility further.

This study offers important insights into how institutional variation contributes to inequality through marriage pathways, but it does have a few limitations. Because I do not use a time-varying measure of bachelor's degree completion, I cannot make causal inferences about the mediating effect of bachelor's degree completion on marriage and assortative mating. Future sensitivity analyses will examine bachelor's degree completion as a time-varying covariate to better assess differences in degree attainment as a causal mechanism. Additionally, my multinomial regression results examine the assortative mating outcomes of respondents who did not exit the NLSY sample. This may introduce bias if there are differences in attrition by initial college enrollment or marriage. Future iterations of this analysis will use relative risk models to account for censorship in my assortative mating outcomes.

This study emphasizes that despite the economic benefits of educational expansion (Brand 2023), structural inequalities in college sorting persist through institutional inequalities in marriage outcomes. The growth of community colleges and less-selective four-year institutions has provided educational opportunities for lower-income, Black, and Hispanic students

(Carnevale and Strohl 2013; Fry and Cilluffo 2019), but elite colleges remain bastions of wealth, exclusion, and whiteness (Jack 2019; Karabel 2005). My findings therefore suggest that the marital advantages of attending selective and elite colleges contribute to unequal pathways for the intergenerational transmission of social status. More broadly, this study highlights the long-lasting consequences of initial post-secondary enrollment decisions made during adolescence for individuals' paths to union formation. These educational choices, which are heavily influenced by economic and social constraints, not only affect students' odds of degree attainment but also shape their opportunities for meeting and attracting highly-educated partners.

## Chapter 5: Conclusion

Students face a variety of post-secondary options upon leaving high school, ranging from no college enrollment to open-access community colleges and elite universities. Different institutions offer students considerably different levels of financial resources, peer achievement, and campus social engagement (See Appendix A), which may impact student outcomes. As enrollment choices are often stratified by socioeconomic background and racial identity, institutional heterogeneity may contribute to perpetuating social inequalities (Ciocca Eller and DiPrete 2018; Fry and Cilluffo 2019; Voss et al. 2022). To better understand how institutional heterogeneity contributes to unequal outcomes among college-goers, this dissertation examines how the sector and selectivity of a student's first college influence their educational, economic, and family outcomes in early adulthood. Specifically, I assess the effect of enrolling in the most accessible four-year colleges on bachelor's degree completion and economic disadvantage and describe how marriage outcomes differ across the spectrum of post-secondary options. By considering a more comprehensive set of alternative college options, including non-college and community college enrollment, this study sheds light on the varied implications of the highly stratified post-secondary opportunity structure in the United States.

My findings from Chapter 1 indicate that enrolling in a broad-access four-year college increases the likelihood of degree completion compared to community college attendance. However, students who might have otherwise attended a more selective institution experience lower rates of four-year degree attainment. While my estimates are substantial, ranging from 7 to 12 percentage points, they are modest compared to some prior estimates of the effects of college sector selectivity. Additionally, results suggest that Black, Hispanic, and middle-SES students may be disproportionately disadvantaged by attending a broad-access rather than a more-

selective four-year option. The findings from Chapter 1 emphasize that addressing inequality in degree attainment requires also addressing low degree completion rates across colleges and inequality in access to selective four-year institutions.

The findings from Chapter 2 show that the effects of enrolling in broad-access four-year colleges on degree completion lead to modest changes in economic disadvantage between the ages of 30 and 35. However, compared to not enrolling in any college, attending a broad-access four-year college results in more significant reductions in poverty and low-wage work. Therefore, attending any college provides substantial protection against poverty and low-wage work in early adulthood, with bachelor's degree completion playing a crucial mediating role. Thus, using higher education as a potential pathway to reduced disadvantage necessitates policies that promote bachelor's degree completion for students in all colleges.

The results from Chapter 3 demonstrate a strong relationship between the first college of enrollment, marriage rates, and assortative mating. I show that increased bachelor's degree completion from attending more selective four-year colleges, as opposed to broad-access or community colleges, contributes to higher marriage rates for men. Men and women who attend selective or elite colleges enjoy an additional advantage in marrying a college-educated spouse. In contrast to overall marriage rates, institutional differences in post-secondary enrollment shape assortative mating only partially through differential degree completion. Consequently, those attending highly selective and elite colleges hold additional unexplained advantages in the marriage market.

This dissertation makes important contributions to existing understanding of the consequences of the college opportunity structure and how institutional stratification impacts the early adult outcomes of high school graduates. Still, research should continue to explore the

effects of institutional characteristics on student outcomes. Due to the focus on four-year college selectivity, and on broad-access four-year colleges specifically, this dissertation emphasizes the importance of bachelor's degree completion. However, sub-baccalaureate associate degrees and certificates earned at two-year colleges offer important economic advantages over a high school diploma (Hout 2012; Liu et al. 2015), and returns to any degree depend heavily on field of study (Kim, Tamborini, and Sakamoto 2015; Ma 2009; Webber 2016). Studies that address differences in alternative degrees and major selection are needed to provide additional nuance to understanding of the returns to institutional selectivity and the mediating role of degree attainment. Moreover, while Chapter 1 assessed racial and socioeconomic differences in the effect of broad-access four-year college enrollment on bachelor's degree completion, heterogeneity in institutional effects on disadvantage and marital outcomes merit further examination. By better understanding these complexities, research can support educators and policymakers in developing more targeted interventions to address inequality in higher education and ensure greater access to student success during and after college.



# Tables and Figures

## Chapter 2 Tables and Figures

*Table 2.1: Student Characteristics By College Type and Selectivity*

	Full Sample		Community College		Broad-Access		More Selective	
	Mean		Mean		Mean		Mean	
Completed a BA by 2012	0.55	-	0.26	-	0.47	-	0.73	-
Female	0.57	-	0.57	-	0.58	-	0.57	-
Asian	0.05	-	0.04	-	0.03	-	0.06	-
Black	0.12	-	0.13	-	0.27	-	0.09	-
Hispanic	0.10	-	0.16	-	0.11	-	0.06	-
Other Race	0.04	-	0.04	-	0.03	-	0.04	-
White	0.69	-	0.63	-	0.55	-	0.75	-
Native English Speaker	0.89	-	0.85	-	0.92	-	0.92	-
Lowest Tertile of SES	0.20	-	0.31	-	0.28	-	0.12	-
Middle Tertile of SES	0.32	-	0.39	-	0.36	-	0.27	-
Highest Tertile of SES	0.48	-	0.30	-	0.36	-	0.61	-
Lived with Mother and Father	0.67	-	0.61	-	0.61	-	0.71	-
Parents Expect Less than BA	0.11	-	0.23	-	0.10	-	0.04	-
Parents Expect a BA	0.48	-	0.47	-	0.50	-	0.47	-
Parents Expect Graduate School	0.41	-	0.29	-	0.40	-	0.48	-
Lowest Tertile of Test Scores	0.17	-	0.34	-	0.23	-	0.05	-
Middle Tertile of Test Scores	0.33	-	0.41	-	0.47	-	0.26	-
Highest Tertile of Test Scores	0.50	-	0.25	-	0.30	-	0.69	-
High School GPA <sup>a</sup>	3.07	0.62	2.71	0.61	2.94	0.61	3.31	0.50
College Prep Program 10th	0.62	-	0.48	-	0.59	-	0.71	-
Highest Math at Least Trigonometry	0.61	-	0.32	-	0.53	-	0.79	-
Took at Least 1 AP/IB Class	0.41	-	0.17	-	0.29	-	0.57	-
Academic Concentrator	0.39	-	0.15	-	0.35	-	0.55	-
Educational Attachment Scale	0.21	0.95	-0.06	0.97	0.15	0.91	0.36	0.90
Number of Activities 12th (binary)	0.86	-	0.75	-	0.87	-	0.93	-
Expects Less than a BA	0.07	-	0.15	-	0.05	-	0.03	-
Expects a BA	0.38	-	0.41	-	0.42	-	0.35	-
Expects a Graduate Degree	0.49	-	0.34	-	0.49	-	0.58	-
Uncertain Expectations	0.06	-	0.09	-	0.05	-	0.04	-
Took SAT or ACT	0.87	-	0.65	-	0.97	-	0.99	-
Applied to 0 Colleges	0.20	-	0.54	-	0.05	-	0.00	-
Applied to 1 College	0.24	-	0.22	-	0.26	-	0.24	-
Applied to 2 Colleges	0.19	-	0.11	-	0.30	-	0.21	-
Applied to 3+ Colleges	0.38	-	0.12	-	0.38	-	0.54	-
Applied to Highly Selective College	0.43	-	0.14	-	0.27	-	0.64	-
High School is Public	0.88	-	0.94	-	0.91	-	0.85	-
High School in Urban Area	0.29	-	0.27	-	0.39	-	0.30	-
High School in Suburban Area	0.52	-	0.52	-	0.43	-	0.53	-
High School in Rural Area	0.19	-	0.21	-	0.18	-	0.17	-
High School in the West	0.21	-	0.28	-	0.16	-	0.18	-
High School in the Northeast	0.20	-	0.15	-	0.14	-	0.24	-
High School in the South	0.33	-	0.32	-	0.44	-	0.31	-
High School in the Midwest	0.26	-	0.25	-	0.26	-	0.27	-
High School % Reduced Price Lunch	21.25	21.58	26.75	23.06	28.66	25.81	16.60	18.53
High School Academic Climate	0.01	0.15	-0.02	0.15	0.00	0.15	0.04	0.15

N	7570	2360	660	4560
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Weighted using the ELS Base Year Student Weight

Dashes are used in place of standard deviation for binary variables; <sup>a</sup>Honors courses are not weighted differently in the GPA measure.

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012); Numbers are rounded to the nearest 10 to comply with NCES restricted-used data requirements.

*Table 2.2: Marginal Effects of Broad-Access College Enrollment on Bachelor's Degree Completion, Using Different Weighting Strategies: Overall Sample*

	Relative to Community College Enrollment		Relative to More Selective College Enrollment	
ATE	0.11*** (0.03)	0.10** (0.03)	-0.07** (0.03)	-0.05+ (0.03)
ATO	0.12*** (0.02)	0.08** (0.03)	-0.08*** (0.02)	-0.05* (0.02)
Application Data:	No	Yes	No	Yes

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

Estimates derived from weighted logistic regressions predicting BA completion with first college type and selectivity; \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1

*Table 2.3: Heterogeneous Marginal Effects of Broad-Access Rather than Community College Enrollment, Using Different Weighting Strategies*

SES	Low	Middle	High	Low	Middle	High
ATE	0.07	0.13**	0.14***	0.08	0.10+	0.12**
	0.05	0.05	0.04	0.07	0.05	0.05
ATO	0.12**	0.09*	0.14***	0.09+	0.06	0.10*
	0.04	0.04		0.05	0.04	0.04
Race	Black	Hispanic	White	Black	Hispanic	White
ATE	0.11	0.08	0.15***	0.12	0.03	0.15**
	0.07	0.07	0.04	0.14	0.06	0.05
ATO	0.10+	0.12+	0.14***	0.08	0.10	0.11**
	0.05	0.07	0.03	0.05	0.07	0.03
Controls for Application Data:		No		Yes		

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

Estimates derived from weighted logistic regressions predicting BA completion with first college type and selectivity; \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1

*Table 2.4: Heterogeneous Effects of Broad-Access Rather than More Selective College Enrollment, Using Different Weighting Strategies*

SES	Low	Middle	High	Low	Middle	High
ATE	-0.07	-0.10*	-0.06	-0.03	-0.10*	-0.04
	0.05	0.04	0.04	0.04	0.04	0.04
ATO	-0.03	-0.13**	-0.06+	-0.01	-0.10*	-0.03
	0.05	0.04	0.03	0.05	0.04	0.03
Race	Black	Hispanic	White	Black	Hispanic	White
ATE	-0.15*	-0.13	-0.07*	-0.14*	-0.11	-0.07
	0.06	0.08	0.03	0.07	0.10	0.04
ATO	-0.11*	-0.10	-0.07*	-0.09	-0.05	-0.05+
	0.05	0.07	0.03	0.06	0.08	0.03
Controls for Application Data:	No			Yes		

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

Estimates derived from weighted logistic regressions predicting BA completion with first college type and selectivity; \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1

Figure 2.1: Directed Acyclic Graph of Type and Selectivity on College Enrollment

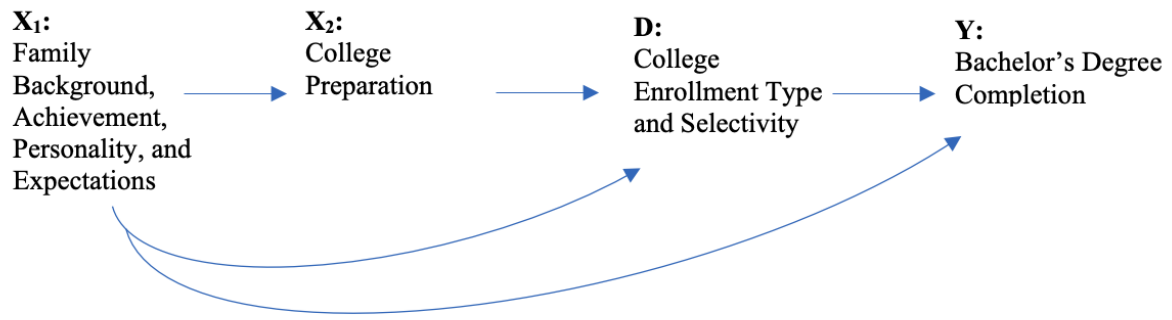
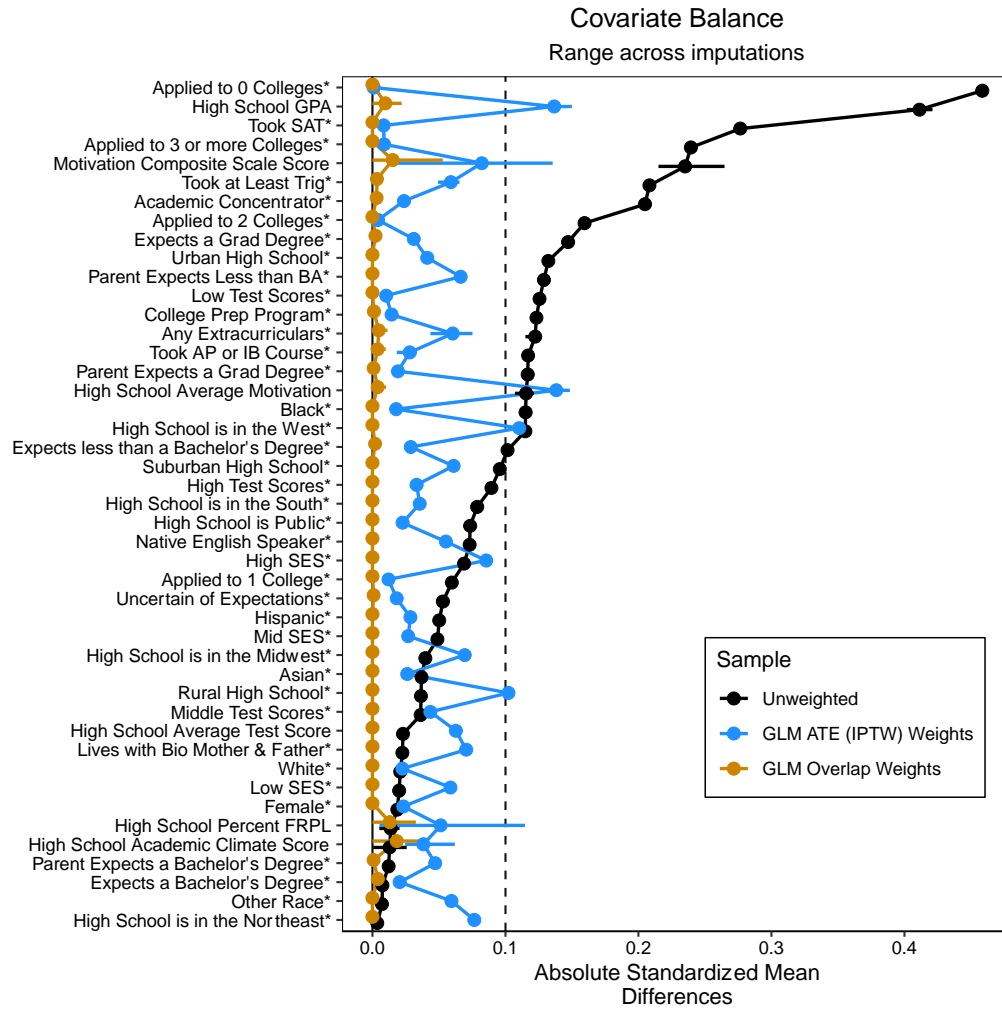


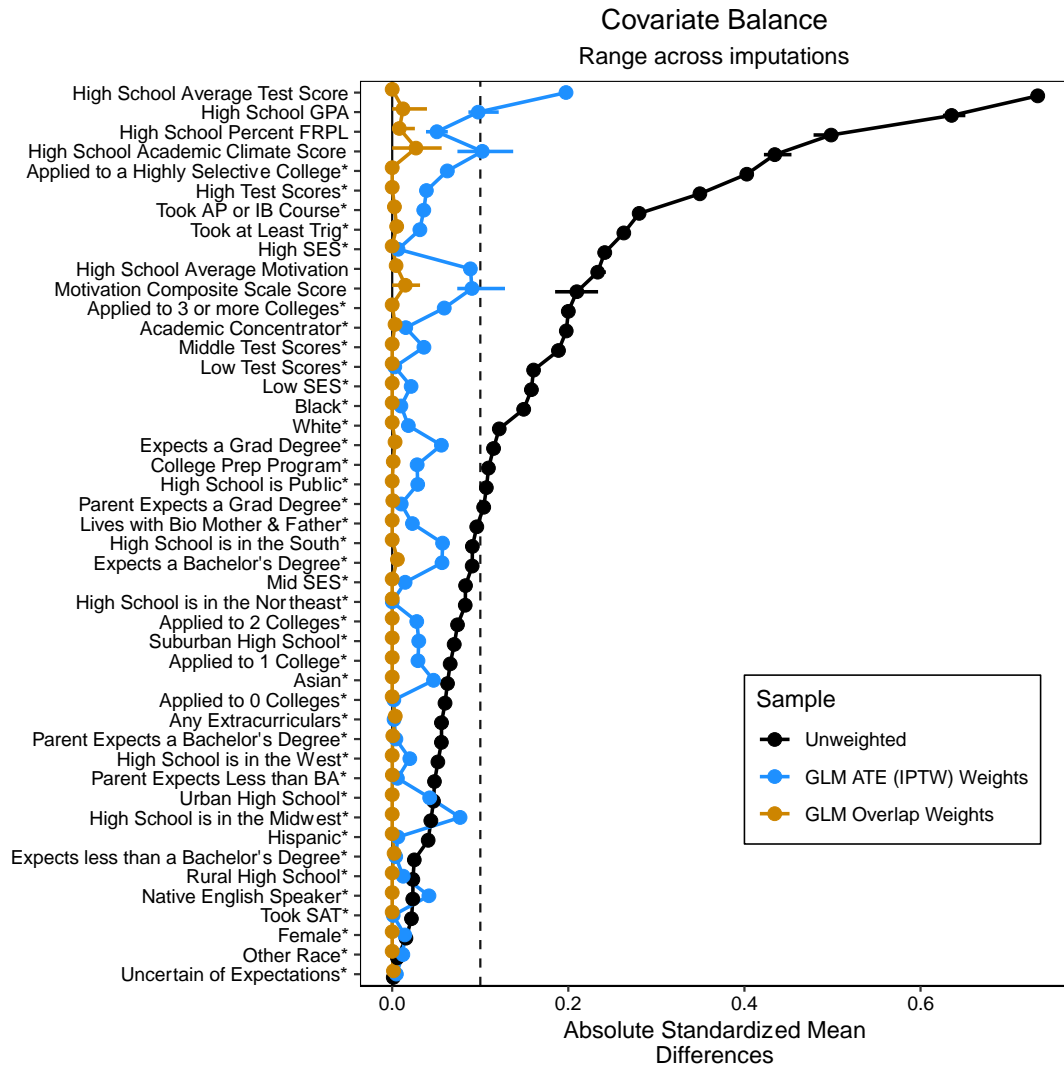
Figure 2.2: Covariate Balance for Broad-Access Four-Year Rather than Community College Enrollment, ATO and ATE Weights



Asterisks (\*) indicate raw differences for binary variables

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

Figure 2.3: Covariate Balance for Broad-Access Four-Year Rather than More Selective Four-Year College Enrollment, ATO and ATE Weights

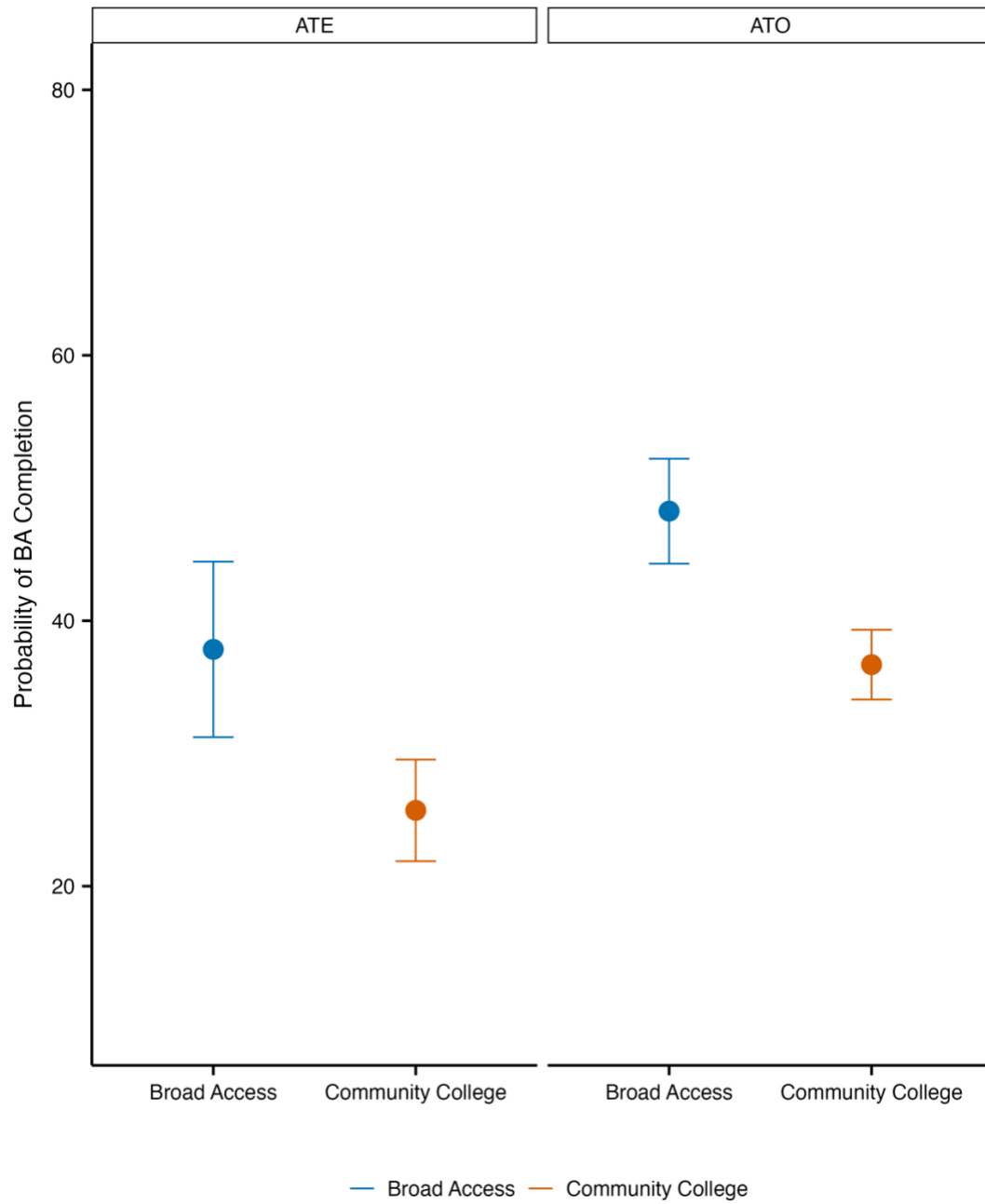


Asterisks (\*) indicate raw differences for binary variables

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)



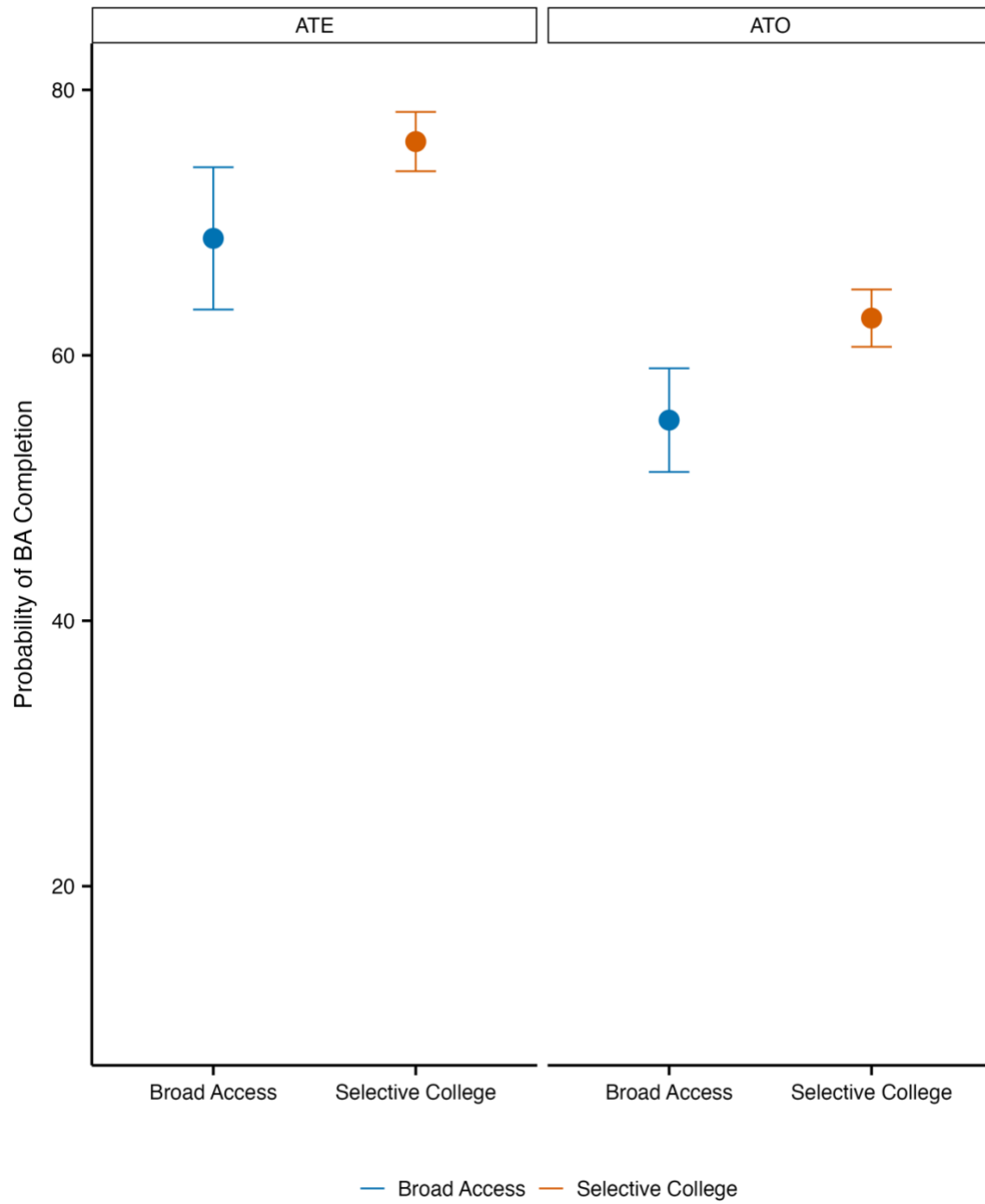
Figure 2.4: Estimated Probability of BA Completion for Broad-Access Four-Year and Community College Entrants, ATE and ATO Weights



Estimates derived from weighted logistic regressions predicting BA completion with first college sector and selectivity. Error bars indicate 95% confidence intervals.

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

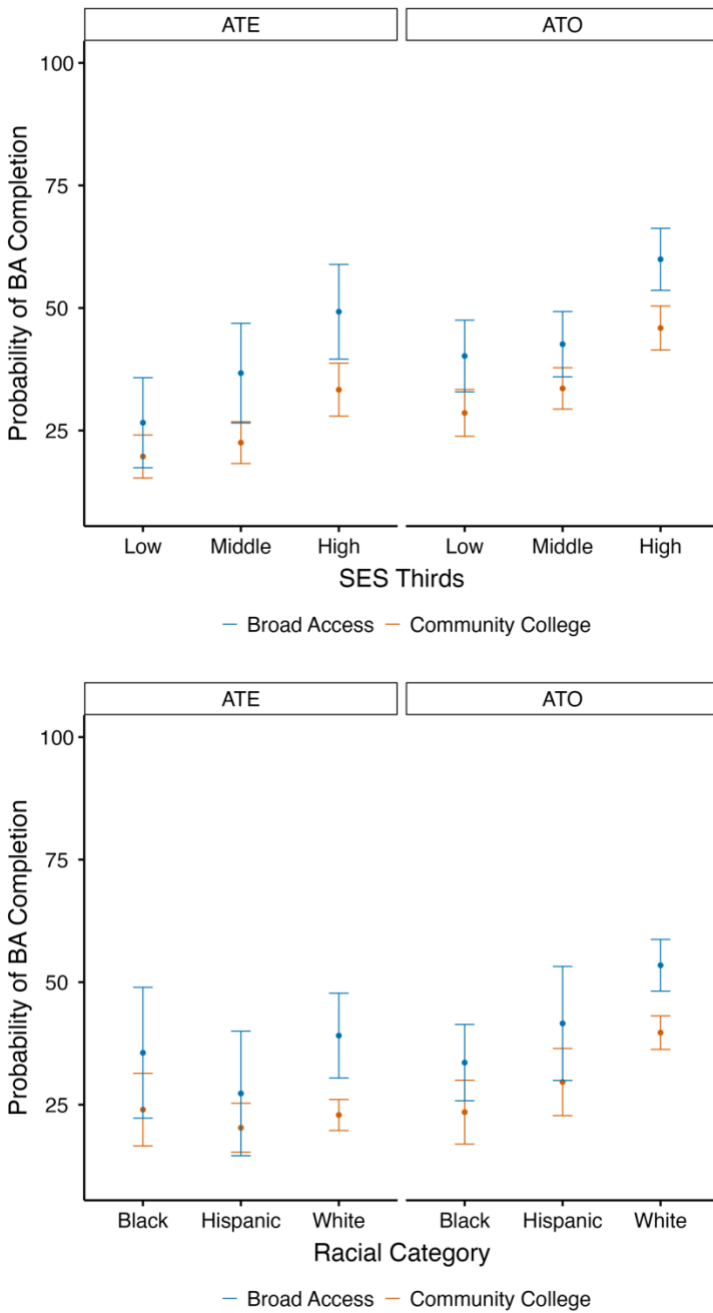
Figure 2.5: Estimated Probability of BA Completion for Broad-Access Four-Year and Selective College Entrants, ATE and ATO Weights



Estimates derived from weighted logistic regressions predicting BA completion with first college sector and selectivity. Error bars indicate 95% confidence intervals.

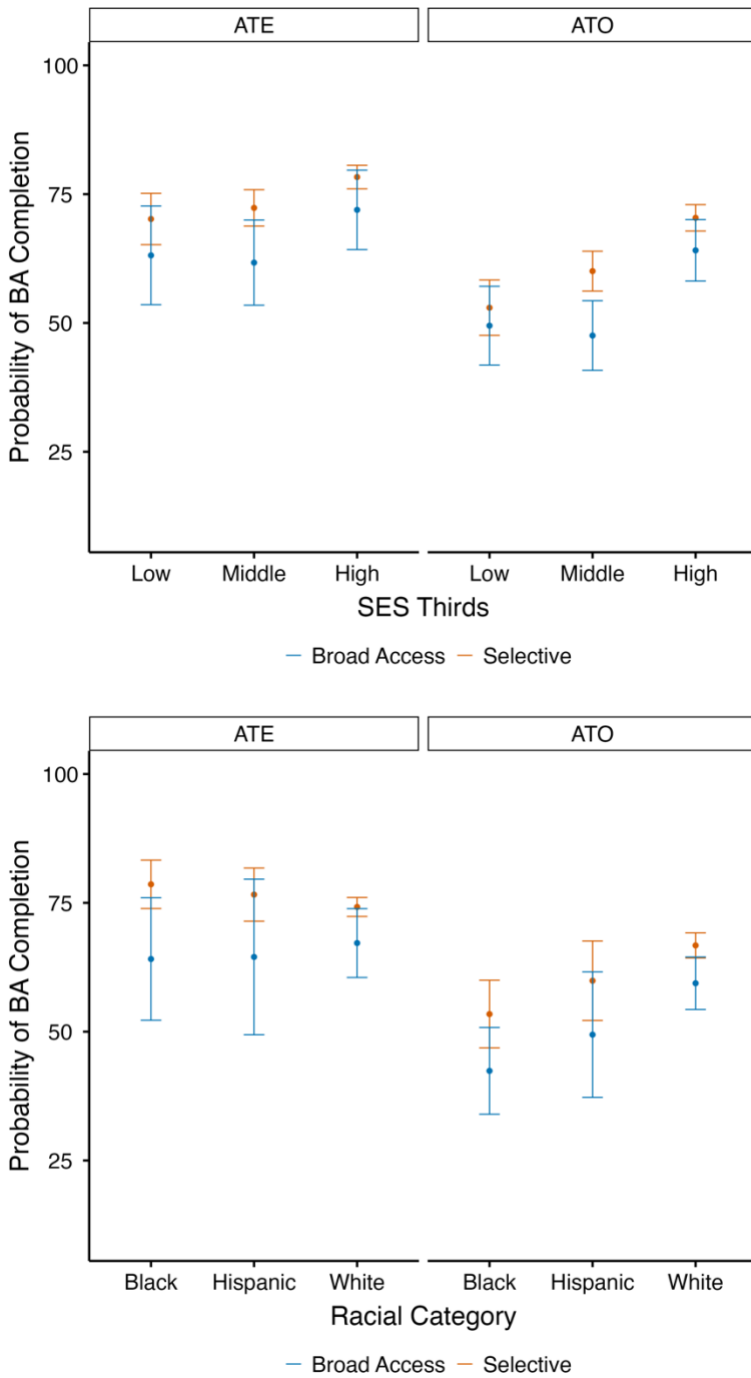
Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

Figure 2.6: Estimated Probability of BA Completion for Broad-Access Four-Year and Community College Entrants by SES, and Race/Ethnicity



Estimates derived from weighted logistic regressions predicting BA completion with first college sector and selectivity interacted with SES and racial or ethnic identity. Error bars indicate 95% confidence intervals. Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

Figure 2.7: Estimated Probability of BA Completion for Broad-Access Four-Year and More Selective College Entrants by SES, and Race/Ethnicity



Estimates derived from weighted logistic regressions predicting BA completion with first college sector and selectivity interacted with SES and racial or ethnic identity. Error bars indicate 95% confidence intervals. Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

## Chapter 3 Tables and Figures

*Table 3.1: Descriptive Statistics of Pre-College Covariates by College Enrollment Category*

	All		No College		Community College		Broad-Access Four-Year		More-Selective Four-Year	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Female	0.51	-	0.44	-	0.54	-	0.56	-	0.56	-
Black	0.14	-	0.17	-	0.14	-	0.28	-	0.10	-
Hispanic	0.11	-	0.14	-	0.15	-	0.11	-	0.06	-
White or Other	0.74	-	0.69	-	0.71	-	0.61	-	0.85	-
US Born	0.96	-	0.96	-	0.95	-	0.95	-	0.96	-
Lives with Bio Parents	0.58	-	0.45	-	0.55	-	0.61	-	0.72	-
Number of HH Members <18	1.29	1.13	1.38	1.19	1.30	1.14	1.31	1.22	1.19	1.05
One Parent is College Grad	0.33	-	0.15	-	0.27	-	0.35	-	0.56	-
Household Income	57903	50772	41035	31921	53159	41650	59222	41954	77891	64558
Income Tertile 1 <sup>a</sup>	0.20	-	0.31	-	0.21	-	0.17	-	0.10	-
Income Tertile 2	0.36	-	0.41	-	0.39	-	0.32	-	0.28	-
Income Tertile 3	0.44	-	0.27	-	0.41	-	0.50	-	0.62	-
High Expectations for Education	0.58	-	0.30	-	0.59	-	0.75	-	0.82	-
Highest Math Less than Algebra 2	0.25	-	0.48	-	0.26	-	0.11	-	0.05	-
Highest Math Algebra 2	0.32	-	0.34	-	0.42	-	0.39	-	0.21	-
Highest Math Trigonometry	0.10	-	0.06	-	0.12	-	0.12	-	0.13	-
Highest Math Pre-Calculus	0.20	-	0.08	-	0.16	-	0.26	-	0.34	-
Highest Math Calculus	0.13	-	0.03	-	0.04	-	0.12	-	0.28	-
Self-Reported High School GPA	3.00	0.74	2.59	0.73	2.89	0.66	3.16	0.61	3.44	0.55
ASVAB Percentile										
ASVAB Tertile 1 <sup>a</sup>	0.18	-	0.33	-	0.20	-	0.11	-	0.04	-
ASVAB Tertile 2	0.35	-	0.43	-	0.44	-	0.41	-	0.20	-
ASVAB Tertile 3	0.47	-	0.23	-	0.35	-	0.48	-	0.76	-
College Prep Program	0.38	-	0.17	-	0.32	-	0.42	-	0.63	-
Friends Expect College	0.60	-	0.48	-	0.60	-	0.62	-	0.73	-
Took the SAT	0.71	-	0.39	-	0.70	-	0.92	-	0.99	-
Delinquency Indicator	1.21	1.69	1.63	1.97	1.25	1.72	1.06	1.55	0.80	1.23
Public High School	0.90	-	0.92	-	0.93	-	0.88	-	0.86	-
Strongly Agree Teachers are Good	0.19	-	0.15	-	0.18	-	0.21	-	0.25	-
Strongly Agree School is Safe	0.36	-	0.27	-	0.32	-	0.40	-	0.47	-
Rural	0.28	-	0.30	-	0.25	-	0.25	-	0.28	-
South	0.34	-	0.35	-	0.36	-	0.33	-	0.30	-
Age in 1997	14.37	1.50	14.43	1.50	14.33	1.54	14.25	1.46	14.36	1.47
Bachelor's Degree Completion	0.34	-	0.03	-	0.21	-	0.52	-	0.72	-
N	5489		1996		1425		360		1708	

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Weighted by the NLSY97 Sampling Weight; Standard deviations are excluded for binary variables, as indicated by the dashed lines; <sup>a</sup> Analyses adjust for linear income and ASVAB score- the tertile proportions are included in this table to demonstrate the distribution of students with low, middle, and high income and ASVAB scores across institutions.

Table 3.2: Means of Outcome Variables by Type and Selectivity of College and Degree Attainment

	Prop. Years in Poverty, 30-39	Prop. Years With Low Wages, 30-39	Prop. w/ 10% Unemployment, 30-39	Any Non-Mortgage Debt, 35	Debt and Disadvantage, 35
<b>First College</b>					
No College	0.14	0.36	0.12	0.65	0.20
Community College	0.06	0.25	0.08	0.76	0.19
Broad-Access College	0.06	0.19	0.08	0.77	0.15
More-Selective College	0.03	0.15	0.05	0.74	0.13
<b>First College by Bachelor's Degree</b>					
No College					
BA	0.03	0.12	0.03	0.79	0.01
No BA	0.14	0.37	0.12	0.64	0.21
Community College					
BA	0.03	0.16	0.05	0.81	0.13
No BA	0.07	0.28	0.08	0.75	0.21
Broad-Access College					
BA	0.02	0.12	0.04	0.76	0.07
No BA	0.09	0.27	0.13	0.77	0.25
More-Selective College					
BA	0.02	0.12	0.04	0.73	0.10
No BA	0.06	0.22	0.06	0.77	0.20

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Weighted by the NLSY97 Sampling Weight

*Table 3.3: Estimated Total Effects of Broad-Access Four-year College Enrollment Relative to Three Post-Secondary Alternatives*

	Relative to No College			Relative to Community College		Relative to More-Selective College	
	Estimate	SE		Estimate	SE	Estimate	SE
Poverty	-0.05	0.02	**	-0.01	0.01	0.01	0.01
Low-Wage Work	-0.08	0.03	**	-0.02	0.02	0.03	0.02
Unemployment	-0.01	0.02		0.01	0.01	0.02	0.01 *
Any Debt & Disadvantage	-0.01	0.03		-0.01	0.03	0.01	0.02

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1; Estimates and standard errors are derived from regressions weighted with ATO balancing weights

*Table 3.4: Total and Path-Specific Effects of Broad-Access Four-year College Enrollment Relative to Three Post-Secondary Alternatives, ATO Weights*

	Relative to No College		Relative to Community College		Relative to More-Selective College	
	Estimate	SE	Estimate	SE	Estimate	SE
Poverty						
Total Effect	-0.05	0.02**	-0.01	0.01	0.01	0.01
Indirect Effect	-0.04	0.01***	-0.01	0.00***	0.00	0.00*
Direct Effect	-0.01	0.02	0.00	0.01	0.00	0.01
Low-Wage Work						
Total Effect	-0.08	0.03*	-0.02	0.02	0.03	0.02
Indirect Effect	-0.07	0.01*	-0.03	0.01***	0.01	0.01*
Direct Effect	-0.01	0.03*	0.01	0.02	0.02	0.02
Unemployment						
Total Effect	-0.01	0.02	0.01	0.01	0.02	0.01*
Indirect Effect	-0.03	0.01***	-0.01	0.00***	0.00	0.00*
Direct Effect	0.03	0.02	0.02	0.01	0.02	0.01+
Any Debt and Disadvantage						
Total Effect	-0.01	0.03	-0.01	0.03	0.01	0.02
Indirect Effect	-0.06	0.01***	-0.02	0.01***	0.01	0.00
Direct Effect	0.04	0.03	0.01	0.03	0.00	0.02

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1; Estimates and standard errors are derived from causal mediation regression analysis weighted with ATO balancing weights



*Table 3.5: Total and Path-Specific Effects of Broad-Access Four-year College Enrollment Relative to Three Post-Secondary Alternatives, ATE IPW Weights*

	Relative to No College		Relative to Community College		Relative to More-Selective College	
	Estimate	SE	Estimate	SE	Estimate	SE
<b>Poverty</b>						
Total Effect	-0.07	0.02**	-0.03	0.03	0.00	0.01
Indirect Effect	-0.02	0.01***	-0.02	0.01***	0.00	0.00+
Direct Effect	-0.05	0.03*	0.00	0.03	0.00	0.01
<b>Low-Wage Work</b>						
Total Effect	-0.03	0.08	0.00	0.02	0.03	0.03
Indirect Effect	-0.04	0.01***	-0.01	0.00***	0.01	0.01+
Direct Effect	0.01	0.09	0.01	0.02	0.02	0.03
<b>Unemployment</b>						
Total Effect	-0.03	0.03	0.00	0.01	0.02	0.01
Indirect Effect	-0.01	0.00***	-0.01	0.00***	0.00	0.00+
Direct Effect	-0.02	0.03	0.01	0.02	0.02	0.01
<b>Any Debt and Disadvantage</b>						
Total Effect	0.04	0.09	-0.03	0.03	0.03	0.03
Indirect Effect	-0.03	0.01***	-0.02	0.01***	0.01	0.01
Direct Effect	0.07	0.10	-0.01	0.03	0.02	0.03

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1; Estimates and standard errors are derived from causal mediation regression analysis weighted with ATO balancing weights

Figure 3.1: Causal Diagram of Path-Specific Effects of Type of College Enrollment on Economic Disadvantage

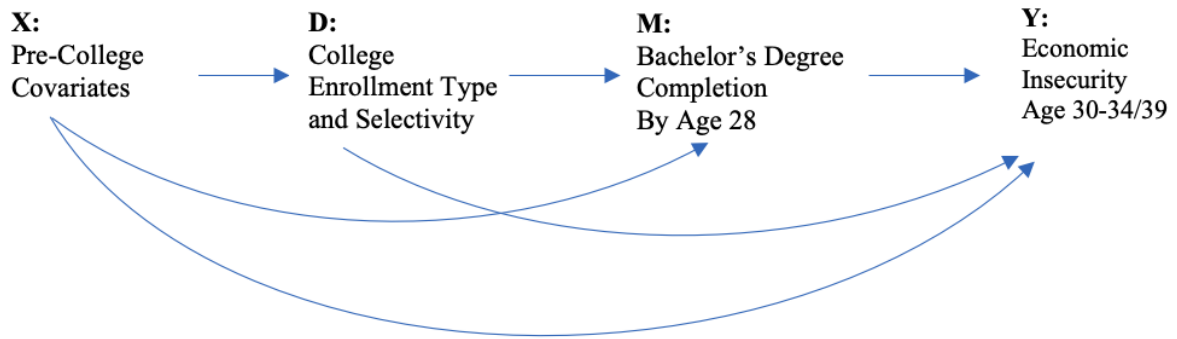
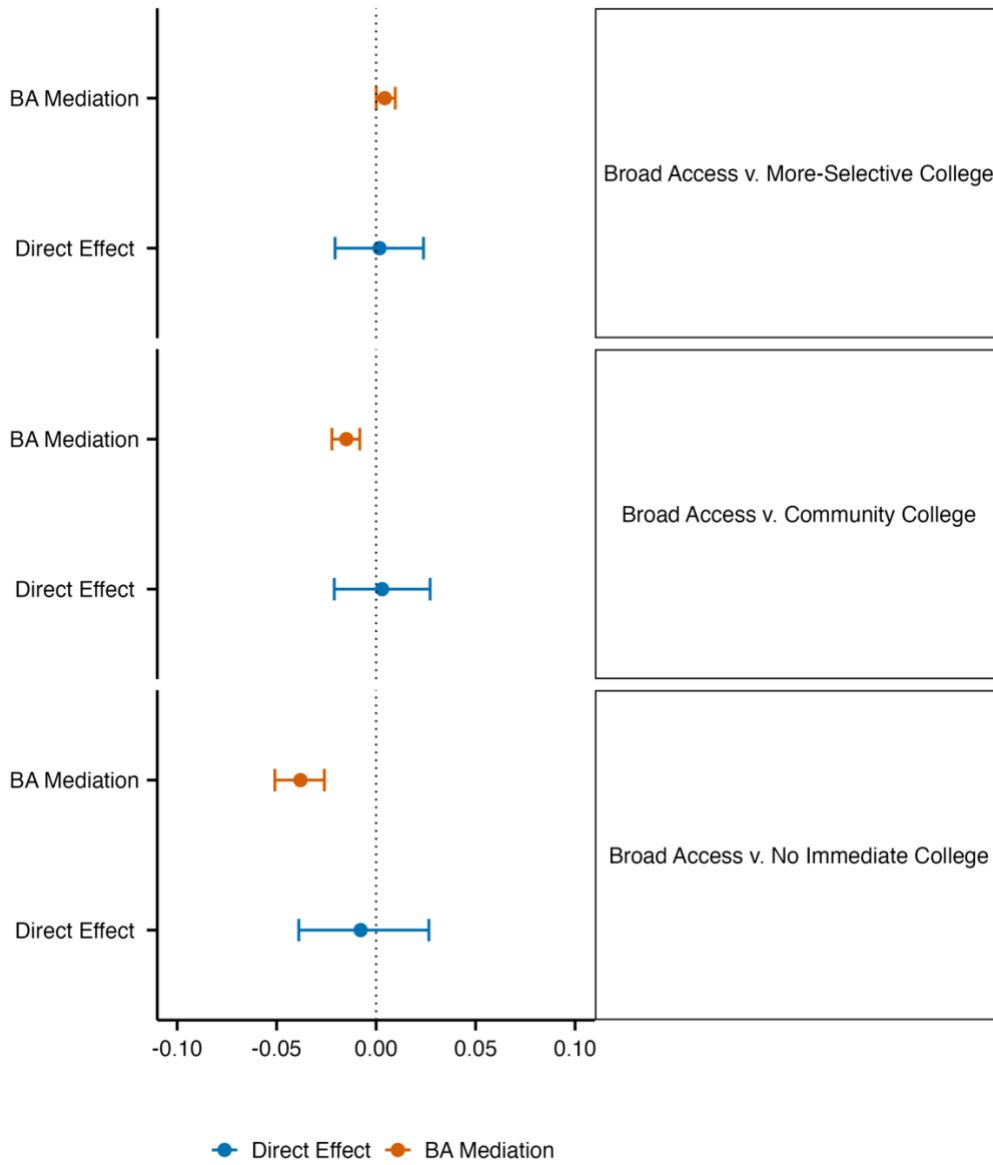
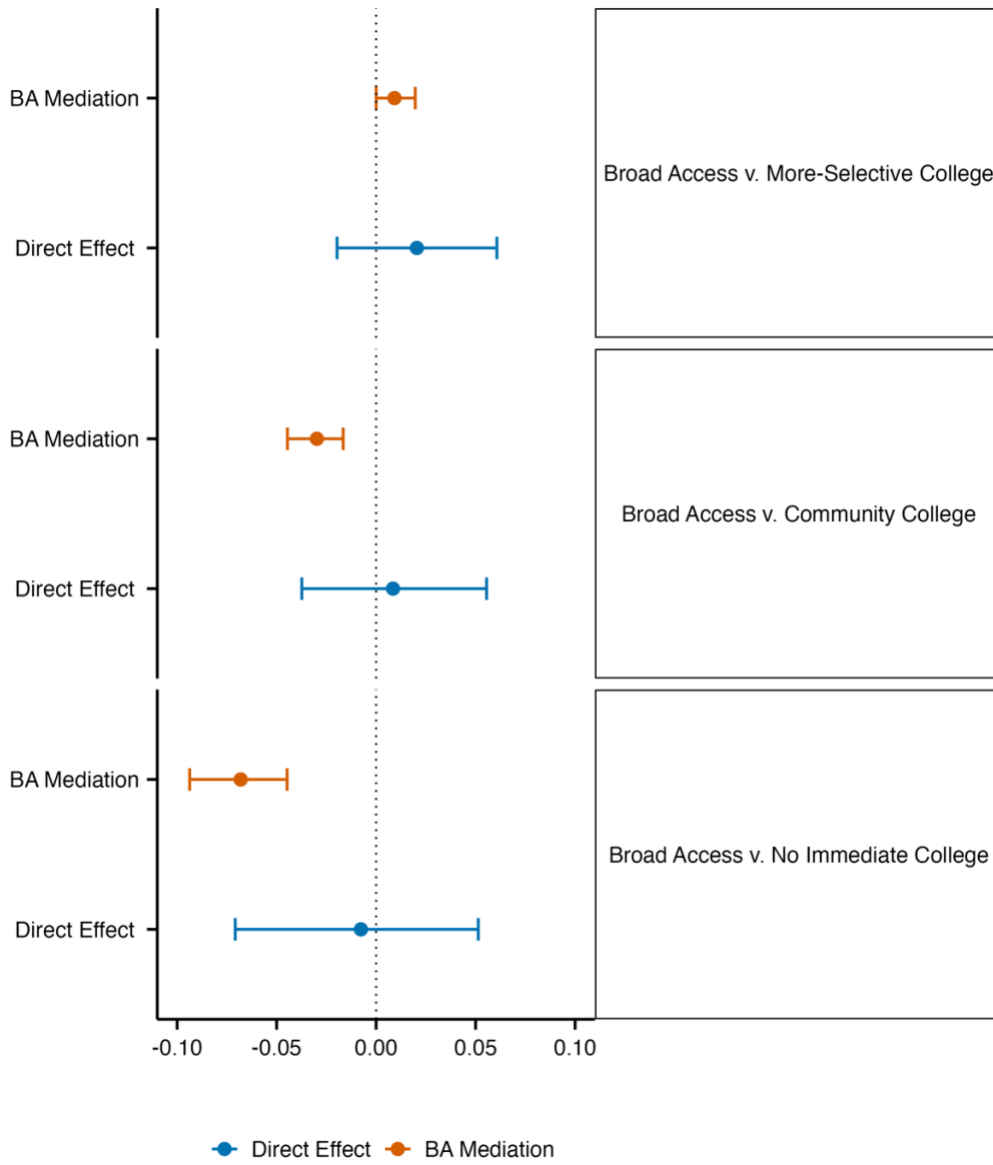


Figure 3.2: Path-Specific Effects of Broad-Access Four-Year Enrollment on Proportion of Time in Household Poverty



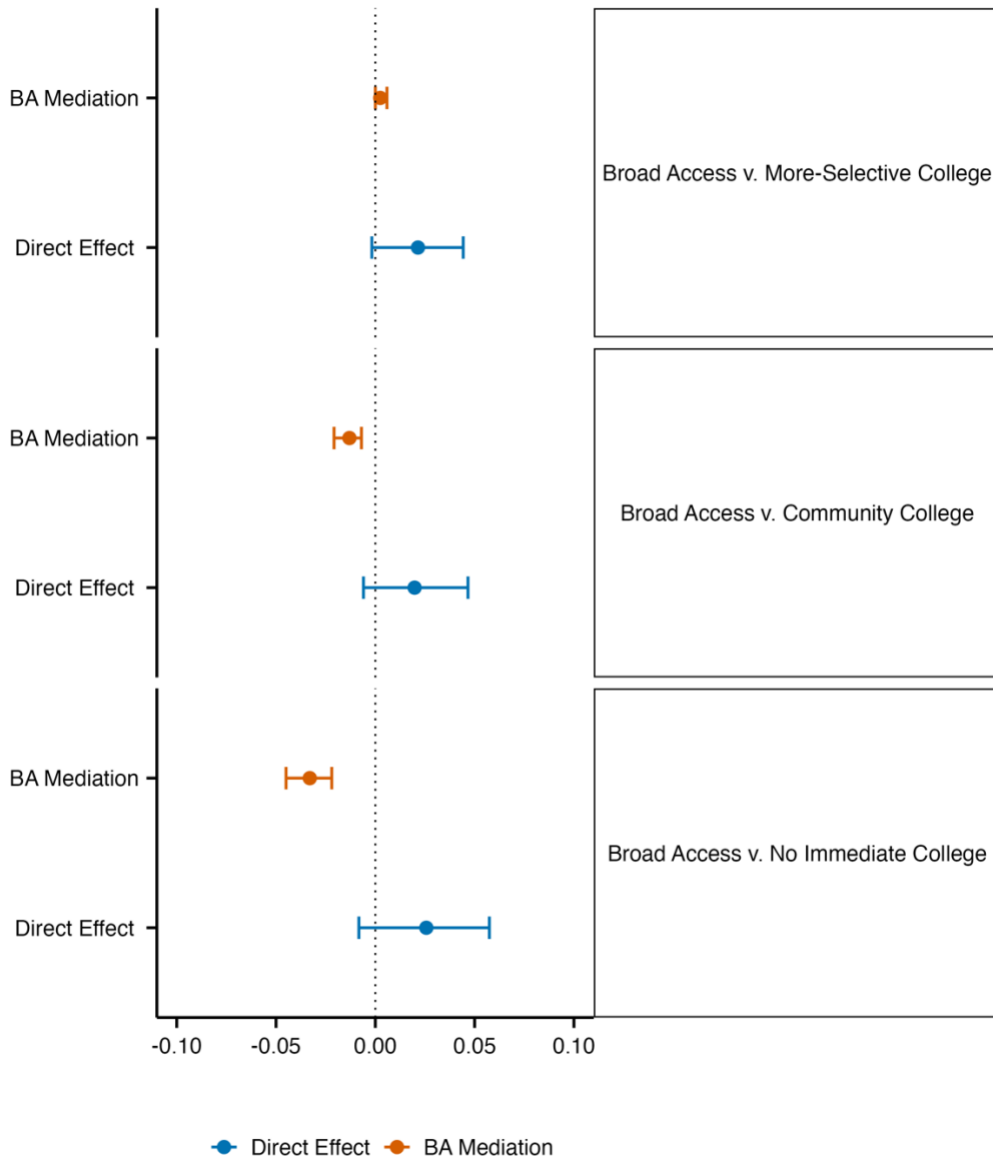
Source: National Longitudinal Survey of Youth, 1997 Cohort

Figure 3.3: Path-Specific Effects of Broad-Access Four-Year Enrollment on Proportion of Time in Low-Wage Work



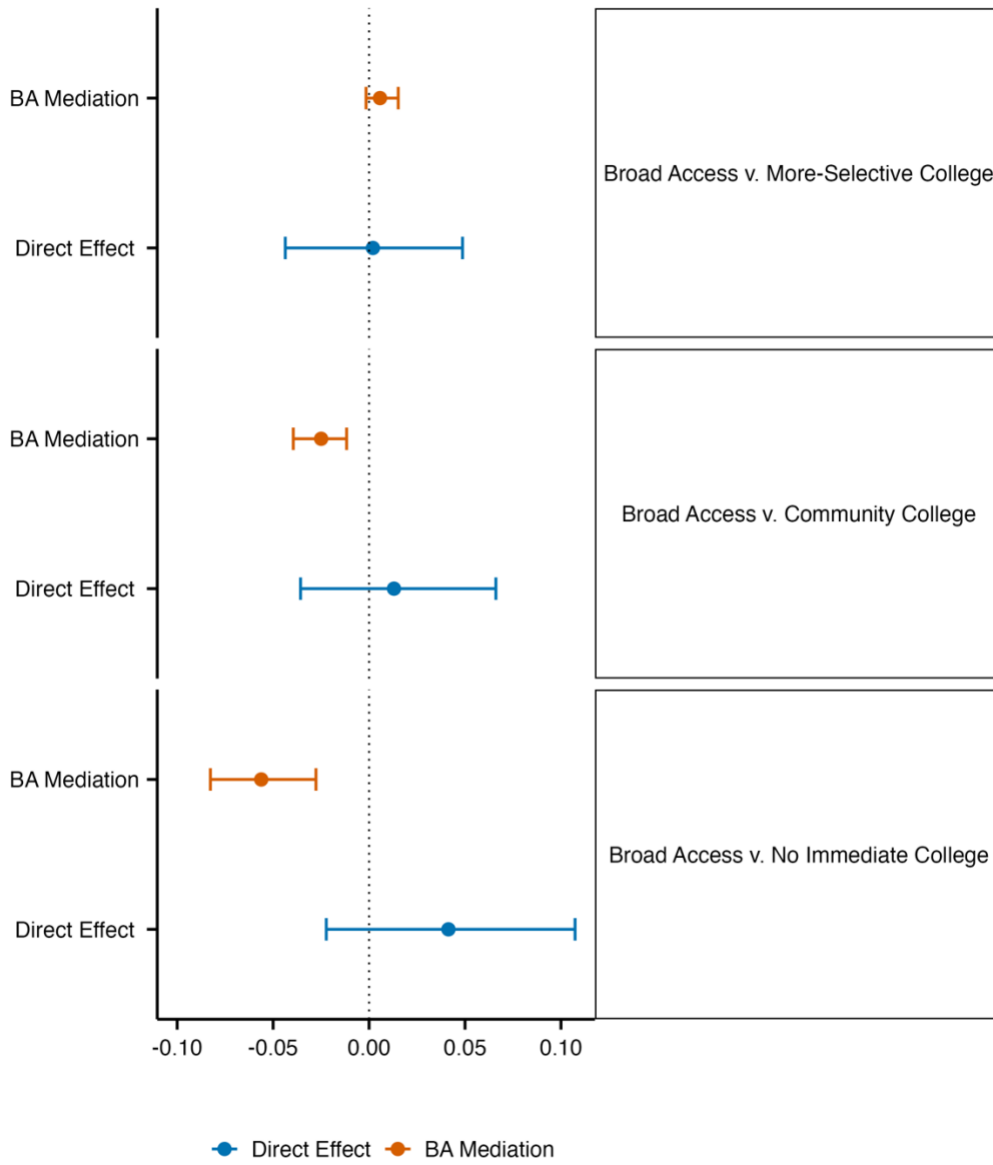
Source: National Longitudinal Survey of Youth, 1997 Cohort

Figure 3.4: Path-Specific Effect of Broad-Access Four-Year College on the Proportion of Time Unemployed



Source: National Longitudinal Survey of Youth, 1997 Cohort

Figure 3.5: Path-Specific Effect of Broad-Access Four-Year College on the Probability of Holding Any Debt while Experiencing Disadvantage



Source: National Longitudinal Survey of Youth, 1997 Cohort

## Chapter 4 Tables and Figures

*Table 4.1: Sample Description by Initial Postsecondary Enrollment or Non-Enrollment*

	All High School Graduates	No College Enrollment	Community College	Broad-Access College	Moderately Selective College	Elite College
<b>Race</b>						
Black	0.15	0.19	0.14	0.28	0.11	0.05
Hispanic	0.11	0.14	0.15	0.10	0.05	0.07
White or Other	0.74	0.67	0.71	0.62	0.84	0.87
US Born	0.96	0.96	0.95	0.96	0.97	0.96
Age in 97	14.26 (1.49)	14.27 (1.50)	14.26 (1.52)	14.17 (1.44)	14.27 (1.48)	14.28 (1.48)
<b>Region</b>						
South	0.33	0.35	0.36	0.34	0.30	0.31
North Central	0.28	0.26	0.24	0.36	0.32	0.21
Northeast	0.18	0.18	0.12	0.16	0.20	0.32
West	0.21	0.20	0.28	0.14	0.18	0.16
Rural	0.28	0.30	0.25	0.25	0.30	0.18
<b>Family Structure</b>						
Both Bio Parents	0.59	0.45	0.56	0.60	0.71	0.80
One Bio & One Other Parent	0.13	0.17	0.15	0.11	0.09	0.04
Single Bio Parent	0.25	0.32	0.26	0.24	0.18	0.15
Other Family Structure	0.04	0.06	0.03	0.05	0.02	0.01
<b>Mom Age Birth First Child</b>						
Younger than 20	0.18	0.27	0.19	0.17	0.11	0.05
20-24	0.38	0.43	0.42	0.36	0.33	0.26
25-29	0.27	0.17	0.23	0.30	0.37	0.42
30 or Older	0.11	0.05	0.10	0.11	0.15	0.24
Number of Younger Siblings	1.29 (1.11)	1.38 (1.16)	1.30 (1.12)	1.28 (1.21)	1.20 (1.03)	1.17 (1.05)
<b>Parent's Religion</b>						
Catholic	0.27	0.24	0.29	0.27	0.27	0.31
Evangelical	0.35	0.43	0.37	0.38	0.28	0.15
Other Christian	0.26	0.22	0.22	0.26	0.32	0.31
Other Religion	0.03	0.01	0.04	0.01	0.04	0.12
No Religion	0.09	0.09	0.08	0.08	0.09	0.12
Parent Graduated College	0.34	0.15	0.27	0.37	0.53	0.71
Household Income	58629 (50749)	41542 (32573)	52755 (41567)	59127 (43010)	71862 (56008)	106022 (83574)
High Educational Expectations	0.60	0.30	0.59	0.75	0.80	0.90
Senior Year GPA	3.02 (0.74)	2.59 (0.73)	2.90 (0.67)	3.17 (0.61)	3.38 (0.57)	3.71 (0.37)
ASVAB Percentile	56.45 (27.69)	39.31 (24.96)	49.84 (24.38)	57.82 (24.04)	71.76 (21.01)	86.78 (15.03)
BA Graduate	0.40	0.06	0.29	0.59	0.73	0.87
<b>Marriage Outcomes</b>						
Married Spouse with BA	0.24	0.07	0.17	0.32	0.39	0.53
Married Spouse with no BA	0.43	0.53	0.50	0.31	0.34	0.15
Never Married	0.34	0.40	0.33	0.37	0.27	0.32
Number of Observations	4847	1661	1284	334	1300	268

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Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Weighted by the NLSY97 sampling weight; Standard deviations of continuous variables are presented in parentheses



Table 4.2: Hazard Ratios from Cox Proportional Hazard Model Predicting Time to Marriage:  
Men

	Model 1: No Covariates		Model 2: Pre- College Covariates		Model 3: BA Completion	
<b>0-4 Years after High School Graduation (~ Ages 18-22)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	0.04	1.00**	0.03	1.01***	0.04	1.01**
Moderately Selective College	0.30	0.19***	0.24	0.20***	0.27	0.23***
Broad-Access College	0.58	0.27*	0.56	0.27*	0.60	0.28+
Community College	0.58	0.15***	0.54	0.15***	0.56	0.15***
No College Enrollment						
<b>5-7 Years after High School Graduation (~ Ages 22-25)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	0.80	0.24	0.62	0.26+	0.60	0.27+
Moderately Selective College	1.04	0.13	0.84	0.14	0.81	0.16
Broad-Access College	0.80	0.24	0.78	0.24	0.76	0.25
Community College	1.11	0.12	1.03	0.12	1.03	0.13
No College Enrollment						
<b>7-12 Years after High School Graduation (~ Ages 25-30)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	1.42	0.18*	1.07	0.20	0.94	0.21
Moderately Selective College	1.62	0.11***	1.31	0.12*	1.16	0.14
Broad-Access College	1.30	0.18	1.27	0.18	1.18	0.19
Community College	1.17	0.11	1.09	0.11	1.06	0.12
No College Enrollment						
<b>12+ Years (~ Ages 30+)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	2.84	0.19***	2.11	0.20***	1.43	0.23
Moderately Selective College	2.63	0.13***	2.11	0.14***	1.50	0.17*
Broad-Access College	1.22	0.24	1.19	0.25	0.95	0.26
Community College	1.38	0.14*	1.28	0.14+	1.17	0.15
No College Enrollment						

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Exponentiated coefficients; \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1; Estimates and standard errors are derived from Cox Proportional Hazard Models

Table 4.3: Hazard Ratios from Cox Proportional Hazard Model Predicting Time to Marriage:  
Women

	Model 1: No Covariates		Model 2: Pre- College Covariates		Model 3: BA Completion	
<b>0-4 Years after High School Graduation (~ Ages 18-22)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	0.10	0.45***	0.08	0.46***	0.12	0.47***
Moderately Selective College	0.29	0.14***	0.22	0.14***	0.31	0.16***
Broad-Access College	0.43	0.21***	0.41	0.22***	0.54	0.22**
Community College	0.68	0.11***	0.59	0.11***	0.65	0.11***
No College Enrollment						
<b>5-7 Years after High School Graduation (~ Ages 22-25)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	0.89	0.22	0.68	0.23	0.91	0.25
Moderately Selective College	1.37	0.12*	1.03	0.13	1.31	0.15+
Broad-Access College	1.09	0.20	1.05	0.20	1.29	0.21
Community College	1.10	0.13	0.95	0.14	1.03	0.14
No College Enrollment						
<b>7-12 Years after High School Graduation (~ Ages 25-30)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	1.46	0.18*	1.13	0.19	0.97	0.21
Moderately Selective College	1.78	0.12***	1.39	0.12**	1.23	0.14
Broad-Access College	1.79	0.17***	1.86	0.17***	1.68	0.18**
Community College	1.49	0.12***	1.35	0.12*	1.29	0.13*
No College Enrollment						
<b>12+ Years (~ Ages 30+)</b>						
	HR	SE	HR	SE	HR	SE
Elite College	1.75	0.22*	1.36	0.23	0.97	0.25
Moderately Selective College	1.99	0.14***	1.61	0.15**	1.20	0.18
Broad-Access College	1.15	0.25	1.22	0.25	0.97	0.26
Community College	1.33	0.16+	1.27	0.16	1.15	0.16
No College Enrollment						

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Exponentiated coefficients; \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1; Estimates and standard errors are derived from Cox Proportional Hazard Models

*Table 4.4: Assortative Mating Outcomes by Gender and Post-Secondary Enrollment*

	Spouse: BA Plus	Spouse: Less than a BA	No Spouse
<b>Men</b>			
Elite College	0.54	0.14	0.32
Moderately Selective College	0.45	0.25	0.30
Broad-Access College	0.30	0.24	0.46
Community College	0.18	0.40	0.42
No College Enrollment	0.08	0.47	0.45
<b>Women</b>			
Elite College	0.47	0.15	0.38
Moderately Selective College	0.29	0.41	0.29
Broad-Access College	0.26	0.37	0.37
Community College	0.11	0.55	0.34
No College Enrollment	0.04	0.54	0.41

Source: National Longitudinal Survey of Youth, 1997 Cohort

Predicted probabilities are derived from unadjusted multinomial logistic regressions of initial post-secondary enrollment on assortative mating

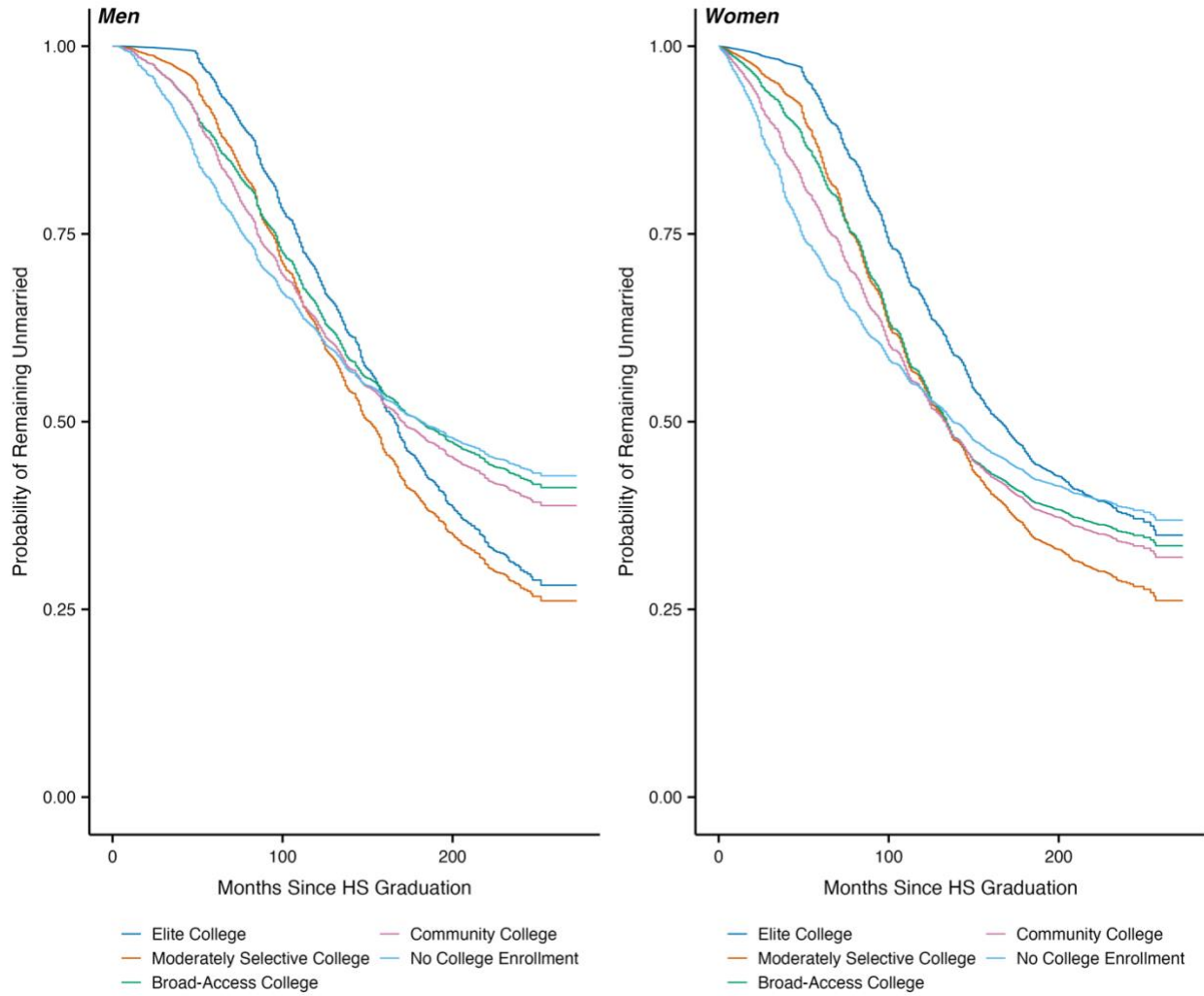
*Table 4.5: Multinomial Logistic Regression Results Predicting Assortative Mating Outcomes by Initial Postsecondary Enrollment and Gender*

Men	Model 1: No Covariates		Model 2: Pre-College Covariates		Model 3: BA Completion	
	OR	SE	OR	SE	OR	SE
<b>Spouse with Less than a Bachelor's Degree Rather than a Bachelor's Degree</b>						
Elite College						
Moderately Selective College	2.10	0.29***	1.42	0.30	1.45	0.30
Broad-Access College	2.99	0.35**	1.54	0.38	1.45	0.38
Community College	8.50	0.29**	3.54	0.33***	2.79	0.33**
No College Enrollment	21.61	0.29***	6.98	0.35***	4.85	0.36***
<b>Never Married Rather than a Spouse with a Bachelor's Degree</b>						
Elite College						
Moderately Selective College	1.15	0.22	0.76	0.24	0.76	0.25
Broad-Access College	2.61	0.28***	1.04	0.32	0.94	0.32
Community College	4.03	0.23***	1.49	0.28**	1.10	0.29
No College Enrollment	9.29	0.24***	2.73	0.30***	1.75	0.31+
<b>Women</b>						
<b>Spouse with Less than a Bachelor's Degree Rather than a Bachelor's Degree</b>						
	OR	SE	OR	SE	OR	SE
Elite College						
Moderately Selective College	4.34	0.27***	3.11	0.28***	2.99	0.28***
Broad-Access College	4.41	0.31***	2.37	0.34*	2.22	0.34**
Community College	15.65	0.28***	7.36	0.32***	5.33	0.32***
No College Enrollment	39.91	0.32***	17.21	0.37***	9.89	0.39***
<b>Never Married Rather than a Spouse with a Bachelor's Degree</b>						
	OR	SE	OR	SE	OR	SE
Elite College						
Moderately Selective College	1.25	0.21	0.85	0.24	0.82	0.24
Broad-Access College	1.81	0.27*	0.63	0.32	0.61	0.32
Community College	3.99	0.23***	1.53	0.29	1.20	0.30
No College Enrollment	12.28	0.27***	3.40	0.35***	2.19	0.37*

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Exponentiated coefficients; \*\*\*p<0.001, \*\*p<0.01, \*p<0.05, + <0.1; Estimates and standard errors are derived from Multinomial Logistic Regression Models

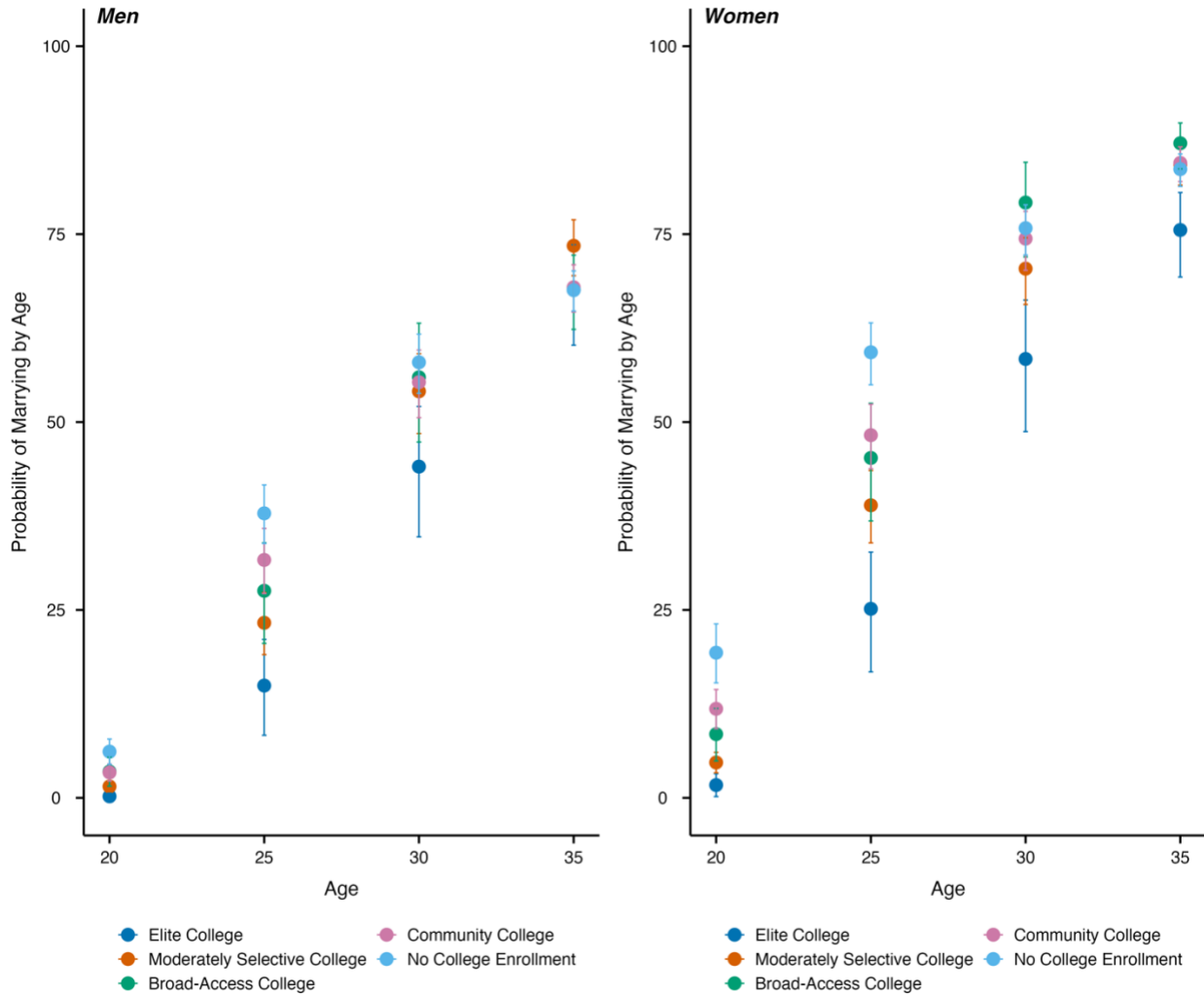
Figure 4.1: Time to Marriage by Initial Post-Secondary Enrollment or Non-Enrollment



Source: National Longitudinal Survey of Youth, 1997 Cohort

Note: Estimates derived from an unadjusted Cox proportional hazard model that allows for a varying relationship between time since high school graduation and post-secondary enrollment, sector, and selectivity.

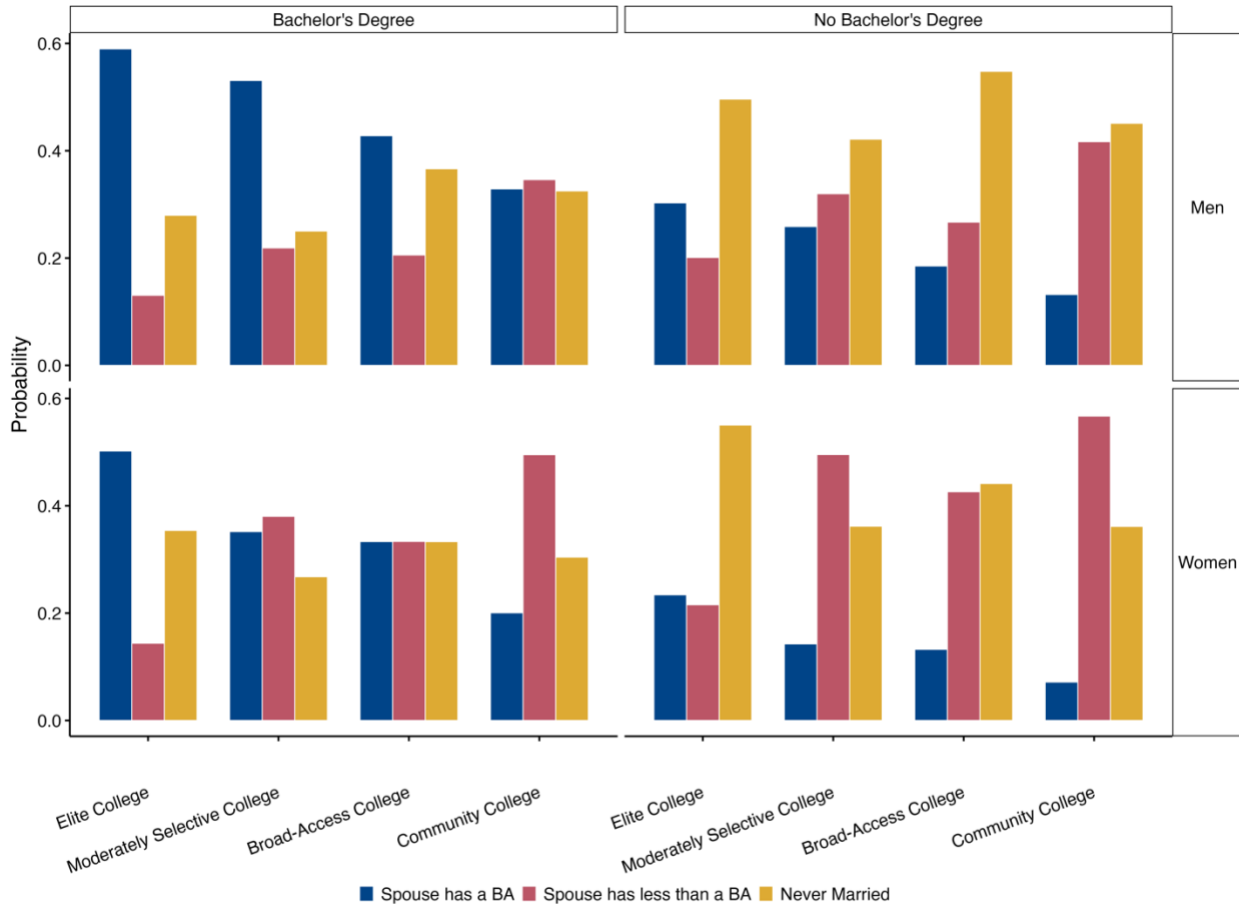
Figure 4.2: Predicted Probability of Being Married at Different Ages by Initial Post-Secondary Enrollment or Non-Enrollment



Source: National Longitudinal Survey of Youth, 1997 Cohort

Note: Estimates derived from a Cox proportional hazard model that allows for a varying relationship between time since high school graduation and post-secondary enrollment, sector, and selectivity and controls for sociodemographic factors, educational expectations, and pre-college achievement.

Figure 4.3: Assortative Mating Outcomes by Gender, Post-Secondary Enrollment, and Bachelor's Degree Completion Status



Source: National Longitudinal Survey of Youth, 1997 Cohort

Note: Estimates derived from a multinomial logistic regression that predicts spouses' education with respondents' initial post-secondary enrollment and bachelor's degree status.

## Appendix A: The Barron's Competitiveness Index

This appendix begins by describing the criteria by which Barron's identifies its College Competitiveness Index Ratings. It then provides descriptive statistics of key college characteristics from the Integrated Post-Secondary Data System across college categories. Lastly, it provides some examples of broad-access four-year colleges in select states (Barron's 2004).

### Criteria for the Barron's Competitiveness Index

Barron's uses the following criteria to identify college competitiveness (Barron's 2004):

- Median entrance exam scores for the 2003-04 first-year class
- Percentages of first-years:
  - o Scoring 500 or higher on both the verbal and math sections of the SAT
  - o Scoring 600 or higher on both the verbal and math sections of the SAT
  - o Scoring 21 or higher on the ACT
  - o Scoring 27 or higher on the ACT
  - o Ranked in the upper fifth of their HS graduating classes
  - o Ranked in the upper two-fifths of their HS graduating classes

*Table A.1: Table of Criteria Used for Barron's Competitiveness*

	Most Competitive	Highly Competitive	Very Competitive	Competitive	Less Competitive	Non- Competitive
HS Rank	Top 20%	Top 35%	Top 50%	Top 65%	Top 65%	Any
GPA	>3.8	>3.5	>3.0	>2.8	<2.5	N/A
SAT Scores	655-800	620-654	573-619	500-572	500 or lower	N/A
ACT Scores	29 or higher	27-28	24-26	21-24	21 or below	N/A
Acceptance Rate	< 30%	30-50%	50-75%	75-85%	85%+	98%+

Source: Barron's Profiles of American Colleges 2004

### Institutional Characteristics

Table A.2 describes the institutional characteristics of institutions, drawn from the Integrated Postsecondary Data System 2005 data files, by sector and Barron's competitiveness.



The most selective four-year colleges are most likely to be private, serve traditional-aged students, and have the highest admissions test scores. They also have fewer students per full-time faculty, are more likely to require first-year students to live on campus, and charge the highest tuition. Their higher resources are reflected in higher faculty salaries and increased spending on academics, student services, and instruction (see IPEDS 2022 for details on these measures). Broad-access four-year colleges, on the other hand, are least likely to be private, are most likely to be designated as HBCU colleges, and serve the highest proportion of non-traditional aged students. They have larger student-faculty ratios and fewer than 25% require first-year students to live on campus. They charge the lowest average tuition, but 50-60% of students take out loans and in similar amounts to students in selective institutions. They have the lowest expenditures on faculty salary, academic support, student services, and instructional support. Moderately selective four-year colleges fall in the middle in their financial support, tuition, faculty salary, and requirements for first-year students to live on campus.

*Table A.2: Means of Institutional Characteristics and Resources by Sector and Competitiveness*

	Elite 4-Year		Moderately Selective 4-Year		Broad-Access 4-Year		
	Most Competitive	Highly Competitive	Very Competitive	Competitive	Less Competitive	Non-Competitive	Community College
Private	0.86	0.73	0.72	0.61	0.57	0.43	0.00
HBCU Designation	0.00	0.00	0.00	0.04	0.17	0.16	0.01
Total Undergrad Enrollment	6488	7630	6892	5805	4617	5412	8567
Percent Undergrads < 25	0.96	0.95	0.88	0.76	0.69	0.66	0.57
Require the SAT	0.96	0.94	0.97	0.96	0.83	0.47	0.04
SAT Verbal 75th Percentile	731	673	627	571	530	550	520
SAT Math 75th Percentile	739	677	629	571	532	549	513
Student-Full Time Faculty	10.70	17.90	19.30	26.80	30.30	37.40	85.40
Percent Taking Out Loans	35	47	59	63	62	53	17
Average Loan Amount	4018	4369	4729	4364	4278	3776	2724
First-Years Live on Campus	0.67	0.59	0.43	0.31	0.25	0.21	0.01
Tuition	25472	20881	16118	12040	10257	7089	2008
Faculty Salary	91152	72852	62781	54165	51189	50431	50087
Academic Support <sup>a</sup>	7212	3293	2061	1476	1415	1217	1010

Student Services Support <sup>a</sup>	5282	3727	2527	2104	2040	1478	1038
Instruction Spending <sup>a</sup>	26542	12508	8001	6134	5429	5149	5234
Avg School Support, Std.	0.46	0.08	-0.05	-0.11	-0.12	-0.14	-0.15
N	70	100	280	630	210	100	1210

Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2004; Barron's Competitiveness Index 2004; Numbers are rounded to the nearest 10 to comply with NCES restricted-used data requirements. <sup>a</sup> Financial Support Per Full-Time Student

## Examples of Broad-Access Four-Year Colleges

Below, I provide examples of broad-access four-year colleges in the five most populous states:

California, Florida, New York, Pennsylvania, and Texas (drawn from the 2004 Barron's Profiles of American Colleges).

### *California*

California Lutheran University  
California State University-Bakersfield  
California State University-San Bernardino  
California State University-Chico  
California State University-Dominguez Hills  
California State University-Fresno  
California State University-East Bay  
California State University-Northridge  
Cogswell Polytechnical College  
Golden Gate University-San Francisco  
Holy Names University  
Humphreys College-Stockton  
La Sierra University  
Menlo College  
New College of California  
Notre Dame de Namur University  
Hope International University  
Woodbury University

### *Florida*

Barry University  
Bethune Cookman College  
Clearwater Christian College

Edward Waters College  
Florida Memorial University  
Saint Thomas University  
Southeastern University  
Warner Southern College

*New York*

CUNY College of Staten Island  
CUNY Lehman College  
CUNY Medgar Evers College  
CUNY New York City College of Technology  
CUNY York College  
Dominican College of Blauvelt  
Dowling College  
Hilbert College  
Mercy College-Main Campus  
Saint Bonaventure University  
St Francis College  
Saint Thomas Aquinas College  
SUNY Maritime College

*Pennsylvania*

Bryn Athyn College of the New Church  
Alvernia College  
Chestnut Hill College  
Clarion University of Pennsylvania  
Edinboro University of Pennsylvania  
Holy Family University  
Keystone College  
Lock Haven University of Pennsylvania  
Mount Aloysius College  
Neumann College  
Peirce College  
University of Pittsburgh-Johnstown  
Saint Francis University  
Slippery Rock University of Pennsylvania

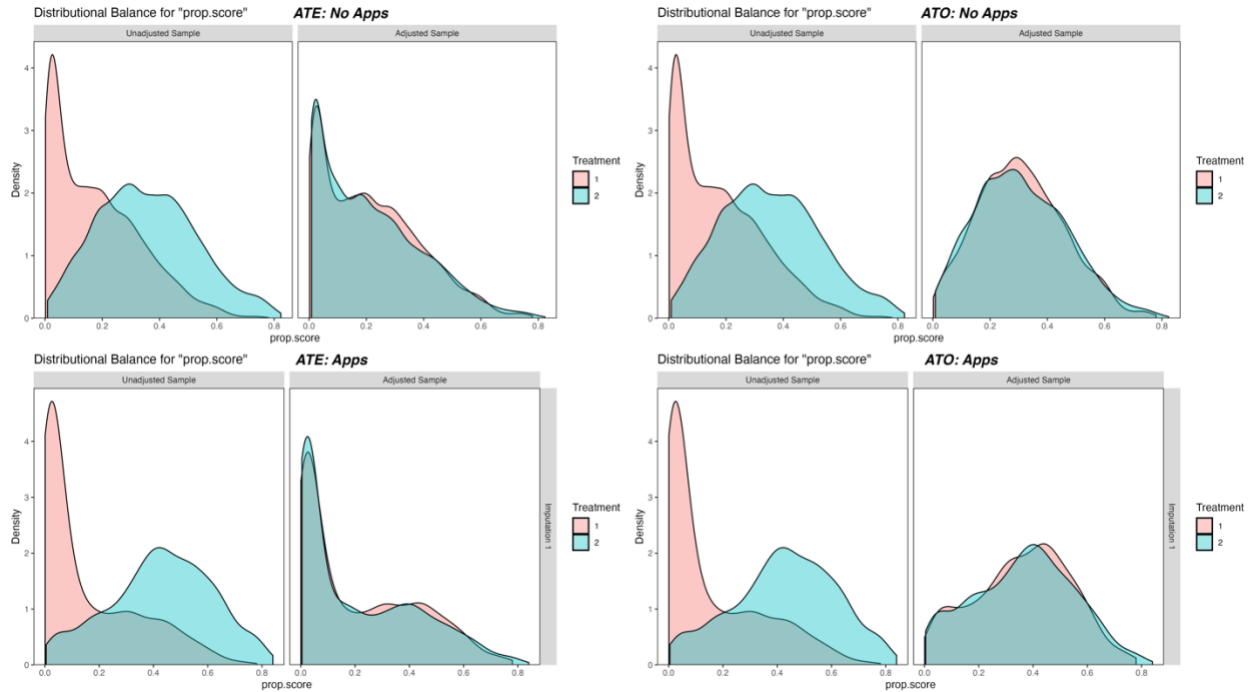
*Texas*

Tennessee State University

Angelo State University  
Concordia University at Austin  
University of Houston-Downtown  
Huston-Tillotson University  
University of the Incarnate Word  
Jarvis Christian College  
Lamar University  
McMurry University  
Midwestern State University  
Northwood University  
The University of Texas-Pan American  
Paul Quinn College  
Prairie View A & M University  
Sul Ross State University  
Texas A & M University-Kingsville  
The University of Texas at Arlington  
The University of Texas at El Paso  
The University of Texas at San Antonio  
Texas Southern University  
Texas Woman's University  
Wayland Baptist University  
Wiley College

## Appendix B: Distribution of Propensity Scores Before and After Applying IPW and Overlap Weights, Chapter 2

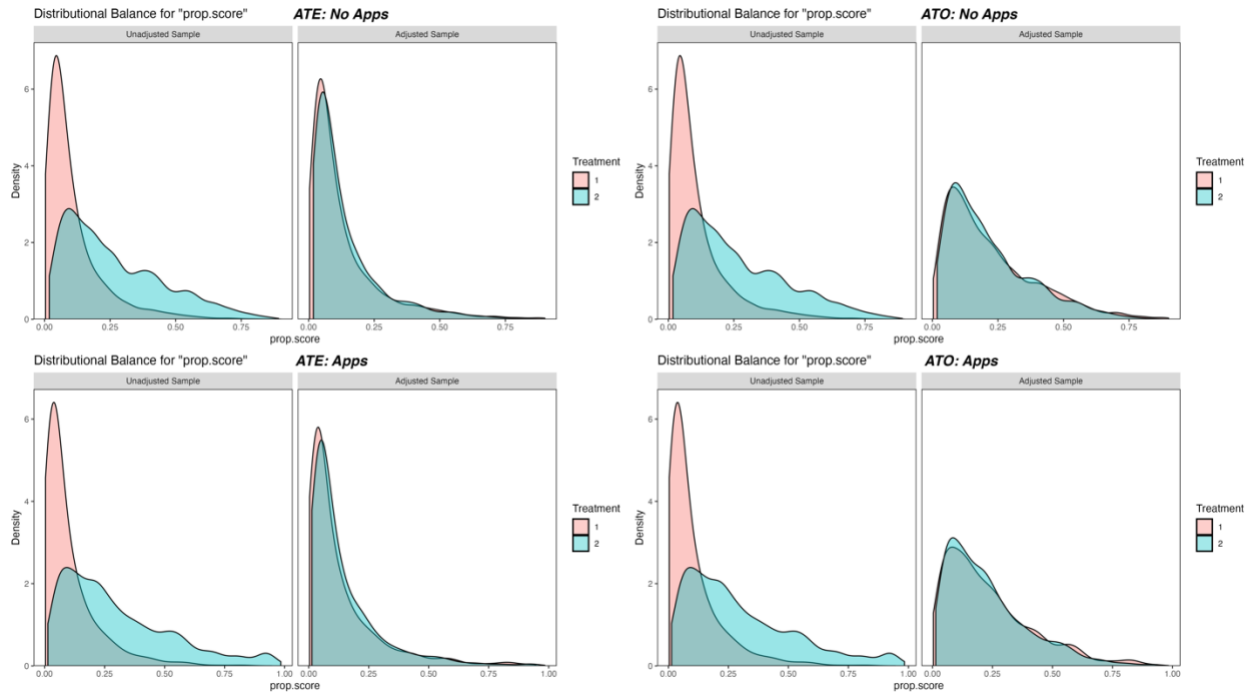
*Appendix Table B.1: Unadjusted and Adjusted Propensity Score Distributions for Broad-Access Rather than Community College Enrollment, Chapter 2*



Note: ATE (IPW) weights are in the left column, and ATO (overlap) weights are in the right column. The top row presents weights that do not adjust for application data, the bottom row presents weights that do adjust for application data.

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

*Appendix Table B.2: Unadjusted and Adjusted Propensity Score Distributions for Broad-Access Rather than More-Selective College Enrollment, Chapter 2*

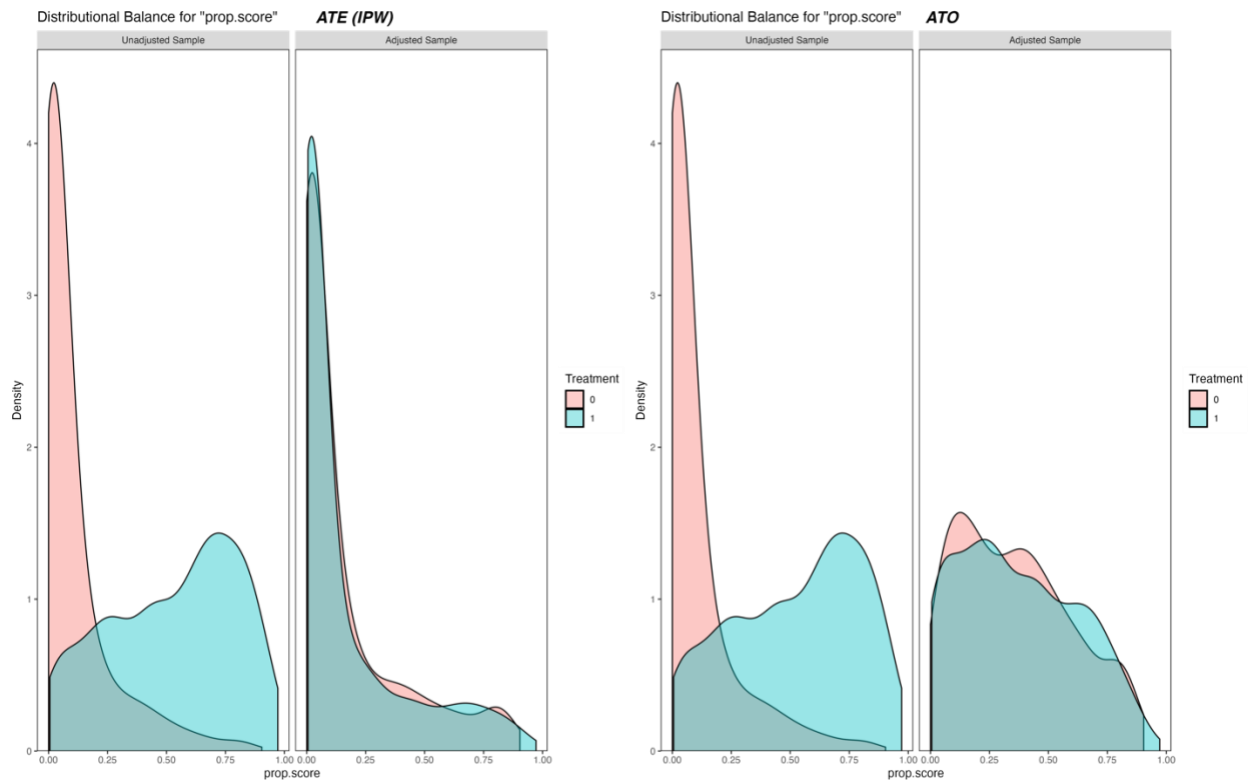


Note: ATE (IPW) weights are in the left column, and ATO (overlap) weights are in the right column. The top row presents weights that do not adjust for application data, the bottom row presents weights that do adjust for application data.

Source: U.S. Department of Education, National Center for Education Statistics, Educational Longitudinal Study (2002/2012)

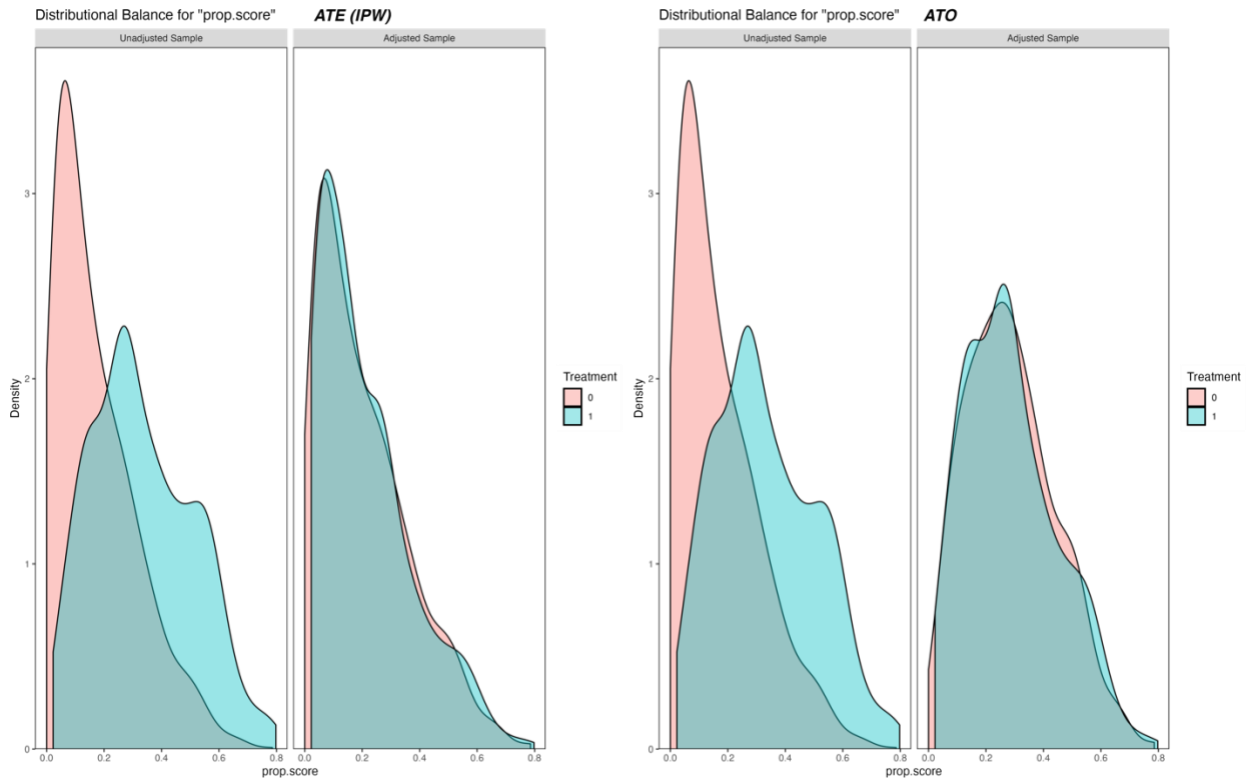
## Appendix C: Overlap of the Propensity Score Distributions Before and After Weighting Adjustment, ATE and ATO Weights, Chapter 3

Figure C.1: Unadjusted and Adjusted Propensity Score Distributions for the No College Enrollment Comparison: IPW and ATO Balancing Weights, Chapter 3



Note: ATE (IPW) weights are in the left column, and ATO (overlap) weights are in the right column.  
Source: National Longitudinal Survey of Youth, 1997 Cohort

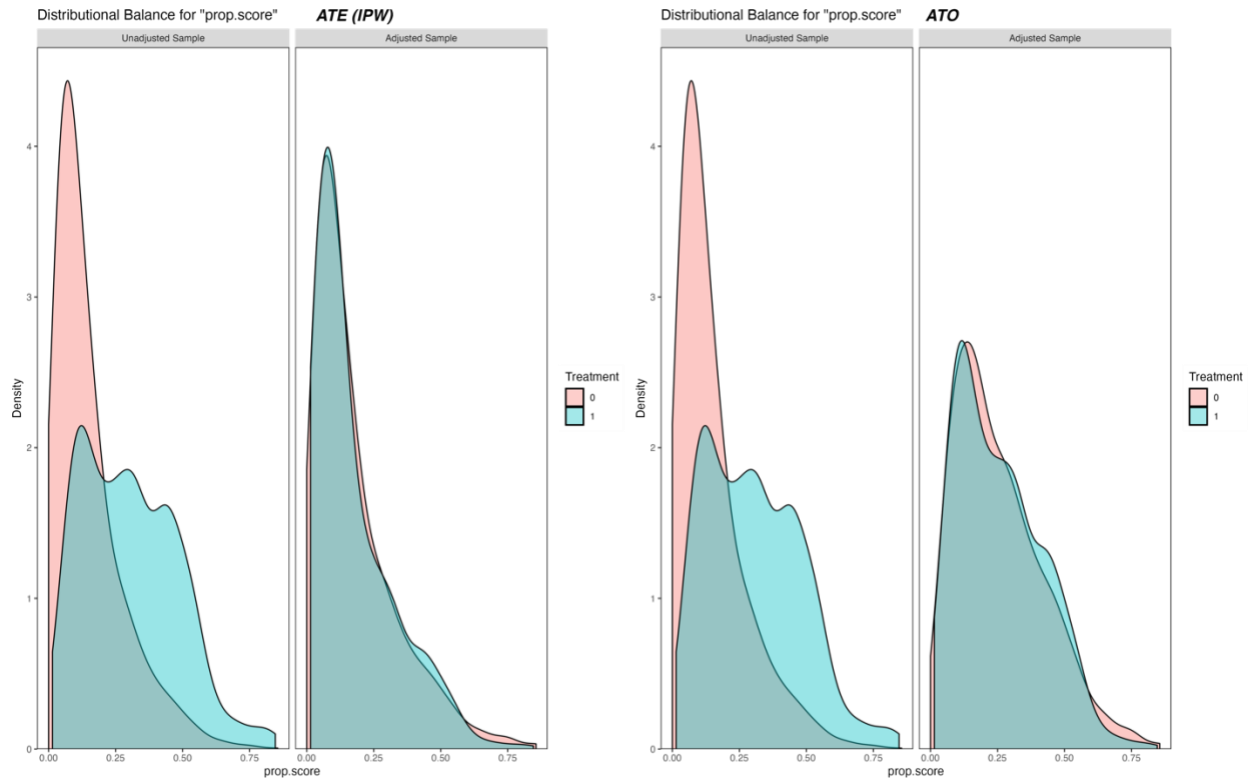
Figure C.2: Unadjusted and Adjusted Propensity Scores for the Community College Enrollment Comparison: IPW and ATO Balancing Weights, Chapter 3



Note: ATE (IPW) weights are in the left column, and ATO (overlap) weights are in the right column.  
 Source: National Longitudinal Survey of Youth, 1997 Cohort



Figure C.3: Unadjusted and Adjusted Propensity Scores for the More Selective College Enrollment Comparison: IPW and ATO Balancing Weights, Chapter 3



Note: ATE (IPW) weights are in the left column, and ATO (overlap) weights are in the right column.  
 Source: National Longitudinal Survey of Youth, 1997 Cohort

## Appendix D: Summary Statistics by Gender, Chapter 4

*Table D.1: Means of Variables by Initial Postsecondary Enrollment or Non-Enrollment, Men, Chapter 4*

	All High School Graduates	No College Enrollment	Community College	Broad-Access College	Moderately Selective College	Elite College
<b>Race</b>						
Black	0.14	0.17	0.13	0.28	0.09	0.03
Hispanic	0.12	0.15	0.15	0.10	0.05	0.07
White or Other	0.75	0.68	0.72	0.62	0.86	0.90
US Born	0.96	0.97	0.94	0.96	0.96	0.97
Age in 97	14.27	14.29	14.22	14.19	14.23	14.55
<b>Region</b>						
South	0.32	0.35	0.32	0.32	0.29	0.30
North Central	0.28	0.26	0.24	0.35	0.35	0.21
Northeast	0.19	0.19	0.16	0.19	0.18	0.31
West	0.21	0.20	0.28	0.13	0.17	0.18
Rural	0.28	0.31	0.24	0.25	0.30	0.15
<b>Family Structure</b>						
Both Bio Parents	0.60	0.49	0.59	0.59	0.73	0.82
One Bio Parent and One Other	0.12	0.16	0.13	0.11	0.09	0.02
Single Bio Parent	0.24	0.29	0.26	0.26	0.16	0.15
Other Family Structure	0.04	0.06	0.03	0.04	0.02	0.01
<b>Mom Age Birth First Child</b>						
Younger than 20	0.18	0.25	0.20	0.14	0.10	0.07
20-24	0.38	0.43	0.41	0.38	0.30	0.23
25-29	0.27	0.18	0.24	0.28	0.40	0.39
30 or Older	0.11	0.05	0.10	0.13	0.16	0.26
Number of Younger Siblings	1.28	1.37	1.31	1.24	1.17	1.12
<b>Parent's Religion</b>						
Catholic	0.29	0.26	0.31	0.30	0.31	0.33
Evangelical	0.33	0.42	0.33	0.38	0.24	0.11
Other Christian	0.25	0.21	0.22	0.22	0.33	0.33
Other Religion	0.04	0.01	0.04	0.02	0.05	0.12
No Religion	0.09	0.09	0.10	0.08	0.08	0.11
Parent Graduated College	0.36	0.17	0.30	0.44	0.58	0.70
Household Income	59573	43153	53777	61218	75116	114651
High Educational Expectations	0.51	0.26	0.49	0.71	0.76	0.91
Senior Year GPA	2.87	2.50	2.77	3.00	3.26	3.69
ASVAB Percentile	56.05	40.63	50.21	55.62	74.17	88.65
BA Graduate	0.35	0.06	0.24	0.49	0.71	0.85
<b>Marriage Outcomes</b>						
Married Spouse with BA	0.26	0.09	0.20	0.33	0.47	0.55
Married Spouse with no A	0.37	0.49	0.41	0.23	0.25	0.15
Never Married	0.37	0.42	0.39	0.44	0.29	0.30
Number of Observations	2374	954	586	146	560	128

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Weighted by the NLSY97 sampling weight

Table D.2: Means of Variables by Initial Postsecondary Enrollment or Non-Enrollment, Women, Chapter 4

	All High School Graduates	No College Enrollment	Community College	Broad-Access College	Moderately Selective College	Elite College
Race						
Black	0.16	0.21	0.15	0.28	0.12	0.08
Hispanic	0.11	0.14	0.15	0.10	0.06	0.07
White or Other	0.73	0.65	0.70	0.62	0.82	0.85
US Born	0.96	0.96	0.95	0.96	0.97	0.94
Age in 97	14.25	14.24	14.30	14.15	14.29	14.04
Region						
South	0.34	0.36	0.39	0.35	0.30	0.32
North Central	0.27	0.26	0.24	0.37	0.30	0.21
Northeast	0.17	0.17	0.09	0.13	0.21	0.33
West	0.21	0.20	0.29	0.15	0.19	0.14
Rural	0.27	0.28	0.26	0.24	0.30	0.20
Family Structure						
Both Bio Parents	0.58	0.40	0.53	0.60	0.70	0.78
One Bio Parent and One Other	0.13	0.17	0.16	0.12	0.09	0.07
Single Bio Parent	0.25	0.36	0.26	0.22	0.19	0.15
Other Family Structure	0.04	0.06	0.04	0.06	0.02	0.00
Mom Age Birth First Child						
Younger than 20	0.18	0.29	0.19	0.18	0.12	0.02
20-24	0.39	0.42	0.42	0.34	0.36	0.28
25-29	0.27	0.16	0.22	0.31	0.34	0.44
30 or Older	0.11	0.06	0.09	0.10	0.14	0.22
Number of Younger Siblings	1.30	1.41	1.29	1.31	1.23	1.23
Parent's Religion						
Catholic	0.24	0.22	0.27	0.24	0.24	0.28
Evangelical	0.37	0.44	0.41	0.38	0.31	0.18
Other Christian	0.27	0.23	0.22	0.29	0.32	0.28
Other Religion	0.03	0.01	0.03	0.01	0.03	0.12
No Religion	0.09	0.10	0.07	0.08	0.10	0.13
Parent Graduated College	0.33	0.11	0.24	0.32	0.50	0.73
Household Income	57684	39190	51851	57526	69315	97395
High Educational Expectations	0.68	0.37	0.69	0.78	0.84	0.89
Senior Year GPA	3.17	2.74	3.02	3.30	3.47	3.72
ASVAB Percentile	56.86	37.25	49.53	59.53	69.86	85.05
BA Graduate	0.46	0.07	0.32	0.67	0.74	0.90
Marriage Outcomes						
Married Spouse with BA	0.21	0.05	0.13	0.31	0.32	0.52
Married Spouse with no A	0.48	0.58	0.59	0.37	0.41	0.14
Never Married	0.30	0.37	0.28	0.32	0.27	0.35
Number of Observations	2473	707	698	188	740	140

Source: National Longitudinal Survey of Youth, 1997 Cohort

Notes: Weighted by the NLSY97 sampling weight

## References

- Ahearn, Caitlin E., Jennie E. Brand, and Xiang Zhou. 2022. "How, and For Whom, Does Higher Education Increase Voting?" *Research in Higher Education*. doi: 10.1007/s11162-022-09717-4.
- Alon, Sigal, and Marta Tienda. 2005. "Assessing the 'Mismatch' Hypothesis: Differences in College Graduation Rates by Institutional Selectivity." *Sociology of Education* 78:294–315.
- Araki, Satoshi. 2020. "Educational Expansion, Skills Diffusion, and the Economic Value of Credentials and Skills." *American Sociological Review* 85(1):128–75. doi: 10.1177/0003122419897873.
- Armstrong, Elizabeth A., and Laura T. Hamilton. 2013. *Paying for the Party How College Maintains Inequality*. Cambridge, MA.: Harvard University Press.
- Arum, Richard, and Josipa Roksa. 2010. *Academically Adrift: Limited Learning on College Campuses*. Chicago: University of Chicago Press.
- Arum, Richard, Josipa Roksa, and Michelle J. Budig. 2008. "The Romance of College Attendance: Higher Education Stratification and Mate Selection." *Research in Social Stratification and Mobility* 26(2):107–21. doi: 10.1016/j.rssm.2008.02.003.
- Attewell, Paul, David Lavin, Thurston Domina, and Tania Levey. 2007. *Passing the Torch: Does Higher Education for the Disadvantaged Pay Off Across the Generations?* Russell Sage Foundation.
- Autor, David H. 2014. "Skills, Education, and the Rise of Earnings Inequality among the 'Other 99 Percent.'" *Science (New York, N.Y.)* 344(6186):843–51. doi: 10.1126/science.1251868.
- Barron's. 2004. *Barron's Profiles of American Colleges 2004*. Barron's Educational Series.
- Beattie, Irene R., and Megan Thiele. 2016. "Connecting in Class? College Class Size and Inequality in Academic Social Capital." *Journal of Higher Education* 87(3):333–62.
- Becker, Gary S. 1962. "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70(5):9–49.
- Belfield, C. R., and T. Bailey. 2011. "The Benefits of Attending Community College: A Review of the Evidence." *Community College Review* 39(1):46–68. doi: 10.1177/0091552110395575.
- Binder, Amy J., Daniel B. Davis, and Nick Bloom. 2016. "Career Funneling: How Elite Students Learn to Define and Desire 'Prestigious' Jobs." *Sociology of Education* 89(1):20–39. doi: 10.1177/0038040715610883.

- Black, Dan A., and Jeffrey A. Smith. 2004. "How Robust Is the Evidence on the Effects of College Quality? Evidence from Matching." *Journal of Econometrics* 121(1–2):99–124. doi: 10.1016/j.jeconom.2003.10.006.
- Black, Dan A., and Jeffrey A. Smith. 2006. "Estimating the Returns to College Quality with Multiple Proxies for Quality." *Journal of Labor Economics* 24(3):701–28. doi: 10.1086/505067.
- Bleemer, Zachary. 2022. "Affirmative Action, Mismatch, and Economic Mobility After California's Proposition 209." *The Quarterly Journal of Economics* 115–60. doi: 10.1093/qje/qjab027.
- Bloome, Deirdre, Shauna Dyer, and Xiang Zhou. 2018. "Educational Inequality, Educational Expansion, and Intergenerational Income Persistence in the United States." *American Sociological Review* 83(6):1215–53. doi: 10.1177/0003122418809374.
- Blossfeld, Hans-Peter. 2009. "Educational Assortative Marriage in Comparative Perspective." *Annual Review of Sociology* 35(1):513–30. doi: 10.1146/annurev-soc-070308-115913.
- Bowen, William G., and Derek Bok. 1998. *The Shape of the River: Long-Term Consequences of Considering Race in College and University Admissions*. Princeton: Princeton University Press.
- Brand, Jennie E. 2023. *Overcoming the Odds. The Benefits of Completing College for Unlikely Graduates*. New York: Russell Sage Foundation.
- Brand, Jennie E., and Charles N. Halaby. 2006. "Regression and Matching Estimates of the Effects of Elite College Attendance on Educational and Career Achievement." *Social Science Research* 35(3):749–70. doi: 10.1016/j.ssresearch.2005.06.006.
- Brand, Jennie E., and Yu Xie. 2010. "Who Benefits Most from College? Evidence for Negative Selection in Heterogeneous Economic Returns to Higher Education." *American Sociological Review* 75(2):273–302. doi: 10.1177/0003122410363567.
- Brand, Jennie E., Jiahui Xu, Bernard Koch, and Pablo Geraldo. 2021. "Uncovering Sociological Effect Heterogeneity Using Tree-Based Machine Learning." *Sociological Methodology* 51(2):189–223. doi: 10.1177/0081175021993503.
- Brand, Jennie, Fabian Pfeffer, and Sara Goldrick-Rab. 2014. "The Community College Effect Revisited: The Importance of Attending to Heterogeneity and Complex Counterfactuals." *Sociological Science* 1(October):448–65. doi: 10.15195/v1.a25.
- Braxton, John M., Amy S. Hirschy, and Shederick A. McClendon. 2004. "Understanding and Reducing College Student Departure." in *ASHE-ERIC Higher Education Report*. San Francisco, CA: Wiley Periodicals.

- Buchmann, Claudia, Thomas a. DiPrete, and Anne McDaniel. 2008. "Gender Inequalities in Education." *Annual Review of Sociology* 34(1):319–37. doi: 10.1146/annurev.soc.34.040507.134719.
- Burrus, Jeremy, Richard D. Roberts, James Carlson, Brent Bridgeman, Marna Golub-smith, and Ruth Greenwood. 2013. *Putting and Keeping Students on Track: Toward a Comprehensive Model of College Persistence and Goal Attainment*.
- Card, David. 2001. "Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems." *Econometrica* 69(5):1127–60.
- Carnevale, Anthony P., and Jeff Strohl. 2013. *Separate and Unequal: How Higher Education Reinforces the Intergenerational Reproduction of White Racial Privilege*. Georgetown Center on Education and the Workforce.
- Cherlin, Andrew J. 2004. "The Deinstitutionalization of Marriage." *Journal of Marriage and the Family* 66(November):848–61.
- Chetty, Raj, John N. Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan. 2017. "Mobility Report Cards: The Role of Colleges in Intergenerational Mobility." *NBER Working Paper*.
- Choi, Seongsoo, Inkwan Chung, and Richard Breen. 2020. "How Marriage Matters for the Intergenerational Mobility of Family Income: Heterogeneity by Gender, Life Course, and Birth Cohort." *American Sociological Review* 85(3):353–80. doi: 10.1177/0003122420917591.
- Ciocca Eller, Christina, and Thomas A. DiPrete. 2018. "The Paradox of Persistence: Explaining the Black-White Gap in Bachelor's Degree Completion." *American Sociological Review* 83(6):1171–1214. doi: 10.1177/0003122418808005.
- Cohodes, Sarah R., and Joshua S. Goodman. 2014. "Merit Aid, College Quality and College Completion: Massachusetts' Adams Scholarship as an In-Kind Subsidy." *American Economic Journal: Applied Economics* 6(4):251–85. doi: 10.1257/app.6.4.251.
- Collins, Randall. 1979. *The Credential Society: An Historical Sociology of Education and Stratification*. New York: Academic Press.
- Cox, D. R. 1972. "Regression Models and Life-Tables." *Journal of the Royal Statistical Society: Series B (Methodological)* 34(2):187–202. doi: 10.1111/j.2517-6161.1972.tb00899.x.
- Dale, Stacy Berg, and Alan B. Krueger. 2002. "Estimating the Payoff to Attending a More Selective College: An Application of Selection on Observables and Unobservables." *Quarterly Journal of Economics* 117(4):1491–1527. doi: Doi 10.1162/003355302320935089.

- Dale, Stacy Berg, and Alan B. Krueger. 2011. "Estimating the Return to College Selectivity over the Career Using Administrative Earnings Data." *NBER Working Paper*.
- DeWine, Paul R., Marilee Bresciani Ludvik, Mark Tucker, Shaila Mulholland, and Wendy Bracken. 2017. "Exploring a Successful Community College Student Transition to a Research-University Environment." *Community College Journal of Research and Practice* 41(12):809–22. doi: <https://doi.org/10.1080/10668926.2016.1232669>.
- Dougherty, Kevin J., and Gregory S. Kienzl. 2006. "It's Not Enough to Get through the Open Door: Inequalities by Social Background in Transfer from Community Colleges to Four-Year Colleges." *Teachers College Record* 108(3):452–87.
- Doyle, William R. 2009. "The Effect of Community College Enrollment on Bachelor's Degree Completion." *Economics of Education Review* 28:199–206. doi: 10.1016/j.econedurev.2008.01.006.
- Duncan, Otis Dudley. 1961. "Chapter 6: A Socioeconomic Index for All Occupations; Chapter 7: Properties and Characteristics of the Socioeconomic Index." Pp. 109–61 in *Occupations and Social Status*, edited by A. J. J. Reiss, O. D. Duncan, P. K. Hatt, and C. C. North.
- Edin, Kathryn, and Maria Kefalas. 2005. *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Berkeley: University of California Press.
- Edin, Kathryn, and Joanna M. Reed. 2005. "Why Don't They Just Get Married? Barriers to Marriage among the Disadvantaged." *The Future of Children* 15(2):117–37. doi: 10.1353/foc.2005.0017.
- Esteve, Albert, Christine R. Schwartz, Jan Van Bavel, Iñaki Permanyer, Martin Klesment, and Joan Garcia. 2016. "The End of Hypergamy: Global Trends and Implications." *Population and Development Review* 42(4):615–25. doi: 10.1111/padr.12012.
- Feng, Acton Jiashi. 2022. "Revisiting Horizontal Stratification in Higher Education: College Prestige Hierarchy and Educational Assortative Mating in China." *Demography* 59(1):349–69. doi: 10.1215/00703370-9656369.
- Ford, Karly Sarita. 2020. "Marrying Within the Alma Mater: Understanding the Role of Same-University Marriages in Educational Homogamy." *Sociological Research Online* 1–19. doi: 10.1177/1360780419867710.
- Fry, R. 2004. "Latino Youth Finishing College: The Role of Selective Pathways." *Pew Hispanic Center* 23:1–32.
- Fry, Richard, and Anthony Cilluffo. 2019. *A Rising Share of Undergraduates Are From Poor Families, Especially at Less Selective Colleges*. Pew Research Center.
- Fry, Richard, and Kim Parker. 2012. *Record Shares of Young Adults Have Finished Both High School and College* *Social & Demographic Trends*. Pew Research Center.

- Gaddis, S. Michael. 2015. "Discrimination in the Credential Society: An Audit Study of Race and College Selectivity in the Labor Market." *Social Forces* 93(4):1451–79. doi: 10.1093/sf/sou111.
- Gasman, Marybeth. 2013. *The Changing Face of Historically Black Colleges and Universities*. Penn Center for Minority Serving Institutions.
- Ge, Suqin, Elliott Isaac, and Amalia Miller. 2022. "Elite Schools and Opting In: Effects of College Selectivity on Career and Family Outcomes." *Journal of Labor Economics* 40(S1):S383–426.
- Gerber, Theodore P., and Sin Yi Cheung. 2008. "Horizontal Stratification in Postsecondary Education: Forms, Explanations, and Implications." *Annual Review of Sociology* 34(2008):299–318.
- Goldin, Claudia, and Lawrence F. Katz. 2008. *The Race Between Education and Technology*. Cambridge: Harvard University Press.
- Goldrick-Rab, Sara. 2006. "Following Their Every Move : An Investigation of Social-Class Differences in College Pathways." *Sociology of Education* 79:61–79.
- Goldrick-Rab, Sara. 2016. *Paying the Price: College Costs, Financial Aid, and the Betrayal of the American Dream*. Chicago: The University of Chicago Press.
- Goldrick-Rab, Sara, Jed Richardson, and Anthony Hernandez. 2017. *Hungry and Homeless in College: Results from a National Study of Basic Needs Insecurity in Higher Education*. Madison: Wisconsin HOPE Lab.
- Goldscheider, Frances, Eva Bernhardt, and Trude Lappegård. 2015. "The Gender Revolution: A Framework for Understanding Changing Family and Demographic Behavior." *Population and Development Review* 41(2):207–39. doi: 10.1111/j.1728-4457.2015.00045.x.
- Goodman, Joshua, Michael Hurwitz, and Jonathan Smith. 2014. "College Access, Initial College Choice, and Degree Completion." *NBER Working Paper* (20996).
- Granovetter, Mark. 1974. *Getting a Job: A Study of Contacts and Careers*. University of Chicago Press.
- Greifer, Noah. 2020. *Package "WeightIt": Weighting for Covariate Balance in Observational Studies*.
- Grimshaw, Damian. 2011. *What Do We Know about Low-Wage Work and Low-Wage Workers? Analysing the Definitions, Patterns, Causes and Consequences in International Perspective*. No. 28. Conditions of Work and Employment Series. ILO.



- Hainmueller, Jens. 2011. "Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies." *Political Analysis* 16:25–46. doi: 10.1093/pan/mpr025.
- Heckman, James J., John Eric Humphries, and Gregory Veramendi. 2018. "The Non-Market Benefits of Abilities and Education." *Journal of Human Capital* 12(2). doi: 10.1086/697535.
- Heil, Scott, Liza Reisel, and Paul Attewell. 2014. "College Selectivity and Degree Completion." *American Educational Research Journal* 51(5):913–35. doi: 10.3102/0002831214544298.
- Hess, Frederick M., and Taryn Hochleitner. 2012. *College Rankings Inflation: Are You Overpaying for Prestige?* No. 3. Washington, D.C.: American Enterprise Institute for Public Policy Research.
- Hout, Michael. 2012. "Social and Economic Returns to College Education in the United States." *Annual Review of Sociology* 38:379–400. doi: 10.1146/annurev.soc.012809.102503.
- Hout, Michael. 2015. "A Summary of What We Know about Social Mobility." *The ANNALS of the American Academy of Political and Social Science* 657(1):27–36. doi: 10.1177/0002716214547174.
- Hoxby, Caroline. 2009. "The Changing Selectivity of American Colleges." *Journal of Economic Perspectives* 23(4):95–118. doi: 10.1257/jep.23.4.95.
- Hoxby, Caroline, and Sarah Turner. 2015. "What High-Achieving Low-Income Students Know about College." *American Economic Review* 105(5):514–17.
- Hu, Xioadan, Justin C. Ortagus, and Dennis A. Kramer. 2018. "The Community College Pathway: An Analysis of the Costs Associated with Enrolling Initially at a Community College Before Transferring to a 4-Year Institution." *Higher Education Policy* 31:359–80.
- Huang, Jian, Henriëtte Maassen van den Brink, and Wim Groot. 2009. "A Meta-Analysis of the Effect of Education on Social Capital." *Economics of Education Review* 28(4):454–64. doi: 10.1016/j.econedurev.2008.03.004.
- Imai, Kosuke, Luke Keele, and Dustin Tingley. 2010. "A General Approach to Causal Mediation Analysis." doi: 10.1037/a0020761.
- Imai, Kosuke, Luke Keele, and Teppei Yamamoto. 2010. "Identification, Inference and Sensitivity Analysis for Causal Mediation Effects." *Statistical Science* 25(1):51–71. doi: 10.1214/10-STS321.
- Imai, Kosuke, and Marc Ratkovic. 2013. "Covariate Balancing Propensity Score." *J. R. Statist. Soc. B* 76:243–63. doi: 10.1111/rssb.12027.

- IPEDS. 2022. "IPEDS Survey Components: Finance Glossary." Retrieved June 7, 2023 (<https://nces.ed.gov/ipeds/use-the-data/survey-components-glossary/2>).
- Kalleberg, Arne L. 2013. *Good Jobs, Bad Jobs The Rise of Polarized and Precarious Employment Systems in the United States, 1970s to 2000s*. New York: Russell Sage Foundation.
- Kalmijn, Matthijs. 1998. "Intermarriage and Homogamy: Causes, Patterns, Trends." *Annual Review of Sociology* 24(1):395–421. doi: 10.1146/annurev.soc.24.1.395.
- Kim and Tamborini. 2019. "Are They Still Worth It? The Long-Run Earnings Benefits of an Associate Degree, Vocational Diploma or Certificate, and Some College." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 5(3):64. doi: 10.7758/rsf.2019.5.3.04.
- Kim, ChangHwan, Christopher R. Tamborini, and Arthur Sakamoto. 2015. "Field of Study in College and Lifetime Earnings in the United States." *Sociology of Education* 88(4):320–39. doi: 10.1177/0038040715602132.
- King, Michael D. 2021. "College as a Great Equalizer? Marriage and Assortative Mating Among First- and Continuing-Generation College Students." *Demography* 58(6):2265–89. doi: 10.1215/00703370-9461389.
- Kuh, George D., Jillian Kinzie, John H. Schuh, and Elizabeth J. Whitt. 2010. *Student Success in College: Creating Conditions That Matter*. Washington, D.C.: Wiley.
- Lamidi, Esther. 2015. *Marriage in the U.S.: Twenty-Five Years of Change, 1989-2014*.
- Li, Fan, Kari Lock Morgan, and Alan M. Zaslavsky. 2018. "Balancing Covariates via Propensity Score Weighting." *Journal of the American Statistical Association* 113:390–400. doi: 10.1080/01621459.2016.1260466.
- Light, Audrey, and Wayne Strayer. 2000. "Determinants of College Completion: School Quality or Student Ability?" *Journal of Human Resources* 35(2):299–332.
- Lin, Nan. 1999. "Social Networks and Status Attainment." *Annual Review of Sociology* 25(1):467–87. doi: 10.1146/annurev.soc.25.1.467.
- Liu, Vivian Y. T., Clive R. Belfield, and Madeline J. Trimble. 2015. "The Medium-Term Labor Market Returns to Community College Awards: Evidence from North Carolina." *Economics of Education Review* 44:42–55.
- Lockwood Reynolds, C. 2012. "Where to Attend? Estimating the Effects of Beginning College at a Two-Year Institution | Elsevier Enhanced Reader." *Economics of Education Review* 31:345–62. doi: 10.1016/j.econedurev.2011.12.001.

- Long, Bridget Terry, and Michal Kurlaender. 2009. "Do Community Colleges Provide a Viable Pathway to a Baccalaureate Degree?" *Educational Evaluation and Policy Analysis* 31(1):30–53. doi: 10.3102/0162373708327756.
- Long, Mark C. 2008. "College Quality and Early Adult Outcomes." *Economics of Education Review* 27:588–602. doi: 10.1016/j.econedurev.2007.04.004.
- Long, Mark C. 2010. "Changes in the Returns to Education and College Quality." *Economics of Education Review* 29(3):338–47. doi: 10.1016/j.econedurev.2009.10.005.
- Ma, Jennifer, Matea Pender, and Meredith Welch. 2019. *Education Pays 2019: The Benefits of Higher Education for Individuals and Society*. CollegeBoard.
- Ma, Yingyi. 2009. "Family Socioeconomic Status, Parental Involvement, and College Major Choices—Gender, Race/Ethnic, and Nativity Patterns." *Sociological Perspectives* 52(2):211–34. doi: 10.1525/sop.2009.52.2.211.
- Manski, Charles F., and David A. Wise. 1983. "Econometric Modeling of Student Behavior; Application and Admission; College Attendance v. College Completion." Pp. 26–42; 67–90; 129–58 in *College Choice in America*. Cambridge: Harvard University Press.
- Mare, Robert D. 1991. "Five Decades of Educational Assortative Mating." *American Sociological Review* 56(1):15–32.
- McCaffrey, Daniel F., Greg Ridgeway, and Andrew R. Morral. 2004. "Propensity Score Estimation With Boosted Regression for Evaluating Causal Effects in Observational Studies." *Psychological Methods* 9(4):403–25. doi: 10.1037/1082-989X.9.4.403.
- McClendon, David. 2018. "Crossing Boundaries: 'Some College,' Schools, and Educational Assortative Mating." *Journal of Marriage and Family* 80(4):812–25. doi: 10.1111/jomf.12482.
- McClendon, David, Janet Chen-Lan Kuo, and R. Kelly Raley. 2014. "Opportunities to Meet: Occupational Education and Marriage Formation in Young Adulthood." *Demography* 51(4):1319–44. doi: 10.1007/s13524-014-0313-x.
- Mcfarland, Joel, Bill Hussar, Jijun Zhang, Xiaolei Wang, Sarah Hein, Melissa Diliberti, Emily Forest Cataldi, Farrah Bullock Mann, and Amy Barner. 2019. *The Condition of Education 2019*. Washington, D.C: National Center for Education Statistics: U.S. Department of Education.
- McLanahan, Sara. 2004. "Diverging Destinies: How Children Are Faring under the Second Demographic Transition." *Demography* 41(4):607–27.
- McPherson, Miller, Lynn Smith-Lovin, and James M. Cook. 2001. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology* 27(1):415–44. doi: 10.1146/annurev.soc.27.1.415.

- Melguizo, Tatiana. 2008. "Quality Matters: Assessing the Impact of Attending More Selective Institutions on College Completion Rates of Minorities." *Research in Higher Education* 49:214–36. doi: 10.1007/s11162-007-9076-1.
- Mize, Trenton. 2019. "Best Practices for Estimating, Interpreting, and Presenting Nonlinear Interaction Effects." *Sociological Science* 6:81–117. doi: 10.15195/v6.a4.
- Monaghan, David B., and Paul Attewell. 2014. "The Community College Route to the Bachelor's Degree." *Educational Evaluation and Policy Analysis* 37(1):70–91. doi: 10.3102/0162373714521865.
- Morgan, Stephen L., and Christopher Winship. 2007. *Counterfactuals and Causal Inference: Methods and Principles for Social Research (Analytical Methods for Social Research)*. Cambridge, UK: Cambridge University Press.
- Mountjoy, Jack, and Brent R. Hickman. 2021. "The Returns to College(S): Relative Value-Added and Match Effects in Higher Education." *NBER Working Paper* (29276).
- Musick, Kelly, Jennie E. Brand, and Dwight Davis. 2012. "Variation in the Relationship between Education and Marriage: Marriage Market Mismatch?" *Journal of Marriage and Family* 74(1):53–69. doi: 10.1111/j.1741-3737.2011.00879.x.
- Nguyen, Tuan D., Jenna W. Kramer, and Brent J. Evans. 2019. "The Effects of Grant Aid on Student Persistence and Degree Attainment: A Systematic Review and Meta-Analysis of the Causal Evidence." *Review of Educational Research* 89(6):831–74. doi: 10.3102/0034654319877156.
- Nielsen, Kelly. 2015. "'Fake It 'Til You Make It': Why Community College Students' Aspirations 'Hold Steady.'" *Sociology of Education* 88(4):265–83. doi: 10.1177/0038040715601889.
- Oreopoulos, Philip, and Uros Petronijevic. 2013. "Making College Worth It: A Review of the Returns to Higher Education." *Future of Children* 23(1):41–65.
- Oreopoulos, Philip, and Kjell G. Salvanes. 2011. "Priceless: The Nonpecuniary Benefits of Schooling." *Journal of Economic Perspectives* 25(1):159–84. doi: 10.1257/jep.25.1.159.
- Ovink, Sarah, Demetra Kalogrides, Megan Nanney, and Patrick Delaney. 2018. "College Match and Undermatch: Assessing Student Preferences, College Proximity, and Inequality in Post-College Outcomes." *Research in Higher Education* 59(5):553–90. doi: 10.1007/s11162-017-9482-y.
- Pascarella, Ernest T., and Patrick T. Terenzini. 2005. "How College Affects Students: Summary." Pp. 534–45 in *How College Affects Students*.
- Pearl, Judea. 2009. "Causal Inference in Statistics: An Overview." *Statistics Surveys* 3(September):96–146. doi: 10.1214/09-SS057.

- Porter, Stephen R. 2006. "Institutional Structures and Student Engagement." *Research in Higher Education* 47(5):521–58. doi: 10.1007/s11162-005-9006-z.
- Quadlin, Natasha, Emma D. Cohen, and Tom VanHeuvelen. 2021. "Same Major, Same Economic Returns? College Selectivity and Earnings Inequality in Young Adulthood." *Research in Social Stratification and Mobility* 75. doi: 10.1016/j.rssm.2021.100647.
- Raley, R. Kelly, and Jenifer Bratter. 2004. "Not Even If You Were the Last Person on Earth!: How Marital Search Constraints Affect the Likelihood of Marriage." *Journal of Family Issues* 25(2):167–81. doi: 10.1177/0192513X03256515.
- Raley, R. Kelly, Megan M. Sweeney, and Danielle Wondra. 2015. "The Growing Racial and Ethnic Divide in U.S. Marriage Patterns." *The Future of Children / Center for the Future of Children, the David and Lucile Packard Foundation* 25(2):89–109.
- Rauscher, Emily. 2019. "Why Who Marries Whom Matters: Effects of Educational Assortative Mating on Infant Health in the United States 1969–1994." *Social Forces* soz051. doi: 10.1093/sf/soz051.
- Reardon, Sean F., and Kendra Bischoff. 2011. "Income Inequality and Income Segregation." *American Journal of Sociology* 116(4):1092–1153. doi: 10.1086/657114.
- Ridgeway, Greg. 2019. "Generalized Boosted Models: A Guide to the Gbm Package."
- Rivera, Lauren A. 2012. "Hiring as Cultural Matching: The Case of Elite Professional Service Firms." *American Sociological Review* 77(6):999–1022. doi: 10.1177/0003122412463213.
- Roderick, Melissa, Vanessa Coca, and Jenny Nagaoka. 2011. "Potholes on the Road to College: High School Effects in Shaping Urban Students' Participation in College Application, Four-Year College Enrollment, and College Match." *Sociology of Education* 84(3):178–211. doi: 10.1177/0038040711411280.
- Rosenbaum, James E., Caitlin E. Ahearn, and Janet E. Rosenbaum. 2019. *Bridging the Gaps: College Pathways to Career Success*. New York: Russell Sage Foundation.
- Rosenbaum, James E., Caitlin E. Ahearn, Janet E. Rosenbaum, and Kelly I. Becker. 2016. "Beyond Earnings and Social Reproduction: Can College Lead to Good Jobs without Reproducing Social Inequalities?" *The Russell Sage Foundation Journal of the Social Sciences* 2(1):90–110.
- Rosenbaum, James E., Regina Deil-Amen, and Ann E. Person. 2006. *After Admission: From College Access to College Success*. New York: Russell Sage Foundation.
- Rosenbaum, Paul R., and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70(1):41–55.

- Sassler, Sharon. 2010. "Partnering across the Life Course: Sex, Relationships, and Mate Selection." *Journal of Marriage and Family* 72(3):557–75. doi: 10.1111/j.1741-3737.2010.00718.x.
- Sassler, Sharon, and Daniel T. Lichter. 2020. "Cohabitation and Marriage: Complexity and Diversity in Union-Formation Patterns." *Journal of Marriage and Family* 82(1):35–61. doi: 10.1111/jomf.12617.
- Schneider, Daniel, Kristen Harknett, and Matthew Stimpson. 2019. "Job Quality and the Educational Gradient in Entry Into Marriage and Cohabitation." *Demography* 56:451–76. doi: 10.1007/s13524-018-0749-5.
- Schneider, Daniel, and Orestes P. Hastings. 2015. "Socioeconomic Variation in the Effect of Economic Conditions on Marriage and Nonmarital Fertility in the United States: Evidence From the Great Recession." *Demography* 52(6):1893–1915. doi: 10.1007/s13524-015-0437-7.
- Schudde, Lauren, and Raymond Stanley Brown. 2019. "Understanding Variation in Estimates of Diversionary Effects of Community College Entrance: A Systematic Review and Meta-Analysis." *Sociology of Education* 92(3):247–68. doi: 10.1177/0038040719848445.
- Schwartz, Christine R. 2013. "Trends and Variation in Assortative Mating: Causes and Consequences." *Annual Review of Sociology* 39:451–70. doi: 10.1146/annurev-soc-071312-145544.
- Schwartz, Christine R., and Robert D. Mare. 2005. "Trends in Educational Assortative Marriage from 1940 to 2003." *Demography* 42(4):621–46. doi: 10.1353/dem.2005.0036.
- Scott, Marc, Thomas Bailey, and Greg Kienzl. 2006. "Relative Success? Determinants of College Graduation Rates in Public and Private Colleges in the U.S." *Research in Higher Education* 47(3):249–79. doi: 10.1007/s11162-005-9388-y.
- Smith, Jonathan. 2013. "Ova and out: Using Twins to Estimate the Educational Returns to Attending a Selective College." *Economics of Education Review* 36:116–80. doi: 10.1016/j.econedurev.2013.06.008.
- Smith, Jonathan, and Kevin Stange. 2016. "A New Measure of College Quality to Study the Effects of College Sector and Peers on Degree Attainment." *Education Finance and Policy* 11(4):369–403. doi: 10.1162/EDFP\_a\_00209.
- Smock, Pamela J., and Christine R. Schwartz. 2020. "The Demography of Families: A Review of Patterns and Change." *Journal of Marriage and Family* 82(1):9–34. doi: 10.1111/jomf.12612.
- Spence, Michael. 1973. "Job Market Signaling." *The Quarterly Journal of Economics* 87(3):355–74. doi: 10.2307/1882010.

- Stephan, Jennifer L., James E. Rosenbaum, and Ann E. Person. 2009. "Stratification in College Entry and Completion." *Social Science Research* 38(3):572–93. doi: 10.1016/j.ssresearch.2009.02.001.
- Stuart, Elizabeth A. 2010. "Matching Methods for Causal Inference: A Review and a Look Forward." *Statistical Science* 25(1):1–21. doi: 10.1214/09-STS313.Matching.
- Sweeney, Megan M., and Maria Cancian. 2004. "The Changing Importance of White Women's Economic Prospects for Assortative Mating." *Journal of Marriage and Family* 66(4):1015–28. doi: 10.1111/j.0022-2445.2004.00073.x.
- Therneau, Terry M. 2023. "A Package for Survival Analysis in R."
- Tingley, Dustin, Teppei Yamamoto, Kentaro Hirose, Luke Keele, and Kosuke Imai. 2019. *Mediation: R Package for Causal Mediation Analysis*.
- Tinto, Vincent. 1993. *Leaving College: Rethinking the Causes and Cures of Student Attrition*. University of Chicago Press.
- Tinto, Vincent. 2010. "From Theory to Action: Exploring the Institutional Conditions for Student Retention for Education." Pp. 51–89 in *Higher Education: Handbook of Theory and Research*. Vol. 25, edited by J. C. Smart. Dordrecht: Springer.
- Torche, Florencia, and Amy L. Johnson. 2019. "State of the Union: Education." *Pathways*, 21–24.
- Van Bavel, Jan, Christine R. Schwartz, and Albert Esteve. 2018. "Annual Review of Sociology The Reversal of the Gender Gap in Education and Its Consequences for Family Life." *Annual Review of Sociology* 44:341–60. doi: 10.1146/annurev-soc-073117.
- VanderWeele, Tyler J. 2016. "Mediation Analysis: A Practitioner's Guide." *Annual Review of Public Health* 37(1):17–32. doi: 10.1146/annurev-publhealth-032315-021402.
- Voss, Kim, Michael Hout, and Kristin George. 2022. "Persistent Inequalities in College Completion, 1980 – 2010." *Social Problems* (00):1–29. doi: 10.1093/socpro/spac014.
- Wathington, Heather, Joshua Pretlow, and Elisabeth Barnett. 2016. "A Good Start? The Impact of Texas' Developmental Summer Bridge Program on Student Success." *Journal of Higher Education* 87(2):150–77. doi: [10.1080/00221546.2016.11777398](https://doi.org/10.1080/00221546.2016.11777398).
- Webber, Douglas A. 2016. "Are College Costs Worth It? How Ability, Major, and Debt Affect the Returns to Schooling." *Economics of Education Review* 53:296–310. doi: 10.1016/j.econedurev.2016.04.007.
- Western, Bruce, Christine Percheski, and Deirdre Bloome. 2008. "Inequalities among American Families with Children, 1975 to 2005." *American Sociological Review* 73(6):903–20.

- Whitaker, David G., and Ernest T. Pascarella. 1994. "Two-Year College Attendance and Socioeconomic Attainment: Some Additional Evidence." *The Journal of Higher Education* 65(2):194–210. doi: 10.1080/00221546.1994.11778490.
- Witteveen, Dirk, and Paul Attewell. 2017. "The Earnings Payoff from Attending a Selective College." *Social Science Research* 66:154–69. doi: 10.1016/J.SSRESEARCH.2017.01.005.
- Xie, Yu, James M. Raymo, Kimberly Goyette, and Arland Thornton. 2003. "Economic Potential and Entry into Marriage and Cohabitation." *Demography* 40(2):351–67.
- Xu, Di, Sabrina Solanki, and Ashley Harlow. 2020. "Examining the Relationship Between 2-Year College Entry and Baccalaureate Aspirants' Academic and Labor Market Outcomes: Impacts, Heterogeneity, and Mechanisms." *Research in Higher Education* 61:297–329. doi: 10.1007/s11162-019-09559-7.
- Zhou, Xiang. 2022. "Attendance, Completion, and Heterogeneous Returns to College: A Causal Mediation Approach." *Sociological Methods & Research* 0(0). doi: <https://doi.org/10.1177/00491241221113876>.
- Zhou, Xiang, and Guanghui Pan. 2022. "Higher Education and the Black-White Earnings Gap." *American Sociological Review*.