College for All, Degrees for Few: For-Profit Colleges and Socioeconomic Differences in Degree Attainment

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The recent expansion of for-profit colleges in US higher education has ignited much debate over the potential contributions, and limitations, of profit-maximizing educational businesses to socioeconomic inequality. For-profit colleges have a strong economic incentive to retain students, and can offer innovative services in order to compete with more established institutions. But for-profit colleges may also seek to increase revenues in ways that are not beneficial for student outcomes. Using detailed longitudinal information on a nationally representative sample of recent high school students (ELS 2002), this paper provides the first comprehensive and systematic assessment of the effect of attendance at for-profit colleges on socioeconomic inequality in student outcomes, measured as the attainment of bachelor's degrees. Results from logit models and weighted regression technique indicate that low-SES students that attend for-profit colleges are substantially less likely to earn a bachelor's degree than observationally similar students that attend non-profit open admission colleges. By contrast, enrollment at for-profit colleges has little bearing on the likelihood of high-SES students to earn a bachelor's degree. These findings suggest that for-profit colleges contribute to the maintenance of socioeconomic disadvantage, in that low-SES students with mobility aspirations are paying more for their education and yet are less likely to reap the benefits of their investment.

Introduction

One of the most dramatic recent changes in the US higher education system has been the expansion of the for-profit sector during the first decade of the twenty-first century (Deming, Goldin, and Katz 2012; Tierney and Hentschke 2007). Enrollments in all types of postsecondary institutions increased by 35 percent from 2000 to 2010, rising from 22 million students to nearly 30 million students. Yet, enrollment at for-profit colleges during this time period increased by 400 percent: from one million students to over four million in 2010. By comparison, enrollment at public and private non-profit colleges increased by only 22 percent during that

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time.[1] By 2010, 14.7 percent of all students in US higher education were enrolled at for-profit colleges, up from only 4 percent in 2000 (NCES 2012, table 4).

The rapid growth of the for-profit sector in US higher education ignited much debate over the potential contributions and limitations of profit-maximizing educational institutions to social equality. Supporters of for-profit education highlight the potential benefits of increasing student choice in the market of higher education. These arguments suggest that increasing competition among institutions that differ in their organizational structure and incentives can diversify the educational services offered to students, and enable students to find organizational environments that better suit their needs and capabilities (e.g., Tierney and Hentschke 2007). Moreover, for-profit colleges, which derive most of their revenues from tuition, have a strong incentive to offer services that increase student satisfaction and retention. Many for-profit colleges today offer innovative services and products that are especially appealing to disadvantaged students, including open admission policies, flexible academic schedules and enrollment modes, a variety of in-class and online academic settings, and academic programs in career-relevant fields that can lead to bachelor's degree attainment (Holland and DeLuca 2016; McMillan-Cottom 2017; Ruch 2003; Tierney and Hentschke 2007). These services can potentially improve the academic outcomes of disadvantaged students relative to other non-profit open admission colleges—the main competition of for-profit colleges—and subsequently reduce inequality in degree attainment (e.g., Ruch 2003).

But profit-maximizing incentives can also increase socioeconomic inequality in student outcomes. For-profit colleges may seek to increase their revenues in ways that are not necessarily beneficial for student outcomes, and the innovative services they provide may not be conducive for student outcomes. Recent evidence indicates that for-profit colleges use institutional accreditation to artificially increase their tuition rates (e.g., Cellini and Goldin 2012), therefore increasing the costs of college enrollment and potential debt. Almost a quarter of federal subsidized loans and Pell Grant dollars today go to the for-profit sector (College Board 2013, figure 8b), and estimates suggest that about 75 percent of the profits of this sector come from taxpayer-funded student aid (Deming, Goldin, and Katz 2012; Mettler 2014). High costs can negatively impact student retention, especially among disadvantaged students (Holland and DeLuca 2016). Other evidence reveals high institutional expenditures on marketing relative to instruction, alongside a wide use of questionable and aggressive marketing methods (e.g., McMillan-Cottom 2017; US GAO 2010; US Senate HELP Committee 2012). Together, these practices raise questions regarding the commitment of for-profit colleges to student success, especially in light of low graduation rates and exceptionally high loan default rates in the sector (College Board 2013, figure 12c; US Senate HELP Committee 2012).

Despite the growing prominence of for-profit colleges in higher education, and their overwhelming reliance on tax dollars that are intended to increase social mobility, we know surprisingly little about how they impact socioeconomic inequality. Nearly all studies on for-profit colleges to date focused on comparing the labor market returns to degrees earned at for-profit institutions to those earned at non-profit institutions (e.g., Cellini and Chaudhary 2014;

Chung 2009; Denice 2015; Grubb 1993; Lang and Weinstein 2012). These studies, valuable though they are, tell us little about the impact of for-profit colleges on inequality since they consider only a highly select group of success stories. The majority of students at open admission colleges, however, including those at for-profit colleges, do not earn a degree and therefore do not have access to the rewards associated with these degrees. To understand whether and how for-profit colleges impact socioeconomic inequality, we first need to consider how for-profit colleges influence the opportunities of students from different social backgrounds to earn degrees.

This study provides the first systematic and comprehensive assessment of the influence of for-profit colleges on socioeconomic inequality in students' academic outcomes, measured here as bachelor's degree attainment. I focus on bachelor's degree attainment for two main reasons: first, a major finding in the stratification literature is that bachelor's degree attainment is key for social mobility among disadvantaged groups in the United States, while certificates and associate degrees have only marginal impact, if any (e.g., Pfeffer and Hertel 2015; Torche 2011). Second, the majority of growth in enrollment at the for-profit sector occurred among four-year bachelor's degree–granting institutions (Kinser 2006). Thus, a focus on bachelor's degree attainment allows a clear assessment of whether for-profit colleges offer an alternative mobility path for disadvantaged students that might otherwise enroll at two-year open admission colleges.

One of the main challenges in assessing the impact of for-profit colleges on students' outcomes is the nonrandom selection of students into institutions, which likely confounds the effect of the institution with that of students' characteristics. This is especially important when considering for-profit colleges, which target and enroll a high share of disadvantaged students who have, on average, less academic preparation and lower standardized test scores, which are correlated with students' likelihoods of earning a degree (Holland and DeLuca 2016; McMillan-Cottom 2017; Sirin 2005). I tackle these challenges with longitudinal data on a large, nationally representative sample of students who were in the 10th grade in 2002 (Educational Longitudinal Study of 2002, hereafter "ELS"). The main strength of the ELS, in addition to its recency, is that it contains the richest information available today on students' family backgrounds, high school academic preparation and performance, attitudes toward school, coursework, and other attributes collected prior to their college enrollment. These data enable me to construct plausible and defensible comparison groups among students, and to tease out (to the greatest extent possible with non-experimental data) the institutional effect of for-profit colleges on students' academic outcome.

To foreshadow my results, for-profit emerges as a distinct category of open admission institutions that are consequential for overall socioeconomic inequality. Among a recent cohort of high school sophomores, (1) low- and middle-SES students were more likely than their affluent peers to attend for-profit colleges relative to other types of colleges, including non-profit open admission colleges; and (2) once enrolled, low- and middle-SES students that attended for-profit colleges were substantially less likely than their statistical counterparts in other open admission colleges, including community colleges, to earn a bachelor's

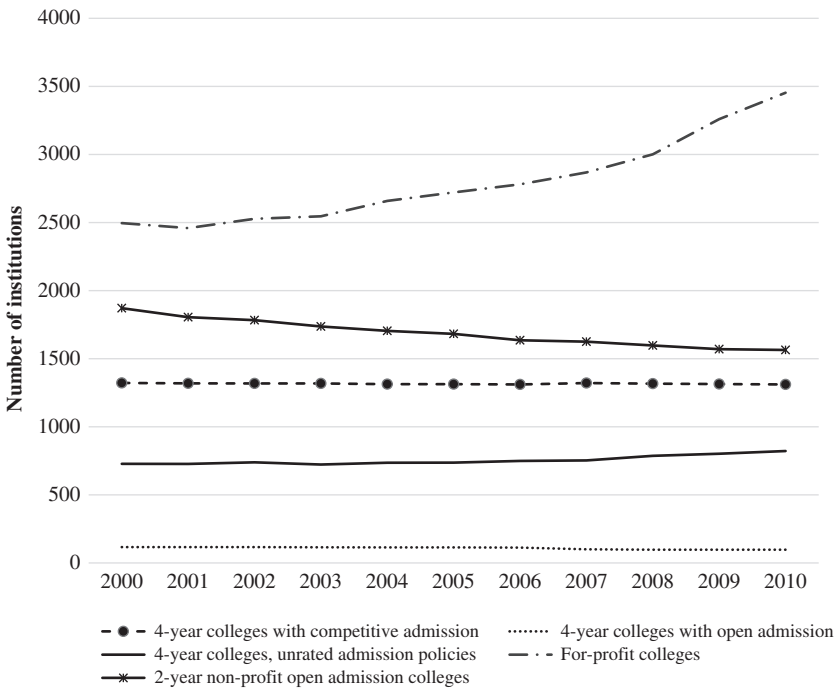
degree. The likelihood of students from the top-SES quartile to attain a bachelor's degree, in contrast, was not affected by attendance at for-profit colleges relative to other open admission colleges.

Theoretical Motivation and Significance

The expansion of for-profit colleges and socioeconomic inequality

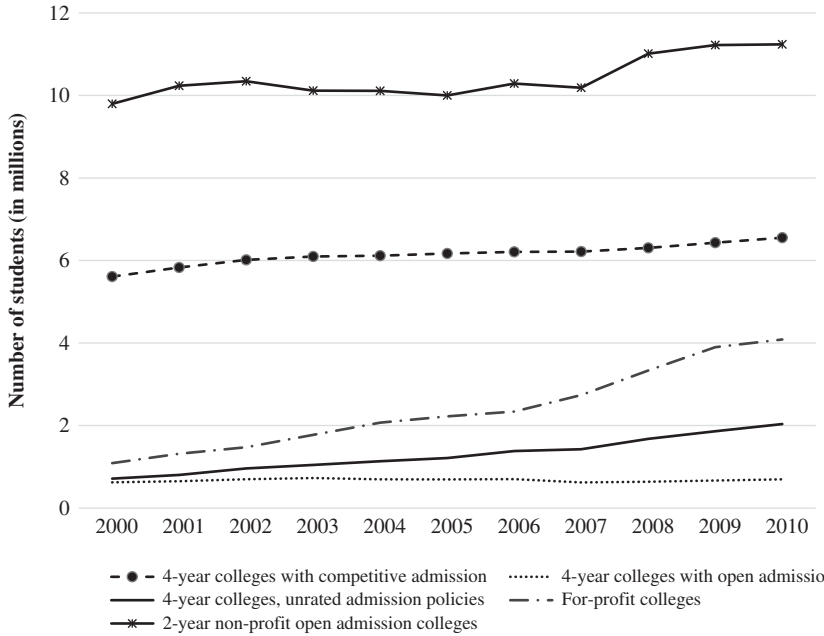
The recent expansion of for-profit colleges occurred in the context of rising demand for higher education across all social strata, but especially among students from the low-SES families, vis-à-vis large budget cuts to community colleges and other state-funded institutions (Turner 2006). The changing landscape of higher education over the first decade of the twenty-first century is well captured by figure 1a, which graphs trends in the number of accredited institutions between 2000 and 2010, and figure 1b, which graphs enrollment figures at accredited postsecondary institutions during the same time period. Enrollment at community colleges and other open admission two-year colleges was relatively stable between 2000 and 2008 and then increased substantially (figure 1b), while the number of non-profit two-year open admission institutions decreased steadily throughout the decade (figure 1a). The number of non-profit four-year colleges that offer open admission stayed relatively flat throughout the decade

Figure 1a. Number of accredited postsecondary institutions 2000–2010, by type of institution



Source: IPEDS institutional files 2000–2010.

Figure 1b. Enrollment in accredited postsecondary institutions 2000–2010, by type of institution



Source: IPEDS institutional and enrollment files 2000–2010.
Notes: Based on 12 months' unduplicated enrollment count.

(figure 1a), although enrollment at these colleges increased slightly (figure 1b). Declines in the availability of slots at two- and four-year open admission colleges, coupled with stagnation at competitive admission four-year institutions, created high demand for slots at institutions with open admission (e.g., Kirkham 2011). Not surprisingly, the for-profit sector flourished during that time period, expanding from 2,500 institutions in 2000 to a peak of 3,500 institutions in 2010 (see figure 1a) and enjoying a 400 percent increase in enrollment: from 1.08 million in 2000 to over 4 million students in 2010 (see figure 1b).

The increase in the number of slots in higher education can have important implications for socioeconomic stratification in higher education. Decades of research show that increasing the number of slots at less selective colleges, which are usually less prestigious, can enhance socioeconomic stratification by the type of college students attend (Alon 2009; Arum, Gamoran, and Shavit 2007; Ayalon and Shavit 2004; but see also Breen [2010] for a different conclusion). As more students enter higher education, competition for slots at the top institutions and programs becomes fiercer. High-SES students are generally quicker to adapt to these changes, and secure themselves positions at more prestigious colleges and programs. Low-SES students, in contrast, are slower to adapt and consequently become more crowded at less prestigious colleges (Alon 2009). By these accounts, we can expect a growing concentration of low-SES students at for-profit colleges relative to their more affluent counterparts. These patterns

may be amplified by the recruitment efforts of many for-profit colleges that target specifically low-income students (e.g., McMillan-Cottom 2017).

The case of for-profit colleges, however, deviates from previous educational expansions in several important respects. The expansion of community colleges since the 1960s increased the diversity of institutions by creating another tier of institutions that offered different degrees and admission polices (two-year rather than four-year). The recent expansion of for-profit colleges, by contrast, diversified institution types among a preexisting category of open admission institutions. This diversification is not only in the control of the institution, but also in the costs of education and the degrees students can pursue at open admission colleges (Kinser 2006). Unlike community colleges, which offer certificates or associate's degrees, many for-profit colleges today also offer bachelor's degree–level programs, and they tend to allow their students significant amount of fluidity between degree tracks (Kinser 2006).[2] Between 2000 and 2010, the number of four-year-degree-granting for-profit colleges offering bachelor's degrees increased by 135 percent while two-year and less than two-year for-profit colleges expanded by less than 20 percent. In 2010, 65 percent of all students in the for-profit sector were enrolled in a four-year degree-granting institution (IPEDS data, author's calculations). Thus, a growing concentration of low-income students at for-profit colleges may increase the likelihood of low-income students to attend a four-year college. Yet, at $15,230, the average tuition at for-profit colleges is about five times higher than the average tuition at community college ($3,350), which can increase stress and constraints in the lives of students, especially disadvantaged students (Cellini 2010; Cellini and Goldin 2012; Goldrick-Rab 2010; College Board 2014).

The growth of the for-profit sector diversified the opportunities available to students who wish to pursue postsecondary education but are lacking the credentials to secure positions at competitive admission colleges. These changes in the ecology of higher education can modify the distribution of students across different types of institutions in higher education. Specifically, the decrease in slots at community colleges vis-à-vis increase in demand for education likely pushed many low-SES students toward for-profit colleges. As a result, low-SES students, inevitably, pay more for their education. But it is yet unclear whether, and how, their educational outcomes are impacted by these trends. The next section reviews the evidence for a relationship between college type and student outcomes.

For-profit colleges and bachelor's degree attainment

Changes in the distribution of students across college types imply that students from different social backgrounds are placed in distinct organizational, academic, and social circumstances that differ also by costs. But these changes alone may not impact socioeconomic inequality in degree attainment. For changes in the distribution of students across institutions to be consequential for inequality, systematic variation in the characteristics of different college types—their social, academic, and organizational environment—needs to impact the likelihood of

students to earn a degree, above and beyond their social background, academic preparation, and attitudes.

Previous research has documented an association between college type and bachelor's degree attainment, especially as it relates to college selectivity and highest level of degree offering. Attending a more selective institution, for example, is positively associated with students' likelihood of earning a bachelor's degree, even when social background and academic preparation are accounted for (Alon and Tienda 2005). Similarly, attending a four-year college is associated with higher rates of bachelor's degree attainment relative to community college (e.g., Doyle 2009; Rouse 1994). The sources of the association between college type and student outcomes, however, are less clear. This is, in part, due to the empirical challenge of nonrandom selection of students into institutions in standard observational data. Students select colleges (and colleges select students) based on their prior academic achievements, test scores, attitudes, aspirations, financial ability, and information, which are also highly correlated with their likelihood of earning a bachelor's degree regardless of the institution they attend. These back-door associations generate non-causal correlations between the type of institution students attend and their outcomes, even if the environment they encounter in college has no bearing on their subsequent achievements. It follows that differences in student outcomes by college type may reflect unobserved and observed nonrandom selection of students into colleges.

But differences in student outcomes by college type may also reflect the influence of the unique social, academic, and organizational environment students encounter in different colleges. The organizational inequality literature has long recognized that institutional arrangements in the workplace, for example, influence the behaviors and outcomes of individuals from different social background (e.g., Stainback, Tomaskovic-Devey, and Skaggs 2010). Similarly, the social and organizational circumstances students encounter in their chosen college can shape the experience of students in higher education and their subsequent outcomes (e.g., Clotfelter et al. 2013; Gelbgiser and Alon 2016; Kerckhoff 1995). Gelbgiser and Alon (2016), for example, exploit variation in the institutional arrangements of different fields of study and show that this variation explains differences in students' likelihood to obtain a bachelor's degree, above and beyond their social and academic background factors. In a similar vein, Tinto's (1987) model of student retention highlights the importance of fit between college and student characteristics (see also Wetzel, O'Toole, and Peterson [1999]). It follows that differences in graduation rates by type of college can emerge even when differences in the propensity of students to attend different types of colleges are accounted for.

Recent advances in measuring the effect of college type with observational data focused primarily on estimating differences between community colleges and four-year competitive admission colleges (e.g., Brand, Pfeffer, and Goldrick-Rab 2014; Doyle 2009; Leigh and Gill 2003; Rouse 1994). These studies apply innovative methods to estimate both student propensity to attend different colleges, and assess potential heterogeneity in the effect of colleges on student outcomes, and found mixed results. Yet, these studies tell us little about whether

differences between for-profit and non-profit open admission colleges are consequential for student outcomes. Since for-profit colleges are a viable and increasingly prominent alternative to community colleges and other non-profit open admission colleges, this question is key for our understanding of the opportunities available to disadvantaged students to earn degrees.

Recent reports suggest that despite large heterogeneity within the sector (e.g., Deming, Goldin, and Katz 2012), the social, organizational, and academic environments at for-profit colleges systematically differ from those at non-profit colleges. Organizationally, for-profit colleges reject many of the structures that are the bread and butter of most non-profit colleges, including tenure systems and faculty governance. Instead, for-profit colleges operate as businesses governed by considerations of efficiency and revenue generation (Kinser 2006; Lechuga 2010). Many for-profit colleges today are part of large national chains that are managed and controlled by publicly traded companies, like the Apollo Education Group and the DeVry Education Group.[3] These differences have direct implications for the environment students encounter within college. For example, for-profit colleges often prioritize marketing and sales efforts over other organizational efforts, which can help increase enrollment but are not necessarily conducive for student retention (e.g., McMillan-Cottom 2017). Similarly, to increase efficiency, many for-profit colleges relay on easy-to-replicate courses that can be administrated in multiple locations, by multiple instructors, or taught online (Hentschke, Lechuga, and Tierney 2010; Ruch 2003). These practices, which reduce the costs of instruction, can increase the available course options, and increase flexibility in choosing courses, locations, and academic schedule. At the same time, greater flexibility can negatively impact the likelihood of students to find stable mentors, peers, and support groups outside their existing networks, which are consequential for student retention (Tinto 1987). To illustrate, 59 percent of all students at for-profit colleges in 2013 enrolled in at least one online course, compared to 29 percent of students at community colleges (NCES 2016, Table 311.15). Moreover, the average for-profit college attended by ELS cohort members had at least four branches, relative to only one at non-profit colleges. These differences in the characteristics of open admission colleges may be especially consequential for low-SES students, which tend to have fewer social, cultural, and financial resources to help them navigate the academic landscape (Holland and DeLuca 2016; Lareau 2015). High-SES students, by contrast, can draw on their existing networks—their parents, their peers, and so on—to guide and support them throughout their academic career.

The aforementioned discussion suggests that the key for evaluating the impact of for-profit colleges on socioeconomic inequality in degree attainment is to assess whether for-profit colleges impact the likelihood of students from different social strata to earn a degree, above and beyond their social background, academic preparation, and aspirations. This is the focus of the current investigation. My goal is to both expand existing scholarship on educational expansion by considering for-profit colleges as a distinct category of institutions, and highlight systematic variation in the opportunities available to students who enter open admission colleges to obtain bachelor's degrees. To this end, I investigate two

related empirical questions: (1) How are students from different socioeconomic backgrounds distributed across different types of postsecondary institution types, especially across for-profit and non-profit open admission colleges? (2) How do the academic outcomes of students from different social backgrounds systematically differ by the sector of open admission college they attend?

Data and Measurement

Data and sample

The empirical investigation in this paper is based on the Educational Longitudinal Study (ELS), a large, nationally representative sample of students who were in the 10th grade in 2002. The 15,400 high school sophomores in the base year of the ELS were re-surveyed three times: in 2004, in 2006, and in 2012, when most students were eight years removed from high school. Most of the ELS respondents graduated high school in 2004 and were entering college between 2004 and 2007, during the rapid expansion of for-profit colleges. The timing of the ELS makes it ideal for exploring my research questions.

An important strength of the ELS dataset relative to other datasets that focus on first-time college students (e.g., the BPS) is that the ELS contains rich information on students' social, economic, and academic background collected from students, parents, teachers, and schools *prior* to college enrollment. This information is critical for the assessment of the selection processes that channel students into different postsecondary destinations in order to identify (to the extent possible) any effects of college type on student outcomes. The ELS also contains detailed information on the timing of entrance to postsecondary education, type of institutions attended, and degrees earned. This information is collected from both students and the institutions they attended, thereby providing high-quality and accurate information on students' destinations and outcomes in higher education.

Despite these strengths, the ELS is not without limitations. First, the ELS sample is not representative of the population of students at for-profit colleges, many of whom are older and returning students. To date, there are no available micro-level data that contain a representative sample of students at for-profit colleges. Datasets like the BPS 04/09, which focus only on first-time students, fail to accurately represent the population of for-profit colleges given the high share of returning students at these colleges. In this respect, the ELS dataset is preferable to the BPS since it outlines a clearly defined population (i.e., a high school cohort) for which the effects of for-profit colleges on socioeconomic inequality can be systematically assessed. A related limitation of the ELS cohort is that the share of low-SES students that attend for-profit colleges is lower than those documented in national reports, since many of them are older and returning students. Nonetheless, even among this select group of college goers, substantial socioeconomic differences in the likelihood to attend for-profit colleges exist (see table 1), with over 10 percent of low-SES students in the ELS sample attending for-profit colleges. Last, it is important to keep in mind that the ELS

Table 1. Observed and adjusted proportions of students who attended any college, and college destinations among students that entered higher education by 2007. High school sophomores of 2002

	Distribution						Socioeconomic differences		
	Bottom SESQ		Middle SESQ		Top SESQ				
	Observed proportion	Adjusted proportion	Observed proportion	Adjusted proportion	Observed proportion	Adjusted proportion	Observed gap (T-B)	Adjusted gap (T-B)	Share of the observed gap that is explained by pre-college factors
Panel A: Observed and adjusted proportion of students who attended postsecondary education by 2007									
Any college	0.71	0.80	0.84	0.84	0.96	0.91	0.25	0.11	56%
Panel B: Observed and adjusted proportion of students at different college destinations among high school sophomores who attended any postsecondary education by 2007									
For-profit colleges	0.10	0.07	0.07	0.07	0.02	0.05	−0.08	−0.02	75%
Non-profit open admission colleges	0.62	0.49	0.49	0.47	0.27	0.41	−0.35	−0.08	77%
Competitive admission colleges	0.28	0.45	0.44	0.46	0.71	0.54	0.43	0.09	79%

Source: ELS 2002.

Note: Data are weighted. Adjusted rates for panel A are based on a logit model predicting college attendance (model 1, table 2). Adjusted rates for college for panel B are based on logit and multinomial logit models predicting college enrollment and college destinations (models 2 and 4, table 2). Unweighted sample sizes are: for bottom SESQ, $n = 1{,}799$ in panel A, and $n = 1{,}355$ in panel B. For middle SESQ, $n = 4{,}573$ for panel A, and $n = 3{,}970$ in panel B. For top SESQ, $n = 3{,}207$ in panel A, and $n = 3{,}132$.

data document the experience and outcomes of only one cohort of students at a specific time period.

The analyses in this study focus on the subset of 9,579 members of the initial ELS cohort who (1) participated in all ELS waves; and (2) have non-missing information on postsecondary enrollment status, timing and type of first postsecondary institution attended, and degree attainment by 2012.[4] I constructed sample weights that allow projections for the entire population of students who were in the 10th grade in 2002, and used item-specific best-subset linear regression to impute missing information on the adjustment variables.[5] The standard errors in all analyses are clustered by school to account for the survey design.

Main variables

Bachelor's degree attainment is the main outcome of interest. It is a categorical variable coded 1 if the respondent earned a bachelor's degree or higher by 2012 and 0 if not.[6]

Postsecondary institution type captures the type of the first institution students enroll in up to three years after high school graduation (i.e., by the end of 2007).[7] I differentiate between for-profit and non-profit institutions, and further differentiate non-profit institutions by their admission policies using the Barron's competitiveness index (NCES 2009) and information from the IPEDS. The main college type of interest is that of students who went to for-profit colleges, and includes both four-year and two-year for-profit colleges. Nearly all for-profit colleges have open admission policies.[8] I compare the academic outcomes of these students to those of students who entered non-profit colleges with open admission policies. This group consists primarily of students that attended community colleges (80 percent) but also includes a small group of students that attended other open admission two-year colleges (1 percent) and open admission four-year colleges (19 percent).[9] In sensitivity analyses, I separate two-year and four-year open admission colleges and obtain nearly identical results.[10] For completeness, I include two additional college destinations: students who did not attended any postsecondary institution by 2007, and students that attended four-year colleges with competitive admission policies. The latter group includes four-year institutions rated as "less competitive," "competitive," "most competitive," "highly competitive," or "very competitive" by the Barron's competitiveness index.[11] Schools rated as "special" ($N = 33$) in the Barron's index were classified on a case-by-case basis.[12] This yields four distinct postsecondary destinations: (1) *no college*; (2) *for-profit colleges*; (3) *non-profit open admission colleges*; and (4) *competitive admission non-profit colleges*.

Because this classification focuses on the first institution the student attends, it does not capture students who transitioned from one institutional category to another. Although a detailed study of multiple transition types would be useful, it exceeds the capabilities of the ELS sample size. Nonetheless, this focus is not likely to meaningfully alter the results reported here. About 60 percent of ELS respondents that attended for-profit colleges as their first institutions did not attend any other institution during the study period (with a similar rate across

different SES quartiles). Moreover, among the respondents that did attend a second institution, 30 percent attended a different for-profit college, 24 percent attended a competitive admission college, and 46 percent attended non-profit open admission colleges.

Students' socioeconomic status is measured by a composite score constructed by the National Center for Educational Statistics (NCES), divided into quartiles. This measure is based on students' family income, parents' education, and SEI scores.[13] I measure the breadth of socioeconomic inequality by focusing on the comparison between the bottom SES quartile and top SES quartile, although the middle quartiles are included in all analyses. In additional analyses not shown here, I use separate measurements of parental education and family income to account for students' socioeconomic status and obtain very similar results.

Pre-college predictors

I account for potential back-door associations between student characteristics, institution type, and student outcomes with a set of measures of students' prior academic ability, achievements, attitudes toward education, and educational aspirations that are more comprehensive than the standard set of covariates used in most studies on educational attainment. These measures include:

- *Prior academic achievements and ability*: measured by students' cumulative GPA in 12th grade as reported by the school, as well as by students' math scores in the 10th and 12th grade and reading scores in the 10th grade in a series of standardized tests administrated by the data collectors.
- *High school coursework:* measured by three categorical variables indicating the highest level of coursework student attained in three subjects: math, science, and foreign language courses by 12th grade. See Appendix B for a full list of all categories.
- *Composite college entrance exam*: measured by the percentile ranking of students' scores in the SAT or ACT test.
- *Commitment to school:* many educational theories highlight the importance of students' commitment to school in channeling students to different college destinations and subsequent attainment, but measures of commitment are often absent from empirical models. I account for students' school commitment using a composite standardized measurement based on 31 different items that reflect parents', students', and teachers' assessment of the respondent' behavioral commitment to school when they were in the 10th grade.[14]
- *Educational expectations:* educational attainment models attribute a central role to students' educational aspirations and plans. I measure students' planned educational attainment with two indicators: (1) *Students' declared educational plans*, a categorical variable indicating whether or not the student expects to earn a bachelor's degree by the time they are 30 (measured in 12th grade). Since this measurement is upwardly biased by the "college for all" culture, I also measure students' educational plans as a function of (2) *the educational requirements of students' expected occupation*. This variable is based

on students' verbatim occupational plans in the 12th grade, coded and matched with O*Net information regarding the required education for the occupation.
- *Demographic and geographic factors:* including student' gender, race, high school type, and geographic region at 10th grade. Descriptive statistics for all pre-college variables are available in Appendix B.

Analytic strategy

I examine the effect of for-profit colleges on students' degree attainment in several stages: First, I assess the selection process that channels students from different socioeconomic background into different postsecondary destinations. I do so by fitting several logit and multinomial logit models that predict postsecondary destinations as a function of students' socioeconomic status, adjusting for the comprehensive list of pre-college variables discussed above. Building on these results, I estimate the association between institution type and the likelihood of bachelor's degree attainment by fitting a series of logit models that predict BA attainment as a function of student institution, adjusting for all pre-college factors. To assess socioeconomic variation in the association between college type and student outcomes, I fit these models separately for the top- and bottom-SES quartile students, as well as fit a model (to the pooled data) that includes SES quartile by institution type interactions.

Last, I examine the association between students' institution and their outcomes among low-SES students in light of possible unobserved selection into for-profit colleges (relative to non-profit open admission colleges) and assess possible heterogeneity in this effect. I do so by estimating a weighted regression, a method developed from the counterfactual literature on causal inference, which balances the data based on students' propensity to attend for-profit colleges and helps detect heterogeneity in the treatment effect that can be related to unobserved characteristics (see Morgan and Winship 2014, chapter 7).

Results

Socioeconomic differences in access to for-profit colleges

Long-standing socioeconomic differences in college enrollment are evident among this recent cohort of high school sophomores: only 71 percent of students from the bottom of the SES quartile attended any postsecondary institution, compared to 96 percent of students from the top SES quartile (panel A in table 1, "Observed proportion" columns). But even among students who attended postsecondary institution, socioeconomic differences in the type of institutions they attend are large (see panel B in table 1): nearly two-thirds of low-SES students attend a non-profit open admission college, relative to only a quarter of high-SES students. An overwhelming majority (71 percent) of high-SES students, by contrast, attend competitive admission four-year colleges, in comparison to only 28 percent of low-SES students. Yet, the largest socioeconomic differences are found in the likelihood to

attend for-profit colleges: students from the bottom SES quartile are five times more likely than students from the top SES quartile to attend for-profit college (10 vs. 2 percent). Thus, even though a relatively small share of all ELS respondents attended for-profit institutions, these colleges are an important focal point for socioeconomic differences in higher education.

Socioeconomic differences in the observed distributions of students across different postsecondary destinations reflect, in part, socioeconomic differences in academic preparation, attitudes, and educational plans. To what extent do background factors account for socioeconomic differences in college type? To examine this question, I fit a series of logit and multinomial models predicting students' college enrollment, and college type (conditional on college enrollment) as a function of their SES and their pre-college characteristics (see table 2). For each outcome of interest, I estimate an unadjusted model that includes only students' socioeconomic status as the predictor, and a nested fully adjusted model that also includes all the pre-college factors described above. The coefficients for socioeconomic status in the adjusted models capture socioeconomic differences in college destinations that are unrelated to socioeconomic differences in high school achievements, test scores, attitudes, and plans. I assess the contribution of these pre-college factors to socioeconomic inequality in college destinations by calculating the discrete portability changes between the observed proportion of students from each socioeconomic quartile that attend the different college types and their predicted proportion based on the adjusted models in table 2.[15] The difference between the observed and predicted proportions denotes the socioeconomic gap that is explained by these factors. The adjusted proportions are presented in the "Adjusted proportion" columns in table 1.

Socioeconomic differences in prior academic achievements, attitudes, and aspirations account for the majority of differences in the college destinations. The observed share of low-SES students who transition to higher education after high school is 25 percentage points lower than that of high-SES students. This gap decreases by more than half once socioeconomic differences in academic preparation, attitudes, and educational expectations are taken into account (compare the "observed gap" and the "adjusted gap" columns in table 1). Socioeconomic differences in academic preparation, attitudes, and aspirations are even more consequential in sorting the ELS respondents who entered higher education into different college types, and account for 75 of the observed socioeconomic gap in the likelihood to attend for-profit colleges (decreasing from 8 to about 2 percentage points), 77 percent of the gap in the likelihood to enter nonprofit open admission colleges (decreasing from 35 to 8 percentage points), and 79 percent of the observed gap in the likelihood to enter competitive admission colleges (decreasing from 43 to 9 percentage points).

Taken together, these analyses confirm that socioeconomic differences in college attendance, and subsequent choice of college type, especially for-profit colleges, are large and significant. Low-SES students are substantially more likely to attend for-profit colleges than high-SES students. An equally important finding is that the majority of these differences—between 75 and 79 percent—are accounted for by socioeconomic differences in students' academic preparation,

Table 2. Coefficients from logit and multinomial logit models predicting postsecondary destinations. High school sophomores of 2002

Population:	All high school sophomores of 2002		High school sophomores of 2002 that attended any postsecondary institution by 2007			
Postsecondary education destination:		Any college vs. no postsecondary education	Non-profit open admission college vs. for-profit college	Competitive admission college vs. for-profit college	Non-profit open admission college vs. for-profit college	Competitive admission college vs. for-profit college
Model #	(1)	(2)	(3)		(4)	
SES quartile (top SESQ = 0)						
Bottom SESQ	−2.33**	−1.22**	−0.60**	−2.37**	−0.23	−0.85**
	(0.148)	(0.162)	(0.206)	(0.214)	(0.226)	(0.238)
Middle SESQ	−1.62**	−0.90**	−0.48*	−1.55**	−0.23	−0.72**
	(0.141)	(0.148)	(0.190)	(0.186)	(0.197)	(0.200)
Adjustment variables:						
Female		0.16+			0.00	−0.04
		(0.086)			(0.131)	(0.149)
Race (white = 0)						
Hispanic		0.46**			−0.11	−0.40+
		(0.150)			(0.222)	(0.235)
Black		0.66**			−0.08	0.67**
		(0.149)			(0.217)	(0.235)
Asian		0.52*			−0.16	0.11
		(0.210)			(0.263)	(0.271)
Other race		−0.42+			0.18	0.57
		(0.249)			(0.424)	(0.511)

(*Continued*)

Table 2. ***continued***

Population:	All high school sophomores of 2002	High school sophomores of 2002 that attended any postsecondary institution by 2007			
Postsecondary education destination:	Any college vs. no postsecondary education	Non-profit open admission college vs. for-profit college	Competitive admission college vs. for-profit college	Non-profit open admission college vs. for-profit college	Competitive admission college vs. for-profit college
Model #	(1) (2)	(3)		(4)	
Region (Midwest = 0)					
Northeast	0.23 (0.155)			−0.55** (0.198)	0.03 (0.208)
South	−0.42** (0.111)			0.09 (0.182)	−0.05 (0.212)
West	−0.02 (0.150)			−0.15 (0.211)	−0.47+ (0.241)
Urbanicity (suburban = 0)					
Urban	0.06 (0.117)			−0.21 (0.170)	0.00 (0.182)
Rural	0.23+ (0.119)			0.08 (0.173)	0.11 (0.200)
HS type (public = 0):					
Catholic	1.12** (0.285)			0.54* (0.250)	1.12** (0.244)
Private	0.77** (0.296)			0.43 (0.325)	0.13 (0.321)
SAT score (pct)	0.00 (0.004)			−0.00 (0.007)	0.03** (0.007)

Math (10th grade)	−0.00 (0.008)	0.01 (0.010)	0.00 (0.011)
Math (12th grade)	0.01+ (0.007)	0.01 (0.010)	0.01 (0.010)
Reading (10th grade)	0.00 (0.007)	−0.00 (0.011)	−0.00 (0.012)
GPA (12th grade)	0.44** (0.092)	0.30* (0.142)	0.75** (0.162)
Science pipeline (low-level science = 0)			
Chemistry 1 or Physics 1	−0.01 (0.114)	−0.07 (0.176)	0.36+ (0.206)
Chemistry 1 and Physics 1	0.22 (0.207)	0.15 (0.301)	0.65* (0.322)
Chemistry 2 or Physics 2 or advanced bio	0.37 (0.236)	0.22 (0.258)	0.58+ (0.305)
Chemistry and physics and level 7	0.33 (0.342)	0.16 (0.536)	0.74 (0.549)
Missing transcripts	0.46* (0.215)	−0.61* (0.280)	0.50+ (0.300)
Math pipeline (None/Low/Middle academic = 0)			
Middle academic ii	0.26* (0.120)	0.18 (0.197)	0.62** (0.222)
Advanced i	0.44** (0.164)	−0.11 (0.245)	0.50+ (0.271)
Advanced ii/Pre-calculus	0.84** (0.222)	−0.24 (0.291)	0.66* (0.305)

(*Continued*)

Table 2. ***continued***

Population:	All high school sophomores of 2002	High school sophomores of 2002 that attended any postsecondary institution by 2007			
Postsecondary education destination:	Any college vs. no postsecondary education	Non-profit open admission college vs. for-profit college	Competitive admission college vs. for-profit college	Non-profit open admission college vs. for-profit college	Competitive admission college vs. for-profit college
Model #	(1)	(2)	(3)	(4)	
Advanced iii/Calculus	0.60			−0.55	0.45
	(0.365)			(0.461)	(0.462)
Language pipeline (no credit = 0)					
0.5–1 Carnegie unit 9th-grade instruction	0.23+			−0.34+	−0.52*
	(0.135)			(0.203)	(0.266)
0.5–1 Carnegie unit 10th-grade instruction	0.70**			−0.31	−0.14
	(0.117)			(0.191)	(0.233)
0.5–1 Carnegie unit 11th-grade instruction	0.59**			0.07	0.34
	(0.182)			(0.256)	(0.288)
0.5–1 Carnegie unit 12th-grade instruction	0.38			−0.22	0.34
	(0.369)			(0.404)	(0.422)
0.5–1 Carnegie unit AP/IB instruction	0.87**			0.20	0.83+
	(0.337)			(0.447)	(0.478)
12th-grade educational expectations: bachelor's degree	1.14**			0.55**	2.13**
	(0.099)			(0.143)	(0.172)
12th-grade occupational plans (missing = 0)					
College or more	0.50*			0.30	−0.10
	(0.205)			(0.327)	(0.410)

HS or less		0.06 (0.202)			−0.40 (0.324)	−0.95* (0.419)
HS/College		0.04 (0.358)			0.17 (0.469)	−0.14 (0.560)
Don't know		−0.03 (0.200)			0.71* (0.345)	0.28 (0.427)
10th-grade commitment (factor score)		0.10+ (0.060)			0.07 (0.089)	0.16 (0.108)
Constant	3.24** (0.138)	−0.38 (0.366)	2.40** (0.173)	3.37** (0.171)	1.56* (0.660)	−3.09** (0.751)
Observations	9,579	9,579	8,457	8,457	8,457	8,457
Model chi-square	255.6	1,101	396.6	396.6	1,524	1,524
df	2	39	4	4	78	78
Pseudo R-squared	0.0708	0.297	0.0572	0.0572	0.298	0.298

Source: ELS 2002.

Note: Robust standard errors in parentheses. The dependent variable for model 1 is postsecondary attendance by 2007 (logit model). The dependent variable for model 2 is college destinations: for-profit colleges, non-profit open admission colleges, and competitive admission colleges (multinomial logit model). For-profit colleges are the reference category for models 3 and 4.

** $p < 0.01$ * $p < 0.05$ + $p < 0.1$

attitudes, and educational expectations, rather than socioeconomic differences in tastes and preferences. Put differently, it is not clear from these results that low-SES students have a preference for for-profit colleges, net of other factors, as some may have suggested. Instead, pre-college characteristics generate differences in the opportunities available to students when they enter higher education. In the next section, I assess the implications of these different pathways in higher education to student outcomes.

For-profit colleges and bachelor's degree attainment

Students that enroll in different types of institution may encounter social, academic, and organizational circumstances that can impact their outcomes. Table 3 contains information on the characteristics of institutions ELS students attend, including whether the institution is accredited, whether the institution has non-traditional academic calendars, curriculum offerings, number of branches, average investment on instruction per student, share of part-time salary, and average size of student body in the year the student began their studies. While these characteristics are certainly not exhaustive of all potential (or consequential) organizational differences between institutions, they nonetheless provide a snapshot of systematic differences in the environments students encounter at different college types.[16]

Fewer for-profit colleges attended by the ELS cohort were accredited relative to non-profit open admission colleges and competitive admission colleges (90 percent vs. 96 percent and 100 percent). Among accredited colleges, for-profit colleges had, on average, more branches than non-profit colleges (average of 4, with a standard deviation of 9.6, in comparison to an average of 1.2 among non-profit open admission colleges and to 1.4 at competitive admission colleges), reflecting the geographic flexibility that for-profit colleges provide to their students. Accredited for-profit colleges were also more likely to offer their students scheduling flexibility, with 51 percent of for-profit colleges offering non-traditional academic calendars compared to only 1 percent of non-profit open admission and none among competitive admission colleges. Accredited for-profit colleges offer, on average, a more focused set of programs relative to non-profit open admission colleges, at least as measured by the availability of occupational and academic program. Only 36 percent of for-profit colleges offer both academic and occupational programs, relative to 90 percent of non-profit open admission colleges. Yet, only 17 percent of competitive admission colleges offer both academic and occupational programs. Accredited for-profit colleges ELS members attended were also smaller, on average, than the average non-profit open admission colleges (though the large standard deviation suggests there is more heterogeneity in size of colleges in the for-profit sector than among non-profit colleges), have a higher share of part-time faculty relative to open admission colleges (but not competitive admission colleges), and the average investment on instruction per student is slightly higher than that of non-profit open admission colleges, but substantially lower than that at competitive admission non-profit colleges.

How consequential are the differences in organizational and academic environments to student outcomes? To examine this question, I fit a series of logit

Table 3. Selected characteristics of colleges ELS students attended, by type of institution

	For-profit colleges		Non-profit open admission colleges		Competitive admission colleges	
	Mean	SD	Mean	SD	Mean	SD
Institutional accreditation	0.9		0.96		1.00	
Characteristics of accredited institution						
Number of branches	4.07	9.63	1.20	1.78	1.39	1.97
At least one occupational training program	0.72		0.92		0.17	
At least one academic program	0.65		0.98		1.00	
Both occupational and academic programs	0.36		0.90		0.17	
Non-traditional academic calendars	0.51		0.01		0.00	
Prop. part-time faculty	0.64	0.31	0.46	0.26	0.74	0.18
Institutional investment on instruction (per-student)	2,606.87	2,266.07	1,941.59	3,047.47	6,363.42	5,250.96
Student enrollment	4,095.89	18,956.94	7,985.82	7,216.15	11,953.13	9,341.63

Source: IPEDS and ELS 2002:2012.
Note: Information on college characteristics is available only for accredited institutions.

models that predict students' likelihood of attaining a bachelor's degree by 2012 as a function of the first college they attended, while adjusting for the same comprehensive list of pre-college factors that, as tables 1 and 2 show, captures a substantial share of class-based differences in the type of college students attend. For-profit colleges are set as the reference category in these models, which allows for a direct comparison between the effect of for-profit colleges and other college types. I account for socioeconomic-based variation in the effect of for-profit colleges on degree attainment by, first, fitting the models separately for students from each SES quartile and, second, fitting to the pooled sample a model that includes interactions of SES quartile by institution type.[17] The coefficients from these models, presented in log odds form, are reported in table 4.

The results in table 4 reveal systematic variation in the impact of open admission colleges on student outcomes: low-SES students that attend for-profit colleges are significantly less likely to earn a bachelor's degree than observationally similar low-SES students that attend community colleges and other non-profit open admission colleges (see models 1 and 2, table 4). Similar, though less extreme, patterns are evident among middle-SES students (models 3 and 4, table 4). The story is quite different for high school sophomores from the top SES quartile that attended open admission colleges (models 5 and 6, table 4). For these students, the coefficient for non-profit open admission colleges is negative with a large standard error, suggesting that for these students, there are no significant differences in the likelihood of attaining a bachelor's degree by the type of open admission college they attend. The results from models 7 and 8 are consistent with this interpretation: the interaction terms for "bottom SES" and institution types in these models are large, and large relative to their standard errors, reflecting class-based differences in the impact of institution type on student outcomes. In all models, and consistent with previous research (e.g., Alon and Tienda 2005), students that attend competitive admission colleges are more likely than observationally similar students that attend open admission colleges to earn a bachelor's degree, and this effect is stronger for low-SES students than for high-SES students.

The asymmetrical effects of institution type by SES quartile are easily visible in figures 2a and 2b, which graph the adjusted predicted degree attainment rates for students from each SES quartile by the type of institution they attend.[18] The predicted bachelor's degree attainment rates in figure 2a are standardized to reflect the high school academic achievements, test scores, attitudes and expectations of the average tenth grader in 2002. The predictions in figure 2b are standardized to reflect the characteristics of the average high school sophomore that attended a for-profit college as their first institution.

Under both standardizations, the negative effect of for-profit colleges on the degree attainment rates of low-SES student is remarkable. The predicted degree attainment rates of low-SES students that attended non-profit open admission college, and have the pre-college characteristics of the average tenth grader in 2002, is more than twice that of *observationally similar* low-SES students that attended a for-profit college: 19 vs. 7 percent (figure 2a). These differences are even stronger when the predictions are standardized to the characteristics of the average high school sophomore that attended for-profit colleges (figure 2b): the

Table 4. Coefficients from a logit model predicting bachelor's degree attainment by 2012. High school sophomores in 2002 who entered higher education by 2007

Population:	Bottom SES quartile		Middle SES quartile		Top SES quartile		All	
Mode specification:	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Model #:	1	2	3	4	5	6	7	8
College type (for-profit college = 0)								
Non-profit open admission colleges	1.62** (0.501)	1.32** (0.512)	1.01** (0.232)	0.53* (0.244)	−0.34 (0.373)	−0.51 (0.409)	−0.34 (0.373)	−0.40 (0.395)
Competitive admission colleges	3.63** (0.488)	2.36** (0.500)	2.70** (0.234)	1.34** (0.250)	1.55** (0.376)	0.43 (0.417)	1.55** (0.376)	0.49 (0.393)
SES quartile (Top SESQ = 0)								
Bottom SES quartile							−3.13** (0.607)	−2.46** (0.631)
Middle SES quartiles							−1.93** (0.433)	−1.37** (0.453)
College type*SESQ interactions:								
Non-profit open admission colleges*bottom SESQ							1.97** (0.627)	1.67* (0.654)
Non-profit open admission colleges*middle SESQ							1.35** (0.439)	0.93* (0.463)
Competitive admission colleges*bottom SESQ							2.08** (0.628)	1.91** (0.646)
Competitive admission colleges*middle SESQ							1.15** (0.447)	0.86+ (0.466)

(*Continued*)

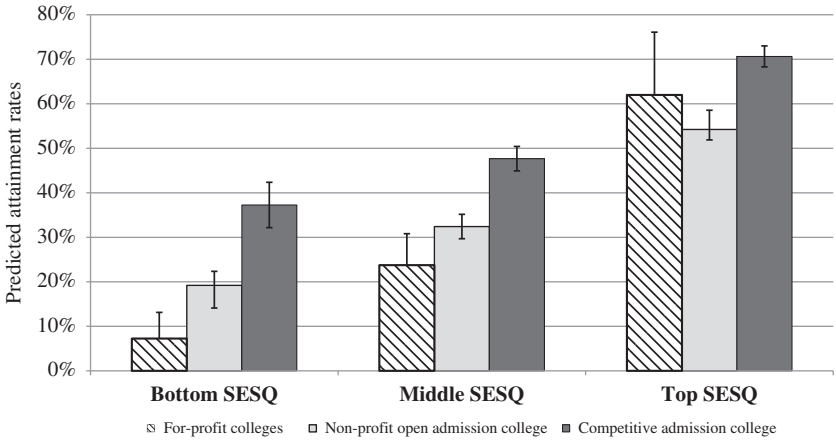
Table 4. ***continued***

Population:	Bottom SES quartile		Middle SES quartile		Top SES quartile		All	
Mode specification:	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Model #:	1	2	3	4	5	6	7	8
Constant	−3.34**	−5.28**	−2.33**	−5.55**	−0.51	−3.84**	−0.37	−3.90**
	−0.502	−0.97	(0.237)	(0.541)	−0.38	−0.729	(0.368)	(0.545)
Observations	1,355	1,355	3,970	3,970	3,132	3,132	8,457	8,457
Model chi-square	202.7	352.8	367.8	740.4	247.9	460.7	1,113	1,679
df	3	28	3	28	3	28	9	34
Log Likelihood2	−247,582	−211,356	−735,153	−632,603	−405,879	−357,717	−1,389,000	−1,214,000
Pseudo R-squared	0.176	0.296	0.138	0.258	0.128	0.232	0.199	0.300

Source: ELS 2002.

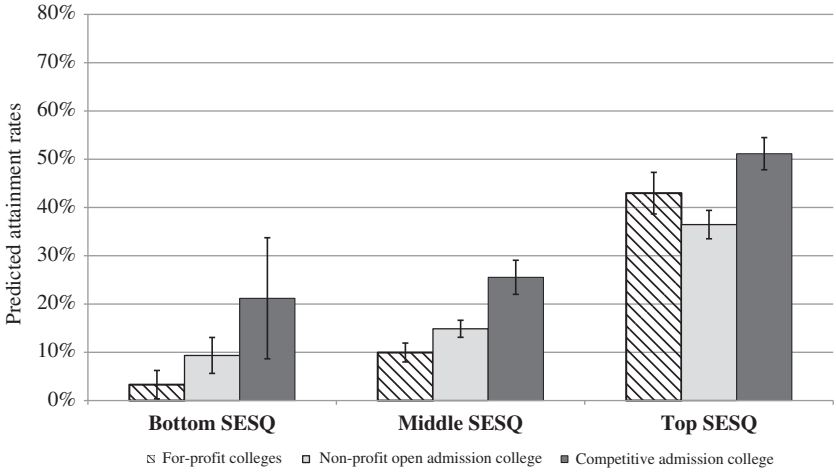
Note: Data are weighted. Robust standard errors in parentheses. The "adjusted" models control for prior academic achievements and ability, composite college entrance exam, commitment to school at 12th grade, educational expectations and occupational plans, and demographic and geographic factors. These variables are described in the method section. All models adjust for students' gender.

Figure 2a. Predicted bachelor's degree attainment rates (adjusted the for pre-college charecteristics of the average high school sophomore in 2002), by students' first postsecondary institution and SES quartile



Source: ELS 2002.
Note: The bars denote the 95 percent confidence intervals for the predicted probabilities.

Figure 2b. Predicted bachelor's degree attainment rates (adjusted for pre-college characteristics of the average for-profit student), by students' first postsecondary institution and SES quartile



Source: ELS 2002.
Note: The bars denote the 95 percent confidence intervals for the predicted probabilities.

bachelor's degree attainment rates of low-SES students that attended a non-profit open admission college are three times higher than those of *observationally similar* low-SES students that attended a for-profit college among these students. The degree attainment rates of high SES students, in contrast, are quite

similar at for-profit colleges and non-profit open admission colleges under both standardizations. Sensitivity analyses suggest that these findings are robust across model specifications and measurements of socioeconomic status. The results are virtually identical in models that limit the sample to students that attended open admission institutions (i.e., for-profit colleges and non-profit open admission colleges), models that account for the highest level of degree offered in the institution, and models that account for family income and parents' education instead of the composite measurement of socioeconomic status (results are available from the author).

These results point to two notable conclusions: first, the educational outcomes of low-SES students are much more susceptible to the influence of the academic environment of their first institution than more advantaged students. Second, there are consequential differences in how different types of open admission institutions influence the educational outcomes of low-SES students. These differences are often overlooked in studies that lump together open admission colleges.

Unobserved selection and heterogeneity in the effect of for-profit colleges

The low degree attainment rates of low-SES students at for-profit colleges relative to non-profit open admission colleges reported in figures 2a and 2b may capture the impact of the unique academic and social environment at for-profit colleges that is especially unfavorable to bottom-SES students (see Xie, Brand, and Jann [2012]). Alternatively, the negative effect of for-profit colleges could also result from unobserved selection patterns, where low-SES students enter for-profit colleges based on unobserved factors that are related to their outcomes. In this section, I examine the evidence for such patterns within the subpopulation of low-SES students, considering both the possibilities for positive and negative selection. In this context, positive selection among low-SES students would be present if the students who are most likely to enter for-profit colleges are those who would benefit the most from doing so. Negative selection among low-SES students would be the opposite pattern, where those low-SES students who are most likely to enter for-profit institutions are also those most likely to suffer a greater penalty for attending for-profit colleges. If evidence of negative selection exists among low-SES students who enter for-profit colleges, then it can be responsible for apparent, but not necessarily real, lower degree attainment of low-SES students at for-profit institutions in comparison to low-SES students at other institutions, especially non-profit open admission colleges.

I assess this possibility by estimating a weighted regression, which examines heterogeneity in the "treatment" effect of attending a for-profit college on the likelihood of attaining a bachelor's degree among low-SES students (see Morgan and Winship [2014], chapter 7, for an introduction).[19] This technique offers a robust and straightforward way to estimate the average treatment effect for the treated across the full sample or, in this case, within the subpopulation of low-SES students. The logic is to compare the average effect among low-SES students whose measured characteristics match those that enter for-profit institutions (the

"ATT" for average treatment effect for the treated) and the average effect among low-SES students whose measured characteristics match those who do enter for-profit institutions (the "ATC" for average treatment effect for the controls). Differences between estimates of the ATT and ATC may then indicate heterogeneity in the treatment effect that is related to students' unobserved propensity to enter the treatment: negative selection would be present if the estimated ATT is more negative than the estimated ATC, since it will suggest that those who are most likely to attend for-profit colleges are those who are most likely to be harmed by having done so. The differences emerge because, net of the variables we observe, low-SES students who attend for-profit colleges differ in their unobservable characteristics.

The weighted regression technique is especially useful for assessing heterogeneity in the effect of for-profit colleges in light of observed (and likely unobserved) differences in the composition of the sample of low-SES students that attend for-profit colleges and those that attend non-profit open admission colleges. Low-SES high school sophomores that attend for-profit colleges have lower test scores, academic achievements, and commitment scores than low-SES students that attend non-profit open admission colleges (24th vs. 30th percentile for college entrance exam, −11 vs. −9 in 10th-grade math, −13 vs. −10 for 12th-grade math, and −8 vs. −6 in 10th-grade reading scores; see Appendix B for the distribution of these scores among high school sophomores in 2002). It is possible that low-SES students that attend for-profit colleges also differ in other unobserved characteristics, like social and cultural capital, that are consequential for degree attainment and are responsible for the negative effects reported in table 4. The ATT and ATC weights balance these observed differences and allow differences in unobservable characteristics that are associated with bachelor's degree attainment at for-profit colleges to emerge.[20,21]

The results from the weighted regression, presented in table 5, imply that the negative effect of for-profit colleges on the likelihood of low-SES students to earn a bachelor's degree is not driven by negative selection. Under both the ATT and ATC weights, for-profit colleges have a negative effect on the likelihood of low-SES students to earn a bachelor's degree (relative to non-profit open admission colleges) and the effect is similar in magnitude, and even slightly larger when the ATC weights are applied (−1.46 for the ATT vs. −1.55 for the ATC), indicating the possibility of positive selection. A corollary is that negative selection, whether it is based on observable or unobservable characteristics, is not likely to account for the negative effect of attending for-profit colleges on low-SES students' likelihood of earning a BA relative to other non-selective institutions. If anything, the negative effect of for-profit colleges reported in figures 2a and 2b may be slightly attenuated by patterns of positive selection to for-profit colleges among students from the bottom SES quartile.

Together, the results provide compelling evidence that for-profit colleges negatively impact the likelihood of students from the bottom SES quartile to earn a bachelor's degree relative to non-profit open admission colleges. Although the possibility of negative selection based on unobserved characteristics cannot be ruled out using non-experimental data, it seems unlikely given the comprehensiveness and

Table 5. Coefficients for for-profit colleges vs. non-profit open admission colleges from a weighted regression predicting bachelor's degree attainment. High school sophomores in 2002 from the bottom SES quartile that attended open admission colleges

	Coefficient for for-profit colleges	(se)
Average treatment effect of for-profit colleges for the treated (ATT)		
Estimated on students who are observationally similar to students who attend for-profit colleges		
Model 1: College type only	−1.12*	(0.512)
Model 2: Model 1+ pre-college factors	−1.46**	(0.485)
Average treatment effect of for-profit colleges for the control (ATC)		
Estimated on students who are observationally similar to students who attend non-profit open admission colleges		
Model 1: College type only	−1.47**	(0.517)
Model 2: Model 1+ pre-college factors	−1.55**	(0.422)

Source: ELS 2002.
Note: See main text for further explanation on the weights. The reference category is non-profit open admission colleges. Robust standard errors in parentheses.
** $p < 0.01$ * $p < 0.05$ + $p < 0.1$

richness of the measurements (e.g., the commitment measurement based on 31 different indicators). Moreover, unobserved characteristics like motivation, cultural capital, or intelligence, which are not included in the model, are likely correlated with students' attitudes toward high school, measured ability, coursework, educational plans, and other social or academic factors and therefore are unlikely to meaningfully conflict with the results reported here. Nonetheless, cautious interpretation of the results is warranted. Although the set of pre-college factors in the models accounts for a substantial share of socioeconomic differences in the type of institutions students attend, the treatment assignment process was not perfectly modeled, and therefore the ATT and ATC effects should be interpreted as only indicative of underlying patterns in the data rather than fully identified causal effects.

Discussion and Conclusions

For-profit colleges are a viable and increasingly more common option for students who aspire for upward mobility through higher education but are lacking the academic credentials to secure a position at competitive admission colleges. Many of these students are from a disadvantaged background and rely on student loans and Pell Grants to fund their education. Understanding whether and how for-profit colleges impact the outcomes of students from different social

backgrounds is important for both policymakers that need to assess public investment in higher education, and for social scientists that study social mobility and inequality.

This study has identified an important and, I argue, extremely consequential source of socioeconomic inequality in higher education. I find that among a recent cohort of high school students, low-SES students were more likely than their affluent counterparts to enter for-profit colleges relative to any other type of institution. Once enrolled, low-SES students at for-profit colleges were significantly less likely than observationally similar students that attended non-profit colleges to earn a bachelor's degree eight years after high school. Similar patterns, though slightly weaker, are found among middle-SES students. Students from the top SES quartile, in contrast, suffered no penalty in their likelihood of attaining a degree at for-profit colleges. These results, which are robust across different model specifications and measures of family background, indicate that at least in the case of US higher education, for-profit educational institutions contribute to a growing type of inequality —one in which the students with the least amount of resources are paying more for their education but are increasingly less likely to reap the benefits of their investment. Since the attainment of a bachelor's degree is key for the social mobility of low-SES students (e.g., Torche 2011), for-profit colleges are contributing to the intergenerational transmission of disadvantage.

An important theoretical implication of these results is that for-profit colleges emerge as a distinct and important category of institutions in higher education that differs systematically from non-profit open admission colleges in the environment they provide to students, their organizational structure, their strategies, and how they consequently shape their students' outcomes. It follows that focusing on the comparison between community colleges and competitive admission colleges, or no college, tells only a part of the story of how disadvantage is generated and maintained in the social structure. This variation is important also for evaluating the returns to degrees earned at different postsecondary destinations: the negative effect of for-profit colleges on students' outcomes implies that the selection into degrees is not constant across institution types, which will upwardly bias the estimations for degrees earned by students that attended for-profit colleges. Future research should take note of this variation and estimate the returns to degrees alongside the likelihood of observationally similar students to graduate at different college types.

The most important question that arises from these findings is *why* for-profit colleges have their deleterious effects on the likelihood of earning a bachelor's degree for low-SES students, in particular. More research and data is needed to fully assess this question, but the results of this study imply that one promising direction for future research is to focus on the organizational structure of for-profit colleges. Colleges are organizational actors that respond to changes in their technical, legal, and normative environments in ways that impact student experience. The heterogeneity in organizational characteristics within the for-profit sector (e.g., Deming, Goldin, and Katz 2012) suggests that the response to market changes has not been uniform. Future research can exploit this variation in organizational characteristics to identify characteristics that are consequential

for student-level outcomes. This type of research can also help identify whether the socioeconomic differences in the effect of for-profit colleges are caused by differences in the type of for-profit colleges that low- and high-SES students attend, or by differences in vulnerability to organizational environments. One potential source for the effect of for-profit colleges on low-income students may be that the flexibility for-profit colleges allow their students, which is appealing to low-SES students, acts as a double-edged sword because it does not provide the individualized guidance and support that are especially beneficial for the academic success of low-SES students, and may prevent them from establishing social ties that can provide them social support, identity, and guidance throughout their studies (Calcagno et al. 2008; Holland and DeLuca 2016; Plank and Jordan 2001; Tinto 1987).

Another possibility is that some for-profit colleges actively direct students to shorter programs as a way to balance between profit-maximization and external regulatory pressures. The low graduation rates at for-profit colleges are often cited as a reason to increase regulation on the sector (e.g., US Senate HELP Committee 2012). To avoid scrutiny, for-profit colleges may capitalize on the rising aspirations of low-SES students to earn a bachelor's degree to attract students. Yet, once enrolled, they may attempt to increase retention by shifting students to shorter-length programs that lead to associate degrees and certificates. Indeed, many students at for-profit colleges begin their education in four-year programs, but later obtain associate or certificate degrees (Cellini and Chaudhary 2014). At the same time, low-SES students may be discouraged by the cost of their education from pursuing a bachelor's degree, and prefer to opt out to shorter programs that provide associate degrees or certificates (Heller 1997). By contrast, many community colleges embrace a role of "stepping stone" and structure their programs to ease the transition to baccalaureate programs. Four-year institutions may be more likely to accept credits from community colleges, or perhaps even reserve spots for graduates of the local community colleges (conditional on meeting academic requirements).

Unpacking these, and possibly many other, sources of institutional effects on degree attainment is critical to designing effective higher education policy and "leveling the playing field" for disadvantaged students.

Notes

1. See figure 1b. Enrollment figures are based on 12-month unduplicated headcount enrollment reports in all accredited US postsecondary institutions collected by the US Department of Education.
2. Although there are non-profit open admission four-year institutions, they account for only a small fraction of non-profit open admission institutions in US higher education.
3. Notably, two of these large corporations were recently shut down by the federal government due to evidence of fraud and other regulatory violations.
4. To avoid censoring due to timing of transition to higher education, the analytic sample includes only students who graduated high school by 2004. The sample weights adjust for this restriction and allow projections for the entire population of students

who were in the 10th grade in 2002. In sensitivity analyses I estimated the models without this exclusion, and the results were nearly identical.

5. These weights use the 10th grade and last follow-up panel weight developed by the data distributors, multiplied sequentially by two estimated inverse probabilities (from two logit models) that account for non-participation in all four waves of the survey, and non-response on the two dependent variables (type of first college and type of degree attained). These logit models predict inclusion in the relevant samples with demographic characteristics, family background, and base-year indicators of academic engagement.
6. Only four respondents began their postsecondary education after 2007 and attained a BA by 2012. Since these cases are exceptional, they were omitted from the sample.
7. Limiting the sample to students who transitioned immediately to higher education can bias the estimates for low-SES students, who are more likely to enter higher education later.
8. Only one of the 291 for-profit colleges attended by the ELS members was ranked by the 2004 Barron's classification as "competitive," and an additional 12 colleges were classified as "less competitive." Twenty-four sample members attended these colleges, accounting for less than 5 percent of the weighted sample of students that attended for-profit colleges ($N = 520$). In sensitivity analyses, I excluded these students, and obtained identical results.
9. These institutions are rated as "inclusive" in the Barron's classification or are listed as having "open admission policies" in the IPEDS data. For further discussion on these broad access institutions, their prominence in contemporary higher education, and alternative institutional categorizations, see Kirst, Stevens, and Proctor (2010).
10. The highest level of degree offering at for-profit colleges is relatively fluid (Cellini and Chaudhary 2014; Kinser 2006). Between 2000 and 2010, many for-profit colleges began offering four-year degree programs as a strategy to attract students, often without meaningful change in their operation. I therefore classify colleges by their control and admission policies. For reference, 30 percent of students that attended accredited for-profit colleges in the ELS data were enrolled in a college that offered (at least in 2005) bachelor's degree programs, relative to only 12 percent of students that attended non-profit open admission colleges.
11. Two sensitivity analyses for this classification yielded very similar results: In the first, I use a more detailed classification that distinguishes between "competitive colleges" and "more competitive schools." In the second, I included only students that attended open admission institutions.
12. A total of 246 ELS respondents who attended four-year institutions that are not rated in Barron's Index or by the NCES were omitted from the sample. The sample weights adjust for this omission.
13. The quartiles are calculated for the entire sample of 15,400 tenth graders. Due to unequal attrition patterns, the size of the quartiles is not equal in the analytic sample.
14. See Appendix A for the full list of items.
15. Assessing discrete changes in predicted probabilities is preferable to direct comparison of coefficients from the logit and multinomial logit models, which are subjected to the problem of rescaling (e.g., Breen, Karlson, and Holm 2013).
16. Information is based on the IPEDS, and is only available for accredited institutions.
17. The pooled models restrict the effect of pre-college factors to be equal for students from different socioeconomic background. The results from the separate models and the pooled models are similar, suggesting that this restriction does not mask underlying patterns in the data.

18. Predictions are based on model 8 in table 4.
19. In analyses not shown here, I use other parametric and non-parametric methods suggested by Xie, Brand, and Jann (2012), with very similar results.
20. The ATT weights effectively create a representative sample of low-SES students at non-profit open admission colleges who are observationally similar to low-SES students at for-profit colleges. The ATC weights create a representative sample of low-SES students at for-profit colleges that are observationally similar to low-SES students who attend community colleges.
21. I estimate weighted regression in three iterative steps: first, I fit a comprehensive logit model predicting the likelihoods of bottom SES students to attend a for-profit college. Next, I use the propensity scores from this model to construct the ATT and ATC weights. Last, once sufficient balance in the samples is achieved, I fit logit models predicting students' likelihoods to obtain a bachelor's degree as a function of their college type with the ATT and ATC weights. These models also include all the pre-college adjustment variables to account for remaining imbalance in the samples. I evaluate the balance in the sample with a diagnostic routine developed by Morgan and Todd (2008). The balance of the samples of for-profit colleges and community college students significantly improved with the ATT and ATC weights: the average of standardized mean difference decreased from 0.1496 to 0.0108 and 0.0416, respectively.

Appendix

Appendix A. Indicators of commitment to school in 10th grade

Teacher reports of commitment (inter-item scale reliability of 0.77)
Does this student usually work hard for good grades in your class? (English teacher)
Does this student usually work hard for good grades in your class? (math teacher)
How often does this student complete homework assignments for your class? (English teacher)
How often does this student complete homework assignments for your class? (math teacher)
How often is this student attentive in class? (English teacher)
How often is this student attentive in class? (math teacher)
Has this student fallen behind in school work? (English teacher)
Has this student fallen behind in school work? (math teacher)
How often is this student absent from your class? (English teacher)
How often is this student absent from your class? (math teacher)
How often is this student tardy to your class? (English teacher)
How often is this student tardy to your class? (math teacher)
Student reports of commitment (inter-item scale reliability 0.70)
How many times did the following things happen to you in the first semester or term of this school year?
I was late for school.
I cut or skipped class.
I got in trouble for not following school rules.
I was transferred to another school for disciplinary reasons.
How often do you spend time on the following activities outside of school?
Visiting friends at a hangout
Driving or riding around
How much do you like school?
How often do you come to class without these things?
Pencil/pen or paper
Books
Homework done
How many times did the following things happen to you in the first semester or term of this school year?
I was absent from school.
I was put on in-school suspension.
I was suspended or put on probation.
Parent reports of commitment (inter-item scale reliability 0.79)

(*Continued*)

Appendix A. ***continued***

Has your tenth grader ever been considered to have a behavior problem at school?
Since your tenth grader's school opened last fall, how many times have you or your spouse/partner contacted the school about the following?
Your tenth grader's problem behavior in school
Your tenth grader's poor attendance record at school
Your tenth grader's poor performance in school
Since your tenth grader's school opened last fall, how many times have you or your spouse/partner been contacted by the school about the following?
Your tenth grader's problem behavior in school
Your tenth grader's poor attendance record at school
Your tenth grader's poor performance in school

Source: ELS 2002.

Appendix B. Descriptive statistics and definitions of adjustment variables

Variable name	Description	Mean	St. deviation
Prior academic achievements and ability			
Math score at 10th grade (standardized)	Based on standardized test administrated by the ELS	0.097	0.983
Math score in 12th grade (standardized)	Based on standardized test administrated by the ELS	0.093	0.994
Reading score in 10th grade (standardized)	Based on standardized test administrated by the ELS	0.094	0.977
GPA at 12th grade	Cumulative GPA score reported by the school	2.789	0.787
High school coursework	Based on the NCES coding schema developed by Burkam and Lee (2003)		
Science pipeline:	The highest courses student took in science		
Low-level science		0.257	
Chemistry 1 or Physics 1		0.304	
Chemistry 1 and Physics 1		0.181	
Chemistry 2 or Physics 2 or advanced biology		0.101	
Chemistry and physics and level 7		0.099	
Missing transcripts	If student did not participate in the HS transcript study	0.058	
Math pipeline:	The highest courses student took in math		
None/Low/Middle academic		0.187	
Middle academic ii		0.224	
Advanced i		0.175	
Advanced ii/Pre-calculus		0.190	
Advanced iii/Calculus		0.167	
Missing transcripts	If student did not participate in the HS transcript study	0.058	

(*Continued*)

Appendix B. ***continued***

Variable name	Description	Mean	St. deviation
Foreign language pipeline:	The highest courses student took in foreign language		
No credit		0.156	
0.5–1 Carnegie unit 9th-grade instruction		0.102	
0.5–1 Carnegie unit 10th-grade instruction		0.318	
0.5–1 Carnegie unit 11th-grade instruction		0.188	
0.5–1 Carnegie unit 12th-grade instruction		0.105	
0.5–1 Carnegie unit AP/IB instruction		0.073	
Missing transcript	If student did not participate in the HS transcript study	0.058	
Composite college entrance exam			
Standardized test scores (in percentiles)	SAT and ACT scores converted to percentile scales	45.554	28.847
Commitment to school at 12th grade			
Commitment factor	A factor score based on 32 questions reported by students, teachers, and parents regarding students' behavioral commitment to school	0.153	0.871
Educational expectations and occupational plans			
Expect to earn a bachelor's degree or more	Based on the response to the prompt "As things stand now, how far in school do you think you will get?"	0.77	
Educational requirements of expected occupations	Based on students' verbatim responses to the question "Write the name of the job or occupation that you expect or plan to have at the age of 30" that were matched with ONET information regarding the educational requirements of the expected occupation		
College or more	Expected occupation requires a college degree or more	0.524	
High school or less	Expected occupation requires high school diploma or less	0.143	

High school/College	Expected occupation may require either high school or college degree	0.021
Don't know	If respondent didn't know what occupation they plan to have at the age of 30	0.280
Missing	If respondent did not answer the question	0.031
Demographic and geographic factors:		
Gender:		
Women		0.524
Race		
Hispanic		0.134
Black	Non-Hispanic black	0.144
White	Non-Hispanic white	0.641
Asian	Non-Hispanic Asian	0.054
Other race	Non-Hispanic Native American and other races	0.027
Geographic region in 10th grade	Geographic region of school in 10th grade	
West		0.219
South		0.343
Northeast		0.186
Midwest		0.253
High school type (private=0)	If student attended a public high school	0.915

Source: ELS 2002.

About the Author

Dafna Gelbgiser is an Assistant Professor at the Department of Labor Studies at Tel Aviv University. She studies the sources and patterns of inequality in education and labor market outcomes by race, immigrant status, gender, and social class background. Her recent work examines how variations in organizational forms and practices impact patterns of inequality in US higher education. Prior to joining Tel Aviv University, she was a Research Scientist at Facebook.

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