KEY POINTS

- The overall level of educational attainment in the United States has stagnated for the past three decades. The relatively modest gains that have been made are concentrated among students in the top two income quartiles. Bachelor's degree attainment in the bottom quartiles has remained flat.
- Substantial gaps in graduation rates persist even when controlling for students' academic preparation and demographic characteristics. The bottom line is that with very few exceptions, disparities in educational attainment by socioeconomic status in American public higher education are pervasive and cannot be explained away by differences in academic preparation.
- Dropping off the path from matriculation to graduation doesn't occur just early in the process, or even in the first two years. More than 40% of withdrawals occur among students who have already completed their first two years of college.
- Attending a more selective college or university is associated with higher average educational attainment rates regardless of race and even after controlling for the students' academic qualifications.
- Unlike students in the bottom and second income quartile, for students in the third and highest quartiles there is essentially no relationship between net price and graduation rates in either four or six years.

Improving Educational Attainment: Recent Trends and Challenges

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A large majority of full-time students pursuing bachelor's degrees at four-year colleges and universities in the United States attend public universities. The struggle, therefore, to improve educational attainment and reduce the marked disparities in outcomes that lead to greater inequalities of all kinds will take place mainly within our nation's public universities. Matthew Chingos, research associate at the Andrew W. Mellon Foundation and Brookings Institution fellow, and Michael McPherson, president of the Spencer Foundation, discuss the findings in their book, *Crossing the Finish Line: Completing College at America's Public Universities*, written with William Bowen, president emeritus of the Andrew W. Mellon Foundation and Princeton University. The authors built and analyzed massive databases gathered from 21 prestigious flagship universities across the country and essentially all the public universities in the four state systems of Maryland, North Carolina, Ohio and Virginia. Their aim was to search for clues about how to make America's colleges and universities more successful in moving entering students on to graduation. Not surprisingly, no "silver bullets" revealed themselves throughout the course of the authors' work; nevertheless, their findings point toward important steps that colleges and universities, state governments, and the federal government can take to improve college outcomes, particularly for disadvantaged students.[1]

We began by collecting data on the approximately 125,000 members of the 1999 entering cohort at the 21 prestigious, research-intensive flagship universities listed in Table 1.

These 21 institutions were chosen to achieve both geographic diversity and a mix of other characteristics, including differences in racial composition and in degree of

[1] This summary is based on the authors' remarks at the Forum's 2010 Aspen Symposium and on their book written with William Bowen, *Crossing the Finish Line: Completing College at America's Public Universities* (Princeton University Press, 2009). Tables and figures (other than Figure 5) are reprinted by permission of Princeton University Press. Figure 5 is reprinted by permission of *The New York Times*.

Table 1.

Flagship Universities by Selectivity Cluster

SEL I
University of California–Berkeley
University of California–Los Angeles (UCLA)
University of Maryland–College Park
University of Michigan
University of North Carolina–Chapel Hill
University of Virginia

SEL II
Pennsylvania State University
Rutgers, The State University of New Jersey
University of Florida
University of Illinois at Urbana–Champaign
University of Texas–Austin
University of Washington
University of Wisconsin–Madison

SEL III
Iowa State University
Ohio State University
Purdue University
Stony Brook University
University of Iowa
University of Minnesota–Twin Cities
University of Nebraska–Lincoln
University of Oregon

Table 2.

State System Universities by Selectivity Cluster or HBCU Status

Maryland
SEL A
University of Maryland–Baltimore County
SEL B
Frostburg State University
Salisbury University
Towson University
HBCU
Bowie State University
Coppin State University
University of Maryland–Eastern Shore

Ohio
SEL A
Miami University
SEL B
Bowling Green State University
Cleveland State University
Kent State University
Ohio University
Shawnee State University
University of Akron
University of Cincinnati
University of Toledo
Wright State University
Youngstown State University
HBCU
Central State University

North Carolina
SEL A
North Carolina State University
University of North Carolina–Asheville
SEL B
Appalachian State University
East Carolina University
University of North Carolina–Charlotte
University of North Carolina–Greensboro
University of North Carolina–Pembroke
University of North Carolina–Wilmington
Western Carolina University
HBCU
Elizabeth City State University
Fayetteville State University
North Carolina A&T University
North Carolina Central University
Winston–Salem State University

Virginia
SEL A
College of William and Mary
James Madison University
University of Mary Washington
Virginia Tech
SEL B
Christopher Newport University
George Mason University
Longwood University
Old Dominion University
Radford University
University of Virginia's College at Wise
Virginia Commonwealth University
Virginia Military Institute
HBCU
Norfolk State University
Virginia State University

selectivity, as approximated by the average SAT/ACT of enrolled students.

We also gathered data on the 1999 entering cohorts at essentially all public universities in the four state systems of Maryland, North Carolina, Ohio and Virginia, as listed in Table 2. These 47 additional institutions differ from the flagships mainly in terms of their enrollment (4,100 first-time, full-time freshmen on average at the flagships compared to 1,400 at the state system level) and their average SAT/ACT scores, which were 170 points higher at the flagships. Importantly, the systems group included nearly a dozen historically black colleges and universities (HBCUs).

As is evident from the tables, the universities in the study are divided into selectivity clusters—not to endorse the "rankings game," which we regard as foolish and hurtful to students trying to find the best fit between their capabilities and interests and the characteristics of institutions to which they may choose to apply—but rather, because the use of such clusters allows us to study the strong relationship between selectivity per se and outcomes such as graduation rates and time to degree.

The massiveness of the database is such that it includes nearly a quarter of *all* full-time freshmen at all four-year public universities and roughly 15% of full-time students at all public and private four-year colleges and universities in the country. Further, while the institutions included in the database reflect a thoughtful, but not scientifically-based sampling effort, it is important to note that the key characteristics of the subset of the state system institutions that we call SEL B (the second level of selectivity) closely resemble those of the rest of American higher education, and therefore are representative on a broad scale.

Twin Problems

The motivating idea behind the study is two-fold: First, the overall level of educational attainment in the United States has stagnated for the past three decades. Second, the relatively modest gains that have been made are concentrated among students from the top income quartile, along with somewhat less growth among those in the top half of income distribution. Meanwhile, the bachelor's degree attainment rate of the other socioeconomic groups has remained flat.

Stark disparities in educational attainment exist in relation to both socioeconomic status (SES) and levels of parental education. Figure 1 breaks down college graduation rates by both family income and parents' education, using data from a nationally representative dataset assembled by the U.S. Department of Education.

This figure tracks all students who were in eighth grade in

1988 and indicates whether they had earned a bachelor's degree by the time they turned 26 years old. Completion rates range from 9% for students in the bottom income quartile and whose parents did not graduate from college, to 68% for students in the top income quartile who have at least one parent who graduated from college. That is, students in the latter group were more than *seven times* more likely to graduate from college than the first-generation college goers in the bottom income quartile.

Differences in pre-college preparation clearly play a sizeable role in explaining differences in college outcomes by SES, but they do not explain all, or even most, of the graduation gap. *When we control for students' test scores in math and reading, the differences are not as large, but substantial gaps in graduation rates persist.*

We consider these overall stagnating completion rates and disparities in attainment by SES to be twin problems because one cannot be addressed without the other. Even in the totally unjustifiable scenario where one cared only about white affluent students, there simply aren't enough of these students to increase the nation's level of educational attainment to where it needs to be. Although the 68% attainment rate for the highest SES group may seem high in a relative sense, in an absolute sense it is low. Common sense suggests that appreciably more than two-thirds of students from the most advantaged families in the country should be expected to earn bachelor's degrees. The educational attainment of the high-SES students is certainly less troubling than that of low-SES students from an equity standpoint, but both are important in terms of the stock of human capital in the country and the efficiency with which educational resources are used.

A related problem is the long and increasing time spent to earn a bachelor's degree. Of all the students who enrolled full-time in a four-year college or university immediately after graduating from high school in 1992, the national data show that not only are high-SES students more likely to graduate, but they do so more quickly: for example, 46% of the most advantaged group graduated within four years, whereas just 19% of the least advantaged group did so. Indeed, more than half of the first-generation college students in every income quartile took more than four years to graduate.

Moreover, it is disturbing to see that dropping off the path from matriculation to graduation doesn't occur just early in the process, or even in the first two years. Figure 2 shows the cumulative withdrawal rates each semester at the flagships in our database broken down by SES.

Note that all of the lines continue to trend upward over time. Taken altogether, *more than 40% of withdrawals occur among students who have already completed their first two years of college.*

Figure 1.

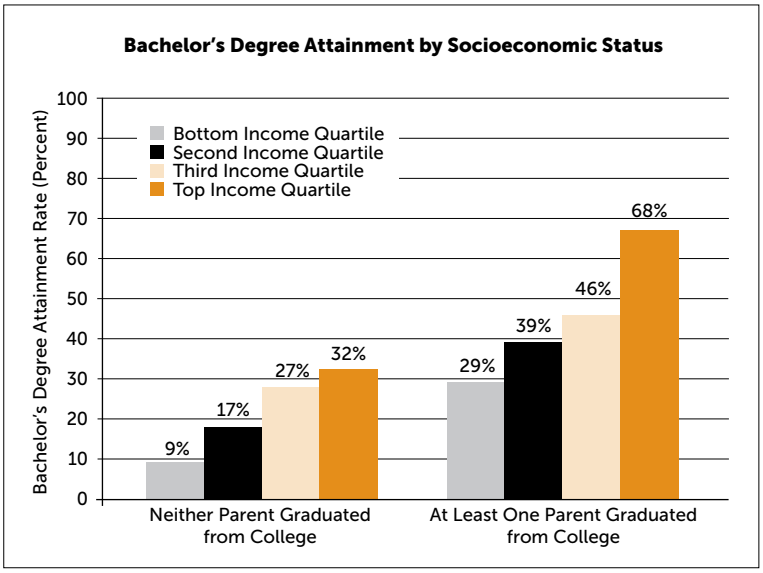


Figure 2.

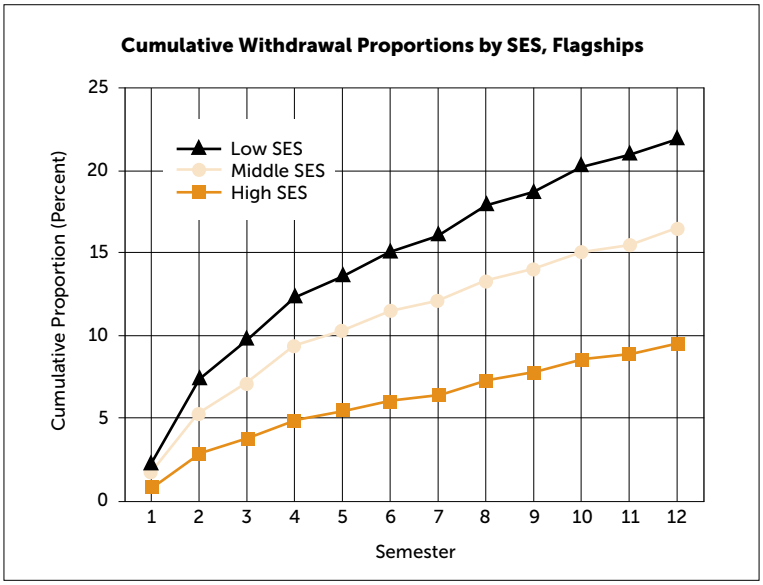


Figure 2 also shows a distinct withdrawal rate gap between low- and high-SES students that emerges in the second semester. The semester-by-semester change in the cumulative withdrawal proportion then remains higher for low-SES students than for high-SES students every semester. These differences accumulate over time to produce substantial disparities in the six-year graduation rate.

Note that adjusting for students' academic preparation and demographic characteristics does not alter this finding. The bottom line is that, with very few exceptions, disparities in educational attainment by SES are pervasive in American public higher education and cannot be explained away by differences in academic preparation.

Undermatching

The problems outlined above are daunting to say the least, and it will take multi-pronged, sustained efforts to tackle them. One approach we suggest is to address what we call the *undermatch* problem. Students are considered to have undermatched when they enroll in institutions that are less selective than those for which they appear to be qualified.

We analyzed the actual admissions outcomes of the entire cohort of students who graduated from high school in North Carolina in 1999 and established the combination of SAT scores and GPAs that would result in a 90% chance of admission to either NC State or the University of North Carolina-Chapel Hill. These two universities account for 90% of all SEL A enrollments in the state (that is, the highest selectivity level). We then checked the entire cohort for students who met the combination thresholds that gave them at least a 90% chance of admission to NC State or UNC-Chapel Hill, and found more than 6,200 such students.

Of those students, more than 40% did *not* attend a SEL A institution but instead enrolled at a SEL B institution (30%), an HBCU (1%), a two-year college (3%), or no college at all (9%). Of course some undermatching is to be expected for a variety of reasons such as being nearer to home, a better fit along other criteria, and such. That said, though, within this group of highly academically qualified North Carolina seniors, undermatches appear to have been most common among students from disadvantaged backgrounds.

Figure 3 shows that family income and parental education, not surprisingly, are both strongly correlated with college choices and drive many undermatches.

Again, we regard this entire group as presumptively qualified for admission to SEL A institutions, yet those from more affluent and better educated families were appreciably more likely than their less privileged peers to attend one of the most selective universities. At one end of the spectrum, it is striking—and disturbing—that only about one-third of these well-qualified seniors who came from families with no previous experience of higher education (neither parent had more than a high school diploma) attended a highly selective institution.

The undermatching problem is concentrated at the applications stage of the college enrollment process. Two-thirds of the students who could have attended a highly selective university did not even apply to such a university. And while we don't have direct evidence on this point, we suspect that both the quantity and quality of college counseling available to high school students may be a significant cause of the undermatching. Often, counselors are the chief source of information for students, particularly those with low family incomes; if counselors were trained to raise the aspirations of students—especially those with high academic qualifications—then more students might be better matched and, likewise, more successful in earning their bachelor's degrees.

Undermatching is highly consequential because students who attend more selective institutions graduate at higher rates and in less time than do observationally-equivalent students attending less selective institutions. Figure 4 compares graduation rates for the North Carolina students who undermatched to SEL B institutions (which, you will recall, are widely representative of the rest of American higher education) and students who did not undermatch.

Students who undermatched had a six-year graduation rate 15 percentage points lower than those who matched

Figure 3.

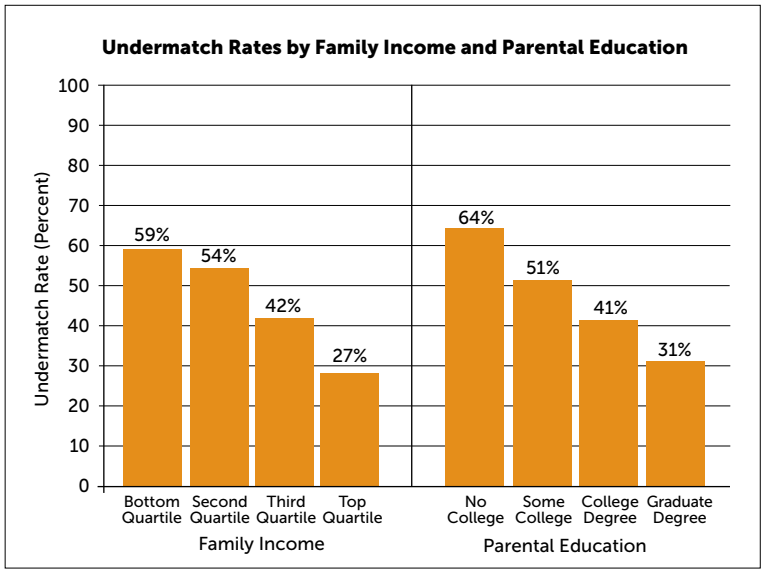
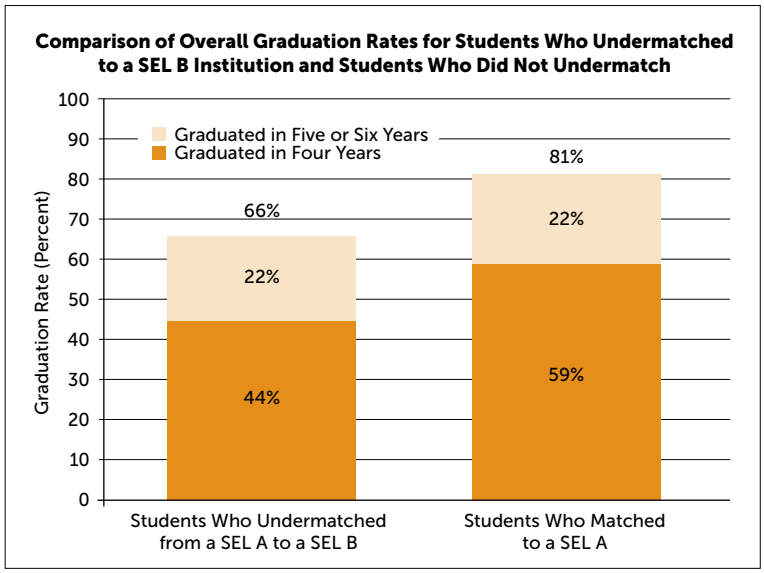


Figure 4.



to SEL A institutions, 66% compared to 81%. Time to degree was also faster for the matched students than for the undermatched group—as can be seen by comparing the four-year graduation rates. Regression analyses using all the standard controls mute the differences somewhat, but the adjusted difference in four-year graduation rates remains a striking 10 percentage points. In short, the undermatched students paid a considerable price in terms of the time it took them to graduate and in the reduced probability that they would finish at all.

This may at first seem counterintuitive, but *attending a more selective college or university is associated with higher average educational attainment rates, regardless of race, and even for those with weaker academic qualifications upon entering.* One potential explanation for this pattern of higher graduation rates at more selective institutions, even after controlling for students' qualifications, involves peer effects and expectation levels: More selective institutions have more highly talented students, who can learn from each other and benefit from their interactions. In terms of expectations, consider that in a setting where the graduation rate is 50%—which is not atypical at less selective institutions—every other student will drop out, and the stigma for doing so may be minimal. On the other hand, the environment is likely quite different at an institution where expectations are that you will be a member of the class of, say 2003 (for the high school class of 1999), and where more than 70% of students will indeed graduate within four years.

Net Price and Graduation Rates

Given that undermatching is much more likely for students from low family incomes, it's clear that issues of affordability factor into their enrollment decisions. And it is quite likely that these students simply don't have enough information about what their net price actually would be, which would help them overcome the intimidating sticker price.

We attempted to dig into this issue by looking at the net price students faced—taking into account the full sticker price and their grant aid—and how that influenced their likelihood of graduating. We used data from all of the in-state students at each of the flagships in our study, and broke the analysis down by income quartiles.

Figure 5 shows the four-year graduation rate by net price among full-time, in-state freshmen in the bottom income quartile. The net prices are actually negative because low-income students generally receive aid that exceeds tuition and fees and thus get some help with their living costs as well.

Graduation rates, which are adjusted to compare students with similar academic characteristics, decline steadily as the net price rises. Our estimates, based on detailed statistical analyses, imply that each $1,000 increase in annual net price is associated with a roughly 4.5 percentage point decline in the four-year graduation rate (and a 3 percentage point decline in the six-year graduation rate) for students in the lowest income group.

The relationship is similar for students in the second income quartile. However, for the students in the third and fourth income quartiles, the plot line virtually levels out. Figure 6 shows the four-year graduation rate for full-time, in-state freshmen in the top income quartile.

We found that for students in both the third and highest income quartile, there is essentially no relationship between net

Figure 5.

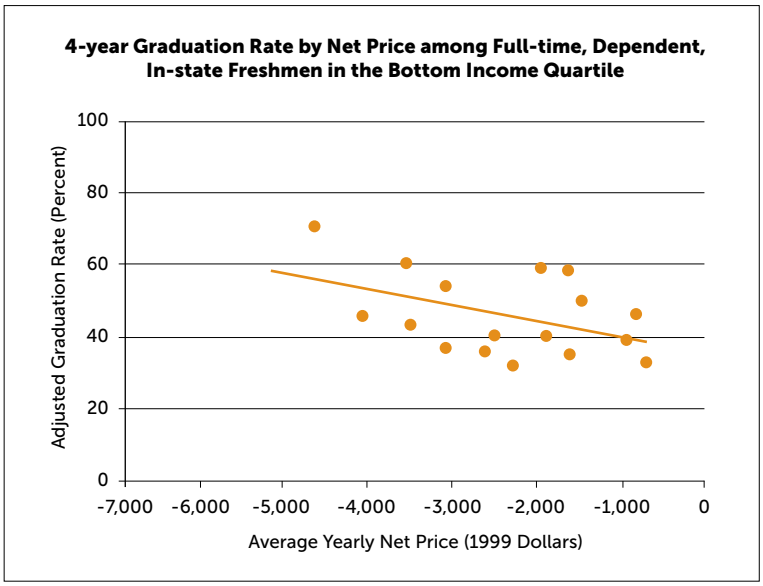
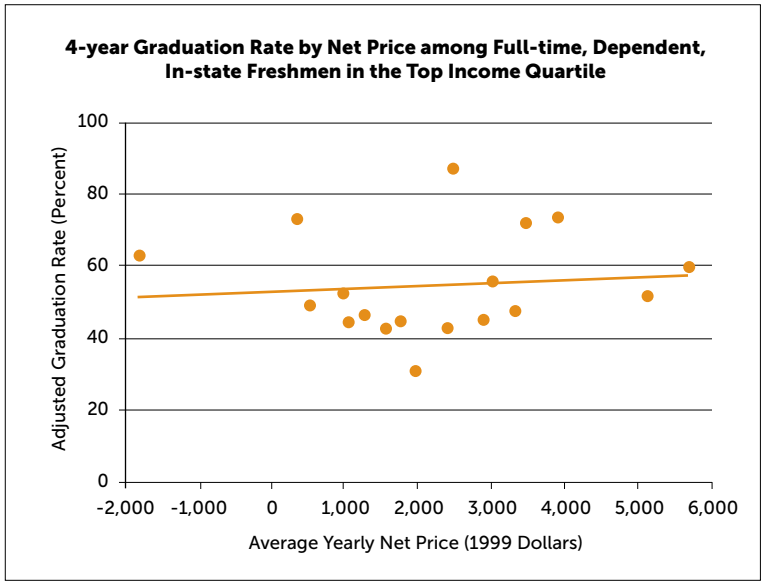


Figure 6.



price and graduation probability in either four or six years. This finding has important implications for how institutions distribute their aid, whether based on need or merit—and depending upon their goals.

Conclusion

Our study spotlights two key issues, among others. The first is the sorting of students into different selectivity levels and undermatching. This issue is not so much a question of what should be done within institutions to improve their graduation rates, but rather what can be done across institutions to help students enroll where they have the best chance of graduating.

Factors that may lead low-income students and those with less-educated parents to undermatch include their perceptions of the cost, perceptions of the value, cultural expectations, and concern about finding their place and feeling comfortable in a selective institution. Our aim is to develop persuasive and effective interventions at the high school level to address these factors. To that end, in collaboration with MDRC, we are developing an intense intervention focused on improving the college choices of low-income students. Our aim is to conduct a full-scale, randomized controlled study in multiple cities to test ways to boost the enrollment rate of qualified students in selective institutions.

The second critical issue at play here is the fact that public universities are not going to be able to address the problem of low graduation rates by spending more. Public universities are being asked to do more with less support—although the focus largely has been on access and not on persistence and graduation. That too should change. In this environment, all colleges and universities need to innovate and find ways to accomplish more with less.

One obvious way to do so is to make better use of technology. Another follow-up to our work, then, is for the Mellon Foundation's nonprofit spin-off, Ithaka, to pursue a randomized controlled study of high quality, web-based courses to substitute for some of the large introductory courses given at public universities. The idea is to conduct the study at several campuses within two or three public university systems; to assess the effectiveness of the courses in terms of learning outcomes; and produce a careful estimate of the cost implications of the new course delivery methods.

We believe that these follow-up efforts, focused sharply on improving educational attainment within realistic cost constraints, will in the end make things better. Lasting improvements surely will require reasonably long time horizons, patience, persistence, and a willingness to be guided by evidence—as well as the capacity to harvest the low-hanging fruit as quickly as possible. But the goal of helping more Americans from all backgrounds complete college in a timely fashion is well worth the effort that will be required.

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