ELEVATING COLLEGE COMPLETION

EDITED BY FREDERICK M. HESS
AND LANAE ERICKSON HATALSKY

AEI THIRD WAY

Elevating College Completion

Edited by Frederick M. Hess
and Lanae Erickson Hatalsky

Contents

Foreword

It feels like an ocean's worth of ink has been dedicated to the rising cost of college. From press coverage to the latest public opinion polls to the drumbeat of proposals for "free college," you could be forgiven for assuming that the only real problem with American higher education is the price tag. And cost is, indeed, a real issue. But it is hardly the only one. At least as pressing is the reality that only about half of students who begin college actually complete their degree. This yawning gap between those who enroll in higher education and those who graduate has been persistent, even as our economy shifts and increasingly makes a credential beyond high school a necessity, rather than a luxury, in the workforce. It is becoming increasingly difficult—and expensive—to brush this college completion problem under the rug.

As Congress looks to reauthorize the Higher Education Act—through which taxpayers shell out about $130 billion per year in grants and loans—the completion problem deserves to be a meaningful part of the deliberations. At the same time, a single-minded focus on college completion can be unhelpful for students and taxpayers alike. As we have seen in K–12, it is possible for a focus on simple metrics to yield gamesmanship, corner cutting, or manipulation. We are all too familiar with colleges that are content to churn out watered-down degrees with little labor market value or that take care to only admit the most academically prepared students—leaving someone else to serve others for whom the path to completion will be more difficult. Reforms intended to boost college completion need to be approached with caution, designed with attention to potential consequences, and informed by due regard for the full range of outcomes that matter to taxpayers and students.

Given both the importance of the problem and the need to tackle it in thoughtful, constructive ways, education scholars at the American Enterprise Institute and Third Way have recruited a talented cadre of researchers

to publish this series of in-depth reports on the current college completion landscape, the major drivers of graduation rates, and the best levers for increasing completion both at individual institutions and system-wide—without spurring undesirable consequences in the process.

The Chapters Ahead

Balancing the role of federal and state policymakers with the actions students, families, and college administrators can take is a daunting task, but the truth is that today's lackluster completion rates drain federal coffers and burden debt-laden dropouts. This problem is pervasive and disconcerting for both the left and the right. Even in these polarized times, this challenge presents opportunities for fruitful, bipartisan cooperation.

In the first chapter, Bridget Terry Long, dean of the Harvard University Graduate School of Education, reviews the most recently available federal data and finds substantial room for improvement at most of America's colleges and universities. While the share of students who finish college has crept up in recent years, the gain has been modest, at best. In 2016, the overall completion rate of full-time, first-time students was 49.1 percent at four-year institutions and 38.6 percent at two-year institutions. At community colleges and other two-year public schools, the completion rate is even lower. Through her analysis, Long explains how the college dropout problem represents significant costs for students and taxpayers alike. Students who fail to complete college receive lower average earnings than comparable students who graduate, are often burdened with student debt, and experience opportunity costs from time lost while enrolled. Taxpayers, on the other hand, experience costs in wasted government subsidies, forgone tax revenue, and student loans that are less likely to be repaid. This chapter documents what we know about student-level characteristics that are typically associated with college success and what else university leaders, educators, and policymakers might do to begin improving college completion rates in America.

In the second chapter, Sarah Turner, a professor of economics and education at the University of Virginia, describes the potential for federal and state policies to influence college completion. Her chapter makes clear that poor

college completion rates are not "new," nor are they the fault of one political party or presidential administration. Turner cautions would-be reformers, flagging a key challenge: Using policy to raise completion rates can invite unintended consequences that add no benefit for students or taxpayers. Clumsy or ill-conceived policy is fraught with perverse incentives, and these might lead college administrators to "game the system" without meaningfully raising the level of educational attainment.

With that caution in mind, Turner reviews a series of potential policy options to improve completion rates. For example, she analyzes the recent uptick in the number of states using "performance-based funding" policies, which allocate a larger share of public subsidies to institutions with the most impressive outcome metrics. Policies like these, while implemented with the best of intentions, might simply encourage some schools to generate low-quality degrees or admit only the most academically prepared students in the first place. This example and others highlighted in the chapter illustrate how state and federal policymakers should ensure that appropriate guardrails are in place for any policy aimed at improving college completion.

In the third chapter, Mark Schneider, formerly a visiting scholar at the American Enterprise Institute, and Kim Clark of the Education Writers Association evaluate several institution-level practices aimed at improving completion rates. They identify more than 600 "failure factories"—schools that graduate less than a third of their students within six years, producing alumni who often struggle in the job market—and notable "success factories." They then review five potential institutional practices that may help boost student completion without encouraging colleges to compromise their standards. These include providing comprehensive supports to students facing academic challenges, offering emergency grants to juniors and seniors with unmet financial need, and using data to provide better guidance to students. Notably, they also include program costs, implementation challenges, and the potential impact of related college-level initiatives aligned with these practices.

In the fourth chapter, Matthew M. Chingos, director of the Urban Institute's Education Policy Program, turns to the K–12 education system to review what can be done to improve the academic preparation of students for college. Chingos reports that a student's academic preparation in high school is one of the strongest predictors of college degree attainment and

that policymakers can do more to ensure that more students are academically prepared for college when they arrive on campus. His analysis points to a handful of high school–level initiatives that have effectively raised students' academic readiness. For example, one carefully studied program in a Chicago school district found that students who took two algebra classes concurrently (rather than a single math class) had much higher high school graduation rates, college entrance exam scores, and college enrollment levels. Another study found that after controlling for selection bias, students who enrolled in more rigorous courses also had higher high school graduation rates and college enrollment levels. While scaling up these programs can risk creating different results than originally intended, educators should focus on these practices that enhance student readiness as part of a larger effort to increase postsecondary attainment.

In the fifth chapter, Mesmin Destin, associate professor of psychology and education at Northwestern University, describes how psychological factors—including a student's mindset, goals, and motives—can affect college completion. While postsecondary institutions vary considerably in their missions, resources, and student bodies, the findings from a growing body of research suggest that programs and initiatives aimed at raising college completion can be enhanced when they consider the unique perspectives, feelings, and psychological elements of the students at their specific schools. His careful review of the literature finds that approaches that incorporate psychological factors—such as linking classroom work to real-world aspirations and using online modules that help activate students' motivation and sense of belonging—can improve student success in higher education. While the current research offers promising opportunities for improving completion, Destin also offers several important cautions to policymakers, including that they should avoid one-size-fits-all programs and high-stakes measurements of these psychological factors, since there is still much we do not know about how policies might adversely affect institution or student behavior.

Reason for Optimism

Improving the completion rate at America's colleges and universities will be difficult work, and creating low-cost, quick-fix solutions is unrealistic.

While there are no silver bullets, we know that higher education providers are already making hundreds of decisions that affect students' experience and motivation in a way that makes it more or less likely they will succeed. Programs and policies like those discussed in the pages ahead illustrate what colleges can do to help students graduate, without compromising standards or lowering the bar for college completion. The chapters take seriously the real possibility that policy interventions aimed at improving completion can create a slew of unintended consequences for students, colleges, and taxpayers.

As a final caveat, improving college completion requires a partnership between multiple stakeholders, and one of those stakeholders is students. College students must be able and willing to do the requisite work to earn a diploma and not just expect to be handed a degree. At the same time, colleges should look for ways to offer courses, support programs, and guidance services that a student might need to fully succeed.

We can agree that students who are willing to do the work should complete their degrees and that taxpayers should see a return on the investment they make to help students get to and through college. We have the opportunity to seek solutions that focus not only on whether students can afford to *arrive* on campus but also on whether those students will *leave* with the education and the credential they came for. Left or right, that is a cause we can all embrace.

—Frederick M. Hess and Lanae Erickson Hatalsky

The College Completion Landscape: Trends, Challenges, and Why It Matters

BRIDGET TERRY LONG

During the past half century, the United States has made tremendous progress in increasing access to postsecondary education. From 1960 to 2016, the percentage of recent high school graduates who went on to higher education increased from 45.1 percent to 69.8 percent.[1] However, with the growing availability of data and increased ability to track students over time and across institutions, the country needs to do far better at supporting college student persistence and success. The conventional way to measure graduation rates is to examine how many students complete a degree within 150 percent of the expected completion time—that is, six years for a bachelor's degree and three years for an associate degree. Using this metric, research suggests that about only half of students enrolled at four-year colleges and universities graduate within 150 percent of the expected completion time, and the completion rate is even lower for students enrolled at two-year colleges.[2]

Given that the goal of higher education for most students is to complete a degree or credential that is worthwhile in the labor market, the low levels of completion are disconcerting, and both students and society at large experience high costs due to non-completion. Increasingly, there are examples in which the tuition and fees college students pay, as well as the opportunity costs of enrollment, are not justified by the meager returns experienced by students, especially those who leave higher education before completing their program. Further, for taxpayers, investments in students through institutional subsidies and financial aid sometimes do not translate into higher educational attainment and the expected increases in tax revenue, reductions in government dependency, and other social benefits. The college

completion problem is large and has serious implications for many aspects of our society and country.

College completion is only one of many possible ways to gauge student postsecondary success. Students, families, and researchers would like to know more than just whether students finished their program or degree requirements. Measures of student learning or a sense of the quality of the degree would be ideal, and there are continual efforts within higher education to establish such assessments and indicators.[3] In addition, the conversation about college completion increasingly has focused on "credentials of value," attempting to discern whether the degree or certificate completed results in a wage that is sufficient to pay back student loans and live at a reasonable standard of living. Although these additional measures and nuances are vitally important to understanding how well students are doing, my analysis centers on the most common measure of student success: college completion.[4]

A Look at College Completion Rates: What Do We Mean by College Completion?

The American higher education system is incredibly diverse in the types of institutions that exist and the range of educational programs, credentials, certificates, and degrees that are available to students. For that reason, it is important to clearly define "college completion." What completion means for one student may be entirely different for another student. In addition, until recently, researchers have been limited in how they define completion due to an inability to track students over time and across institutions. However, higher education needs to coalesce around a common set of definitions to avoid inconsistencies and misunderstandings about the problem of college completion.[5]

The most prominent measure of completion is derived from the Integrated Postsecondary Education Data System (IPEDS), which is an annual federal survey of colleges conducted by the National Center for Education Statistics at the US Department of Education. Institutions that participate in federal student aid programs are required to report information on enrollments, finances, completions, faculty and staff, and financial aid. For the 1997–98 school year, a graduation rates survey was added in response to the

Student Right-to-Know and Campus Security Act of 1990; over time, information for subgroups (e.g., by gender, race, and ethnicity) and additional measures (such as reporting rates for 150 percent and 200 percent of normal time, which would be six and eight years, respectively, for a four-year college) have been added.[6] The publicly available IPEDS data allow individuals to examine completion rates for thousands of institutions, which one can group by institutional type and track over time, given fairly consistent definitions for over a decade.

Unfortunately, the federal data have several drawbacks. First, the institutions report the information, which means that the federal data rely on each college's ability to track its own students in order to accurately calculate completion rates.[7] More pressing concerns, however, have developed from the fact that the most consistent federal measure of completion focuses on only a subset of college students: first-time, full-time students who begin during the fall term and graduate within a certain time frame. As such, this federal rate overlooks many students who attend part time, including older students, those at community colleges, and many students of color. Transfer students are also not counted in this rate. Analysis suggests that in 2012, only 55 percent of all new students at four-year institutions were first time and full time, leaving more than two million students out of the calculation.[8] In response to this critique, IPEDS recently expanded its data collection to include part-time students, non-first-time students (i.e., transfers), and students who begin during terms other than fall.

The IPEDS completion rate data, by design a survey of colleges, are an "institutional graduation rate" rather than a "total" graduation rate—that is, some students complete degrees at other institutions, and this may not be observed by the college. Analysis of the *Beginning Postsecondary Students Longitudinal Study: 1996–2001* suggests that the overall graduation rate, once it accounts for students' mobility across institutions, is about 8 percent higher than the institutional graduation rate.[9] Acknowledging this, the National Student Clearinghouse (NSC) has become a leading source for information on postsecondary outcomes. Unlike the IPEDS, which relies on self-reported institutional information, the NSC uses actual student enrollment and completion records, which are likely to provide the most accurate measure.

Moreover, these records are linked across schools, and this gives the NSC the advantage of being able to track students across institutions. The

NSC currently covers 98 percent of college enrollments.[10] This is important because, according to a recent NSC report, 29 percent of students who began at public two-year institutions completed credentials at a different institution.[11] Another important distinction is that the NSC definition of completion focuses on all first-time students; therefore, unlike the measure from IPEDS, students do not need to attend full time to be included in the rate.[12] As a result, although IPEDS is a good source to examine institutional variation, the NSC measures give a broader sense of completion for a range of enrollment patterns.

Trends from the IPEDS Data. The federal data from the 2016 IPEDS survey give us a picture of college completion. Table 1 displays the completion rates for students by institution level (four and two year) and sector (public, nonprofit private, and for-profit) of institution. The overall completion rates count finishing any formal degree or certificate, and the measure is calculated for 150 percent of normal time, which is six years for a bachelor's degree and three years for an associate degree.[13] Overall, 49.1 percent of students at four-year institutions and 38.6 percent of students at two-year institutions completed some kind of educational credential.[14]

However, the rates differ by institution type. Completion rates are higher at the four-year institutions (compared to the two-year colleges) and the private institutions (compared to the public institutions). Universities, which are more heavily involved in research activities than other schools, also tend to have higher completion rates than other four-year institutions: The overall six-year completion rate at public research and doctoral universities is 61.3 percent, compared to 40.3 percent at other four-year institutions. Similarly, the mean 2016 completion rate at private research and doctoral universities (i.e., institutions more focused on research than other schools) is 77.8 percent compared to 52.7 percent at other private four-year colleges.

However, across all sectors of higher education, a substantial proportion of students did not complete any educational credential over 150 percent of normal time. Fewer than half of students did so in all sectors, except for public four-year universities and private four-year colleges and universities. The statistics are also a bit misleading for the two-year sector. When one considers how student enrollment is distributed across the different kinds of two-year institutions, completion rates are clearly the lowest for the segment

Table 1. College Completion Outcomes, 2016

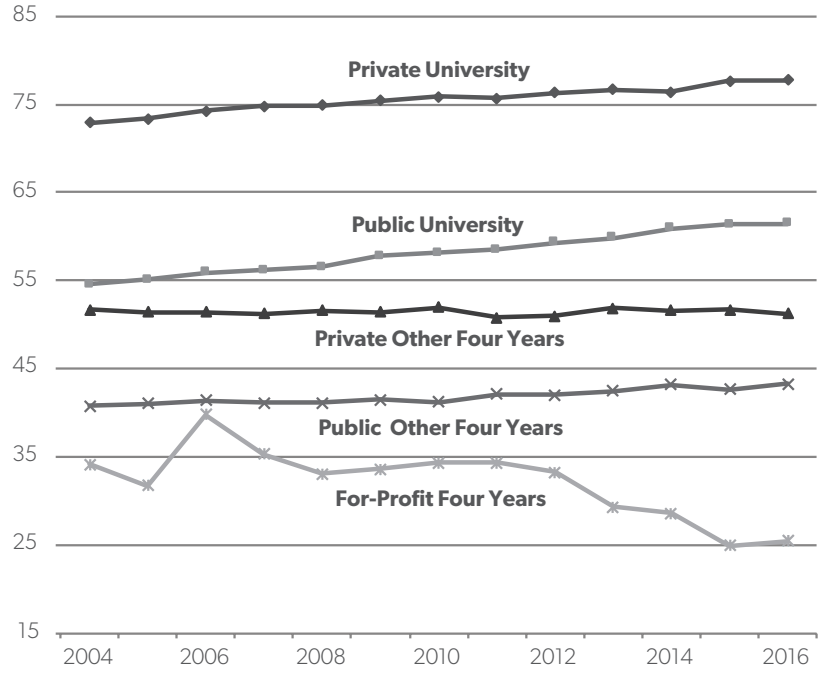
	Overall Completion Rate *(150 Percent of Normal Time)*	Bachelor's Degree Completion Rate		
		Four Years	Five Years	Six Years
Public Four Years	45.3%	27.8%	43.5%	48.5%
Universities	*61.3%*	*38.2%*	*56.7%*	*61.5%*
Other Four Years	*40.3%*	*23.7%*	*38.4%*	*43.5%*
Private Four Years	54.4%	44.5%	52.5%	54.3%
Universities	*77.8%*	*64.4%*	*75.3%*	*77.7%*
Other Four Years	*52.7%*	*42.9%*	*50.7%*	*52.5%*
For-Profit Four Years	34.3%	26.8%	29.3%	31.1%
Public Two Years	26.0%			
Private Two Years	49.6%			
For-Profit Two Years	57.7%			

Note: "Private" refers to private nonprofit schools. Universities are defined as research or doctoral institutions according to the 2000 Carnegie Classifications. Completion is measured for first-time, full-time students seeking a degree or certificate. If an institution reported a completion rate of zero, it is not included in this analysis.
Source: Author's analysis using the Integrated Postsecondary Education Data System from survey year 2016.

that serves the most students: public two-year colleges. Therefore, although the average completion rate for two-year institutions is 38.6 percent, once one weighs the outcome measure by college size—meaning that larger schools are counted more heavily than smaller ones—the enrollment-adjusted completion rate for students at two-year colleges is actually 24.4 percent, as more students attend the schools with lower rates than with higher ones.[15]

The columns on the right side of Table 1 restrict the measure of completion to bachelor's degrees and display how completion rates change over four-, five-, and six-year windows measured from the time a student enrolls. As expected, completion rates increase with more time. There is a considerable jump at public and private institutions from four to five years, with additional growth in the sixth year, which is especially noticeable at public four-year institutions that are not research universities. This growth over time underscores the importance of the time horizon used to judge completion. Students typically take longer than four years (for a bachelor's degree) or two years (for an associate degree) to finish, especially because

Figure 1. Six-Year Bachelor's Degree Completion Rates, 2004–16 (Percentages)

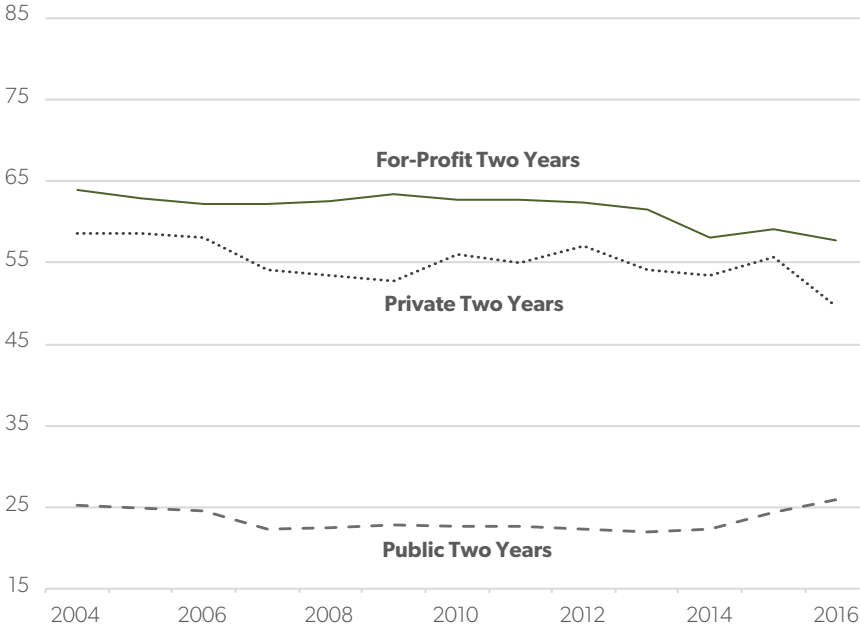


Note: Completion rates are expressed as percentages. Completion is defined for first-time, full-time students seeking a degree or certificate who began six years prior (e.g., fall 2010 for survey year 2016).
Source: Author's analysis using the Integrated Postsecondary Education Data System.

many devote their initial years in college to completing developmental and remedial courses, working part-time jobs, having periods of part-time attendance, or stopping out of college temporarily.[16]

The consistent definition IPEDS uses enables one to look at completion trends over time. Although completion rates have improved during the past decade or so, the growth for most sectors has not been considerable, and several sectors have experienced decreases in their completion rates during the past decade. Figure 1 displays how the six-year bachelor's degree completion rate has changed from 2004 to 2016. During this time, completion rates at public four-year universities increased 12 percent, from 54.5 percent to 61.3 percent. Private universities and other public four-year institutions

Figure 2. Completion Rate Within 150 Percent of Normal Time at Two-Year Colleges, 2004–16 (Percentages)



Note: Completion rates are expressed as percentages. Completion is defined for first-time, full-time students seeking a degree or certificate who typically began three years prior (e.g., fall 2013 for survey year 2016).
Source: Author's analysis using the Integrated Postsecondary Education Data System.

experienced a 6 percent increase in their completion rates. However, bachelor's degree completion rates were stable at private four-year institutions that are not universities, and for-profit four-year colleges experienced a 25 percent decline in completion rates over the period.

Completion rates at two-year institutions have also changed, as shown in Figure 2. The rates reported are for the overall completion of any degree or certificate within 150 percent of normal time. Within this sector, the public two-year colleges have experienced a 3 percent increase in completion rates. However, the other two-year institutions have not fared as well: Private two-year colleges saw a 15 percent decline, and the for-profits saw a 10 percent decline.

Taken together, the trend data suggest that outcomes have improved within the public sector but are declining at for-profit institutions; the private institutions that are not universities are also suffering. These patterns raise the question about the determinants of college completion. This is a period of shifting enrollment and resources, as well as better data collection and measurement, which could help explain some of the trends from 2004 to 2016. But it is also a time of increased attention to the issue of student success and degree completion. Further analysis is needed to understand the degree to which institutional actions—such as improved educational supports and services—and policy have influenced these trends.

A Broader Definition of College Completion: The National Student Clearinghouse. As noted, the completion rate from the federal IPEDS survey gives only a partial picture of student outcomes because the traditional measure focuses on full-time students. In contrast, the NSC measure includes part-time students and thus gives a broader picture of completion for a wider range of students.[17] Doug Shapiro and colleagues present the most recent college completion rates using the NSC data.[18] Overall, they calculate a six-year completion rate of 56.9 percent for the cohort that began a postsecondary study in fall 2011. This is larger than what the IPEDS data report, and the discrepancy may be related to several factors.

First, the NSC data are better able to track students across institutions, and they use a different definition of a cohort. The completion rates reported also have a different base year (2010 for IPEDS and 2011 for NSC), and the outcomes for two-year colleges are based on six years, rather than three. In general, the NSC data suggest that private four-year institutions have the highest rates of completion (similar to what was found in the IPEDS data), and, over the course of six years, the NSC reports that nearly 4 of 10 students who start at public two-year colleges complete a formal credential.

Because it can track students over time and across institutions, the NSC report details where students completed their degree or certificate: at the starting institution, a different four-year institution, or a different two-year college (Table 2).[19] For each type of institution, the bulk of students complete their credentials at the starting institutions, but a substantial proportion complete elsewhere. This varies from 17 percent and 16 percent of students from public and private four years, respectively, to 29 percent and 37 percent

Table 2. Six-Year Completion Outcomes from the 2017 NSC Data

	Public Four Years	Private Four Years	For-Profit Four Years	Public Two Years
Completed at Starting Institution	53.5%	63.7%	22.1%	26.5%
Completed at Different Four-Year Institution	7.8%	10.0%	11.2%	7.7%
Completed at Different Two-Year Institution	3.4%	2.3%	2.0%	3.3%
Total Completion Rate	64.7%	76.0%	35.3%	37.5%

Note: The NSC defines a cohort as first-time, but not necessarily full-time, students who were 18 or older and seeking a degree or certificate.
Source: Doug Shapiro et al., *Completing College: A National View of Student Completion Rates—Fall 2011 Cohort*, National Student Clearinghouse Research Center, 2017, Figure 8.

for the public two years and for-profit four years, respectively. Therefore, if an institution is unable to track student enrollment at other colleges, then it will substantially underestimate its own completion rate.

The NSC data show that some of the completion accomplished by four-year students happens at two-year colleges, which may suggest downward adjustment in goals or finishing an associate degree before returning to a four-year institution. On the flipside, 20.5 percent of students who start at public two-year colleges and complete a credential do so at four-year institutions, which highlights the transfer function of community colleges. However, research suggests that although many students who begin at two-year colleges intend to obtain a bachelor's degree, they do not reach that goal.[20] One normative question related to these patterns is: To what degree are institutions responsible for the outcomes of students who transfer to other schools? The initial institution may be partly responsible for a student's completion or failure to complete at another institution, but this is not currently considered in accountability regimes.

The NSC data provide a longer horizon—eight years—to observe how completion rates change over time.[21] Focusing on the fall 2009 cohort, Shapiro and colleagues found that 52.9 percent had completed a degree or certificate within six years.[22] Two years later (i.e., after eight years), this rate had climbed to 59 percent. This suggests that there is a large group of

students who progress slowly to an educational credential; given that the NSC measure includes part-time students, this longer time frame may be reasonable when measuring student outcomes. However, given the high cost of college, the longer time to degree has important repercussions, not just for students who must shoulder the burden of additional years of tuition and lost wages but also for taxpayers who subsidize the costs of higher education each year.

How Outcomes Vary

Average college completion rates vary by institutional and student characteristics. The following sections take a closer look at how these factors affect degree attainment.

Outcomes Vary By Institutional Characteristics. Although overall college completion rates underscore the problem of non-completion generally, an investigation into how rates vary by institution and student profile may elucidate the underlying drivers of outcomes. Institutional mission and resources, admissions practices, and student body characteristics are some of the reasons why outcomes vary.

Using IPEDS data, Table 3 shows how completion varies by institutional selectivity as measured by the percentage of applicants who are accepted for admission. A college's selectivity rate is correlated with the academic preparation level of incoming students; based on the substantial literature linking preparedness to college success, one would expect more selective institutions to have higher completion rates, all else being equal in terms of institutional resources and practices.

And that is what I find. Focusing on selectivity, institutions that accept a smaller proportion of applicants have higher completion rates. At public and private four-year colleges that accept fewer than 50 percent of applicants, the six-year completion rate in 2016 was 56.9 percent and 64.2 percent, respectively. In contrast, broad-access public and private institutions that accepted more than 75 percent of their applicants had completion rates of 47.1 percent and 52.8 percent, respectively. This pattern presents a cautionary tale: Institutions could raise their completion rates by increasing their admissions

Table 3. College Completion Outcomes by Institutional Admissions Selectivity, 2016

	Overall Completion Rate (150 Percent of Normal Time)	Bachelor's Degree Completion Rate		
		Four Years	Five Years	Six Years
Public Institutions				
Accept < 50%	56.9%	35.3%	51.5%	56.7%
Accept 50–75%	51.9%	30.1%	47.1%	52.5%
Accept > 75%	47.1%	26.4%	42.4%	47.2%
Private Institutions				
Accept < 50%	64.2%	53.8%	62.6%	64.4%
Accept 50–75%	56.5%	45.0%	54.0%	55.7%
Accept > 75%	52.8%	42.9%	50.2%	52.0%

Note: "Private" refers to private nonprofit schools. Universities are defined as research or doctoral institutions according to the 2000 Carnegie Classifications. Completion is measured for first-time, full-time students seeking a degree or certificate. If an institution reported a completion rate of zero, it is not included in this analysis.
Source: Author's analysis using the Integrated Postsecondary Education Data System from survey year 2016.

standards alone—that is, without making any other changes to educational quality or support. The flipside is also true: Broad-access institutions with open admissions policies that allow anyone to enroll are at risk of having lower completion rates. For this reason, completion rates should be treated carefully in accountability schemes so that institutions do not have greater incentives to "game the system" than to improve the student experience.

The patterns found by institutional characteristics have also spurred suggestions to only compare the completion rates of similar institutions. In other words, some say it is not appropriate to interpret the difference in the completion rates of public universities and community colleges as suggesting differences in quality or institutional effectiveness because each type of institution has different student bodies and resources. There have been several public efforts to highlight comparisons of the student outcomes for similar schools. This work suggests that although resources and student preparation levels are undoubtedly related to an institution's completion rate, these factors do not entirely explain why completion rates are much higher at some schools compared to others.

For example, Frederick Hess and colleagues document how the average six-year graduation rates vary not only across but also within selectivity groupings.[23] They use selectivity groupings as defined by *Barron's Profiles of American Colleges*, which categorizes institutions according to the high school class rank and test scores of the incoming freshman class, as well as admissions rates. For colleges rated as "very competitive," the six-year graduation rate for the top third of institutions averaged 74 percent. In contrast, institutions in the bottom third averaged a six-year graduate rate of only 49 percent, a difference of 25 percentage points.[24] Even among the "most competitive" colleges, there was a difference of 13 percentage points between the average of the top third and bottom third of institutions.[25] As Hess and colleagues highlight, "There are vast disparities—*even among schools educating similar students*."[26]

The College Results Online project by Education Trust provides a platform for exploring how completion rates can vary among similar institutions. Users can select a four-year nonprofit institution and see how its graduation rate compares to similar colleges serving similar students. Peer groups are determined by numerous factors that have been found to be statistically related to completion. These include SAT or ACT scores of the freshman class, selectivity ratings, Carnegie Classifications, sector, size, and student body characteristics such as the percentage from low-income families, the percentage age 25 or above, and the percentage who attend part time. Beyond the overall graduation rate, the College Results tool also displays rates by race, ethnicity, and gender; these data show that even when the overall rate is high, there may be significant gaps across groups and that not all students do equally well at a particular institution. Moreover, some institutions have been more successful in minimizing racial gaps in completion rates than others.

Therefore, despite the connection between completion rates and the characteristics and student body of a college, outcomes are also determined by other factors, including institutional practices and decisions regarding resources. John Bound, Michael Lovenheim, and Sarah Turner emphasize this point in their examination of how and why college completion rates have changed over time.[27] They conclude that though the preparedness of entering students plays a role, an institution's characteristics and resources are more important in determining graduation rates—and this highlights the potential importance of institutional action in improving completion outcomes.

Table 4. Overall College Completion Rates by Student Characteristics, 2016

	OVERALL RATE	BY GENDER		BY RACE OR ETHNICITY						
		Men	Women	White	Black	Hispanic or Latino	Asian	Native American	Two or More Races	Unknown Race
Public Four Years	45.3%	42.1%	48.2%	48.2%	36.9%	42.9%	52.8%	45.6%	44.6%	48.6%
Universities	*61.3%*	*57.8%*	*64.7%*	*63.0%*	*51.2%*	*56.8%*	*65.7%*	*51.8%*	*56.2%*	*63.3%*
Other Four Years	*40.3%*	*37.2%*	*43.1%*	*43.5%*	*32.1%*	*38.3%*	*48.0%*	*42.9%*	*40.2%*	*42.9%*
Private Four Years	54.4%	52.3%	59.7%	59.1%	46.9%	55.7%	68.3%	70.0%	62.6%	58.1%
Universities	*77.8%*	*76.2%*	*79.9%*	*81.1%*	*69.6%*	*74.4%*	*82.1%*	*79.3%*	*79.8%*	*77.5%*
Other Four Years	*52.7%*	*50.4%*	*58.1%*	*57.4%*	*44.8%*	*54.0%*	*66.8%*	*68.6%*	*60.6%*	*56.0%*
For-Profit Four Years	34.3%	35.3%	38.9%	47.1%	38.6%	41.4%	62.6%	57.6%	58.2%	37.1%
Public Two Years	26.0%	25.4%	26.5%	29.4%	17.3%	25.4%	37.1%	36.2%	25.2%	31.2%
Private Two Years	49.6%	50.3%	53.6%	59.8%	45.3%	60.4%	70.2%	62.5%	56.0%	68.2%
For-Profit Two Years	57.7%	56.4%	58.5%	63.1%	50.6%	67.5%	74.9%	71.9%	66.9%	62.1%

Note: "Private" refers to private nonprofit schools. Universities are defined as research or doctoral institutions according to the 2000 Carnegie Classifications. Completion is defined as finishing a formal degree or certificate 150 percent of normal time. Completion is measured for first-time, full-time students seeking a degree or certificate. If an institution reported a completion rate of zero, it is not included in this analysis.
Source: Author's analysis using the Integrated Postsecondary Education Data System from survey year 2016.

Outcomes Vary By Student Profile. The differences in completion rates by institutional type are partly driven by the types of students each part of higher education tends to serve. As shown in Table 4, students in different demographic groups have varying levels of completion, and this can help explain why some sectors of higher education have lower rates than others. However, even within a sector, students from different genders and racial or ethnic groups have different likelihoods of college completion. Using the IPEDS definition of completion and focusing first on gender, women had higher completion rates across all types of institutions than men did in 2016. The gender gap in favor of women is especially large at public and private four-year institutions, but there is little average difference for students who begin at community colleges.

The NSC data also document differences in completion by gender. Using their broader definition of completion, they find that for the fall 2011 cohort, 43.2 percent of men completed within six years at their starting institutions compared to 47.5 percent of women. An additional 10.7 percent of men completed at a different institution compared to 12.7 percent of women.[28]

The remainder of Table 4 displays differences by student racial or ethnic group. In general, Asian and white students have higher completion rates than black and Hispanic or Latino students.[29] Native American, multiracial, and those with unknown race tend to fall in the middle in terms of their outcomes, although this can vary.[30] The differences within sector present several interesting patterns. First, at universities, the institutions most focused on the research mission in higher education, all groups have more than half of their students complete within six years, and, except for black students, at least nearly three-fourths of students at private universities complete. Meanwhile, at the other four-year public and private institutions, the gaps by race and ethnicity are especially large between Asian students and black and Hispanic students. The outcomes at for-profit four-year colleges are also much stronger for students who are not black or Hispanic. Meanwhile, at the public two-year colleges, black students have especially low completion rates—just half the proportion that Asian students experience.

Underlying these trends by race and ethnicity are important differences in income and resources. In terms of income, for instance, in 2016 the median family income was $49,370 for black students and $51,110 for Hispanic students. In contrast, Asian families had a median income of $93,500 and white families a median income of $82,070.[31] There are also documented differences in K–12 education quality by race given how students are distributed across different neighborhoods and communities with varying resources and school outcomes. On average, black children attend schools with more inexperienced teachers, fewer opportunities to take advanced courses, lower average test scores, and higher proportions of low-income students.[32] For these reasons, the patterns observed by race should be interpreted as also representing differences in the underlying resources of students by background.

The differences found by race do have important implications for the future. Given current population trends, the US Department of Education predicts a

22 percent increase in the number of postsecondary students who are black between 2014 and 2025. The projected increase is even larger for Hispanic students, with an expected increase of 32 percent, from 3.2 million to 4.2 million students over an 11-year time frame. In contrast, the number of students who are white is expected to increase only 3 percent during this time.[33] Given these trends, unless something can be done to improve the outcomes of black and Hispanic students, national completion rates will fall, resulting in substantial losses for our country.

The Costs of Non-Completion

These trends and patterns of not receiving a postsecondary credential document the failure of millions of students to meet their educational goals. However, far larger costs, for both the individual and society, stem from non-completion.

Earnings and Tax Revenue. Simply put, non-completion prevents students from enjoying the increase in earnings that would be possible with a degree. Estimates of the returns to education suggest that college graduates with a bachelor's degree between ages 25 and 29 earn roughly $15,500 more per year on average than individuals with only a high school diploma in the same age group.[34] Each additional year of college results in increased earnings. For this reason, students who have even a few terms or semesters of college study usually experience a gain in their earnings even without a degree.

However, there is an especially large jump in earnings the year a student earns a degree. This has been documented in the research literature as "sheepskin effects," also known as credential effects.[35] Some suggest that employers are willing to compensate students at higher rates because they interpret completion as a sign of perseverance and hard work. Additional research has demonstrated that extended college attendance culminating in a postsecondary degree actually has causal effects on students. This means that higher education is more than just a signal of a student's traits and abilities; instead, it actually increases the productivity and other attributes of a graduate.[36]

Table 5. Median Earnings, Taxes Paid, and Employee Benefits by Education Level, 2015

Full-Time Year-Round Workers Age 25 and Older

		High School Diploma Only	Some College, No Degree	Associate Degree	Bachelor's Degree
Median Earnings and Taxes by Education Level					
Annual Income		$36,800	$41,700	$46,000	$61,400
Taxes Paid		$7,600	$8,900	$10,100	$14,500
After-Tax Income		$29,200	$32,800	$35,900	$46,900
Earnings Distribution by Gender					
Women	25th Percentile	$23,000	$26,000	$28,800	$37,100
	Median	$31,200	$36,100	$40,200	$51,700
	75th Percentile	$42,100	$50,600	$55,500	$75,800
Men	25th Percentile	$28,900	$32,400	$36,500	$47,000
	Median	$41,600	$49,700	$52,100	$71,400
	75th Percentile	$60,900	$71,000	$76,000	$102,000
Employer-Provided Health Insurance Coverage					
All Workers		54%	59%	61%	66%
Employer-Provided Pension Plan Coverage					
Private Sector		43%	48%	51%	52%
Public Sector		73%	75%	77%	79%

Note: Estimated taxes represent the estimated average federal income, Social Security, Medicare, state and local income, sales, and property taxes paid at these income levels. The public sector includes employees of federal, state, and local governments.

Source: Jennifer Ma, Matea Pender, and Meredith Welch, *Education Pays*, College Board, 2016, Figures 2.1, 2.5, 2.13, and 2.14A; US Census Bureau, "Income, Poverty, and Health Insurance in the United States," 2015, Table PINC-03; Internal Revenue Service, 2014; and US Census Bureau, "Current Population Survey Annual Social and Economic Supplement," 2016.

Recent data, as shown in Table 5, document the jump in earnings that college graduates receive. Note that national earnings data (i.e., from the US Census Bureau) focus on the completion of associate and bachelor's degrees relative to "some college," which is a catchall category for anyone who has attended at least a term of higher education but did not receive a degree.[37] As shown in the top panel of Table 5, students with a degree make more, on

average, than those with no degree: There is an annual difference of $4,300 for those with an associate degree and nearly $20,000 more annually for those with a bachelor's degree. The gain in earnings is larger for men than for women. Moreover, the difference is especially large for individuals at the 75th percentile of the income distribution. Those with some college earn more than those with only a high school diploma, but the average gain is fairly small.

The gains in earnings from completing a degree are not just enjoyed by individual students. Those who have higher earnings tend to pay more in taxes. As shown in Table 5, the tax revenue collected from college graduates is higher than the tax revenue collected from those with some college. Proportionally, those with a bachelor's degree pay relatively more in taxes than those without a college degree, so the loss to taxpayers each time a student does not complete his or her program is understated by the difference in earnings.

Employment and Benefits. Beyond income, students who complete their degrees are also more likely to enjoy employer-provided benefits, such as health insurance and pension plan coverage. These percentages are displayed in Table 5. There are small but meaningful differences between the percentage of those with some college who receive health care and pension benefits and the percentage who receive them if they have a college degree: There is a difference of 7 and 4 percentage points, respectively, in terms of health insurance and pension plan coverage relative to those with a bachelor's degree. This makes clear that focusing on earnings alone ignores other employment benefits enjoyed by those who complete a degree.

Table 6 considers the negative outcomes that are more prevalent for those with only some college. The upper panel displays trends in unemployment rates from 1995 to 2015. The data show that, for all time periods, individuals without a college degree have higher rates of unemployment. The difference was greatest in 2010, during the Great Recession. By 2015, rates had come down, but the proportion of workers who are unemployed is similar for those with only a high school diploma and those with some college. Meanwhile, those with associate and bachelor's degrees or higher have fared much better. This suggests that another benefit to completion is being

Table 6. Unemployment, Poverty, and Government Dependency by Education Level, 2015

Individuals Age 25 and Older

	High School Diploma Only	Some College, No Degree	Associate Degree	Bachelor's Degree or Higher
Unemployment Rates				
1995	4.8%	4.3%	3.3%	2.4%
2000	3.4%	2.9%	2.3%	1.7%
2005	4.7%	4.2%	3.3%	2.3%
2010	10.3%	9.2%	7.0%	4.7%
2015	5.4%	5.0%	3.8%	2.6%
Percentage Living in Households in Poverty				
All Households	13%	11%	8%	4%
Married Couples with Related Children Under 18	11%	6%	4%	2%
Female Householders with Related Children Under 18	35%	31%	23%	13%
Percentage Living in Households That Participated in Various Public Assistance Programs				
Medicaid	29%	24%	21%	12%
School Lunch	11%	9%	8%	3%
SNAP	13%	11%	8%	3%
Housing Assistance	4%	3%	2%	1%

Source: Jennifer Ma, Matea Pender, and Meredith Welch, *Education Pays*, College Board, 2016, Figures 2.12A, 2.16A, and 2.17; US Bureau of Labor Statistics, "Labor Force Statistics from the Current Population Survey"; and US Census Bureau, "Current Population Survey Annual Social and Economic Supplement," 2016.

insulated from unemployment, particularly during times of recession, which is good for both the individual and the public purse.

Poverty and Government Dependency. Poverty is also more prevalent for individuals who have not completed college. Among those with some college, the percentage of individuals living in households in poverty was 11 percent in 2015, compared to 8 percent for those with an associate degree and 4 percent for those with a bachelor's degree or higher. The poverty rate is especially high for female-headed households with children; again, those

with some college have trends that appear closer to the group with only a high school degree as opposed to the college completers.

Given the differences in poverty rates, it is not surprising that there are also differences in the percentage of individuals who participate in public assistance programs. Individuals with some college are slightly more likely to participate in Medicaid and the Supplemental Nutrition Assistance Program (SNAP) than those with an associate degree, but the differences compared to those with a bachelor's degree or higher are quite large; the proportion participating in Medicaid is half that of those with some college and is one-fourth to one-third of the rates experienced by the some college group for school lunch, SNAP, or housing assistance. These gaps not only signal the individual costs of not completing a degree but also highlight the costs to society of higher rates of government dependency from those who begin higher education but do not complete it.

Health and Civic Responsibility. It is important to note the differences found by education level in other outcomes. For example, health outcomes tend to be better for individuals with a college degree. Those who complete a degree are also more likely to volunteer and participate in civic activities such as voting. For example, individuals with a bachelor's degree were nearly two and half times more likely to volunteer and twice as likely to vote during the 2014 midterm election than were those with only a high school degree.[38]

Student Debt. While non-completers are missing out on potential benefits, many of them are still suffering with the cost of higher education. In recent years, the amount of debt that students are taking on to pay for college has ballooned. According to the College Board, 30 percent of undergraduates borrowed from the federal Stafford Loan Program, with an average debt of $6,590 among borrowers.[39]

Unfortunately, many of those students will not complete a college credential and will struggle to repay their loans. Data suggest that non-completers are less able to engage in repayment. In 2010–11 and 2011–12, only 34 percent of non-completers paid down at least $1 of their loan principal after three years. In comparison, 60 percent of completers had done so.[40]

Conclusion and Implications

Higher education has made substantial progress in better understanding and measuring rates of college completion. Increasing evidence documents that the costs of non-completion are more than just forgone earnings and opportunities; there are also financial responsibilities these students must confront without the benefit of the gains of a credential. As a society, we also lose the many public and social benefits of having a more educated populace. The challenges and missed opportunities due to low rates of degree completion underscore the significance of the problem our nation faces.

Notes

1. National Center for Education Statistics, "Digest of Education Statistics," https://nces.ed.gov/programs/digest.

2. US Department of Education, National Center for Education Statistics, "Tracking Students to 200 Percent of Normal Time: Effect on Institutional Graduation Rates," December 2010, https://nces.ed.gov/pubs2011/2011221.pdf.

3. For example, the National Survey of Student Engagement collects student-level information on time use and activities students participate in that institutions provide for their learning and development. Another example is the College Learning Assessment, which aims to test student reasoning and communication skills.

4. See Frederick M. Hess et al., *Diplomas and Dropouts: Which Colleges Actually Graduate Their Students (and Which Don't),* American Enterprise Institute, June 3, 2009, http://www.aei.org/publication/diplomas-and-dropouts/. As noted in the authors' analysis that focuses on graduation rates, the indicator is not "invariably a good sign or low graduation rates necessarily a bad one," especially because "an easy way to pad graduation rates is to drop standards and hand a diploma to every student who walks through the door." However, as the authors emphasize, nearly all students who enter four-year institutions expect to earn a bachelor's degree. "College students do not pack their belongings into the back of a minivan in early September wondering *if* they will get a diploma—only *when*."

5. In K–12, different ways of measuring high school graduation spurred confusing, misguided debates about the state of secondary education until a common standard was accepted by schools and the government.

6. Carol Fuller, *The History and Origins of Survey Items for the Integrated Postsecondary Education Data System*, US Department of Education, National Postsecondary Education Cooperative, 2011, http://nces.ed.gov/pubsearch.

7. The institutional capacity to do this has increased incredibly in recent years. Some

institutions subscribe to the National Student Clearinghouse or use social media (e.g., LinkedIn) to track students who transfer to other institutions. Also, some institutions have access to system-wide databases, which can help institutions track enrollments within a state.

8. *Chronicle of Higher Education*, "Why Colleges Don't Want to Be Judged by Their Graduation Rates," October 17, 2014. The calculation noted was made using the 2003–04 Beginning Postsecondary Students Longitudinal Study.

9. Hess et al., *Diplomas and Dropouts*.

10. This paper will discuss NSC results for the cohort that began in fall 2011. At that time, the NSC data covered 99 percent of public four years, 93 percent of private four years, and only 63 percent of for-profit four years.

11. See Doug Shapiro et al., *Completing College: A National View of Student Completion Rates—Fall 2011 Cohort*, National Student Clearinghouse Research Center, 2017. In addition, the NSC measures of completion represent unduplicated head counts. In contrast, other data sources such as IPEDS might double count a student who attends multiple institutions, especially if enrollment is concurrent.

12. The NSC measure also explicitly includes former dual-enrollment students who had previously taken college courses while still in high school; it excludes current dual-enrollment students who were still in high school.

13. The term "normal time" is taken from the IPEDS survey. As shown in Table 1, the time most students take to complete a bachelor's degree is not normally four years, which makes the term out of date.

14. Author's calculations from IPEDS.

15. The weighted average is slightly higher if one uses full-time equivalent (FTE) enrollment. It is 25.4 percent, still far lower than the institutional average of 38.6 percent.

16. See Eric Bettinger, Angela Boatman, and Bridget Terry Long, "Student Supports: Developmental Education and Other Academic Programs," *Future of Children: Postsecondary Education in the U.S.* 23, no. 1 (Spring 2013): 93–116.

17. NSC defines a cohort as first-time, degree-seeking students 18 or older who began in the fall of 2011.

18. Shapiro et al. present the most recent college completion rates using the NSC data. See Shapiro et al., *Completing College.*

19. Data are not provided on completion rates for private and for-profit two-year institutions.

20. For example, see Bridget T. Long and Michal Kurlaender, "Do Community Colleges Provide a Viable Pathway to a Baccalaureate Degree?," *Educational Evaluation and Policy Analysis* 31, no. 1 (2009): 30–53.

21. IPEDS also surveys for completion rates 200 percent of normal time, which is eight years for four-year institutions, but it does not ask for eight-year outcomes from two-year colleges.

22. See Shapiro et al., *Completing College*.

23. See Hess et al., *Diplomas and Dropouts*. The authors use the 2007 IPEDS data, which are for students who entered in 2001.

24. According to *Barron's Profiles of American Colleges*, institutions in the "very competitive" category typically admit students who rank in the top 35–50 percent of their

graduating high school class and have median freshman test scores ranging from 573 to 619 on the SAT and from 24 to 26 on the ACT. These colleges admit between one-half and three-quarters of their applicants.

25. "Most competitive" colleges are defined as requiring a class rank in the top 10–20 percent, a high school GPA of B+ to A, and freshman test scores between 655 and 800 on the SAT and 29 and above on the ACT. These institutions typically admit fewer than one-third of applicants.

26. Hess et al., *Diplomas and Dropouts*, 1.

27. See John Bound, Michael Lovenheim, and Sarah Turner, *Why Have College Completion Rates Declined? An Analysis of Changing Student Preparation and Collegiate Resources*, National Bureau of Economic Research, 2009.

28. Shapiro et al., *Completing College*.

29. I use the terms "Hispanic or Latino" following the IPEDS survey terminology, even though these can be distinct groups.

30. Some of the differences in completion rates across types of institutions may be due to small sample sizes, especially for Native American students, as other years of data suggest different patterns.

31. US Census Bureau, "Annual Social and Economic Supplement of the Current Population Survey," 2017.

32. See Sean F. Reardon, Demtra Kalogrides, and Ken Shores, "The Geography of Racial/Ethnic Test Score Gaps," *American Journal of Sociology*, forthcoming; and Charles Clotfelter, Helen F. Ladd, and Jacob Vigdor, "Who Teaches Whom? Race and the Distribution of Novice Teachers," *Economics of Education Review* 24, no. 4 (2005): 377–92.

33. William J. Hussar and Tabitha M. Bailey, *Projections of Education Statistics to 2025*, US Department of Education, National Center for Education Statistics, 2017.

34. Jennifer Ma, Matea Pender, and Meredith Welch, *Education Pays*, College Board, 2016.

35. For a discussion of this issue, see David Card, "The Causal Effect of Education on Earnings," in *Handbook of Labor Economics, Volume 3*, eds. Orley Ashenfelter and David Card (Amsterdam: Elsevier Science B. V., 1999).

36. Philip Oreopoulos and Uros Petronijevic, "Making College Worth It: A Review of the Returns to Higher Education," *Future of Children* 23, no. 1 (2013): 41–65.

37. The completion of certificates is not captured in these large-scale national data sets.

38. Ma, Pender, and Welch, *Education Pays*.

39. Sandy Baum et al., *Trends in Student Aid 2017*, College Board, 2017.

40. Baum et al., *Trends in Student Aid 2017*.

The Policy Imperative: Policy Tools Should Create Incentives for College Completion

SARAH TURNER

The problem of stagnant college completion rates is not new to the 21st century. The low levels of college completion observed today are similar to those observed a quarter century ago.[1] There is no single cause of low rates of college completion, nor will there be a simple "magic bullet" policy solution. The challenge is persistent and complex, while the returns to increasing college completion are substantial.

The consequences of low college completion rates are magnified in an environment with high economic returns for those who complete college.[2] The wage premium associated with collegiate attainment has increased markedly in recent decades. Compared to a worker with no more than a high school degree, the advantage in earnings for a college graduate has increased from about 46 percent in 1973 to about 82 percent in 2016. Those with "some college" without a degree earn only slightly more than high school graduates.[3] Looking at the broader picture, the differences in collegiate attainment by family income may limit long-term upward mobility in the US and exacerbate trends toward increased income inequality.

Policy: A Key Driver

Given the substantial role that state and federal policymakers play in funding, producing, and regulating postsecondary education, how can they improve college completion? Indeed, the federal government spent nearly $158 billion on student financial aid in higher education in 2015–16. (Of this, $96 billion was in loan subsidies, another $42 billion in grant aid, and the rest from higher education tax benefits and work study programs.) In

addition, state and local appropriates exceeded $76 billion that year.[4] In turn, more than 17 million students were enrolled at the undergraduate level in 2015, more than 13 million of whom were enrolled at public colleges and universities.[5] With this level of public investment, the question is whether changes in public policies would increase completion rates.

Over the past decade, college completion has gained prominence in public discourse. Federal policymakers, state associations, policy organizations from across the political spectrum, and blue ribbon commissions have made strong statements about the goal of increasing collegiate degree attainment. In introducing the 2010 United States federal budget, President Barack Obama declared, "By 2020, America will once again have the highest proportion of college graduates in the world."[6] Similarly, the Gates Foundation's initiative on postsecondary attainment is explicit in its objective:

> We've set an ambitious goal to help the nation double the number of low-income adults who earn postsecondary degrees or credentials—meaningful credentials with value in the workplace and labor market—by age 26. To accomplish this, America must connect the millions of young Americans who have the will to get the education they need with a way to get there.[7]

The Lumina Foundation states a similar objective: "increasing the share of Americans with high-quality degrees, certificates and credentials to 60 percent by 2025."[8]

Laudable as these goals are, they do not address the underlying challenges in the higher education market. Collegiate attainment is a complex, multidimensional process with many moving pieces, institutional actors, and types of students. Any expectation of a low-cost, quick fix in the form of an accountability mechanism or information-based intervention is unrealistic. And, although money matters in fostering college completion, the evidence discussed below does not suggest that increasing public spending without other adjustments (such as changes in student behavior and institutional organization) would increase college completion substantially. Increasing completion rates with the types of degrees that produce labor market rewards should be recognized as a hard problem, one that is worthy of sustained, iterative, and reflective policy investment at the state and federal levels.

There have been gains in the past decade—both modest increases in college completion and large improvements in the body of knowledge about college attendance and attainment.[9] At the same time, there are still institutions with completion rates so low as to require remedial action.

The ongoing challenge is to use policy to provide incentives for college completion without generating unintended consequences, such as the proliferation of degrees that do not produce returns in the labor market. State and federal policy must foster consumer protections that safeguard the interests of students, particularly those who may have the least experience with higher education. Finally, another objective of state and federal policy is to foster a well-functioning postsecondary market in which individuals' choices lead to efficiency and high productivity.

I will begin, then, by addressing the elusive promise of postsecondary accountability. I will then look at both the allocation of state funds and the role of federal financial aid to consider how resources (and their distribution) affect college completion.

Accountability: The Dominant Theme

The triumvirate of policy buzzwords in higher education is "access," "affordability," and—most recently—"accountability." Although alliterative, all three lack a clear empirical definition. Common usage ties "access" to the enrollment of low-income students, "affordability" to the cost of college for students and families, and "accountability" to outcome measures with rewards and sanctions. Here is one assessment from about 15 years ago:

> With few exceptions, recent discussions in policy circles have focused on questions of *access*, loosely defined as the extent to which individuals from different circumstances enroll in college to the near exclusion of questions of attainment. Emphasis on vaguely defined notions of "collegiate access and affordability" in public discourse has diverted attention away from the monitoring of outcomes such as courses completed and degrees awarded.[10]

Times have changed. "Accountability" has risen to be a dominant theme in higher education policy discussions, and college completion is among the most commonly referenced outcomes in this rubric.[11]

Federal Accountability Efforts. At the K–12 level, federally mandated test-based accountability policies took hold in 2001 when President George W. Bush brought forward the No Child Left Behind Act.[12] Slightly more than a decade later, President Barack Obama called for comprehensive accountability policy in higher education:

> Today, the federal government provides more than $150 billion each year in direct loan and grant aid for America's students. In an era of limited resources, we must allocate the federal investment in student aid wisely, in order to promote opportunity in higher education and ensure the best return on investment. The President will call on Congress to consider value, affordability, and student outcomes in making determinations about which colleges and universities receive access to federal student aid, either by incorporating measures of value and affordability into the existing accreditation system; or by establishing a new, alternative system of accreditation that would provide pathways for higher education models and colleges to receive federal student aid based on performance and results.[13]

An explicit goal was to design ratings based on measures such as college completion rates, given the absence of any viable test-based accountability metric for the postsecondary sphere. What emerged from the policy process was something more toothless than a federal accountability metric. And, as a policy matter, that may not be a bad thing. Were the federal government to endeavor to "score" diverse higher education institutions and attach punitive actions or financial rewards to these measures, the unintended consequences would likely dominate any potential benefits.[14]

Released in September 2015, the College Scorecard and its publicly available data provide a valuable accounting of differences among institutions in completion and post-enrollment earnings for students. The data are accompanied by a thoughtful, academic-friendly report, which is exceedingly rigorous in explaining the pitfalls and challenges of measuring

college completion.[15] That college completion rates are not the only outcome metric in these data is a methodological strength—not a weakness of the approach. The College Scorecard also includes earnings and debt after graduation. A basic tenet in economic theory is that including multiple outcomes in an evaluation metric lessens incentives to distort behavior on a single output margin, and that lesson would seem to apply equally in higher education.

What emerged from the federal process in 2015 was not a mechanism of rewards and sanctions but something far more empirical in the form of a database with measures of collegiate outcomes, including completion rates and earnings. Although the comprehensive range of outcomes (including earnings) and alternative computational approaches are an innovation of the College Scorecard, the basic completion rate metrics were already reported in the federal College Navigator and in various research reports.[16]

Measuring Completion Outcomes. The College Scorecard measures and data repository might be the most comprehensive assembly of evidence on completion, earnings, and employment outcomes because it relies on data from institutional records from the IRS, Federal Student Aid, and the National Student Clearinghouse, in addition to data from the Integrated Postsecondary Education Data System (IPEDS). Broadly, this resource reiterates findings from the institutional IPEDS surveys and other federal and state sources about the current college completion rates.

It should be noted that measuring college completion rates comprehensively at the level of individual institutions is a tradition of less than two decades, even as many other outcomes of colleges and universities (including enrollment and degrees awarded) have been available for more than 50 years.[17] The IPEDS surveys began including cohort completion rates in 1996, making 2002 the first year for observing bachelor degree completion within 150 percent of the expected time.[18] In addition to federal data-collection efforts, the expansion of databases that record the progression of individuals from K–12 through postsecondary education has facilitated the collection of information on completion rates. Since 2006, the federal government has given 47 states State Longitudinal Data System grants, which marry K–12, higher education, and workforce data. Such data allow researchers to identify how precollegiate characteristics affect

collegiate outcomes and how collegiate outcomes, including choice of major and completion, affect labor market outcomes.

The data from various sources tell a compelling story: There are vast differences among colleges and universities in college completion. This variation is particularly marked among institutions in the bottom half of the distribution of colleges as measured by selectivity or institutional resources. In addition, although college completion rates are closely associated with other measures of performance (such as earnings and student loan repayment rates) for four-year institutions, they are only weakly related to these outcome measures for two-year institutions.[19]

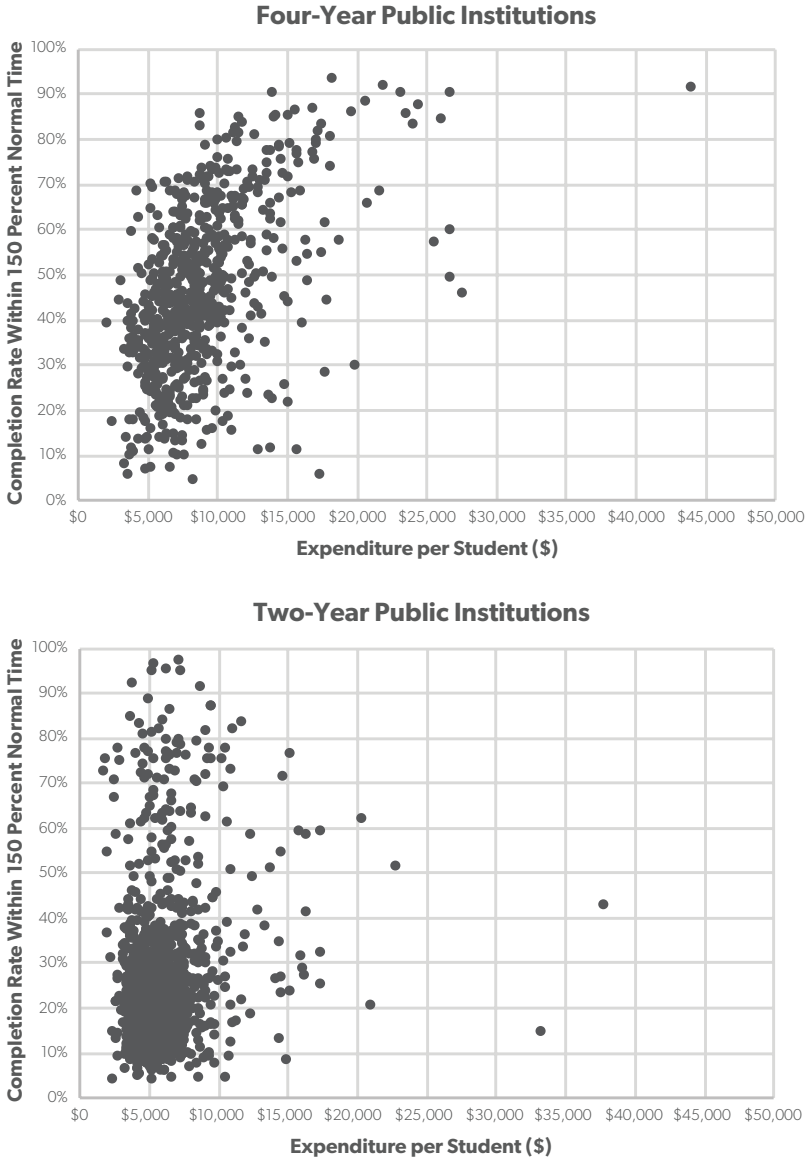
Figures 1–2 show the association between completion rates (within 150 percent of expected time) and instructional expenditures by control of institution. Particularly for four-year public and nonprofit institutions, there is a marked positive relationship between instructional spending and completion rates.[20] That said, there are also substantial differences among institutions with similar levels of expenditures in student outcomes; this variation is particularly prominent among for-profit institutions and among two-year or associate programs in the public sector.

Table 1 shows counts of four-year institutions and students with completion rates below 20 percent. Although 20 percent is an arbitrary cutoff, a completion rate of less than one in five cannot be taken as a signal of strong performance. Notably, these poorly performing institutions are distributed among the for-profit, public, and nonprofit sectors; no group of institutions has the monopoly on poor performance. Although for-profit institutions (some of which are very small in scale) are the most numerically present (followed by nonprofits and then publics), 38 percent of students enrolled at four-year institutions with low completion rates are at public institutions, 44 percent are at for-profits, and the remainder are at nonprofits.

Beyond the four-year sector, low completion rates are rampant at community colleges, of which 352 public campuses (of about 910) have program completion rates below 20 percent. These institutions represent about 2.4 million students, or 40 percent of total enrollment in the community college sector.

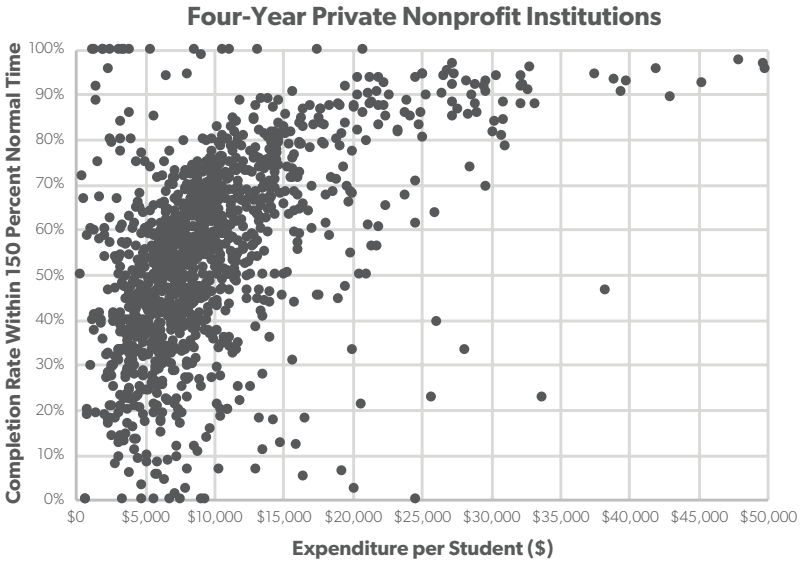
A more chilling measure to accompany these institution counts is the incidence of institutions with completion rates less than the three-year cohort default rate on student loans. In 43 four-year public schools, the three-year

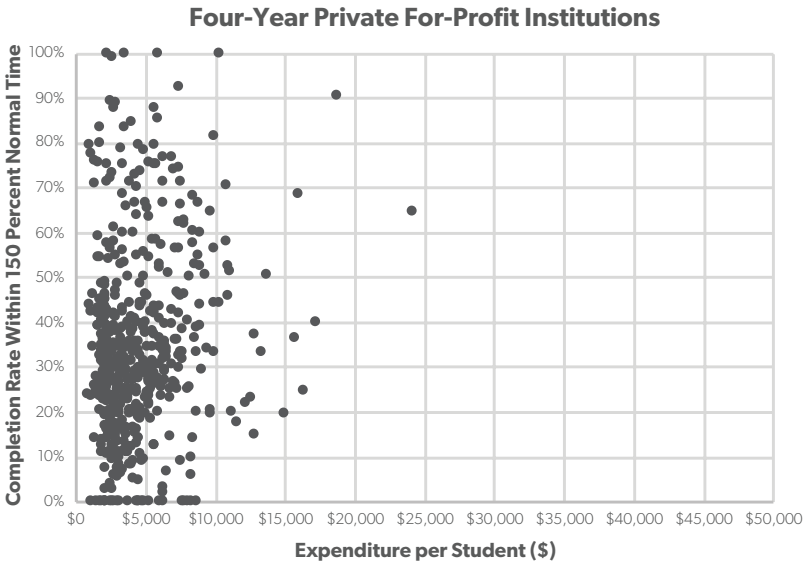
Figure 1. Completion Rates at Public Institutions



Note: Completion rates reflect the percentage of first-time, full-time students completing degrees within 150 percent of the expected degree completion time. Institutions with fewer than 20 undergraduate students are omitted.
Source: Author's calculations based on the College Scorecard data.

Figure 2. Completion Rates at Private Institutions





Note: Completion rates reflect the percentage of first-time, full-time students completing degrees within 150 percent of the expected degree completion time. Institutions with fewer than 20 undergraduate students are omitted.
Source: Author's calculations based on the College Scorecard data.

Table 1. Completion Rate Below 20 Percent in 150 Percent of Normal Time

	Public	Private Nonprofit	Private For-Profit
Number of Institutions	55	82	123
	21.2%	31.50%	47.30%
Number of Students	261,255	120,529	301,750
	38.20%	17.60%	44.10%

Source: Author's calculations based on the College Scorecard data.

cohort default rate is greater than the completion rate. This is also the case for 147 four-year private nonprofit schools and 98 for-profit schools.[21] In other words, students at these schools who borrow face a greater likelihood of defaulting than completing a degree. It would seem, then, that college attendance at these schools leaves many students worse off—lacking a degree, defaulting on a student loan, or both.

State Policies and Appropriations

The decline in resources per student from state sources is unmistakable over the past two decades. Between academic year 2000–01 and academic year 2014–15, constant dollar appropriations from state sources to higher education held constant at about $77 billion while enrollment increased from 8.7 million to 11.1 million students. This resulted in a drop in appropriations from $8,886 to $6,966 per student.[22]

Money Matters. Because public providers account for 72 percent of undergraduate enrollment, the potential impact of this drop in appropriations is substantial. Some of the losses have been offset with increases in tuition levels, effectively shifting the burden of who pays for college. The share of public universities' total educational revenues covered by net tuition revenue rose from 29.4 percent in 2001 to 43.3 percent in 2011.[23] By 2017, tuition provided more revenue than state appropriations in 28 states.

When students and their families must pay for a greater share of the costs of education, it is not surprising that borrowing levels increase as

well, as debt per college graduate has increased from $12,200 ($22,000 per borrower) to $15,800 ($27,000 per borrower) between 2005–06 and 2015–16.[24] What is more, states with the most severe economic downturns in the 2008 recession were among those in which public institutions raised tuition the most, but many institutions still faced declines in total resources per student, with these declines most apparent outside the most selective public research universities.[25]

Such erosion in resources likely has real consequences for student attainment in completion rates and the time it takes students to obtain a degree.[26] David Deming and Christopher Walters show that increases in collegiate spending produce substantial effects on completion rates and degree attainment, while changes in tuition levels do not appear to affect either enrollment or completion. Their results suggest a 10 percent increase in total spending is associated with a 0.52 percentage point increase in the graduation rate.[27]

Within states, appropriations cuts appear to translate differently in terms of real cuts in spending at different kinds of institutions. Flagship and relatively selective public institutions may be able to recoup some lost appropriations with increased revenues from other sources, including higher tuition charges and increases in the enrollment of students paying full tuition from out of state. However, broad-access institutions (colleges that admit nearly all students) are likely to face real declines in expenditures per student with declines in state appropriations; these institutions tend to have little capacity to attract full-pay students from out of state or abroad.

In a model in which expenditures are tied to attainment, a decline in resources per student leads to a decline in completion. System-wide, the result is increased stratification in resources among institutions in a state, combined with erosion in completion rates at the broad-access schools where many low-income students matriculate.

Even as erosion in public funding contributes to low completion rates, many public universities outside the selective research universities often face market challenges that go beyond short-term changes in state support. Public colleges and universities are not necessarily "nimble critters."[28] Location and curricular structure at many public universities and nonprofit colleges are poorly matched with market demand. Some colleges may be operating at a scale that is not sustainable, with deficit spending and deferred maintenance leading to long-term decline and erosion of assets. Yet, it is administratively

difficult to close or merge programs that are no longer economically viable or that have outlived their usefulness, much less entire campuses. Often there are entrenched interests willing to invest substantial sums in litigation and lobbying to preserve the status quo.[29]

A distinction between poorly performing institutions in the for-profit sector and those in the public and nonprofit sectors is that market forces will force the former to exit the market. As a point of illustration, while 107 for-profit institutions closed their doors in 2014–15 and 2015–16, zero public institutions closed, and only 13 private nonprofit institutions closed.[30]

State policymakers have a particular responsibility for oversight in the public sector because market forces will not generate closure. Additionally, the short-term costs of restructuring struggling institutions often limit states' capacity to do so, even though the long-term gains from restructuring can be sizable. A recent study of college consolidations affecting more than 10,000 students in the university system in Georgia found increases in student persistence with cost increases for cohorts matriculating post-consolidation, suggesting the consolidation led to improvements in efficiency.[31]

Performance Funding. One strategy employed by states with increasing frequency is to tie some fraction of state institutional appropriations to degree completion, along with other measures of student characteristics and outcomes. Although there are a few examples of performance funding that date to the late 1970s (such as Tennessee), the vast majority of performance funding schemes were adopted after 2008, coincident with the fiscal pressures of the Great Recession and the increased attention to completion rates in public dialogue. One report from the National Council of State Legislatures indicates that 32 states have some sort of performance-based funding scheme, in which institutions with better outcome measurements receive a larger share of public funds.[32] States differ markedly in the metrics used and the share of funds at risk or subject to performance targets. In addition to completion rate metrics, several states include measures of intermediate completion (such as retention and course completion).

In the main, the jury is still out on how these policies affect completion rates at the college level and outcomes more generally. Theory suggests some caution: Performance funding systems that weigh completion rates heavily could risk generating incentives for degree mills—schools or

programs that churn out poor-quality degrees that have little value in the labor market. Such performance funding systems may also generate incentives for "cream skimming," whereby only the most high-achieving students are accepted into degree programs, limiting opportunities for students who may be regarded as "higher risk." In addition, funding formulas that identify subgroups on "threshold" characteristics, such as eligibility for a federal Pell Grant, risk shifting the composition of enrollment away from students who may be "near poor."[33]

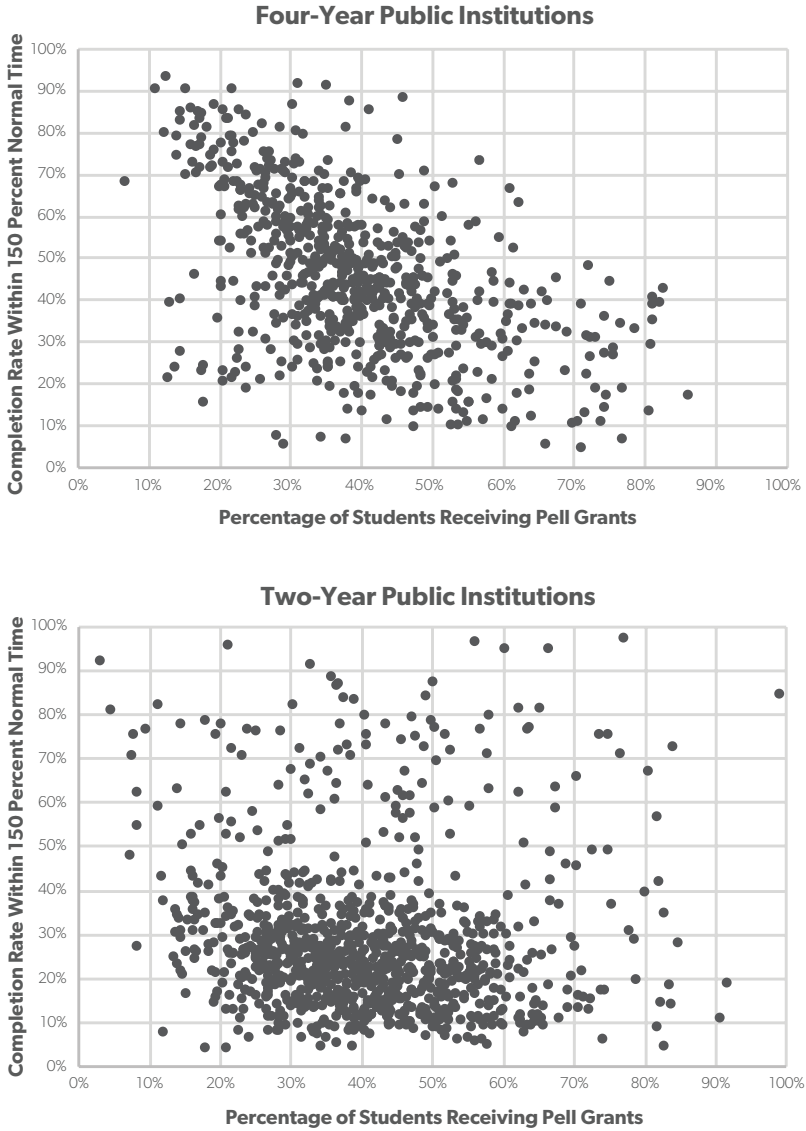
Federal Policy and Title IV

The primary funding channel through which the federal government affects college completion is federal financial aid, distributed largely under the heading of Title IV of the Higher Education Act. This aid includes need-based Pell Grants and federally subsidized student loans and covers a large umbrella of degree programs and students, including both recent high school graduates and students returning to postsecondary education after substantial labor market experience.[34] The rationale for these programs is to alleviate credit constraints that might otherwise deter students from making high-return investments in postsecondary programs, allowing them to borrow against their future predicted earnings to finance their education today.

Yet demonstrably low completion rates among Pell Grant recipients, combined with high default rates among borrowers who do not complete school, raise questions about whether students and taxpayers would be better served if Pell Grants included explicit incentives for college completion.[35] Figures 3–4 present completion rates (150 percent of normal time) for Pell Grant recipients in two- and four-year institutions. There is a striking negative relationship between institutions serving a large share of Pell Grant recipients and the completion rates of these students, even as there is clearly substantial variation among institutions. This suggests that a policy focus that rewards only *enrollment* of Pell Grant–eligible students would be poorly aligned with the objective to increase college completion among students eligible for those grants.

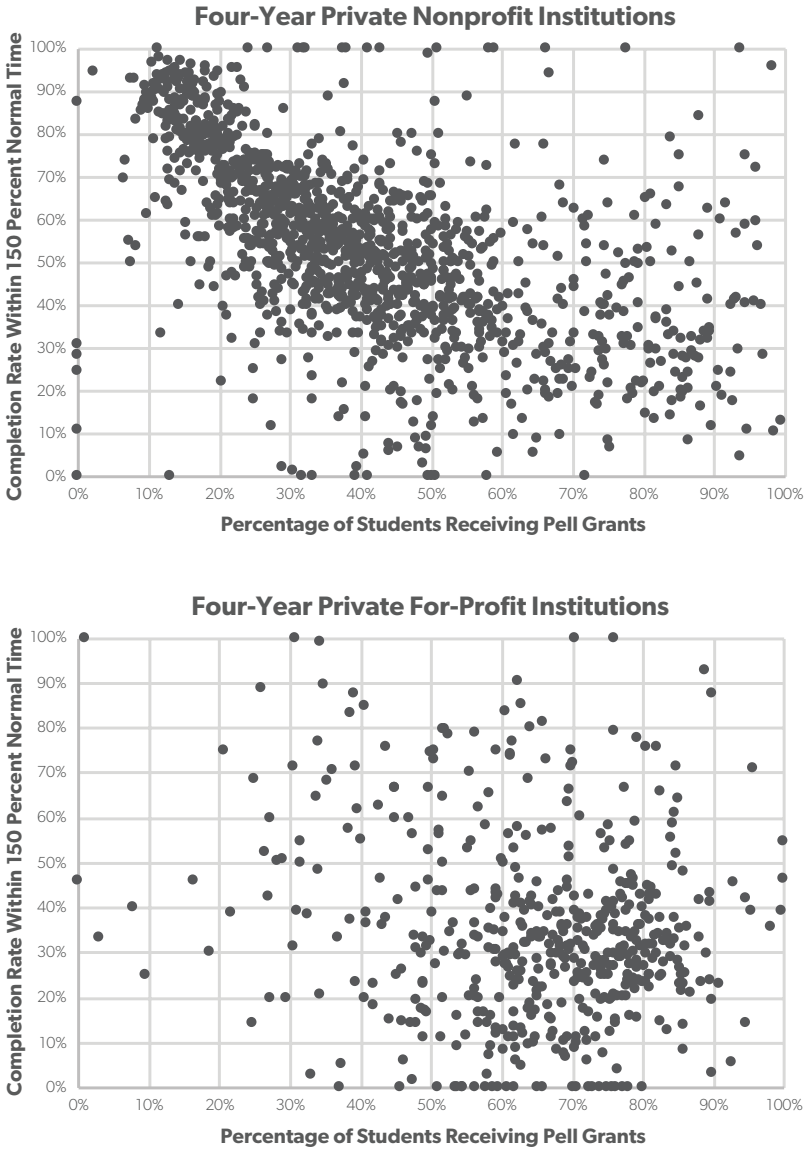
Several policy experts have asked whether federal student aid policy could include institutional incentives to increase student persistence and

Figure 3. Enrollment and Completion of Pell Grant–Eligible Students at Public Institutions



Note: Completion rates reflect the percentage of first-time, full-time students completing degrees within 150 percent of the expected degree completion time. Institutions with fewer than 20 undergraduate students are omitted.
Source: Author's calculations based on the College Scorecard data.

Figure 4. Enrollment and Completion of Pell Grant–Eligible Students at Private Institutions



Note: Completion rates reflect the percentage of first-time, full-time students completing degrees within 150 percent of the expected degree completion time. Institutions with fewer than 20 undergraduate students are omitted.
Source: Author's calculations based on the College Scorecard data.

degree completion.[36] Most prominent among these is a proposal by Kristin Blagg and Matthew Chingos to create some "risk sharing" that links student outcomes to the universities' financial aid obligations, with institutions required to return a portion of the financial aid of students who drop out before the end of the term. These policy experts also note the importance of ending federal aid eligibility for colleges where a high proportion of students earn unacceptably low wages after leaving.[37]

Yet such proposals are admittedly hard to get right: If the incentives are too strong, they might foster social promotion among lagging students, and policy could drive behavior changes at the institution level that are not actually improving how those schools serve students. Alternatively, if incentives are too weak, the behavior of higher education institutions likely will not change a lot.

Institutional Eligibility for Title IV Aid. The strongest tool that the federal government has to change the behavior of colleges and universities is limiting access to Title IV aid. For many institutions, cutting off aid access is an effective death sentence.[38] Yet, although default rates have been part of the policy guidelines for determining access to Title IV aid, college persistence and completion have not.

Two considerations argue for using completion thresholds in determining access for aid eligibility: First, they can be observed earlier than defaults, which may take several years to materialize in the data because, for example, a three-year default rate cannot be measured until at least three years after an individual has separated from a program. Second, they identify a broad range of programs in which educational outcomes are weak. Given the enormous cost burden to students of attending institutions that are unlikely to produce a pathway to improved labor market outcomes, federal policy needs to be swift in requiring demonstrated change (or closure) among institutions with poor performance.

There is much to be said for better using federal regulatory policy to focus on protecting consumers from low-performing institutions.[39] The current accreditation mechanism, which allows institutions access to Title IV dollars, imposes high compliance costs but provides little meaningful accountability. Whether the examples are outright fraud (such as the widely reported case of Corinthian Colleges) or simply poor performance, it is often

the most vulnerable students who enroll at the programs with the lowest performance.[40] And the accreditation system is not currently weeding out those programs.

Although one hopes that market forces generated by students making well-informed choices would force underperforming institutions out of the market, the simple truth is that some of the worst outcomes are from a modest number of institutions and disproportionately affect low-income students already at a disadvantage.[41] Whether these institutions are under-resourced (perhaps due to limited state funding) or simply mismanaged is not relevant for students who find themselves worse off as a result of enrollment.

Indeed, Milton Friedman, a strong proponent of injecting private market forces in education, reminds us of the importance of government regulation in ensuring schools meet certain minimum standards. He noted the role of government in "assuring that the schools met certain minimum standards such as the inclusion of a minimum common content in their programs, much as it now inspects restaurants to assure that they maintain minimum sanitary standards."[42] Current federal policy does not sufficiently accomplish that goal.

The Road Ahead

The market environment that will foster increased college completion requires sufficient student financial aid to resolve credit constraints, but it also requires well-functioning colleges in the private and public sectors and well-informed college choice. Policymakers and researchers are much more focused on the challenges of college completion than they were two decades ago, and they have much better tools for measurement. Due to enhanced federal data-collection efforts, the capacity to measure college completion has been transformed and continues to improve with innovations in federal data collection and state systems that record progression in college toward degree attainment.

Improving College Choice. Unfortunately, what researchers and government agencies know about college completion rates and other outcome measures (such as default rates and earnings) does not appear to have

substantially influenced how students decide on a college. Federal resources such as the College Scorecard and College Navigator may have more utility for researchers than for students and families.

There is ample evidence that many students do not apply to (or attend) colleges that are well matched to their achievements and aspirations. In particular, high-achieving low- and moderate-income students are less likely than their more affluent peers to attend an institution where expected graduation rates are high.[43]

Most of the policy action and research literature has focused on the choices of recent high school graduates, yet guidance is likely most lacking with older students (including the many independent students receiving Pell Grants). Adults with limited college education and several years of full-time labor force participation may lack the resources, such as high school guidance counselors and a large group of peers making similar decisions, that are available to those at the transition from high school to college.[44] Adult students' challenges in choosing a college are particularly acute during labor market downturns when unemployment or the obsolescence of skills generates increased participation in higher education.

Improving college choice is likely among the most powerful *potential* college completion reform strategies. If students choose colleges that have strong records of completion and are well matched with their academic preparation and career aspirations, they may be more likely to complete degree programs. Moreover, when students "vote with their feet" and make well-informed choices about where to attend college, the higher education marketplace improves as strong institutions are rewarded and low-performing ones exit or reform.

Although the idea of helping students improve college choice with information-based interventions holds great promise, such approaches are in the developmental stages, and most do not have demonstrated efficacy. It would be a mistake—and a waste of resources—to simply declare another federal program to deliver information.[45] What is needed are federal and state investments in developmental efforts to understand how different strategies of information dissemination and education improve students' and parents' ability to use data in decision-making.

There are two pieces to the challenge of improving market information available to students. The first is improving the raw metrics that are

available in the public domain that record student outcomes. Given that so much of the relevant data are effectively in federal control, the organization and release of these data require federal policy action. This includes both student-level inputs and institution-level metrics of outcomes and program progress.[46]

The second piece of the challenge is to enable students, their families, trusted adults, and college counselors to analyze the data in terms of benefits and costs of different college choices. Because students' needs are likely to differ markedly with their environments, family circumstances, and level of achievement and objectives, it seems highly unlikely that the federal government is well positioned to develop a single application that meets such a broad range of needs. Rather, a decentralized yet competitive development process is likely to benefit both students and the collegiate market.[47] One approach would be for the federal government to provide a small number of development teams—potentially comprised of researchers and policy entrepreneurs—with resources to develop and test efficacy of delivery modules.[48]

Degree completion rates are an important outcome measure for higher education because they are the most direct indicator available of whether a student achieved competency in a chosen course of study. Particularly at the level of the bachelor's degree and in some certificate programs, degree completion is also linked to substantial labor market rewards. Recognition (if not applause) that there has been substantial progress in measuring completion rates is certainly in order. Even as the improved metrics have been a bonus to academic researchers, those improvements have not yet sufficiently influenced student choices or state and federal higher education policy.

Addressing Poor Performance. Given the substantial role that state and federal policymakers play in funding, producing, and regulating postsecondary education, how can they improve college completion? It is useful to recognize what policy *can* and *cannot* do (along with what policy should and should not do) to increase college completion. State and federal policy can neither "regulate" nor "buy" increased production of high-return college graduates because the production of college-level knowledge requires the active investment of students and institutions. Attempts to address the college completion challenge with policy efforts focused narrowly on accountability, ratings, and incentives will almost surely end poorly with a

proliferation of "degree mills" or efforts by institutions to limit postsecondary opportunities through "cream skimming."

Still, an important role for state and federal policy is to ensure that there are sufficient guardrails in place so that institutions that do not demonstrate systematic patterns of success in college completion, as well as other indicators such as earnings and loan repayment, do not lure students to an unfulfilled promise of college education. While colleges unquestionably have different missions, along with varying levels of student preparation and institutional resources, each institution that is eligible for federal financial aid should be able to demonstrate realistic prospects for college completion. Institutions with the lowest completion rates often serve the most at-risk populations, potentially contributing to a cycle of poverty rather than fostering the economic gains that are part of the promise of higher education.

Policymakers should use this moment to assess carefully whether there are opportunities to provide incentives to improve completion rates and increase the efficiency of higher education more generally. While regulation to address the poorest-performing institutions is one tool in the policy quiver, broad-based gains in college completion require innovations in how students choose colleges and the organization of colleges and universities. The opportunities to improve completion rates—and the quality of higher education more generally—are substantial.

Notes

1. In "Going to College and Finishing College: Explaining Different Educational Outcomes," I identify a decline of about 25 percent in college completion rates between 1970 and 2000. Sarah Turner, "Going to College and Finishing College: Explaining Different Educational Outcomes," in *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It*, ed. Caroline M. Hoxby (Chicago, IL: University of Chicago Press, 2004). Using longitudinal microdata, John Bound, Michael Lovenheim, and I show that the college completion rate declined from 50.5 percent for those from the high school class of 1972 who enrolled in college to 45.9 percent for those from the high school class of 1992. We find that the decline is most pronounced among men beginning college at less-selective public four-year schools and those starting at community colleges. We show that changes in college characteristics—including type of institution and resources, as well as resources per student—are particularly important in explaining the decline. See John Bound, Michael Lovenheim, and Sarah Turner, "Why Have College Completion Rates Declined? An Analysis of Changing Student Preparation and Collegiate Resources,"

American Economic Journal: Applied Economic 2, no. 3 (2009): 129–57.

2. David Autor, "Skills, Education, and the Rise of Earnings Inequality Among the 'Other 99 Percent,'" *Science* 344, no. 6186 (May 2014): 843–51, http://www.sciencemag.org/content/344/6186/843.

3. Economic Policy Institute, State of Working America Data Library, "Wages by Education," 2018. Tables are computed from the Economic Policy Institute analysis of Current Population Survey Outgoing Rotation Group microdata.

4. See College Board, *Trends in Student Aid*, 2017, Table 1, https://trends.collegeboard.org/sites/default/files/2017-trends-student-aid_0.pdf; and College Board, *Trends in College Pricing*, 2017, Figure 12B, https://trends.collegeboard.org/sites/default/files/2017-trends-in-college-pricing_1.pdf.

5. US Department of Education, Institute of Education Sciences, National Center for Education Statistics, "Digest of Education Statistics," 2017, Table 303.70, https://nces.ed.gov/programs/digest/d16/tables/dt16_303.70.asp?current=yes.

6. Barack Obama, "Remarks of President Barack Obama—Address to Joint Session of Congress," White House, February 24, 2009, https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-address-joint-session-congress.

7. Bill & Melinda Gates Foundation, *Postsecondary Success*, 2009, https://docs.gatesfoundation.org/Documents/postsecondary-education-success-plan-brochure.pdf.

8. See Lumina Foundation, "Lumina's Goal," http://www.luminafoundation.org/goal_2025/. Similarly, a 2006 Spellings Commission report emphasized college and university attainment as a "key source of the human and intellectual capital needed to increase workforce productivity and growth." US Department of Education, *A Test of Leadership: Charting the Future of U.S. Higher Education*, September 2006, 7, https://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf.

9. For example, the share of 25- to 29-year-olds with bachelor-level degrees has risen from 23.2 percent in 1990 to 29.1 percent in 2000 and 35.6 percent in 2015.

10. See Turner, "Going to College and Finishing College." Footnote 3 examines citations from the *Chronicle of Higher Education* and federal legislation (between 1998 and 2001); "college access" and related terms far outnumbered references to degree completion.

11. As quick evidence, a search of articles on February 20, 2018, in the *Chronicle of Higher Education* produced 552 references to accountability, 460 references to access, and 251 references to affordability in the past year.

12. Test-based accountability policies initially took shape at the state level. As Lovenheim and Turner note, although fewer than five states had any form of accountability system in place in 1993, five years later nearly 25 states had introduced statewide school accountability measures. By the start of the 21st century, more than 40 states had some accountability measures in place. Michael Lovenheim and Sarah Turner, *Economics of Education* (New York: Worth Publishers, 2017).

13. White House, *The President's Plan for a Strong Middle Class & a Strong America*, February 12, 2013, 5, https://obamawhitehouse.archives.gov/sites/default/files/uploads/sotu_2013_blueprint_embargo.pdf.

14. See, for example, the Federal Register request for information and comment on the Postsecondary Institution Ratings System. See 78 Fed. Reg. 76,289 (2013), https://www.

gpo.gov/fdsys/pkg/FR-2013-12-17/pdf/2013-30011.pdf. Caroline Hoxby and I discuss problems related to measures intended to capture outcomes for low-income students. Caroline Hoxby and Sarah Turner, "Measuring Opportunity in U.S. Higher Education" (working paper, 2018).

15. Executive Office of the President of the United States, *Using Federal Data to Measure and Improve the Performance of U.S. Institutions of Higher Education*, January 2017, https://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf.

16. For example, see Frederick M. Hess et al., *Diplomas and Dropouts: Which Colleges Actually Graduate Their Students (and Which Don't)*, American Enterprise Institute, June 3, 2009, http://www.aei.org/publication/diplomas-and-dropouts/.

17. The Higher Education General Information Survey, the predecessor to IPEDS, is available in machine-readable form beginning in 1966.

18. Included in the discussion of bachelor-level degrees throughout this report are bachelor of arts and bachelor of science degrees. The history of federal collection of graduation rates ties to the National Collegiate Athletic Association requirement that colleges report graduation rates beginning in 1985. Subsequently, in 1990, Congress passed the Student Right-to-Know and Campus Security Act because it was believed the information would be broadly useful beyond student athletes. See Bryan Cook and Natalie Pullaro, *College Graduation Rates: Behind the Numbers*, American Council on Education, September 2010, http://www.acenet.edu/news-room/Documents/College-Graduation-Rates-Behind-the-Numbers.pdf.

19. See Executive Office of the President of the United States, *Using Federal Data to Measure and Improve the Performance of U.S. Institutions of Higher Education*, Figures 5-3a and 5-3b.

20. While some research shows the causal impact of spending on completion rates, it is important to also recognize that differences in student characteristics that are correlated with instructional expenditures also contribute to the observed relationship. In general, students who attend institutions with greater expenditures also have higher levels of academic preparation. See John Bound and Sarah Turner, "Cohort Crowding: How Resources Affect Collegiate Attainment," *Journal of Public Economics* 91, no. 5–6 (June 2007): 877–99; and David J. Deming and Christopher R. Walters, "The Impact of Price Caps and Spending Cuts on U.S. Postsecondary Attainment" (working paper, National Bureau of Economic Research, Cambridge, MA, August 2017), http://www.nber.org/papers/w23736.

21. Author's calculations based on the College Scorecard data.

22. College Board, *Trends in College Pricing*, 2015, https://trends.collegeboard.org/sites/default/files/2015-trends-college-pricing-final-508.pdf.

23. William G. Bowen, *The "Cost Disease" in Higher Education: Is Technology the Answer?*, Stanford University, October 2012, http://www.ithaka.org/sites/default/files/files/ITHAKA-TheCostDiseaseinHigherEducation.pdf.

24. College Board, Trends in Higher Education, "Figure 12: Average Cumulative Debt Levels in 2016 Dollars: Bachelor's Degree Recipients at Four-Year Institutions, 2000–01 to 2015–16," https://trends.collegeboard.org/student-aid/figures-tables/loans#Federal%20Loans.

25. Andrew Barr and Sarah Turner, "Expanding Enrollments and Contracting Budgets: The Effect of the Great Recession on Higher Education," *Annals of the American Academy of Political and Social Science* 650, no. 1 (November 2013): 168–93, http://journals.sagepub.com/doi/pdf/10.1177/0002716213500035.

26. John Bound, Michael Lovenheim, and Sarah Turner, "Why Have College Completion Rates Declined: Marginal Students or Marginal College?," *American Economic Journal: Applied Economics* 2, no. 3 (July 2010): 129–57. One cause of the secular decline in state funding for higher education is that higher education funding is often determined as the residual, after-entitlement commitments and other nondiscretionary spending. Indeed, cyclical pressures on higher education are often magnified by federal programs like Medicaid with state-level matching features. See Thomas J. Kane et al., "Higher Education Appropriations and Public Universities: Role of Medicaid and the Business Cycle," Brookings Institution, 2005.

27. Deming and Walters, "The Impact of Price Caps and Spending Cuts on U.S. Postsecondary Attainment."

28. National Conference of State Legislatures, "Performance-Based Funding for Higher Education," July 31, 2015, http://www.ncsl.org/research/education/performance-funding.aspx.

29. David J. Deming, Claudia Goldin, and Lawrence F. Katz, "The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators?," *Journal of Economic Perspectives* 26, no. 1 (Winter 2012): 139–64, https://scholar.harvard.edu/files/lkatz/files/dgk.pdf.

30. US Department of Education, Institute of Education Sciences, National Center for Education Statistics, "Digest of Education Statistics," 2017, Table 317.50.

31. For a fuller discussion of college closings, see Lawrence S. Bacow and William G. Bowen, "The Real Work of 'Saving' 2 Colleges Has Yet to Be Done," *Chronicle of Higher Education*, September 8, 2015, https://www.chronicle.com/article/The-Real-Work-of-Saving-/232901.

32. Lauren Russell, "Short-Term Impacts of College Consolidations: Evidence from the University System of Georgia" (working paper, Massachusetts Institute of Technology, Cambridge, MA, 2016).

33. Jeffrey Tebbs and Sarah Turner, "Low-Income Students: A Caution About Using Data on Pell Grant Recipients," *Change: The Magazine of Higher Learning*, 2005; and Hoxby and Turner, "Measuring Opportunity in U.S. Higher Education."

34. Since 1985–86, the majority of Pell Grant recipients have been "independent" students (24 years old or older, or with independent households), and the proportion of Pell Grant recipients who are in the independent category varies with labor market conditions. Not surprisingly, in response to the Great Recession, this share rose to a peak of 60.5 percent in 2009–10 before falling back to 54.9 percent in academic year 2014–15. College Board, "Federal Pell Award in Current and Constant Dollars over Time," https://trends.collegeboard.org/student-aid/figures-tables/federal-pell-award-current-constant-dollars-over-time. Completion outcomes for these students are a particular concern because they disproportionately attend institutions with weak outcomes. Examining the overall quintile of program completion rate provided by the College Scorecard, more than 33 percent of 25- to 29-year-olds and 41 percent of 30- to 34-year-olds enrolled in 2007

attended institutions in the bottom quintile of all institutions ranked by completion rates. As enrollment of these older students ballooned in subsequent years, nearly 40 percent of the increase of students in these age groups was in the bottom quintile.

35. Robert Kelchen shows the broad correlation between Pell and non-Pell graduation rates. At four-year colleges, the average six-year graduation rate for Pell recipients was 51.4 percent, compared to 59.2 percent for non-Pell recipients. See Robert Kelchen, "A Look at Pell Grant Recipients' Graduation Rates," Brookings Institution, October 25, 2017, https://robertkelchen.com/tag/pell-grant/.

36. A College Board panel report from 2013 provides several thoughtful comprehensive proposals for restructuring the Pell Grant and the structure of student aid more generally. Sandy Baum et al., *Rethinking Pell Grants*, College Board, April 2013, http://media.collegeboard.com/digitalServices/pdf/advocacy/policycenter/advocacy-rethinking-pell-grants-report.pdf.

37. Kristin Blagg and Matthew M. Chingos, *Getting Risk Sharing Right: Creating Better Incentives for Colleges and Universities*, Urban Institute, December 19, 2016, https://www.urban.org/research/publication/getting-risk-sharing-right.

38. Stephanie Cellini, Rajeev Darolia, and Lesley J. Turner, "Where Do Students Go When For-Profit Colleges Lose Federal Aid?" (working paper, National Bureau of Economic Research, Cambridge, MA, December 2016), http://www.nber.org/papers/w22967.

39. David Deming and David Figlio note that regulatory efforts in higher education are most needed among those institutions that rely largely on taxpayer funds, through federal financial aid and state appropriations. See David Deming and David Figlio, "Accountability in U.S. Education: Applying Lessons from K–12 Experience to Higher Education," *Journal of Economic Perspectives* 30, no. 3 (2016): 33–56.

40. Corinthian Colleges, a for-profit chain of colleges that at one point had over 100 campuses, was found to have inflated job-placement statistics and engaged in false and predatory advertising. The institution faced lawsuits from the California attorney general and the Consumer Financial Protection Bureau in 2014, and the school shut down entirely after an April 2015 Department of Education finding that it had mislead students, entering bankruptcy in May 2015. For a summary, see Danielle Douglas-Gabriel, "Feds Found Widespread Fraud at Corinthian Colleges. Why Are Students Still Paying the Price?," *Washington Post*, September 29, 2016, https://www.washingtonpost.com/news/grade-point/wp/2016/09/29/feds-found-widespread-fraud-at-corinthian-colleges-why-are-students-still-paying-the-price/. Critics of the "gainful employment" regulations often note that they are aimed principally at for-profit institutions. Briefly, federal regulations require occupational programs to have expected annual loan payments less than 20 percent of discretionary income to avoid sanctions or loss of eligibility to participate in federal student aid programs. It is important to note that no sector has a full monopoly on poor performance, as low-completion and high-default institutions also persist in the public and private nonprofit sectors. Although bankruptcy and closure do force poorly performing for-profit institutions out of the market, nonprofits and public institutions may be much slower to exit. To give an example of the diversity of institutions with what would appear to be poor performance, the College Scorecard records the following institutions with graduation rates of 12 percent: Jarvis Christian College, Hawkins,

Texas (private nonprofit, 32 percent of students in repayment, 94 percent receive loans, $24,600 average salary 10 years after attendance); Central Alabama Community College, Alexander City, Alabama (public, 43 percent of borrowers in repayment, 40 percent receive loans, $27,500 average salary 10 years after attendance); and South University, West Palm Beach, Royal Palm Beach, Florida (for-profit, 37 percent of borrowers in repayment, 80 percent receive loans, $28,800 average salary 10 years after attendance).

41. Thus, the often-repeated quote: "The U.S., with 4,000 institutions of higher education, probably has 50 of the best universities in the world and undoubtedly 500 of the worst." Robert Stevens, as cited in William Bowen, Martin Kurzweil, and Eugene Tobin, *Equity and Excellence in American Higher Education* (Charlottesville, VA: University of Virginia Press, 2005), 66.

42. Milton Friedman, "The Role of Government in Education," in *Economics and the Public Interest* (News Brunswick, NJ: Rutgers University Press, 1955).

43. William G. Bowen, Matthew M. Chingos, and Michael S. McPherson, *Crossing the Finish Line: Completing College at America's Public Universities* (Princeton, NJ: Princeton University Press, 2009). Examining data from North Carolina on students from a broad achievement range, the authors show that 40 percent of students who were well qualified to attend a selective college in 1999 did not enroll in one; this finding was appreciably more pronounced among students in the bottom quartile of family income (59 percent of SAT-taking students) than among students from the top quartile (27 percent of SAT-taking students). Notably, researchers examining these issues have found that it is at the college *application* stage—not in college admissions nor matriculation decisions—during which the behavior of low-income, high-achieving students most clearly diverges from that of their higher-income counterparts. See also Eleanor Wiske Dillon and Jeffrey Andrew Smith, "Determinants of the Match Between Student Ability and College Quality," *Journal of Labor Economics* 35, no. 1 (January 2017): 45–66; Christopher Avery and Sarah Turner, "Aid and Application Awareness" (working paper, Stanford University, 2009), https://csr.coopercenter.org/node/10403; and Caroline Hoxby and Christopher Avery, *The Missing "One-Offs": The Hidden Supply of High-Achieving, Low Income Students*, Brookings Institution, Spring 2013, https://www.brookings.edu/bpea-articles/the-missing-one-offs-the-hidden-supply-of-high-achieving-low-income-students/.

44. Andrew Barr and Sarah Turner, "Aid and Encouragement: Does a Letter Increase Enrollment Among UI Recipients?," *American Economic Journal: Economic Policy* (forthcoming).

45. The PROSPER Act (Section 121) includes language for a new College Dashboard that would effectively replace College Navigator. See American Council of Education, "H.R. 4508, The Promoting Real Opportunity, Success and Prosperity Through Education Reform (PROSPER) Act," December 20, 2017, http://www.acenet.edu/news-room/Documents/ACE-Summary-of-House-Prosper-Act.pdf. This resource would include additional completion rate data and would also be disseminated to Free Application for Federal Student Aid (FAFSA) filers.

46. Caroline M. Hoxby and Sarah Turner, *Informing Students About Their College Options: A Proposal for Broadening the Expanding College Opportunities Project*, Brookings Institution, June 26, 2013, https://www.brookings.edu/research/informing-students-about-their-college-options-a-proposal-for-broadening-the-expanding-college-opportunities-

project/. Full data from FAFSA that distinguish student circumstances, their use of federal aid, and college outcomes at the census block or block group level provide a critical mapping of the distribution of college students, particularly those with financial need. Access to such data would allow researchers to customize interventions on dimensions such as financial literacy, use of debt, take-up of aid programs, and colleges that are most popular locally. The established procedures for restricted-use licenses for the major National Center for Educational Statistics data sets serve as a model for administering and managing these data.

47. It is imperative to distinguish "competitive" from "commercial" in this discussion of a policy need. This is a sphere in which some consumer protections are imperative, so initiatives that are developed with a commercial intent to derive revenue either by "selling" ancillary services (such as student loans) or promoting particular sets of institutions are antithetical to policy goals. The objective of decentralized research and testing should be to develop applications that could be adopted at scale by governments or secondary schools.

48. An important tenant of such an approach is that any "app" or "tool" would be serving a public purpose, requiring safeguards against commercialization and data use. For example, one would not want a system intended to promote college choice to be used to market student loan products or to only recommend "sponsoring" institutions.

Completion Reforms That Work: How Leading Colleges Are Improving the Attainment of High-Value Degrees

MARK SCHNEIDER AND KIM CLARK

Each of the more than 4,500 degree-awarding colleges in the United States claims to provide students with the support they need to succeed in school and life.

Of course, defining just what "success" means is both highly personal and highly controversial. Certainly, higher education is not simply job training. But surveys consistently show that career and financial advantages are among the top expectations of college students[1] and the political leaders who determine the level of taxpayer support for higher education. In today's labor market, most new jobs require some type of postsecondary education.[2] In fact, the vast majority of the best-paying jobs are increasingly reserved for those with bachelor's degrees.[3]

Given the current difficulty in measuring desirable student outcomes, such as student growth in "critical thinking skills" or how much students actually learned in college, both public and private efforts to clarify the contribution of colleges to student success have usually focused on graduates' ability to land jobs with high wages and pay back their student loans. Milestones on the way to those goals, such as attainment of a bachelor's degree and even year-to-year retention rates, are useful (and easier to gather) measures, although they reflect the *process* of getting through postsecondary education rather than successful student outcomes.

Regrettably, whether we focus on process or outcome measures, the data should humble anyone hoping to raise Americans' educational and skill levels. Bridget Terry Long notes that completion rates at some types of institutions—especially public and private not-for-profit universities—have risen

over the past decade.[4] But declines at other types of institutions, such as for-profits, have meant a less dramatic improvement in the overall graduation rate. Integrated Postsecondary Education Data System (IPEDS) data show that 59.6 percent of freshmen entering four-year colleges in 2008 earned a degree from their initial institutions within six years, up from 55.4 percent freshmen in 1996.[5] That level remains in the range seen in previous generations, as described by historian John Thelin. The nation's college graduation rate has remained remarkably stable at about 60 percent for generations, Thelin says.[6] The improved outcome measures available today show that hundreds of American colleges are failing many of their students, as well as the taxpayers who subsidize higher education. For example, IPEDS data show that almost 600 of the nation's approximately 3,000 four-year campuses report that less than one-third of their freshmen earned a four-year bachelor's degree within six years.

The Department of Education's College Scorecard data show that a majority of the former freshmen at more than 200 of the colleges that exceed that low bar are earning annual salaries below $25,000 in their sixth year after starting their studies—which is less than the average pay of those with only a high school education.[7] While the schools on this list are varied, most are open access or nearly open access, serving disadvantaged and often academically unprepared students. More than 50 of them are for-profit institutions. Nearly 40 are institutions focused on either art or religion and so, presumably, serve a population less interested in financial returns. A disproportionate share—more than 40 percent—are in the South, where wages tend to be lower than in other regions. Florida alone accounts for 35 of the colleges.

Still, many of these colleges are failure factories sucking up billions of dollars from students and taxpayers without contributing much to their students' financial stability or careers. In some cases, students graduate with debt but are no better off in the labor market than before enrollment. In contrast, hundreds of other colleges could be described as success incubators, since most of their students go on to land good jobs and live financially stable lives.

How are they doing this? Can their success be replicated to give more Americans the education and credentials they need to thrive in the 21st century?

Despite the importance of higher education and the hundreds of billions of dollars in public and private spending on it every year, we are only now beginning to create a "playbook" of institution-level interventions that just might help the nation and many more students reach an increasingly important goal: a high-value college degree that leads to family-sustaining wages over the long run.

Some Initial Lessons Learned

From extensive interviews with staff and leaders of exemplary programs and with independent researchers who have examined the most successful higher education institutions, we distinguished four themes.

There Is No "Plug and Play" Solution. Simple, affordable, replicable, and scalable improvements that significantly improve success rates remain elusive. Programs or reforms that improved student success in one college all too often fail, often spectacularly and expensively, at another college because of some unique characteristics of the first school's student body or particular style of implementation. Something as simple as failing to adapt the delivery of encouraging messages to the student body's academic schedule or electronic messaging preferences (for example, text versus email) can result in widely differing impacts. "Everything depends on the quality of the implementation," says Loralyn Taylor, director of analytics for university student success initiatives at Ohio University.[8]

Most Programs Help Only as Long as They Are Active. Many colleges have found initial, immediate improvements in retention from programs such as summer bridge experiences for incoming freshmen or yearlong learning communities. However, once those programs end, longitudinal data find little to no significant impact on the later success of the group as a whole. "Most of our studies find shorter-term programs have effects over the short term," says Alexander Mayer, deputy director for postsecondary education at MDRC. "They are very often effective while they are in place. But the effects tend not to continue or grow in the long term or after the program has stopped."[9]

Holistic Beats Piecemeal. The colleges reporting the most success in producing high-value degrees tend to provide holistic, wraparound support for students. "The evidence suggests that holistic and proactive efforts that provide financial aid with other advising and supports are more likely to help students complete college than the sum of their programmatic parts," says Lindsay Page, an assistant professor of research methodology at the University of Pittsburgh School of Education who has studied several completion reform initiatives.[10] Regrettably, comprehensive efforts tend to require large upfront investments and are difficult to implement in the balkanized environments of many colleges in which academic departments, student affairs offices, and career counseling often cannot or will not find the will to coordinate their efforts. Indeed, some administrators may find that some of their professional or institutional goals, such as addressing a short-term budget shortfall or quickly increasing the exclusivity of a department, may directly conflict with such long-term investments.

Investing in Access and Success Saves Money. Short-term budget concerns have caused many colleges to stint on providing important services such as financial aid, tutoring, and advising. But when the horizon is lengthened from the cost per year to examine, for example, the cost of each degree awarded, many of these programs result in lower costs for students, colleges, and taxpayers.

Five Promising Reforms

Five practices used by leading colleges are improving the attainment of high-value college degrees. We focus mainly on bachelor's degrees because of their generally higher value in the job market. Nevertheless, most if not all the reforms can be adopted—if tailored to the schools' and student body's particular needs and characteristics—to improve outcomes of students pursuing any type of postsecondary education. We examine two college-wide reforms and three more targeted programs aimed at reducing financial, academic, and social and cultural barriers to completion.

Table 1. Outcomes of 10 Selective US Colleges with Generous Need-Based Aid

Institution	Net Price for Students from Families Earning <$30k	2016 Graduation Rate	Percentage of Former Freshmen Earning >$25k Six Years After Start	Percentage of Pell Recipients Repaying Loans Within Five Years
Stanford University	$1,630	94%	87%	86%
Williams College	$1,910	94%	68%	81%
University of Chicago	$2,551	94%	83%	84%
Harvard University	$3,294	97%	88%	54%
Vanderbilt University	$3,482	92%	82%	82%
Duke University	$4,728	95%	89%	87%
University of Pennsylvania	$4,939	95%	90%	85%
Yale University	$5,171	98%	83%	85%
Rice University	$5,398	93%	80%	84%
Vassar College	$5,585	91%	67%	89%

Note: This table shows 10 selective colleges with the lowest net prices for low-income students for which earnings and Pell Grant recipient student loan payback data are available.
Source: Authors' calculations based on Integrated Postsecondary Education Data System and the College Scorecard.

Practice 1: Provide more seats for historically disadvantaged students at colleges with track records of producing successful graduates. There is no secret formula to high graduation rates and high student success. The wealthiest colleges have been doing it for decades: taking in well-qualified students, making sure they can afford school, and providing them with top-notch professors and lots of attention and support.

For example, Table 1 shows the outcomes of 10 of the nation's richest, best-staffed selective colleges with generous need-based aid. With this well-honed formula, perhaps the question is not how do these universities achieve graduation rates above 90 percent, but how did they lose even 5–10 percent of their students.

Clearly, raising colleges from 30 percent graduation rates to the more than 90 percent graduation rates of these 10 rich campuses is not realistic in the short run—and maybe in any run. But efforts are popping up across the nation that may increase the number of disadvantaged students who earn high-value college degrees from these kinds of well-resourced schools.

Example. A handful of private liberal arts colleges—such as Amherst, Franklin & Marshall, and Vassar—are demonstrating that elite schools can successfully adjust their models to provide more access to previously overlooked populations.[11] By changing recruiting and admissions practices, Vassar has raised the percentage of its student body eligible for federal Pell Grants (which typically go to students from families earning less than $50,000 a year) from 7 percent in 2006 to 24 percent today. As Jason Delisle has noted, while Pell Grant data are not a perfect indicator of socioeconomic diversity, they are the only publicly available, consistently collected measure available for each college.[12]

Outcomes. The graduation rates for Pell-eligible and minority students at Amherst, Franklin & Marshall, and Vassar are above 80 percent. Research by Stacy Dale and Alan Krueger shows that historically disadvantaged students who graduate from schools characterized as "selective" or "highly selective" by Barron's *Profiles of American Colleges* enjoy an average earnings advantage of about 12 percent compared to peers who did not attend such selective colleges.[13]

Potential Impact. A group of almost 100 selective colleges have recently joined an effort called the American Talent Initiative and have promised to collectively create opportunities for an additional 50,000 low-income students by 2025.[14]

Cost. The costs to an institution of providing such high-quality courses and services to a very low-income student can exceed $90,000. Amherst estimates the total cost of a year's instruction at $99,000.[15] Vassar's annual spending on institutional grants has risen from $26 million to almost $69 million in the past decade.[16]

Implementation Challenges. Although many college officials complain about the difficulty of finding low-income students who can succeed in demanding academic environments, leaders at colleges such as Vassar and Franklin & Marshall say they have had success recruiting through organizations such as the Posse Foundation and QuestBridge and building alliances with high-performing networks of charter schools. The colleges' administrators say the bigger challenge is funding and supporting the students once they

enroll. Although committed schools such as Amherst, Vassar, and Franklin & Marshall provide the necessary funding and advising, some college members of the American Talent Initiative have track records of failing to support those who do not fit the school's typical student profile. African American students at predominantly white schools—such as Juniata College, Lawrence University, and the University of Dayton—have significantly higher dropout rates than do white students, for example. Officials at those schools say they are developing programs to address the achievement gaps.

The need for extra financial aid and support raises questions about the financial sustainability of these efforts. Dramatically higher aid expenses required Vassar to cut back on staffing and some services, which, as Malcolm Gladwell pointed out in his *Revisionist History* podcast, could disadvantage such schools in competing for the smartest or highest-paying students.[17] Finally, even if the Talent Initiative's noble-sounding effort succeeds, the elite schools promise to enroll an additional 50,000 students—which translates to just 2 percent of the current undergraduate student body. Elite schools simply do not have the capacity to significantly increase the number of college graduates.

Practice 2: Provide comprehensive support to all types of students, especially those facing financial or academic challenges. To increase opportunities and success for significant numbers of students, changes must be made at the hundreds of regional campuses and nonselective institutions that serve the bulk of the nation's student body.

Example. Experiments at the City University of New York (CUNY) show how intensive, holistic support can dramatically improve the attainment of large numbers of high-quality degrees for students who did not ace high school. Furthermore, CUNY's investments, although initially expensive, are lowering costs per degree for both CUNY and its students.

Since 1965, CUNY's Search for Education, Elevation, and Knowledge (SEEK) program has enrolled low-income students whose academic records fell just below regular admissions standards at the system's four-year campuses.[18] About 1,600 SEEK students are admitted each year to a CUNY senior college. They are provided with extra support with financial aid, academics, and advising. Unlike regular CUNY students, SEEK participants

are guaranteed enough aid to fully cover tuition, books, and transportation expenses. SEEK participants are also required to participate in a summer prep program and are provided extensive additional tutoring to help them catch up to the regularly admitted students. In addition, they are assigned to dedicated counselors who have comparatively low caseloads of fewer than 200 students and who stick with the student throughout his or her college career. These advisers provide assistance on everything from time management to choice of major.

CUNY has started expanding a similar wraparound program, the Accelerated Study in Associate Programs (ASAP), which was originally designed for two-year colleges, to some four-year campuses. These two CUNY programs—SEEK, which started at the four-year campuses, and ASAP, which started at the community colleges—are among the most-researched efforts to raise the educational achievement level of disadvantaged students.

Outcomes. SEEK alumni, on average, earn approximately $4,000 more per year than similarly qualified students who could not take advantage of the program because their family's incomes were above the SEEK cutoff, according to research by the CLIMB Initiative.[19]

In contrast to the far too many overhyped interventions with little supporting evidence, ASAP has been subjected to rigorous evaluation showing that it increases student success. Indeed, MDRC, the research firm that is evaluating ASAP, has called it "one of the most effective programs we have ever studied." In a randomized controlled trial conducted by MDRC, 40 percent of ASAP participants, all of whom needed at least some remedial preparation for college, earned an associate degree within three years—almost twice the rate of similarly qualified non-ASAP participants.[20]

Potential Impact. In all, CUNY expects to enroll at least 25,000 students in its wraparound programs by the 2018–19 academic year. Similar programs have started or are in the planning stages at five additional colleges in California, Ohio, and New York. The early indicators from the replication efforts in Ohio appear to be positive.[21] For example, students in the pilot program are earning more credits than regular students. But it will take several years to determine whether the replication also increases degree attainment and improves long-term student outcomes.

Cost. The additional financial aid, advising, and tutoring for SEEK students costs an extra $2,700 per year according to CUNY. ASAP, which offers more comprehensive and personalized academic advising and support, had cost an estimated $5,000 more per student per year in the early years. However, as the size of the program has grown, the per-student cost has dropped to $3,400. Because of the dramatic impact on completion, CUNY's cost per degree for ASAP students is at least $6,500 less than it is for non-ASAP students.[22]

The savings for the students are also substantial. The Center for Benefit-Cost Studies of Education (CBCSE) estimated in 2012 that earning an associate degree at CUNY costs the average student about $20,000.[23] But the additional aid and faster completion, which reduces opportunity costs, meant an associate degree costs ASAP students only about $13,000.

CBCSE also found that the initial investments paid long-term benefits to taxpayers in the form of reduced other expenditures and higher tax collections: "For each dollar of investment in ASAP by taxpayers, the return was $3 to $4."[24]

Implementation Challenges. Simultaneously upgrading financial aid, advising programs, and tutoring programs—and making them work together seamlessly—is difficult and crucial. We will not have any insights into how easily ASAP can be replicated until the results from Ohio and other sites are in hand.

Practice 3: Provide completion (or emergency) grants to juniors and seniors who need a little additional financial help reaching the finish line. Cost is the most commonly cited reason for students failing to enroll in college or dropping out.[25] Financial aid simply has not kept up with rising tuition and other costs. The College Board's Trends in Pricing database shows that published tuition and fees for public four-year institutions rose by 31 percent *above the rate of inflation* between fall 2007 and fall 2017.[26] The latest data available, the US Department of Education's National Postsecondary Aid Study (NPSAS) from 2012, show that the average college student who applied for aid received $7,800 less in grants and scholarships than the federal government calculated they needed to afford college.[27] The historical NPSAS data indicate that the "unmet need" gap rose almost 50 percent—even after adjusting for inflation since the 2003–04 academic year.[28]

Predictably, research finds that providing significant additional grant aid to those who need it can increases college completion.[29] Of course, filling those gaps would be prohibitively expensive for most colleges.

Low-cost solutions, such as text-message reminders to students to apply for aid, have had mixed success. One study found that such e-nudges helped community college students receive more funding that helped more of them stay in school but that similar messages had no effect on students at four-year colleges.[30] Slightly higher-cost assistance, such as providing professional help to fill out federal aid applications, has been shown to increase higher education enrollment, persistence, and achievement.[31]

Some colleges are also finding that upfront investments in relatively small, well-timed additional grants can both improve graduation rates and the school's bottom line.

Example. Since 2011, Georgia State University (GSU) has made more than 10,000 automatic completion grants to juniors and seniors who could not register for the next semester because of unpaid bills, have unmet financial need, and are making satisfactory academic progress toward graduation (i.e., they have a grade point average of at least 2.0). Panther Retention Grants can total as much as $2,000 but average $900.[32] Students cannot apply for a retention grant. Instead, GSU staff flags the account of any student who is about to be dropped for nonpayment. The school checks the student's financial aid eligibility to credit any available aid against the debt. Once the aid and any student payments are credited, the school cancels any outstanding balance. Recipients of the grants must meet with a school financial counselor to plan how to pay for the rest of their education.

In a similar experiment, a group of 16 public two-year technical colleges in Wisconsin have tested "emergency" grants—typically awards of no more than $1,000—to address students' unforeseen emergencies, such as car breakdowns and health bills.[33]

Outcomes. Eighty-two percent of GSU seniors who received retention grants have graduated or were still enrolled one year after receiving the grant, GSU reports. In 2017, 1,300 bachelor's degrees—slightly more than one-quarter of all GSU's bachelor's degrees awarded that year—went to recipients of retention grants, according to Timothy Renick, GSU's vice provost and vice

president for enrollment management and student success. That is one reason GSU increased the number of students it graduated from 3,900 in 2010 to 4,700 in 2016.[34] The Wisconsin community colleges reported that nearly three-quarters of the emergency grant recipients had graduated or remained enrolled in the 2012–15 period of the pilot test.

Potential Impact. In addition to Georgia State, 10 additional members of the University Innovation Alliance have launched a test of completion grants.[35] Dozens of other colleges are offering or testing various kinds of emergency grants, according to a survey by the National Association of Student Personnel Administrators.[36]

Costs. In the 2016–17 academic year, GSU gave out 2,000 retention grants for a total expenditure of $1.8 million. Renick says the average size of the grant used to pay unpaid bills preventing students from registering was $900. According to Renick, research indicates that 70 percent of students who leave because of unpaid bills never return. So GSU estimates that forgiving one semester's unpaid bills leads to revenue gains if the student continues on and pays tuition in future semesters. The Wisconsin community colleges spent $1.6 million on administering and awarding emergency grants averaging about $555 apiece to 2,654 students between 2012 and 2015.[37] In short, small targeted financial aid can be highly productive.

Implementation Challenges. Colleges awarding emergency grants have found the programs work best if staff also spend time and resources fact-checking requests to discourage fraud and gaming. In addition, the Great Lakes Higher Education Corporation, which has funded new emergency grant programs at 63 additional colleges, says administrators of the pilot programs learned that it is safer to limit payments directly to vendors rather than paying students. Finally, Renick urges colleges considering completion grants to ignore any temptation to replace the grants with loans: The hassle of collecting on such small-dollar debts would likely mean loans would end up costing more than the simpler grants.

Practice 4: Use new data-gathering and analysis techniques to provide better and more useful guidance to students. Data mining has been making

the private sector more efficient for years. Corporate data collection and analysis can help navigate around traffic jams and match a person with compatible dates. They also ensure that Walmart is well stocked with snow shovels just before a blizzard. Such techniques have only recently been adopted by a few leading colleges and universities to help students find their way through the registrar's office, match them with a compatible major, or make sure they have the courses they need when they need them. A few colleges are finding that big data, smartly applied, can dramatically improve their students' lives.

Example. In 2010, California State University, Fullerton, had a six-year graduation rate of just 51 percent, was reeling from budget cuts, and had just received a report from its accreditor that, although generally positive, questioned whether the school provided "consistently adequate and accurate advising that would ensure that all students understand their requirements toward their major and toward graduation."[38] Little wonder: The school had only about 10 full-time dedicated advisers (in addition to the faculty who also had advising duties) for its approximately 36,000 students.

College leaders, in conjunction with students, developed a plan to address the problems. Starting in the fall of 2014, students would pay an extra Student Success Initiative Fee of $362 per year (raising the total average cost of tuition and fees by almost 6 percent to $6,315) that would fund, among other things, a "retention specialist" for freshmen and sophomores and a "graduation specialist" for juniors and seniors. These new advisers along with new career advisers and other staff were located in one-stop "success centers" in each of the university's divisions (its name for colleges).

Although these new advisers still had huge caseloads, they apparently dramatically influenced students and Fullerton's success through some simple data analysis and outreach. They contacted and offered to assist every continuing student who had not yet registered for classes each summer and winter break. By intervening proactively, the specialists could eliminate bureaucratic, academic, and financial barriers that were impeding students by helping them, for example, get seats in bottleneck classes or file necessary paperwork with the financial aid office.

Outcomes. While there has been no rigorous independent randomized controlled trial of Fullerton's reform efforts, the school's graduation rate rose in

the years after the new advisers were hired: It jumped 6 percentage points—from 56 percent to 62 percent—within the first two years. The number of bachelor's degrees awarded also rose to 8,050 in 2016, an increase of 600 from 2013. Fullerton's graduation specialists (who help juniors and seniors) report that in 2014–15, the initial year of implementation, they prevented 2,488 deferred graduations. For the 2015–16 year, they reported assisting 2,560 students toward speedier graduation.

Potential Impact. The potential impact of data-driven proactive interventions on higher education is vast. Hundreds of other colleges—of all types—are using data to analyze and improve college services. The University Innovation Alliance of 11 large public universities reports that empowering advisers with data tools to alert them when students shows signs of struggling—skipping classes, for example—can improve initial retention rates by 5 percent.[39] At Strayer University, for example, data are used to encourage staff and instructors to respond to student emailed queries in a timely manner, which school officials say is raising student satisfaction and retention.

Costs. For 2016–17, Fullerton budgeted $2.2 million for academic advising. It estimated that every additional adviser costs about $51,000 in salary and benefits.[40] Data analysis vendors charge varying prices depending on the level of services. Large public colleges report paying anywhere from $10,000 to more than $200,000 per year for consultants to build and maintain a data analysis and reporting system.

Implementation Challenges. There are growing concerns about the privacy implications of big data analysis inside schools. Student and financial aid privacy rules appear to prevent some data sharing.[41] Faculty, perhaps jaded by the failure of many previous reform efforts, can be reluctant to adopt yet another technology platform. And some investments in high-cost data and adviser systems have failed. For example, the University of Akron spent more than $800,000 on a data-driven advising program that was dropped after just one year.[42]

Practice 5: Use evidence-based teaching methods to improve instruction. Simply having a postsecondary degree is an advantage in the job

market. But new finer-grained data are showing *which* degrees—especially which skills students master—can have a much larger impact on their later success.[43] To increase the number of high-value degrees, it is crucial to improve the quality of instruction. And a growing body of research is showing just how to do this. Besides student scores on tests, researchers are using data on attendance, retention, and success in more advanced classes to isolate the instructional practices that inspire and advance students.

For science and math classes, for example, Nobel Prize–winning physicist Carl Wieman is leading an effort to replace time-honored, but suboptimal on average, lectures with more powerful learning environments, such as "deliberative practice" sessions in which groups of students work together in class to solve problems. Instead of an hour-long lecture, an instructor starts the class by posing a question. The students work in teams to answer it in class. The instructor then follows up with instruction that reflects on what the students got right or wrong and poses a new question based on the next concept the instructor wishes to cover.[44] Such methods, even when applied by inexperienced graduate students, increased attendance by approximately 20 percentage points and slightly improved midterm test scores.[45]

Academic freedom, budget constraints, tradition, and entropy blocked widespread adoption of these commonsense improvements to education, but Wieman sees a few signs of hope that significant numbers of students will soon benefit from improved instruction. The American Association of Universities (AAU) has seed-funded science-teaching reform efforts at 12 universities, from MIT to Iowa State. And the AAU is pushing all its member institutions to improve their instruction by adopting deliberative practice and other active learning strategies and to make teaching quality an important part of tenure decisions: "Failing to implement evidence-based teaching practices in the classroom must be viewed as irresponsible, an abrogation of fulfilling our collective mission," warned AAU President Mary Sue Coleman.[46]

Evidence-based reforms to remedial education, on the other hand, have gained much more traction and have proved to significantly affect students, in part because of the poor record of standard remedial programs.[47] Approximately half of students who enroll in college score below college level in writing or math skills.[48] Yet 80 percent of those who take remedial math courses fail to pass a college-level math class within three years.

Of course, a broader and better solution would be to improve K–12 education to make sure that all students enter college well prepared. But for colleges dealing with the immediate reality of underqualified undergraduates, reforming remedial courses and curriculum holds the promise of removing at least one of the biggest barriers to educational progress. The reforms that have had the biggest positive impact are compressing courses to speed students through remediation, offering more relevant courses such as statistics instead of algebra, and providing extra support through "co-requirements," in which accelerated remedial courses are paired with required extra tutoring or study skills classes.

Example. Several colleges in Texas, including the University of Texas (UT) at Arlington, have replaced traditional remedial math classes with alternatives such as Quantway and Statway.[49] These replacement courses, developed by the Carnegie Foundation for the Advancement of Teaching, provide students with math skills that are more relevant to their majors.

Outcomes. The success rates for UT Arlington's students in all gateway mathematics courses rose between 5 and 16 percentage points after the 2011 implementation of the new courses, according to the Charles A. Dana Center at the University of Texas at Austin.[50]

Potential Impact. Because half of all freshmen need at least some remediation, the potential impact of improving these courses is vast. And a growing number of colleges are adopting reforms, including public colleges in Tennessee, Texas, and New York.[51] A new California law is now sparking the majority of that state's public colleges to offer corequisite options that allow academically unprepared students to take credit-bearing classes immediately, as long as they are also benefiting from tutoring or other supports.

Costs. SUNY budgeted $1.8 million to train 60 instructors in the Quantway and Statway replacement courses.[52] SUNY estimated those instructors would teach approximately 20,000 students per year, at an estimated upfront investment of just $1.50 per student.

New corequisite programs in Tennessee cost about $10,000 to set up initially. According to research by the Community College Research Center,

the ongoing higher costs ranged from $30 to $100 per student due to the required additional staffing and support.[53] But because more than four times as many students passed the reformed courses (51 percent passed compared to 12 percent), the instructional cost per successful student was significantly lower: $3,800 per student who progressed, compared with $7,800 under the traditional model.

The savings to students could also be significant. The US Department of Education estimates that American students are spending $1.3 billion a year in out-of-pocket costs for remediation, for which they typically receive no college credit.[54]

Implementation Challenges. Some four-year universities are refusing to accept some of the new remedial courses as transfer credit. Because of inconsistent implementation, the results of some of the reforms are not uniform across colleges.[55]

While raising students to at least college-level numeracy and literacy is crucial, it is only the first step in their long journey toward skill mastery and career success. Fixing remediation is a necessary but insufficient milestone toward expanding access to high-value higher education.

A Sound Investment

Although there are concerns about the details of implementation, there is little debate over the nature of the big steps colleges need to take to improve Americans' access to and success in high-value higher education: use evidence-proven teaching methods, offer plenty of guidance and support, and make college prices affordable.

There is also little debate that such steps require significant upfront investments. But a growing body of research indicates they will begin to pay dividends—to the institutions and the students—in as little as a year or two. Perhaps more importantly, the expanding opportunities and improving productivity and civic engagement among our fellow workers and citizens will pay dividends for our country for decades.

Notes

1. Kevin Eagan et al., *The American Freshman: National Norms Fall 2016* (Los Angeles: Higher Education Research Institute, 2017), https://www.heri.ucla.edu/monographs/TheAmericanFreshman2016.pdf.

2. Anthony P. Carnevale, Tamara Jayasundera, and Artem Gulish, *America's Divided Recovery: College Haves and Have-Nots,* Georgetown University, Center on Education and the Workforce, 2016, https://cew.georgetown.edu/cew-reports/americas-divided-recovery/.

3. Anthony P. Carnevale, Tamara Jayasundera, and Artem Gulish, *Good Jobs Are Back: College Graduates Are First in Line*, Georgetown University, Center on Education and the Workforce, 2015, https://cew.georgetown.edu/cew-reports/goodjobsareback/.

4. Bridget Terry Long, *The College Completion Landscape: Trends, Challenges, and Why It Matters*, American Enterprise Institute, May 2018.

5. US Department of Education, Institute of Education Sciences, National Center for Education Statistics, *Digest of Education Statistics: 2016*, February 2018, Table 326.10, https://nces.ed.gov/programs/digest/d16/tables/dt16_326.10.asp.

6. John R. Thelin, "The Attrition Tradition in American Higher Education: Connecting Past and Present" (working paper, American Enterprise Institute, April 2010), http://www.aei.org/publication/the-attrition-tradition-in-american-higher-education/.

7. Authors' calculations based on the College Scorecard data.

8. Personal communication, January 22, 2018.

9. Personal communication, February 12, 2018.

10. Personal communication, February 15, 2018.

11. Martin Kurzweil and Jessie Brown, *Funding Socioeconomic Diversity at High-Performing Colleges and Universities*, American Talent Initiative, February 15, 2017, http://www.sr.ithaka.org/wp-content/uploads/2017/02/ATI-Funding-Socioeconomic-Diversity-02152017.pdf.

12. Jason Delisle, "The Pell Grant Proxy: A Ubiquitous but Flawed Measure of Low-Income Student Enrollment," October 12, 2017, https://www.brookings.edu/research/the-pell-grant-proxy-a-ubiquitous-but-flawed-measure-of-low-income-student-enrollment/.

13. Stacy Dale and Alan B. Krueger, "Estimating the Return to College Selectivity over the Career Using Administrative Earnings Data" (working paper, National Bureau of Economic Research, June 2011), http://www.nber.org/papers/w17159.

14. American Talent Initiative, https://americantalentinitiative.org/.

15. Amherst College, "Costs at Amherst," https://www.amherst.edu/offices/financialaid/firstyear_transfer/costs_amherst.

16. Vassar College, "Common Data Set," https://institutionalresearch.vassar.edu/data/.

17. Malcolm Gladwell, *Revisionist History*, podcast, http://revisionisthistory.com/.

18. City University of New York, "SEEK & College Discovery," http://www2.cuny.edu/academics/academic-programs/seek-college-discovery/.

19. Raj Chetty et al., "Colleges and Upward Mobility: Early Evidence from CLIMB," Equality of Opportunity Project, October 2017, http://d2yiib6ayiqstj.cloudfront.net/2017/

10/CUNYs-SEEK-Program-Improves-Outcomes-for-Low-Income-Students.pdf.

20. Susan Scrivener et al., *Doubling Graduation Rates: Three-Year Effects of CUNY's Accelerated Study in Associate Programs (ASAP) for Developmental Education Students*, MDRC, February 2015, https://www.mdrc.org/publication/doubling-graduation-rates.

21. Colleen Sommo and Alyssa Ratledge, "Bringing CUNY Accelerated Study in Associate Programs (ASAP) to Ohio: Early Findings from a Demonstration in Three Community Colleges," MDRC, September 2016, https://www.mdrc.org/sites/default/files/ASAP_Ohio_final.pdf.

22. Himani Gupta, "The Power of Fully Supporting Community College Students: The Effects of the City University of New York's Accelerated Study in Associate Programs After Six Years," MDRC, October 2017, https://www.mdrc.org/publication/power-fully-supporting-community-college-students.

23. Henry M. Levin and Emma Garcia, *Benefit-Cost Analysis of Accelerated Study in Associate Programs (ASAP) of the City University of New York*, Columbia University, Teachers College, Center for Benefit-Cost Studies in Education, May 2013, http://www1.cuny.edu/sites/asap/wp-content/uploads/sites/8/2014/06/Levin_ASAP_Benefit_Cost_Report_FINAL_05222013.pdf.

24. Henry M. Levin and Emma García, "Accelerating Community College Graduation Rates: A Benefit–Cost Analysis," *Journal of Higher Education* 89, no. 1 (2018): 1–27, https://doi.org/10.1080/00221546.2017.1313087.

25. Jean Johnson and Jon Rochkind, *With Their Whole Lives Ahead of Them*, Public Agenda, December 2009, https://www.publicagenda.org/pages/with-their-whole-lives-ahead-of-them-reality-1.

26. College Board, *Trends in College Pricing 2017*, 2017, https://trends.collegeboard.org/college-pricing.

27. US Department of Education, Institute of Education Sciences, National Center for Education Statistics, QuickStats, https://nces.ed.gov/datalab/quickstats/Home/Index.

28. Authors' calculations based on data from the National Postsecondary Student Aid Survey.

29. Sara Goldrick-Rab et al., "Reducing Income Inequality in Educational Attainment: Experimental Evidence on the Impact of Financial Aid on College Completion," *American Journal of Sociology* 121, no. 6 (May 2016): 1762–817, https://www.journals.uchicago.edu/doi/abs/10.1086/685442.

30. Benjamin L. Castleman and Lindsay C. Page, "Freshman Year Financial Aid Nudges: An Experiment to Increase FAFSA Renewal and College Persistence" (working paper, EdPolicyWorks, University of Virginia, December 2014), https://curry.virginia.edu/uploads/resourceLibrary/29_Freshman_Year_Financial_Aid_Nudges.pdf.

31. Eric P. Bettinger et al., "The Role of Application Assistance and Information in College Decisions: Results from the H&R Block FAFSA Experiment," *Quarterly Journal of Economics* 127, no. 3 (August 2012): 1205–42, https://academic.oup.com/qje/article-abstract/127/3/1205/1921970.

32. Georgia State University, "Panther Retention Grants," http://success.students.gsu.edu/panther-retention-grants/.

33. Great Lakes, "2012–2015 Emergency Grant: Closing Report and Best Practices," February 2016, https://community.mygreatlakes.org/community/strategy/scaling/

emergency-grant-2012.

34. Great Lakes, "2012–2015 Emergency Grant."

35. University Innovation Alliance, "Announcing Our Fourth Scale Project: Last-Mile Grants to Support College Completion," August 16, 2017, http://www.theuia.org/blog/post/announcing-our-fourth-scale-project-last-mile-grants-support-college-completion.

36. Kevin Kruger, Amelia Parnell, and Alexis Wesaw, *Landscape Analysis of Emergency Aid Programs*, National Association of Student Personnel Administrators, 2016, https://www.naspa.org/rpi/reports/landscape-analysis-of-emergency-aid-programs.

37. Personal communication, February 14, 2018.

38. David E. Shulenburger et al., *Report of the WASC Visiting Team: Educational Effectiveness Review*, California State University, Fullerton, March 2012, http://www.fullerton.edu/accreditation/university/CSUFul_Team%20report%20from%20EER%20visit%20S12.pdf.

39. University Innovation Alliance, "Predictive Analytics," 2014, http://www.theuia.org/sites/default/files/UIA_predictive_onepagers.pdf.

40. Student Success Initiative, *FY 2016-17 Year-End Financial Report*, California State University, Fullerton, 2017, http://success.fullerton.edu/_resources/pdfs/FY1617%20SSI%20Year%20End%20Report.pdf.

41. National Association of Student Financial Aid Administrators, *Financial Aid Data Sharing*, June 2017, https://www.nasfaa.org/uploads/documents/june2017_data_sharing_white_paper.pdf.

42. Karen Farkas, "University of Akron Will Not Renew Contract for Freshmen 'Success Coaches,'" Cleveland.com, May 25, 2016, http://www.cleveland.com/metro/index.ssf/2016/05/university_of_akron_ends_contr.html.

43. Mark Schneider, "Does Education Pay?," *Issues in Science and Technology* 30, no. 1 (Fall 2013), http://issues.org/30-1/does-education-pay/.

44. Jeffrey Mervis, "A Better Way to Teach?," *Science*, May 12, 2011, http://www.sciencemag.org/news/2011/05/better-way-teach.

45. Louis Deslauriers, Ellen Schelew, and Carl Wieman, "Improved Learning in a Large-Enrollment Physics Class," *Science* 332, no. 6031 (May 13, 2011): 862–64, http://science.sciencemag.org/content/332/6031/862.

46. Association of American Universities, "Undergraduate STEM Education Initiative," https://www.aau.edu/education-service/undergraduate-education/undergraduate-stem-education-initiative; and Stephen E. Bradforth, "University Learning: Improve Undergraduate Science Education," *Nature* 523, no. 7560 (July 15, 2015), https://www.nature.com/news/university-learning-improve-undergraduate-science-education-1.17954.

47. Elizabeth Ganga, Amy Mazzariello, and Nikki Edgecombe, "Developmental Education: An Introduction for Policymakers," Education Commission of the States and Center for the Analysis of Postsecondary Readiness, February 2018, https://www.ecs.org/wp-content/uploads/Developmental-Education_An-Introduction-for-Policymakers.pdf.

48. Xianglei Chen and Sean Simone, *Remedial Coursetaking at U.S. Public 2- and 4-Year Institutions: Scope, Experiences, and Outcomes*, US Department of Education, Institute for Education Sciences, National Center for Education Statistics, September 2016, https://files.eric.ed.gov/fulltext/ED568682.pdf.

49. Carnegie Foundation for the Advancement of Teaching, "Carnegie Math Pathways,"

https://www.carnegiefoundation.org/in-action/carnegie-math-pathways/.

50. Lindsay P. Fitzpatrick and Douglas Sovde, "The Case for Mathematics Pathways from the Launch Years in High School Through Postsecondary Education," University of Texas at Austin, Charles A. Dana Center, November 2017, http://www.utdanacenter.org/wp-content/uploads/Launch-Years-Brief-Number-1_FINAL.FINAL_.pdf.

51. Andrea Juncos and Michael Lawrence Collins, *Literature Review: Models for Developmental Education Redesign*, Jobs for the Future, November 2015, https://www.jff.org/resources/literature-review-models-developmental-education-redesign/.

52. State University of New York, "Chancellor Zimpher Announces $1.8 Million to Support Math Competency, Decrease Remediation," press release, December 7, 2015, https://www.suny.edu/suny-news/press-releases/dec2015/12-7-15/chancellor-zimpher-announces-18-million-to-support-math-competency-decrease-remediation.html.

53. Clive Belfield, Davis Jenkins, and Hana Lahr, *Is Corequisite Remediation Cost-Effective? Early Findings from Tennessee*, Columbia University, College Community Research Center, April 2016, https://ccrc.tc.columbia.edu/media/k2/attachments/corequisite-remediation-cost-effective-tennessee.pdf.

54. US Department of Education, "Developmental Education: Challenges and Strategies for Reform," January 2017, https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf.

55. Hunter R. Boylan, Barbara J. Calderwood, and Barbara S. Bonham, *College Completion: Focus on the Finish Line*, Appalachian State University, National Center for Developmental Education, March 2017, https://ncde.appstate.edu/sites/ncde.appstate.edu/files/College%20Completion%20w%20pg.%201%20per%20bjc%20suggestion.pdf.

What Matters Most for College Completion? Academic Preparation Is a Key Predictor of Success

MATTHEW M. CHINGOS

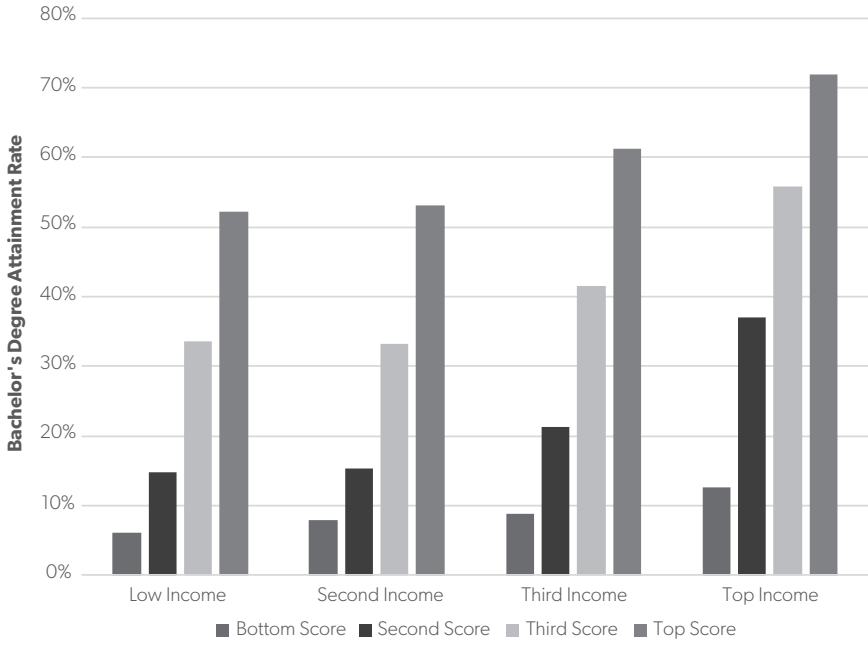
It is well-known that students with higher levels of academic preparation are more likely to enroll in and graduate from college. But discussions of college completion tend to focus on policies, such as financial aid, and institutional factors, such as student support services. This makes sense from the perspective of higher education policymaking, which can do little to change entering students' characteristics beyond changing admissions practices to exclude less-prepared students. However, that would not increase completion overall and would make the system even more inequitable.

Colleges should continue to focus on how they can best serve the students they enroll, but that task would be easier if students arrive on campus better prepared to do college-level work. The goal of this paper is twofold: to provide a high-level overview of what we do and do not know about the student-level factors that predict college success and to discuss what the strong correlation between academic preparation and college completion does and does not mean for policy and practice.

Many factors affect college completion. Demographic characteristics, such as race, ethnicity, and socioeconomic status, consistently predict college enrollment and success rates. Troubling disparities between students of color and their white peers and among students from different socioeconomic backgrounds persist even after adjusting for differences in academic preparation.[1]

But academic preparation, including student ability, matters most, at least in terms of how strongly it predicts success in college. Figure 1, which is broken down by family income and standardized test scores, shows the rates

Figure 1. Bachelor's Degree Attainment Rates by Family Income and Reading/Math Composite Test Score



Source: Author's calculations from Education Longitudinal Study of 2002.

at which a nationally representative sample of 10th-grade students attained bachelor's degrees a decade later.

Students with the same family income grouping whose test performance was among the top quarter nationally were 45–59 percentage points more likely to earn a bachelor's degree by age 26 than were students in the bottom quarter of test scores. Differences in attainment rates among students with similar test scores but different incomes were smaller but still pronounced: 7–22 percentage point differences between the top and bottom income quartiles.

Academic performance in high school predicts not only bachelor's degree attainment but also the rates at which students attain any postsecondary credential, including certificates and associate degrees. These rates are 34–39 percentage points higher for students who were among the top quarter of test takers than they are for students from the same income group but who

were in the bottom quarter of scores.[2] Once again, differences in attainment rates between the top and bottom income groups (among students with similar test scores) are not as large (15–21 percentage points).

Moving beyond the simplistic test score example above, I will first review the empirical evidence on how much various measures of academic preparation predict college success. Often-cited measures include college admissions scores; high school grades; courses taken, including Advanced Placement; and scores on other tests designed to measure "college readiness." Noncognitive factors such as student motivation and grit are also surely important and are the focus of Mesmin Destin's paper in this series.[3]

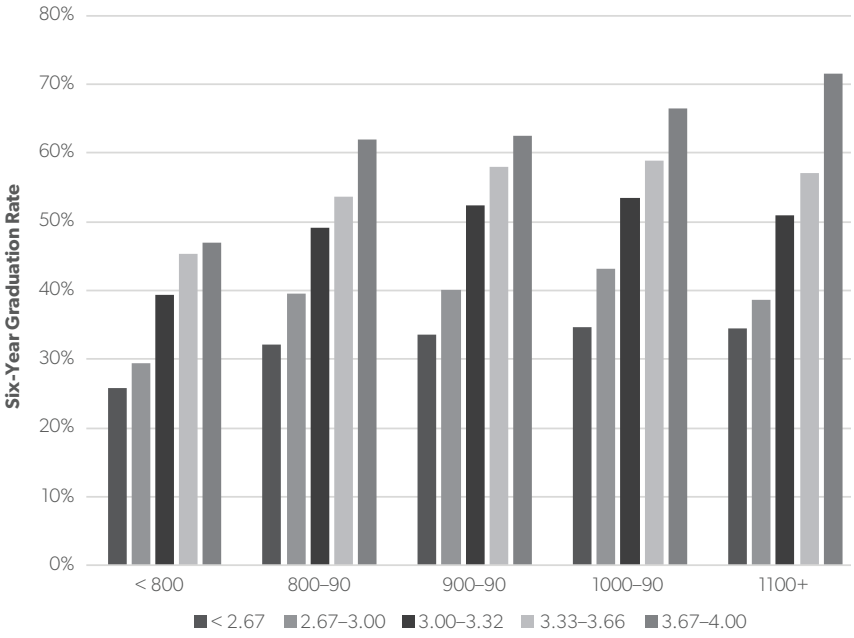
Second, I will provide a conceptual framework for considering how improving preparation might translate into improved success in college and increased degree attainment. I will discuss how much the predictive power of preparation can be used to infer the likely effects of interventions that improve academic preparation, as opposed to unmeasured student ability and family characteristics. This discussion is relevant to whether policy interventions should target particular preparation measures.

Measuring Academic Preparation

How do different measures of preparation predict college completion? Two commonly used measures to summarize students' high school performance (including for admission to selective four-year colleges) are scores on the SAT or ACT college admissions tests and grade point average (GPA) at the end of high school.

Test Scores and Grades. Both SAT or ACT scores and high school GPA are associated with the likelihood that students at four-year colleges earn a bachelor's degree. But when considered together, the predictive power of high school GPA is much stronger. Figure 2 shows that, among students with similar SAT or ACT scores, those with higher high school GPAs are much more likely to graduate. But among students with similar high school GPAs, no strong relationship exists between SAT or ACT scores and graduation rates (except that those who score below 800 are noticeably less likely to complete college).

Figure 2. Six-Year Graduation Rates by SAT or ACT Scores and High School GPA, Less-Selective Public Four-Year Institutions

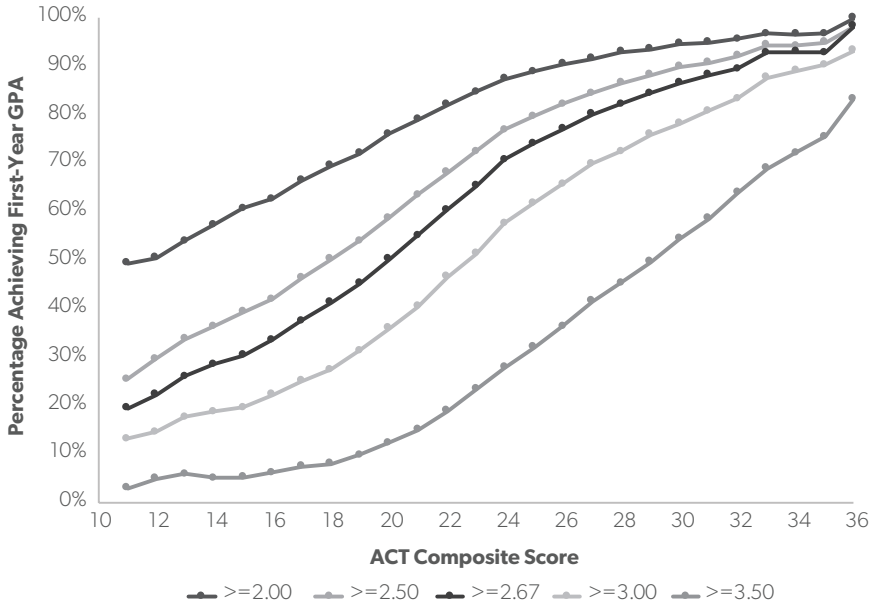


Source: William G. Bowen, Matthew M. Chingos, and Michael S. McPherson, *Crossing the Finish Line: Completing College at America's Public Universities* (Princeton University Press, 2009), Appendix Table 6.7.

This makes sense given that earning good grades requires consistent behaviors over time—showing up to class and participating, turning in assignments, taking quizzes, etc.—whereas students could in theory do well on a test even if they do not have the motivation and perseverance needed to achieve good grades. It seems likely that the kinds of habits high school grades capture are more relevant for success in college than a score from a single test.

The data in Figure 2 are for a group of less-selective (i.e., average SAT or ACT score below 1150) public colleges and universities in four US states, but the much stronger predictive power of high school GPA relative to SAT or ACT scores holds across a wide range of public institutions.[4] And the relatively weak predictive power of SAT or ACT scores vanishes entirely

Figure 3. Likelihood of Achieving Different First-Year College GPAs, by ACT Composite Score



Source: Jeff Allen and Justin Radunzel, "Relating ACT Composite Score to Different Levels of First-Year College GPA," ACT, Table 4, May 2017.

once the student's high school is taken into account, suggesting that the test scores serve partly as a proxy for high school quality.

Why do test scores so strongly predict bachelor's degree attainment on their own (see Figure 1) but not graduation rates once high school GPA is taken into account? Part of the reason is that students with higher test scores are both more likely to enroll in any college and to enroll in more selective colleges (presumably in part because of the use of SAT or ACT scores in the admissions process).[5]

In sum, students with higher test scores are more likely to graduate college in part because they will likely attend better-resourced higher education institutions that graduate more of their students. For an example of this, see Table 1 in the related paper by Mark Schneider and Kim Clark on institutional effects, where the completion rate is over 90 percent at some of the most selective universities.[6] These students, however, are not much more

likely to graduate than those with lower test scores (but with similar high school grades) on the same campus.

The relative strength of SAT or ACT scores and high school GPA to predict college completion depends on various analytic choices. But one finding is consistent: These relationships are generally quite smooth. In other words, there does not appear to be a level of grades or test scores at which a student's chances of finishing college jump dramatically.

This is apparent in Figure 2, as well as in Figure 3, which shows the relationship between ACT composite scores and the likelihood that a student will achieve a target first-year GPA in college. College GPA is the outcome the College Board and ACT typically use to assess the validity of their tests, and SAT or ACT scores are more predictive of college grades than they are of college graduation rates.[7]

The smoothness of these relationships is important because it runs counter to efforts to identify "benchmarks" that indicate college readiness. For example, the ACT defines college readiness benchmarks as those that predict a 50 percent chance of earning at least a B average in the first year of college.[8] In Figure 3, this threshold is reached at an ACT score of 23.

But there is no evidence that reaching this threshold has any real meaning relative to other arbitrarily selected thresholds. For example, a score increase from 21 to 23 is associated with an increase in the chance of earning a B average of about 10 percentage points—but so is a score increase from 23 to 25.

Benchmarks may be useful for some purposes, but they do not provide much actionable information for policymakers or educators because college readiness is a continuum, not a state of being. To borrow a medical analogy, measures of college readiness are more like a body mass index than a pregnancy test.

The SAT and ACT are not the only tests aimed at measuring college readiness. State tests increasingly have this goal, including those developed by consortia of states to assess student performance against the Common Core State Standards—namely, the Partnership for Assessment of Readiness for College and Careers (PARCC) and the Smarter Balanced Assessment Consortium (SBAC). The available evidence indicates that tests are generally similar to college admissions tests in how strongly they predict college grades.[9] There has been one study of a test from each of the Common Core consortia.

The study of PARCC tests finds similar predictive power relative to a state test—that is, the Massachusetts Comprehensive Assessment System.[10] The study of SBAC tests finds similar predictive power relative to the SAT and finds that both tests are weaker predictors than high school GPA is.[11]

The available evidence indicates that a test is a test is a test when it comes to predicting success in college.[12] But this conclusion has to be qualified by the fact that most of this research focuses on college grades (usually in the first year) and not on college completion, and some evidence shows that scores on Advanced Placement and SAT subject exams can better predict college completion than SAT or ACT scores can.[13] More work is needed to assess how strongly the new generation of college readiness measures, especially those tied to state standards, predict which students are most likely to complete a college degree—not to mention how to help those who may be less likely to succeed.

High School Coursework. Students' readiness for college is assessed by not just summary measures such as test scores and grades but also the content and rigor of their high school coursework. Jacob Jackson and Michael Kurlaender review a sizable body of research documenting that students who take more rigorous high school courses are more likely to succeed in college.[14] For example, Clifford Adelman identifies that the highest level of mathematics taken is an important predictor of degree attainment.[15]

Jackson and Kurlaender highlight multiple explanations for the relationship between rigorous high school coursework and future success, including the richer curriculum, higher-ability peer groups, and the likelihood that better teachers are assigned to advanced courses. But they also caution that the relationship between course-taking and future success may be exaggerated by unmeasured traits of students who take these courses, such as their ability, motivation, and work ethic. Family characteristics such as parental education and income likely play a role as well.

Careful attempts to isolate the causal effect of taking more rigorous high school courses suggest that selection bias is unlikely to fully account for the relationship between courses taken and future success. Mark Long and colleagues find that students who take rigorous courses in high school tend to score higher on tests in high school and are more likely to graduate from high school and enroll in college, compared to students

with similar eighth-grade test scores at the same school who did not take such rigorous courses.[16]

Kalena Cortes and colleagues evaluate a Chicago Public Schools policy that assigned students with below-median math performances in eighth grade to a "double dose" of algebra (two instructional periods instead of one) in ninth grade.[17] To isolate the effect of the policy, they compare students who scored just below the participation threshold (the median math score)—and are therefore eligible for the intervention—to students who just missed being eligible. These groups of students were nearly identical except that one had a double dose of algebra and the other had only a single dose. The researchers find that the double dose of algebra increased test scores, high school graduation rates, and college enrollment rates.

Unfortunately, few studies have measured whether interventions aimed at boosting college readiness in high school affect graduation from college. This presumably stems from the long period of time that must pass before college completion can be accurately measured, which would also mean that such information would be dated by the time it is available. On the other hand, it stands to reason that interventions that increase a series of earlier outcomes (test scores, high school graduation, and college enrollment) will also likely increase degree attainment. But this is not always the case. The evidence reviewed above showed that test scores are much weaker predictors of college completion than they are of first-year college grades. And the double-dose algebra study found the opposite: The impact of the intervention on long-term outcomes was much greater than would have been expected based on its impact on test scores.[18]

It is important to remember that an intervention that increases both college enrollment and degree attainment may not appear to increase graduation rates—that is, the completion rates of students who enroll in college. This would be the case if the enrollment effect pushes into college students who have below-average chances of finishing degrees and would thus bring down the average completion rate, even though they are much more likely to earn a degree than if they never went to college. Increasing the pool of college-goers with students who may not have attended college without an intervention may increase the number of students completing a degree without increasing the proportion of entrants who finish.

Interventions That Boost Readiness

College readiness indicators vary not only in how much they predict college success but also in their suitability for intervention. Evidence about the effects of taking particular courses is one of the most relevant factors for policymakers and practitioners, as the obvious implication is to encourage more students to take courses shown to improve enrollment and success in college.

A positive association between taking a certain course and later success may not be causal, so this point should not be taken too far. And of course there are always risks that a scaled-up effort may yield different effects than an initial pilot. But when there is strong evidence, such as the study of double-dose algebra previously discussed, it can offer relatively clear guidance for both policy and practice.

Test scores are something of a counterexample. It is easy to come up with extreme examples of interventions, such as test preparation or even cheating, that are likely to boost test scores but not college completion. At the same time, they can be a useful barometer for assessing the effects of other interventions. More research is needed that specifically links performance on different kinds of tests to college completion, but evidence suggests that tests tied to learning specific content (for example, in a course) are more closely linked to college completion than general tests of ability (even if they are not marketed as such), such as the ACT or SAT.[19]

High school grades share some of the same properties, in that inflating students' grades is unlikely to increase college completion. And enrolling students in easier courses could potentially both increase their GPA and *harm* their chances of succeeding in college. But grades have an important advantage over test scores in that they measure more than just what students can demonstrate they know in a given moment. Grades also capture whether a student shows up to class each day, consistently turns in assignments on time, and engages in other behaviors that are likely useful in a range of settings, including success in college.

The bottom line is that high school grades represent a more useful conceptual frame for college readiness than test scores do. Increasing how much students learn in their high school courses should improve their grades. And the interventions and strategies used to improve their grades might also improve college success independent of learning material specific to a given

course. We would also expect those improvements to appear on standardized tests related to the course material, but the test would likely miss the broader effects that are not specific to the course content.

Tests are still a useful tool for policymakers seeking to create incentives for success in high school. Although holding students, teachers, or schools accountable for achieving certain grades in key courses would almost surely lead schools to push students into easier courses and toward inflating their grades, the outcome would not be so different from that of schools that have passed students (including all the way through graduation) even when they are routinely not showing up to school, as was recently highlighted in Washington, DC.[20] Incorporating scores on end-of-course tests into measuring school performance would be one strategy for mitigating such unintended consequences.

Recommendations

Increasing the academic preparedness of students before they arrive on college campuses holds significant promise for improving postsecondary educational attainment in the United States. And efforts targeted toward groups of students who have historically arrived at college less well prepared have the potential to narrow the troubling disparities in educational attainment that persist along lines of race and class.

Ensuring that efforts to improve college readiness do more good than harm requires paying careful attention to the incentives they create for students, secondary schools, and postsecondary institutions. Unintended consequences to avoid include further inflating grades, granting high school diplomas to students who are not well prepared, and discouraging students who would benefit from college from ever enrolling. Instead, policymakers should work to increase the number of students who enroll in high-quality postsecondary programs that are a good fit for them, which may be a four-year degree, local community college, or vocational school.

Research that is rigorous and relevant should inform policy, but the existing research base is far too limited. Simply calling for more research that tracks students from high school through college completion will not do because this type of work, although potentially informative, is outdated

by the time it is available or useful. This is a constraint imposed by the laws of space and time, which education researchers will not likely bend anytime soon.

An imperfect but potentially valuable solution is to conduct research that links measures at different points in time, such as test scores and grades in high school to high school graduation, college enrollment, performance in college, and graduation from college. For example, the measures of academic performance in high school that more strongly predict success in college could then be used to forecast the longer-term effects of an intervention.

In the meantime, the available evidence suggests at least three lessons for policymakers and practitioners. First, government-driven assessment of high school quality should expand beyond the single year of test scores and graduation rates that are currently required by the federal Every Student Succeeds Act. Graduation rates are ripe for gaming, and performance on a single test provides little actionable information, especially in high schools, where instruction is largely course specific. States could expand their assessment of high school performance to include the kinds of courses taken and their difficulty, as well as student performance in those courses (measured, at least in part, by performance on end-of-course exams that cannot be easily gamed by the school).

Second, K–12 schools and districts should work to increase the number of students who take rigorous courses, which they could be encouraged to do by including course-taking measures in state accountability systems. There are obvious downsides to taking this idea too far—for example, students who cannot do basic math clearly will not be well served by a calculus course. But there is solid evidence of the benefits of certain types of courses, such as additional instruction in algebra for students with below-average math performance. Compelling evidence also shows that providing access to advanced coursework by screening all students—rather than just admitting those who volunteer to take, or are enrolled by their parents in, more rigorous classes—can identify and prepare more students with the potential to succeed, especially students of color.[21]

Finally, researchers and educators should collaborate on pilot interventions aimed at improving success in high school courses. These could be focused on content or on more general strategies aimed at helping students learn how to learn. Evaluating the impact of these trial efforts both in and

beyond the course is necessary to identify and improve on successes and to learn from failures. For example, intensive tutoring targeted to academically struggling students has been successful in Chicago and could be piloted in other contexts in ways conducive to evaluation, such as by randomly selecting some schools to participate, using the other schools as a comparison group, and then expanding the intervention district-wide if it is successful.[22]

Academics are not all that matter for college completion, and clearly policy efforts can affect other malleable student characteristics linked to college success, such as through extracurricular activities, mentoring programs, and efforts to increase school safety. But developing clear, scientifically based measures of college readiness and making sensible use of them in policy and practice is one area that holds significant potential to increase students' chances of earning a degree before they ever step foot on a college campus.

Notes

1. William G. Bowen, Matthew M. Chingos, and Michael S. McPherson, *Crossing the Finish Line: Completing College at America's Public Universities* (Princeton University Press, 2009).

2. Author's calculations from Education Longitudinal Study of 2002.

3. Mesmin Destin, *Leveraging Psychological Factors: A Necessary Component to Improving Student Outcomes*, American Enterprise Institute, May 2018.

4. Bowen, Chingos, and McPherson, *Crossing the Finish Line: Completing College at America's Public Universities*. Jacob Jackson and Michael Kurlaender estimate strong relationships between high school GPA and college success using data from California, but they do not directly compare GPA to a continuous measure of test scores. See Jacob Jackson and Michael Kurlaender, "College Readiness and College Completion at Broad Access Four-Year Institutions," *American Behavioral Scientist* 58, no. 8 (2014): 947–71.

5. See Michael Hurwitz and Meredith Welch, *Measuring Success: Testing, Grades, and the Future of College Admissions* (Johns Hopkins University Press, 2018). On the basis of more recent data, the authors find that SAT scores are more predictive of graduation rates when the analysis is not limited to within-campus comparisons.

6. See Mark Schneider and Kim Clark's paper in this series on institutional effects. Mark Schneider and Kim Clark, *Completion Reforms That Work: How Leading Colleges Are Improving Attainment of High-Value Degrees*, American Enterprise Institute, May 2018.

7. Bowen, Chingos, and McPherson, *Crossing the Finish Line*.

8. Jeff Allen, "Updating the ACT College Readiness Benchmarks," *ACT Research Report Series*, September 2013.

9. Anthony David Fina, Catherine J. Welch, and Stephen B. Dunbar, *Establishing Empirical Links Between High School Assessments and College Outcomes*, University of Iowa

ITP Research Series, 2017.

10. Ira Nichols-Barrer et al., "Predictive Validity of MCAS and PARCC: Comparing 10th Grade MCAS Tests to PARCC Integrated Math II, Algebra II, and 10th Grade English Language Arts Tests," Mathematica Policy Research, 2015.

11. Michael Kurlaender, K. A. Kramer, and Erika Jackson, "Predicting College Success: How Do Different High School Assessments Measure Up?," Policy Analysis for California Education, March 2018, http://edpolicyinca.org/sites/default/files/SBAC-SAT%20Paper.pdf.

12. Bowen, Chingos, and McPherson, *Crossing the Finish Line*. The authors find that SAT and ACT scores are similar in their ability to predict college graduation rates.

13. Bowen, Chingos, and McPherson, *Crossing the Finish Line*.

14. Jackson and Kurlaender, "College Readiness and College Completion at Broad Access Four-Year Institutions."

15. Clifford Adelman, *Answers in the Toolbox: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment,* US Department of Education, National Center for Education Statistics, 1999. See also Clifford Adelman, *The Toolbox Revisited: Paths to Degree Completion from High School Through College,* US Department of Education, National Center for Education Statistics, 2006.

16. Mark C. Long, Dylan Conger, and Patrice Iatarola, "Effects of High School Course-Taking on Secondary and Postsecondary Success," *American Educational Research Journal* 49, no. 2 (2012): 285–322.

17. Kalena E. Cortes, Joshua S. Goodman, and Takako Nomi, "Intensive Math Instruction and Educational Attainment: Long-Run Impacts of Double-Dose Algebra," *Journal of Human Resources* 50, no.1 (2015): 108–58.

18. Cortes, Goodman, and Nomi, "Intensive Math Instruction and Educational Attainment."

19. Bowen, Chingos, and McPherson, *Crossing the Finish Line*.

20. Kate McGee, "In D.C., 34 Percent of Graduates Received a Diploma Against District Policy," All Things Considered, January 29, 2018, https://www.npr.org/sections/ed/2018/01/29/581036306/in-d-c-thirty-four-percent-of-graduates-received-a-diploma-against-district-poli.

21. Susan Dynarski, "Why Talented Black and Hispanic Students Can Go Undiscovered," *New York Times*, April 8, 2016, https://www.nytimes.com/2016/04/10/upshot/why-talented-black-and-hispanic-students-can-go-undiscovered.html.

22. Philip J. Cook et al., "Not Too Late: Improving Academic Outcomes for Disadvantaged Youth" (working paper, Institute for Policy Research, Evanston, IL, February 2015), https://www.ipr.northwestern.edu/publications/docs/workingpapers/2015/IPR-WP-15-01.pdf.

Leveraging Psychological Factors: A Necessary Component to Improving Student Outcomes

MESMIN DESTIN

For decades, researchers and policymakers have sought ways to increase access to higher education, particularly for racial-ethnic groups that are underrepresented in college and people who come from lower socioeconomic status (SES) backgrounds. The federal government is particularly invested in increasing opportunities for these students, given its critical role in supporting civil rights and its large annual investment in Pell Grants. In addition to these efforts, more recent attention has been devoted to the significant number of students who enroll in college but fail to complete their degrees.

While some of the challenges students face may be attributed to their own level of preparation or individual circumstances, growing evidence demonstrates that colleges and universities themselves have a strong capacity to support and encourage students' successful college completion. As Mark Schneider and Kim Clark describe, comprehensive institutional practices such as using evidence-based teaching methods and providing holistic student support can significantly increase course success and college completion rates.[1] However, institutional efforts to increase college completion can be even more effective by systematically taking *psychological factors* into account.

Research in psychological and behavioral science has demonstrated the incredibly powerful role that psychological factors can play in helping encourage college student learning, success, and completion. In simple terms, psychological factors refer to considerations of how people subjectively experience any given task (e.g., assignment), situation (e.g., classroom), or institution (e.g., college). The core psychological question is

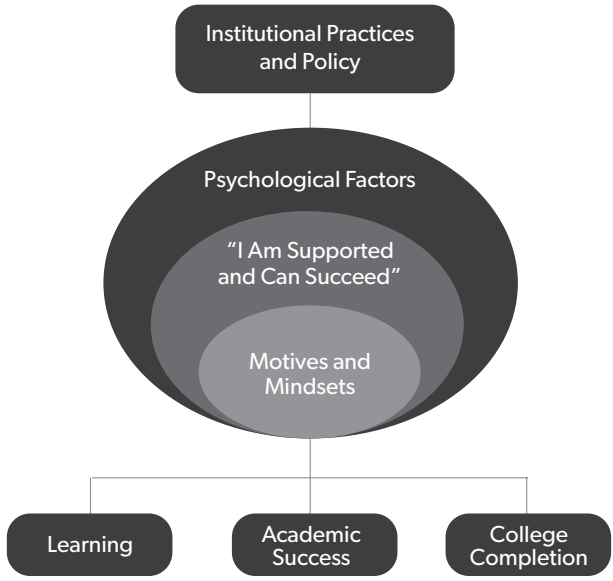
whether these college contexts and practices convey to students that they are supported and likely to reach their goals or that they are unsupported and unlikely to reach their goals. Thoughtful consideration of how institutions convey these messages to students through their policies and practices has enormous consequences for student success.

In one study, for example, students who were randomly assigned to see class assignments as connected to reaching their goals earned grades that were half a grade point higher than grades earned by students randomly assigned to control groups.[2] Similarly, new college students who were randomly assigned to encounter messages that they were likely to learn, grow, and succeed in college were 4–10 percent more likely to remain enrolled by the end of their first year.[3]

Such demonstration studies do not mean that these student interventions should be mandated or uniformly implemented for all students. Instead, these studies and insights point to principles that can inform institutions' general efforts. Policies that are designed to elevate college completion should be attentive to the psychological experience of college students by following two broad guidelines:

1. **Enhance institutions' capacity to align their practices with insights from the study of psychological factors in order to improve student outcomes and respond to demographic changes.** For example, when faculty and staff have diverse backgrounds and perspectives, they are likely to understand the breadth of student experiences in college and support positive student learning outcomes.[4] Further, faculty and staff development that is informed by psychological and behavioral science should be supported. Examples include resources from the Center for the Integration of Research, Teaching and Learning Network and the National Association of Student Personnel Administrators–Student Affairs Administrators in Higher Education.[5] If students regularly encounter faculty and staff who understand students' subjective experiences, students are more apt to perceive that they are supported and likely to reach their goals at the institution.

Figure 1. The Connection Among Institutions, Psychological Factors, and College Student Outcomes



Source: Author.

2. **Evaluate initiatives aiming to elevate college completion by paying attention to the student experience, and incorporate mechanisms for iteration based on systematic feedback.** For example, if a college allocates new financial aid resources to provide more support for students, it should institute mechanisms to evaluate whether resources are disbursed clearly and efficiently. When resources are unclear or difficult to access (even if they are technically available), it signals to students that they are not supported at the institution and unlikely to succeed.[6]

These suggestions describe how institutional practices related to campus resources and personnel can shape consequential aspects of students' psychological experience during college. As shown in Figure 1, psychological factors that consistently convey that students can succeed and are supported can amplify institutional efforts to improve college student

learning, success, and completion. Even the most straightforward attempts to improve student outcomes can fall flat without systematic attention to students' psychological experience.

The movement toward psychologically informed policies and practices can dramatically enhance the effectiveness and efficiency of other approaches to increasing college completion. When guided by sound psychological principles, seemingly small and subtle institutional changes significantly improve student outcomes. At the same time, such considerations can help large and structural changes achieve their desired effects.

Despite the evidence and potential for leveraging psychological factors to enhance policy effectiveness and improve college completion, two barriers and misconceptions have limited their widespread uptake. First, psychological studies can seem small in scale and irrelevant for institutional practice and policy. However, a critical mass of evidence and principles from psychological and behavioral science can now be harnessed to encourage significant positive effects across a wide range of institutions. This report provides descriptions and evidence of two well-studied psychological factors that support student completion—motives and mindsets.

A second barrier is the misconception that psychologically informed policies and practices insulate students from real-world challenges and focus predominantly on making transitions easier. On the contrary, an approach focused on psychological factors attempts not to coddle students but rather to encourage them to take on meaningful challenges and opportunities for growth. This report describes evidence on how psychological factors encourage students to persist in the face of challenges. It also provides cautionary guidance on how such factors should not be used as tool kits to implement blindly but rather as guidelines to systematically consider when developing and implementing comprehensive and holistic institutional practices.

Two Main Psychological Factors

Evidence for the effectiveness of psychologically oriented approaches to improving college completion is robust and growing. A recent report published by the National Academies of Sciences, Engineering, and Medicine affirmed the role of psychological factors in supporting student success

and called for even greater attention to continued research from the scientific community.[7]

Motives and mindsets are two psychological factors that everyday practices of colleges and universities can shape and activate both positively and negatively. Research in psychological and behavioral science can guide institutions to intentionally shape motives and mindsets in ways that have strong and consistent positive effects on student outcomes.

Factor 1: Motives. Motives include students' thoughts about what matters to them and who they may become in life. These thoughts—which are often referred to as goals, expectations, values, or identities—serve as guides that support students' motivation during college. For example, imagine a student who has a goal of becoming a civil engineer. When this student thinks about the future, the student visualizes being an integral part of a team building bridges and tunnels that enhance communities and ultimately improve people's lives.

Research consistently demonstrates that when students can articulate what they are ultimately working toward and why it matters for them and others, it increases their motivation and ability to focus, persist, and succeed in school.[8] Most important, various aspects of the college environment can help develop and encourage these types of supportive and motivating thoughts—or they can inadvertently distance students from their valued goals and identities, with serious positive or negative consequences for their likelihood of success.

In one experiment, researchers studied over 1,000 college students in large biology courses.[9] Half the students were randomly assigned to complete individual writing assignments throughout the semester that the researchers designed to emphasize the connection between the course content and students' own lives and goals. The study found that students who were randomly assigned to this group performed significantly better in the course than students who were not. The assignments were especially beneficial for first-generation college students and those from underrepresented racial-ethnic minority groups. In fact, the experiment led to a 61 percent reduction in the gap in course grades between these students and students from socioeconomic and racial-ethnic groups that are not underrepresented in college.

This experimental demonstration and similar results from several related experiments do not suggest that all students should complete specific

activities or writing assignments from particular studies. Rather, they show the potential benefits of finding ways to consistently activate a positive psychological process for students in a college context. Student success and completion are supported when college and college tasks are made to feel relevant to students, particularly in how they think about what matters to them and whom they hope to become.[10]

Several practices, which institutional policies can encourage, can systematically improve student success by strengthening the connection between students' academic experiences and their motives. First, at the administrative level, many colleges and universities offer generous financial aid and student loans to increase access for students with otherwise limited financial resources. However, the extent to which students know about such resources and the way in which such resources are disbursed can determine whether they support or undermine student motivation and achievement. A study of over 300 college students showed that if students receive financial aid but perceive they are among a small minority of students who rely on such assistance, they feel a weaker connection to the institution and have difficulty imagining and pursuing success.[11]

Similarly, receiving student loans to attend college but having little guidance on how the loans work or how they support students' academic success can actually increase students' stress about future financial stability. On the other hand, when loans are disbursed in a way that reinforces their potential as an investment toward future goals—through adequate financial counseling, for instance—they help improve student performance.[12]

Second, positive interactions with faculty are integral to activating student motives, which affects student success. A meaningful connection with a faculty member helps students maintain a strong identification with the university, which reduces the likelihood of disengagement.[13] It is a long-standing empirical finding that students who have discussions and informal contact with faculty outside of class time are less likely to drop out of college.[14] In general, a robust and cohesive advising network and strategy can ensure that students develop clear goals and find the appropriate path toward those goals.

In one experiment with 13,000 college students, some students were randomly assigned to have access for two years to consistent college coaching resources to help them form clear goals and related strategies.[15] Those who

received the coaching were 14 percent more likely to remain enrolled in college a year after the coaching ended than students in the control group. These and other studies show that regular and substantive interactions with faculty and counselors improve college student outcomes.

Third, at the student level, peer mentoring also supports students' journeys toward their goals.[16] Exposure to peers from a diverse range of backgrounds helps students envision their own success and increases the achievement of students from underrepresented groups.[17] In one experimental demonstration study with over 150 college students, a one-hour program at the beginning of the students' first year of college was designed to expose them to the diversity of experiences and stories of more advanced college students. This program reduced the gap in achievement between first-generation and continuing-generation students by 63 percent during their first year of college and continued to positively influence achievement and how students responded to academic challenges in subsequent years.[18] Through judicious implementation, approaches that carefully foster motivating peer interactions promote student success during college and help reduce or eliminate preventable achievement gaps among students.

Factor 2: Mindsets. The second key psychological factor associated with college completion is mindset, or what is sometimes referred to as students' lay theories. Some environments lead students toward more of a fixed mindset, in which they believe that personal qualities such as intelligence are relatively stable and unchanging. Other environments lead students toward more of a growth mindset, in which they believe that a person's intelligence level can change and develop. In dozens of studies, encouraging more of a growth mindset consistently improves student outcomes.[19]

Think of a student who performs poorly on a difficult quiz or midterm during their first college class. A fixed mindset environment indicates to the student that their ability to perform well in college is low and that it is not going to change. As a result, the student becomes less likely to seek help or employ strategies that could improve their performance. This fixed pathway can lead to discouragement, declining performance, and falling behind in multiple courses. A growth mindset environment, on the other hand, indicates to students that they will have to do something differently to succeed, such as change their study strategies or find resources on campus to enhance

their learning. This growth pathway would be more likely to support motivation and improvement across a student's courses.

Relatedly, college environments also shape students' lay theories about belonging. Contexts that lead students to interpret challenges as a sign that they do not belong in college (compared with those that tell students that experiencing challenges is a normal part of belonging) discourage students and reduce their academic performance, especially among students from groups that are underrepresented in college.[20] For example, when an exam is presented as a way to "weed out" the weakest students, students from underrepresented groups perform worse than when the same exam is presented as a way to support learning.[21]

Perhaps the most important insight to understand about mindset and lay theories, particularly in relation to institutional or public policy, is that environments shape whether students develop certain lay theories and exhibit more of a fixed or growth mindset. For example, in experimental studies with over 9,000 college students, an interactive module during students' online college orientation that explicitly conveyed to them that intellectual ability can change and develop (i.e., a growth mindset) significantly improved academic motivation and performance. This type of experiment has led to a 40 percent reduction in inequality among different sociodemographic groups in the likelihood that students remain enrolled in college after one year.[22]

The effects of individual experimental studies do not suggest that specific interactive modules should be distributed at scale. Every college context is different and can find unique ways to support lay theories and mindsets that are consistent and appropriate to their environment. The relevant insight, rather, is that institutional practice and policy can influence a classroom or university in ways that shape whether struggling students feel a sense of belonging and whether they have more of a fixed or growth mindset response, with significant consequences for college success and completion.

Practices that encourage growth mindsets include student evaluation systems that reward effort and learning rather than basic performance.[23] Further, classes that allow and encourage opportunities for students to take risks (e.g., low-stakes testing) and embrace challenges (e.g., project-based learning) also support the development of resilient growth mindsets.[24] In the same vein, the institutional environments that encourage positive lay

theories and growth mindsets are those in which key administrators are recruited and trained to understand and foster the value that students' abilities are malleable and can develop.[25] Overall, everyday experiences that signal to students that difficulty is normal rather than a sign that they do not belong increase their likelihood of persisting and succeeding.

Supporting Student Persistence

College experiences that activate students' motives, encourage resilient mindsets, and generally convey to students that they are supported and can succeed do not attempt to shield students from academic challenges. On the contrary, they aim to infuse academic difficulty with a sense of meaning that helps students persist, grow, and learn. Almost all students encounter some form of academic or personal difficulty during college.

Imagine two students with roughly the same academic ability and background. For one of them, facing a challenging or ambiguous course project or losing a family member might weaken the resolve to succeed in classes. Under the same circumstances, the other student might become more focused and find ways to successfully overcome the challenges. Any number of personal differences between the two students might explain their divergent responses to personal and academic difficulty. However, increasing evidence shows that when colleges' qualities and practices are meaningfully linked to students' goals and values or infer a sense of belonging and potential for growth, they increase the likelihood that students build and demonstrate persistence.

Several effective classroom-level practices can tap into students' motives and mindsets in ways that support student persistence. For example, classrooms that create a sense of community, engage active learning strategies, and invoke real-world problems all increase the likelihood that students will persist amid difficult coursework. Clearly communicating faculty expectations and using evaluations that emphasize opportunities to learn rather than unnecessary competition also align with psychological factors to encourage persistence, especially for students from underrepresented groups.[26] In general, these psychologically informed practices signal to students that difficulty is a sign that a task is meaningful and important rather

Table 1. Examples of Psychologically Informed Practices at Multiple Institutional Levels

Level	Policy or Practice	Psychological Message
Institutional	Financial aid counseling that normalizes receipt of financial aid and connects current costs and future goals	The institution is supportive of the motives of students from diverse socioeconomic backgrounds
Faculty/ Classroom	Faculty development that encourages innovative teaching and project-based learning	Students are encouraged to embrace challenges as a part of learning
Peer	Peer mentoring programs that connect new students with advanced students from similar and diverse backgrounds	Students from many different backgrounds belong here and succeed

Source: Author.

than meaningless and impossible, which is an incredibly strong predictor of student success.[27]

Further, the availability of a wide range of resources to enhance student learning, such as tutoring, helps increase student persistence and success. These resources are most effective, however, when colleges and universities provide them with attention to psychological factors. Strongly encouraging the wide use of academic support resources and providing opportunities for students to strategize how they will use resources normalizes challenges and difficulties and psychologically links available resources to students' own goals.[28]

A Note of Caution

As institutions and policymakers move toward greater consideration of psychological factors in elevating college completion, there are several important considerations. First, although tempting, they should avoid the path of high-stakes measurement of psychological factors. The measurement of student motives and mindsets continues to evolve and changes depending on the context. Therefore, it is unwise to consider any measure a universal standard.

Further, as students, educators, and institutions become increasingly aware of psychological factors, attaching resources to their measurement may influence researchers and respondents to bias their responses.[29] For example, an attempt to measure faculty mindsets and reward those who indicate more of a growth mindset would ignore the importance of faculty practices, rather than survey responses, in conveying messages to students in a classroom.

Another important consideration is balancing targeted and universal approaches. Without careful implementation, targeted approaches that single out particular types of students can be stigmatizing and can hurt student outcomes. For example, a depersonalized attempt to provide academic support to students from low SES families may signal to individual students that the institution has low expectations for their success, thereby causing them to feel concerned, self-conscious, and less able to focus on their studies. However, thoughtful implementation that organically reaches students and offices that are designated to form meaningful connections with students can help reach those who may benefit the most.

In addition, there are some areas where additional knowledge is necessary to more fully understand the role of psychological factors in student outcomes. Perhaps most notably, a better record of the practices, initiatives, and efforts of individual institutions would be most useful. Many colleges and universities are generally aware of the crucial role that students' subjective experiences play in their likelihood of college completion and have taken steps to acknowledge and address such factors. A systematic review of the extent to which such efforts are carried out and evaluated would benefit researchers and policymakers alike.

Finally, despite the critical mass of evidence on the significance of psychological factors for students and the ability of institutions to influence them, additional funding and research remain necessary to continue the pattern of advancement. In particular, more large-scale experimental studies that collect longitudinal data will provide even greater guidance for institutions seeking to improve student outcomes. Perhaps most important, continuing work in this area will show that attention to psychological factors is necessary in any attempt to influence student outcomes and that psychological factors should be considered as part of holistic approaches to comprehensively improve the experience and outcomes of students in higher education.

Notes

1. Mark Schneider and Kim Clark, *Completion Reforms That Work: How Leading Colleges Are Improving the Attainment of High-Value Degrees*, American Enterprise Institute, May 2018.

2. J. M. Harackiewicz et al., "Closing Achievement Gaps with a Utility-Value Intervention: Disentangling Race and Social Class," *Journal of Personality and Social Psychology* 111, no. 5 (2016): 745–65, https://www.ncbi.nlm.nih.gov/pubmed/26524001.

3. D. S. Yeager et al., "Teaching a Lay Theory Before College Narrows Achievement Gaps at Scale," *Proceedings of the National Academy of Science of the United States of America* 113, no. 24 (June 2016): E3341–E3348, https://www.ncbi.nlm.nih.gov/pubmed/27247409.

4. Sylvia Hurtado, "Linking Diversity and Educational Purpose: How Diversity Affects the Classroom Environment and Student Development," in *Diversity Challenged: Legal Crisis and New Evidence*, ed. G. Orfield (Cambridge, MA: Harvard Publishing Group, 2001), 187–283.

5. Center for the Integration of Research, Teaching and Learning, https://www.cirtl.net/; and National Association of Student Personnel Administrators, https://www.naspa.org/.

6. A. S. Browman and M. Destin, "The Effects of a Warm or Chilly Climate Toward Socioeconomic Diversity on Academic Motivation and Self-Concept," *Personality and Social Psychology Bulletin* 42, no. 2 (February 2016): 172–87, https://www.ncbi.nlm.nih.gov/pubmed/26634272.

7. National Academies of Sciences, Engineering, and Medicine, *Supporting Students' College Success: The Role of Assessment of Intrapersonal and Interpersonal Competencies*, 2017, https://www.nap.edu/catalog/24697/supporting-students-college-success-the-role-of-assessment-of-intrapersonal.

8. Hurtado, "Linking Diversity and Educational Purpose"; Browman and Destin, "The Effects of a Warm or Chilly Climate Toward Socioeconomic Diversity on Academic Motivation and Self-Concept"; and National Academies of Sciences, Engineering, and Medicine, *Supporting Students' College Success.*

9. Harackiewicz et al., "Closing Achievement Gaps with a Utility-Value Intervention."

10. J. M. Harackiewicz and S. J. Priniski, "Improving Student Outcomes in Higher Education: The Science of Targeted Intervention," *Annual Review of Psychology* 69 (January 2018): 409–35; and Chris S. Hulleman et al., "Enhancing Interest and Performance with a Utility Value Intervention," *Journal of Educational Psychology* 102, no. 4 (November 2010): 880–95, http://psycnet.apa.org/buy/2010-21220-001.

11. Browman and Destin, "The Effects of a Warm or Chilly Climate Toward Socioeconomic Diversity on Academic Motivation and Self-Concept."

12. Mesmin Destin and Ryan C. Svoboda, "Costs on the Mind: The Influence of the Financial Burden of College on Academic Performance and Cognitive Functioning," *Research in Higher Education* (August 2017): 1–23.

13. Hulleman et al., "Enhancing Interest and Performance with a Utility Value

Intervention"; Destin and Svoboda, "Costs on the Mind"; and Young K. Kim and Carol A. Lundberg, "A Structural Model of the Relationship Between Student-Faculty Interaction and Cognitive Skills Development Among College Students," *Research in Higher Education* 57 (2016): 288–309.

14. Ernest T. Pascarella and Patrick T. Terenzini, "Student-Faculty Informal Contact and College Persistence: A Further Investigation," *Journal of Educational Research* 72, no. 4 (1979): 214–18, https://www.tandfonline.com/doi/abs/10.1080/00220671.1979.10885157.

15. Eric P. Bettinger and Rachel Baker, "The Effects of Student Coaching: An Evaluation of a Randomized Experiment in Student Advising," *Educational Evaluation and Policy Analysis* 36 (2014): 3–19, https://cepa.stanford.edu/content/effects-student-coaching-evaluation-randomized-experiment-student-advising.

16. T. C. Dennehy and N. Dasgupta, "Female Peer Mentors Early in College Increase Women's Positive Academic Experiences and Retention in Engineering," *Proceedings of the National Academy of Sciences of the United States of America* 114, no. 23 (June 2017): 5964–69, https://www.ncbi.nlm.nih.gov/pubmed/28533360.

17. N. M. Stephens, M. Hamedani, and M. Destin, "Navigating the Social Class Divide: A Diversity Education Intervention Improves First-Generation Students' Academic Performance and All Students' College Transition," *Psychological Science* 25 (2014): 943–53.

18. N. M. Stephens et al., "A Difference-Education Intervention Equips First-Generation College Students to Thrive in the Face of Stressful College Situations," *Psychological Science* 26, no. 10 (2015): 1556–66, https://www.ncbi.nlm.nih.gov/pubmed/26290523.

19. Carol S. Dweck, *Mindset: The New Psychology of Success* (New York: Random House, 2006).

20. Gregory M. Walton and Geoffrey L. Cohen, "A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students," *Science* 331, no. 6023 (March 2011): 1447–51, http://science.sciencemag.org/content/331/6023/1447.full?sid=e738e70a-13c5-4c8f-afa2-365e103d1563.

21. Annique Smeding et al., "Reducing the Socio-Economic Status Achievement Gap at University by Promoting Mastery-Oriented Assessment," *PLOS One* 8 (2013): e71678, http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0071678.

22. Yeager et al., "Teaching a Lay Theory Before College Narrows Achievement Gaps at Scale."

23. Eleanor O'Rourke et al., "Brain Points: A Growth Mindset Incentive Structure Boosts Persistence in an Educational Game," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Toronto, ON: Association for Computing Machinery, 2014), 3339–48.

24. Dweck, *Mindset*; and K. Haimovitz and C. S. Dweck, "What Predicts Children's Fixed and Growth Intelligence Mind-Sets? Not Their Parents' Views of Intelligence but Their Parents' Views of Failure," *Psychological Science* 27, no. 6 (June 2016): 859–69, https://www.ncbi.nlm.nih.gov/pubmed/27113733.

25. Mary C. Murphy and Carol S. Dweck, "A Culture of Genius: How an Organization's Lay Theory Shapes People's Cognition, Affect, and Behavior," *Personality and Social Psychology Bulletin* 36, no. 3 (2010): 283–96, http://journals.sagepub.com/doi/abs/

10.1177/0146167209347380; and Katherine T. U. Emerson and Mary C. Murphy, "A Company I Can Trust? Organizational Lay Theories Moderate Stereotype Threat for Women," *Personality and Social Psychology Bulletin* 41, no. 2 (2015): 295–307, http://journals.sagepub.com/doi/abs/10.1177/0146167214564969.

26. Smeding et al., "Reducing the Socio-Economic Status Achievement Gap at University by Promoting Mastery-Oriented Assessment"; and Mikaël Jury, Annique Smeding, and Céline Darnon, "First-Generation Students' Underperformance at University: The Impact of the Function of Selection," *Frontiers in Psychology* 6 (2015): 710, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4446913/.

27. G. C. Smith and D. Oyserman, "Just Not Worth My Time? Experienced Difficulty and Time Investment," *Social Cognition* 33 (2015): 1–18.

28. P. Chen et al., "Strategic Resource Use for Learning: A Self-Administered Intervention That Guides Self-Reflection on Effective Resource Use Enhances Academic Performance," *Psychological Science* 28, no. 6 (June 2017): 774–85.

29. Angela L. Duckworth and David Scott Yeager, "Measurement Matters: Assessing Personal Qualities Other Than Cognitive Ability for Educational Purposes," *Educational Researcher* 44, no. 4 (May 2015): 237–51, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4849415/.

About the Authors

Matthew M. Chingos is the director of the Urban Institute's Education Policy Program, which undertakes policy-relevant research on issues from prekindergarten through postsecondary education. He is an executive editor of *Education Next* and coauthor of *Game of Loans: The Rhetoric and Reality of Student Debt* (Princeton University Press, 2016). His work has been featured in major media outlets and academic journals, including the *Journal of Public Economics*, *Journal of Policy Analysis and Management*, and *Educational Evaluation and Policy Analysis*. Before joining the Urban Institute, Chingos was a senior fellow at the Brookings Institution. He received a B.A. in government and economics and a Ph.D. in government from Harvard University.

Kim Clark is an assistant director of the Education Writers Association (EWA), where she plays a leading role in directing EWA programming on education beyond high school. Previously, she served as a senior writer for *Money* magazine, where her reporting focused on the financial costs of higher education. She previously covered higher education for *US News & World Report* and created Financialaidletter.com, the first site to post real financial aid letters and show how confusing they can be. She is a corecipient of Gerald Loeb and Henry R. Luce awards for public service journalism and the 2013 top prize for magazine investigative work from the EWA.

Mesmin Destin is an associate professor of psychology and education and a fellow of the Institute for Policy Research at Northwestern University. Destin directs a multidisciplinary lab group and investigates social psychological mechanisms underlying socioeconomic disparities in educational outcomes during adolescence and young adulthood. Using laboratory and field experiments, he studies factors that influence how young people perceive themselves and their futures. At the university level, he examines how subtle social experiences and institutional messaging shape the motivation and educational trajectories of low socioeconomic status and first-generation college

students. He holds a Ph.D. in psychology from the University of Michigan and a B.A. in psychology and sociology from Northwestern University.

Lanae Erickson Hatalsky is vice president for social policy and politics at Third Way, where she advances the case for expanding opportunity and freedom on a wide range of issues. She leads the organization's work on issues such as immigration, abortion, religious liberty, and guns, and she helps drive crucial policy conversations such as how we can ensure our higher education system is delivering for students. She served on President Barack Obama's third Advisory Council on Faith-Based and Neighborhood Partnerships and as legislative counsel at Alliance for Justice, where she investigated the backgrounds of federal judicial nominees on civil and human rights. She earned her J.D. magna cum laude from the University of Minnesota and her B.A. from Mount Holyoke College.

Frederick M. Hess is a resident scholar and the director of Education Policy Studies at AEI, where he works on K–12 and higher education issues. He is also the author of the popular Education Week blog "Rick Hess Straight Up," blogs regularly at *Forbes*, and, since 2001, has served as executive editor of *Education Next*. He teaches or has taught at the University of Virginia, the University of Pennsylvania, Georgetown University, Rice University, Johns Hopkins University, and Harvard University. As an educator, political scientist, and author, Hess is often published in scholarly outlets, such as *American Politics Quarterly*, *Harvard Education Review*, *Social Science Quarterly*, *Teachers College Record*, and *Urban Affairs Review*. He is the author of multiple books, including *Letters to a Young Education Reformer* (Harvard Education Press, 2017) and *The Cage-Busting Teacher* (Harvard Education Press, 2015). He has also edited influential books on the Common Core, entrepreneurship in education, education philanthropy, the impact of education research, and the Every Student Succeeds Act. Hess is the senior founding fellow of the Public Education Foundation's Leadership Institute of Nevada, sits on the review board for the Broad Prize for Public Charter Schools, and serves on the boards of directors of the National Association of Charter School Authorizers and 4.0 Schools. He has an M.A. and a Ph.D. in government, in addition to an M.Ed. in teaching and curriculum, from Harvard University.

Bridget Terry Long is the Saris Professor of Education and Economics and former academic dean of the Harvard Graduate School of Education. She is a research associate of the National Bureau of Economic Research and member of the board of directors for MDRC, a nonprofit social policy research organization, and the Society for Research on Educational Effectiveness. She has been a presidential appointee and served as chair of the National Board for Education Sciences, the advisory panel of the Institute of Education Sciences at the US Department of Education. She has also been a visiting fellow at the Federal Reserve Bank of Boston and recipient of the National Academy of Education/Spencer Postdoctoral Fellowship. She received her Ph.D. and M.A. in economics from Harvard University and her A.B. from Princeton University. Beginning on July 1, 2018, she will be the dean of the Harvard Graduate School of Education.

Mark Schneider is a former visiting scholar at the American Enterprise Institute and former vice president at the American Institutes for Research (AIR). Before those roles, he served as the US Commissioner of Education Statistics from 2005 to 2008. He is a Distinguished Professor Emeritus of Political Science at Stony Brook University, New York. He is also the author and editor of numerous articles and books on education policy, including *Getting to Graduation: The Completion Agenda in Higher Education* (Johns Hopkins University Press, 2012), *Accountability in American Higher Education* (Palgrave Macmillan, 2010), *Charter Schools: Hope or Hype?* (Princeton University Press, 2007), and *Choosing Schools: Consumer Choice and the Quality of American Schoools* (Princeton University Press, 2000), which won the Policies Study Organization's Aaron Wildavsky Best Book Award. He is one of the creators of College Measures LLC, a joint venture of AIR and Matrix Knowledge Group.

Sarah Turner is a professor of economics and education at the University of Virginia. She is also a research associate with the National Bureau of Economic Research. Her research focuses on the economics of the education market, particularly higher education. Recent work focuses on the economics of college choice, how federal financial aid affects students' collegiate attainment, and scientific labor markets and the flow of foreign students to colleges and universities in the US. Turner is a principal investigator of the

Expanding College Opportunities Project, a randomized controlled trial that had significant effects on the college choices of low-income high achievers. She received her B.A. from Princeton University and her Ph.D. in economics from the University of Michigan.

Acknowledgments

We thank the Raikes Foundation for its generous support of this project and its shared enthusiasm about elevating college completion. We also thank Matthew M. Chingos, Kim Clark, Mesmin Destin, Bridget Terry Long, Mark Schneider, and Sarah Turner for contributing the thoughtful research in the volume. Each demonstrated remarkable attention to detail and patience during the editing process and went above and beyond their calling to participate in private and public gatherings pegged to the release of the reports.

We also extend special notes of gratitude to Bethany Little for her wonderful stewardship and advice throughout the production of this project and to Amy Azzam for her superior editorial assistance. Lastly, we thank the staff at AEI and Third Way for their research and administrative support that brought this project to fruition.