BROOKINGS

Improving community college completion rates by addressing structural and motivational barriers

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Summary

Many community college students in the U.S. do not complete a credential or degree, facing dramatically reduced earning potential. However, evidence suggests that helping students navigate the college environment and connect their coursework to their lives can help solve the community college completion puzzle. In this report, Elizabeth Mann Levesque discusses the structural and motivational barriers these students face, potential solutions, and offers policy recommendations to boost completion rates.

Introduction

Community colleges have the potential to provide students across the United States with viable pathways into good-paying jobs. However, many students who enroll in community college in the United States do not complete a certificate or degree. Specifically, fewer than 40 percent of community college students earn a certificate or degree within six years of enrollment (Bailey et al. 2015). Individuals who do not complete any type of certificate (also referred to as a credential) beyond a high school diploma face dramatically reduced earning potential (Belfield and Bailey 2017). Low completion rates are thus an urgent problem for millions of Americans seeking a pathway into the middle class and employers reliant on a skilled and educated workforce.

To address this problem, this report discusses structural and motivational barriers to completion that community college students face, as well as strategies to overcome these barriers. The key takeaways are that making it easier for students to *navigate the college environment* and *connect their coursework to their lives* can improve student outcomes. This analysis is relevant for community colleges, policymakers seeking to provide students with a viable route to upward economic mobility, employers hoping to strengthen their workforce development partnerships, and philanthropies invested in reducing economic inequality.

Before proceeding, it is important to note that this report is not a comprehensive discussion of all the barriers to completion that community college students face. Many factors contribute to low completion rates, including inadequate academic preparation and financial constraints, despite the relative affordability of public two-year colleges (Holzer and Baum 2017; Goldrick-Rab 2016). Indeed, addressing educational and financial barriers is fundamentally important to improving community college completion.[1] The goal here is to spotlight two particular barriers, structural and motivational, that policymakers, colleges, and employers should address to improve students' prospects.

Making it easier for students to navigate the college environment and connect their coursework to their lives can improve student outcomes.

Section 1 discusses the role that community colleges play in the higher education landscape, the well-known but intransigent problem of low completion rates, and the value of completing a postsecondary credential or degree. Sections 2 and 3 discuss the structural and motivational barriers, respectively. Section 4 discusses policy recommendations about how to address these barriers.

Section 1: The problem of low completion rates

Extensive evidence indicates that completing a credential or degree beyond a high school diploma, from an associate's degree all the way up to a doctorate, improves employment outcomes and earnings for individuals (Oyserman 2012; Holzer and Baum 2017; Carnevale et al. 2017; Belfield and Bailey 2017). Yet, community colleges, as the institutions of higher education that serve a large share of low-income students, graduate less than 40 percent of students within six years (Bailey et al. 2015). Thus, community colleges have substantial unrealized potential to improve the earnings and employment outcomes for those at the bottom of the income distribution.

Indeed, community colleges could play a pivotal role in providing a pathway to upward economic mobility because of their ability to reach a large population of low-income and minority students. In fall 2015, community colleges served 41 percent of all U.S. undergraduates. Furthermore, community colleges serve a large share of the country's non-white undergraduates: 56 percent of Native Americans, 52 percent of Hispanics, 43 percent of African-Americans, and 40 percent of Asian/Pacific Islanders. Public community colleges are also more affordable compared to four-year colleges. For 2017-18, the average annual tuition and fees for public, in-district community colleges was $3,570 compared to $9,970 for public, in-state four year colleges.[2] Given these differences in cost, it is unsurprising that a 2011 analysis found that "44 percent of low-income students (those with family incomes of less than $25,000 per year) attend community colleges as their first college after high school."[3] In short, community colleges offer a pathway into higher education for a large share of low-income and minority students.

Fewer than 40 percent of community college students earn a certificate or degree within six years of enrollment.

However, many who *enroll* in community college do not *complete* a post-secondary certificate or degree. Bailey et al. (2015) summarize the problem succinctly: "Most students who enter these colleges never finish: fewer than four of every ten complete any

type of degree or certificate within six years" (p. 1). For example, one analysis finds that, of the students who enroll in community college, only 26 percent earn an associate's or bachelor's degree after six years (Jacob 2018).

The story when we consider four-year degree completion rates for students who start at community colleges is also troubling. According to the Community College Research Center (CCRC) at Columbia University Teachers College (CCRC), 81 percent of entering community college students indicate they want to earn at least a bachelor's degree, but only 33 percent transfer to a four-year institution within six years (Horn and Skomsvold 2011; Jenkins and Fink 2016). Of those who transfer, CCRC reports that "42 percent complete a bachelor's degree within six years (Jenkins and Fink 2016)." The stunning implication is that only "14 percent of the entire cohort of entering community college students earns a bachelor's degree within six years (Jenkins and Fink 2016)."[4] To be clear, the problem is not a lack of aspiration among community college students (Aelenei et al. 2017). Rather, as this report will discuss in detail, structural barriers in many community colleges often make it difficult for students to achieve their goals.

In addition, college completion rates differ systematically by household income. Comparing two age cohorts, those born in 1961-1964 and 1979-1982, Bailey and Dynarski (2011) find that college entry and completion rates rose over time for children from high- and low-income households in both cohorts. However, they note that "the increases were highly uneven, with gains largest at the top of the income distribution and smallest at the bottom" (p. 120). While the college completion rate for the 1979-1982 birth cohort is 54 percent for students from households in the top income quartile, this rate drops precipitously as income declines, to 32 percent for households in the third quartile, 21 percent in the second quartile, and only 9 percent in the lowest quartile.[5]

These low completion rates are clearly problematic, particularly in light of evidence that completing a two-year degree is undeniably valuable in terms of earnings potential. Belfield and Bailey (2017) review analyses of eight states and find that the average earnings gains to completing an associate's degree compared to enrolling in college but not completing a degree are $4,460 for men and $7,160 for women *per year* (p. 7).[6] In a different analysis of data from the state of Florida, Holzer and Baum (2017) similarly find

large returns to higher education.[7] They find that the largest returns are to completing an advanced degree and bachelor's degree, which are associated with, on average, 99 and 71 percent increases in earnings relative to completing only a high school diploma, respectively. While the gains to two-year degrees are smaller, they remain substantial. They find that, on average, completing an associate's degree is associated with a 37 percent increase in earnings compared to only completing a high school diploma.[8] Further, Carnevale (2012) argues that there is important variation in potential earnings by major, describing how, in some cases, students who graduate with a two-year degree in one field stand to earn more than students with a four-year degree in a different field. He explains: "For example, an engineering technician with an associate's degree can make more than a guidance counselor with a master's degree" (p. 61).

Not all associate's degrees yield the same gains. Belfield and Bailey (2017) find heterogeneity in the returns to associate's degrees in different fields, although they find that across all eight states in their analysis, "Earnings gains are highest for health-related fields" (p. 12). Holzer and Baum (2017) find differences in returns to associate of arts versus associate of science degrees; returns to an associate of science or applied science degree are, on average, 59 percent higher than returns to a high school diploma. In comparison, returns to an associate of arts degree are, on average, 29 percent higher than returns to a high school diploma.[9] Similarly, Belfield and Bailey (2017) note that the returns to associate of science degrees are "much greater than the returns to associate degrees in arts" (p. 12).[10] In addition, there is important variation between outcomes for students who attend for-profit colleges compared to public institutions. Cellini and Turner (2018) find that for students in certificate programs, "In all 50 states and Washington, DC students in public institutions have higher earnings and lower debt that their counterparts in for-profit institutions" (p. 3). Despite this variation across different types of associate's degrees, one thing is clear: Community colleges play a crucial role in students' earnings potential.

The estimates of returns to earning a credential are more mixed. Analyzing data from the state of Florida, Holzer and Baum (2017) find that, on average, completing a credential is associated with a 30 percent increase in earnings compared to a high school diploma.[11]

Analyzing statewide administrative data sets across multiple states, Belfield and Bailey (2017) find that returns to earning a certificate "vary widely across states" (p. 7).[12]

Despite this variation, the bottom line is clear: Compared to only earning a high school diploma, completing a postsecondary credential or degree is associated with higher earnings. In this context, low completion rates among students enrolled in community colleges pose a huge problem, not only for individuals' earning potential and related life outcomes, but also for society more broadly. Particularly considering that almost half of all low-income Americans first enroll in a community college to pursue higher education, these low completion rates may exacerbate existing economic inequality. Further, there is a strong case for addressing low completion rates in order for the U.S. to remain competitive in the global economy. Low community college completion rates pose a clear challenge for employers reliant on a healthy labor market. For example, in his discussion of how artificial intelligence and emerging technologies are reshaping the nature of work, West (2018) observes the important role that community colleges play in preparing students for the workforce.

Indeed, the Bureau of Labor Statistics (BLS) predicts that many jobs requiring an associate's degree or a postsecondary non-degree award (such as a credential) are likely to grow in the near future. As of April 2018, the BLS Occupational Outlook Handbook identified 48 different types of jobs that require an associate's degree for an entry-level position. For 69 percent of these jobs, the growth rate is predicted to be as fast as or faster than average.[13] BLS also identified 46 types of jobs that require a postsecondary non-degree award, such as a credential, for entry-level positions. Of these, 36 percent are predicted to grow as fast as or faster than average.[14]

Low completion rates are a problem for the colleges that seek to serve these students, employers reliant on a strong, local, and appropriately trained workforce, and policymakers responsible for creating a strong workforce capable of driving economic prosperity.

These predictions suggest that in many fields, demand for employees who have a certificate or associate's degree is increasing. Yet considering the low completion rates for students who enter community colleges, employers may struggle to fill positions. Indeed, West (2018) highlights results from a Deloitte survey that found that "39% of large company executives said they were either 'barely able' or 'unable' to find the talent their firms required" (p. 112).

Low community college completion rates are a concern for current and prospective students who rely on community colleges to help provide a pathway to financial security. In addition, low completion rates are a problem for the colleges that seek to serve these students, employers reliant on a strong, local, and appropriately trained workforce, and policymakers responsible for creating a strong workforce capable of driving economic prosperity.

A step in the right direction: Providing information on student outcomes

One approach to improving outcomes for community college students (and prospective students) is increasing awareness of the labor market outcomes associated with certain fields of study and degrees. Indeed, evidence suggests a clear need to increase awareness among community college students about outcomes associated with particular programs of study, including information on average earnings and employment opportunities by major and degree. A recent survey of community college students finds that students "overestimate salaries by 13% and underestimate the probability of finding employment by almost 25% in almost all fields" (Baker et al. 2018, p. 19). The authors conclude that

providing community college students with more information on labor market outcomes and increasing the salience of this information "could serve community colleges' goal of improving their students' labor market prospects" (p. 19).

Evidence suggests a clear need to increase awareness among community college students about outcomes associated with particular programs of study, including information on average earnings and employment opportunities by major and degree.

In terms of providing more information, policy appears to be moving in the right direction. State governments maintain websites that provide information on the state labor market, such as the annual salary of different occupations, as well as projections about the likely growth or contraction of available jobs by occupation in the future. The ease of finding and navigating these websites varies, as does the specific type of information available.[15] Some states have partnered with research institutions to provide relevant information via easily navigable sites; the Launch My Career websites are one example of this approach. Working to bridge the information gap, the Skillful initiative is an example of a private-public partnership that seeks to provide resources for job seekers, employers, and coaches. [16] Anthony Carnevale, director of the Georgetown University Center on Education and the Workforce, has advocated for making the connection between postsecondary education and available jobs explicit by creating online matching systems that link job openings with coursework at postsecondary institutions (2012).

The federal government maintains multiple online resources to provide students with information about institutions of higher education. The National Center for Education Statistics maintains the online College Navigator. This resource allows students to explore information on colleges and universities, including information on available majors, cost, enrollment, admissions, retention, and graduation rates. The College Navigator provides

information on graduation rates by major, as well as information on the rate at which students default on their student loans. The Department of Education introduced the online College Scorecard in September 2015. The scorecard provides detailed information on institutions of higher education, including student body characteristics, financial aid, debt after graduation, graduation and retention, and average salaries of former students. [17] In sum, this non-exhaustive discussion provides a glimpse into the valuable online resources that provide information to the public about the labor market outcomes associated with higher education.

While important, providing students with information as they make choices about which program of study to embark upon is only part of the solution to the completion problem. Students who need help making informed decisions may not be the ones who are most likely to use information provided online. Noting variation in how students responded to the initial release of the College Scorecard in September 2015–with private school students demonstrating more responsiveness to new information on reported earnings (Hurwitz and Smith 2018)–Holzer and Baum (2017) argue that "[j]ust making general information available is unlikely to significantly improve the college decisions of students from less-privileged backgrounds" (p. 123). Indeed, as discussed above, Baker et al. (2018) recommend not only making information on earnings available, but also making it more salient in students' decisionmaking.

As the rest of this report discusses in detail, structural and motivational barriers may derail students even when they are equipped with information about labor market outcomes. To preview the nature of these barriers, consider that students who select a major with high potential earnings may find themselves confused about how to complete their chosen program of study. Or, during their coursework, students may not see the connection between their courses and their selected career path. Further, recall that while 81 percent of students enter community college intending to earn a four-year degree, only 14 percent of these students actually do so within six years (Horn and Skomsvold 2011; Jenkins and Fink 2016).

The intent to graduate with a postsecondary degree is clearly present among a majority of community college students. In addition to inaccurate or incomplete information about the potential value of different degrees, other barriers prevent students from reaching their goals. In the subsequent sections, this report discusses structural and motivational barriers to college completion that we should consider alongside strategies designed to provide students with information on labor market outcomes.

Section 2: The structural barrier

The traditional structure of community colleges hampers students' progress toward completing a credential or degree. This is the core critique by researchers who have recently made a strong and convincing case for rethinking the structure of community colleges (Bailey et al. 2015; Holzer and Baum 2017). Bailey et al. (2015) characterize this traditional structure as a "cafeteria model" (p. 13). In this section, I explain the barriers students face in cafeteria-style colleges, as well as promising strategies for addressing these problems. To be clear, the problems in cafeteria-style colleges are attributable to the structure and design features of colleges, not to faculty, staff, and other individuals who work hard on the behalf of students.

The traditional structure of community colleges hampers students' progress toward completing a credential or degree.

To appreciate the nature of this problem, consider the community college environment. Completing a credential or degree requires students to sort through an overwhelming amount of information to make complicated decisions, such as what to major in, what courses to take to satisfy program requirements, whether and how to get involved in a job training program, whether and how to transfer to a four-year program, and what kind of job to pursue after graduation, just to name a few (Scott-Clayton 2011; Bailey et al. 2015).

In the cafeteria model, it is often difficult for students to identify a clear pathway from enrollment to obtaining a credential, earning a two-year degree, or transferring to a four-year program. Program requirements and options are often unclear, and students have insufficient guidance and support to make informed choices. Bailey et al. (2015) describe how in a cafeteria-style college, "Students are left to navigate often complex and ill-defined pathways mostly on their own" (p. 13). The authors link this structure, and students' difficulties navigating it, to dropping out: "We find that the typical student is overwhelmed by the many choices available, resulting in poor program or course selection decisions, which in turn cost time and money, and likely lead many students to drop out in frustration" (p. 22).

Cafeteria-style colleges often do not have enough advising resources to support students as they try to navigate this complex environment. The ratio of students to academic advisers is staggering. Estimates of the typical adviser's caseload vary, but in all cases, it is clear that advisers are stretched incredibly thin. Bailey et al. (2015) cite estimates of approximately one adviser per every 800-1,200 students (p. 58-59). The National Academic Advising Association reports a median of 441 students per adviser in community colleges (Scrivener et al. 2015 p. 26, citing Robbins 2013).

During initial advising sessions, there is typically not enough time for long-term planning, goal-setting, or a thorough orientation to college life and how to navigate from enrollment to completion (Bailey et al. 2015). Bailey et al. (2015) report that on the Community College Survey of Student Engagement, "Only 38 percent of students reported that an advisor helped them to set academic goals and create a plan for achieving those goals" (p .55). Through the orientation and registration process, students often do not learn about the college's program offerings or career or transfer pathways. Without a clear understanding of available opportunities, "They embark on a slate of courses whose relevance to their own nascent goals and interests may not be entirely clear" (Bailey et al. 2015, p. 56). While cafeteria-style colleges may offer support services to help students navigate this terrain, Bailey et al. (2015) conclude that navigating even the support services can be "complicated and confusing" (p. 58-59).

Holzer and Baum (2017) draw a clear connection between the structural barriers in cafeteria-style colleges and low completion rates that is worth quoting at length:

The cafeteria approach reduces success rates among students for a variety of reasons. Students have too many options, too little information about the alternatives, and too little insight into their own skills and preferences when choosing courses and majors...Instead of gathering sufficient information to make sensible choices, students defer difficult choices like choosing a major and fall back on default options, taking the path of least resistance. They struggle to complete the degree or credential they seek, with too little guidance about what courses to take and in what sequence. Students have particular difficulty transferring into other programs and to institutions because the credits they have earned are frequently not accepted (p. 160).

In short, students entering community college often face many decisions about how to define and achieve their goals. Confronted with an overwhelming number of options, many students do not know how to progress from enrollment to program completion, lacking sufficient support in charting a course and adhering to their plans. As a result, students invest time and money in classes that may not feel related to their own goals and may not adequately satisfy specific program requirements. In this environment, students may not see the value in remaining enrolled.

Addressing the structural barrier

Addressing the structural barrier requires rethinking the organization of community colleges to reduce the confusion and frustration that contributes to low completion rates. This type of approach is referred to as the "guided pathways" model. In contrast to the cafeteria model, guided pathways models feature clearly structured programs and extensive advising support. Bailey et al. (2015) describe the guided pathways approach as a comprehensive strategy to address the problems found in the cafeteria model, focusing on program structure, intake and student supports, instruction, and developmental education.

In contrast to the traditional "cafeteria-style model" of community colleges, the guided pathways approach features clearly structured programs and extensive advising support.

Bailey et al. (2015) explain the guided pathways framework as follows.[18] The steps for moving toward completing a credential or degree are much clearer, and the decisionmaking process is simplified. Academic programs are clearly defined, with coherent trajectories. Students who enter without a clear direction are assisted in choosing an area of study with a default curriculum that the student can modify to fit their interests. The intake and student support services provide students with consistent, structured advising. Students are not left on their own to make important decisions about career pathways or to ask for help when they are struggling. Rather, students receive career counseling at the outset, and advisers track students' progress through their programs. In terms of instruction, faculty help to clarify how students will achieve the learning outcomes associated with each program of study. Developmental education courses, which can often be a stumbling block for students, are more deliberately incorporated into programs of study.

Evidence suggests that implementing reforms aligned with this guided pathways approach can improve student outcomes. Perhaps the most high-profile success story of a guided pathways approach is the City University of New York's (CUNY) Accelerated Study in Associate Programs (ASAP). The ASAP program is "designed to help more students graduate and help them graduate more quickly" (Scrivener et al. 2015, p. iii). The program requires participants to attend classes full time, and students are encouraged to take developmental courses early and to graduate within three years. Students receive advising services from advisers with small caseloads, and they receive enhanced career services and tutoring. Students can take blocked courses in the first year, and they can also take a seminar during their first few semesters that emphasizes skills like goal-setting. ASAP participants receive a tuition waiver that covers all expenses including tuition and fees, free use of textbooks, and free passes for public transportation provided that students participate in certain program services (Scrivener et al. 2015, p. iii).

MDRC, a nonprofit, nonpartisan education and social policy research organization, conducted a rigorous evaluation of the ASAP program using a random assignment study at three CUNY community colleges (Scrivener et al. 2015). The study compared low-income students who needed developmental coursework and were randomly assigned to participate in ASAP with similar students who were randomly assigned to a control group; the control group students had access to the standard CUNY services for students. The results were overwhelmingly positive. The evaluation found that over three years, ASAP students earned nine more credits than control group students. Graduation rates almost doubled among ASAP students—40 percent of ASAP students had received a degree within three years, compared to 22 percent of the control group. Further, transfer rates to four-year programs were higher among ASAP students (25 percent of the group) compared to control group students (17 percent). The program was also cost effective; because the graduation rate was so much higher among ASAP students, the cost of services per graduate was actually lower.

The authors of the MDRC report underscore the importance of these results: "ASAP's effects are the largest MDRC has found in any of its evaluations of community college reforms. The model offers a highly promising strategy to markedly accelerate credit accumulation and increase graduation rates among educationally and economically

disadvantaged populations" (p. iii). Without a doubt, the ASAP program represents an effective strategy for improving college completion rates among disadvantaged populations.

Several aspects of the ASAP program target the structural barriers found in cafeteria models. In particular, the ASAP program provides comprehensive advisement services, described as such by the authors of the MDRC report:

During the course of the study, ASAP students were required to meet with their assigned adviser in person twice per month throughout each semester; advisers also sometimes communicated with students by phone, e-mail, or text message. Advising appointments were tracked, and attendance was linked to students' receipt of monthly Metro-Cards. ASAP students were assigned an adviser during their first semester and usually continued to see the same person throughout their college careers (Scrivener et al. 2015, p. 26).

As part of the evaluation, ASAP and control group students were surveyed during their first year of college. These survey responses show that students in the ASAP program group reported seeing their advisers much more frequently compared to students in the control group (21 times on average in the first semester compared to four, and 17 times in the second semester compared to two). ASAP students were more likely to rate their advising experiences as high quality, and on average, they reported spending more time with their advisers during each session (64 percent of ASAP survey respondents reported advising sessions of 16 to 30 minutes on average compared to 47 percent of control group survey respondents).[19] Students in the ASAP program also report discussing a wider

range of topics with their advisers. For example, 95 percent of ASAP program participants reported discussing academic progress with their adviser compared to 62 percent of control group respondents (p. 29).

Over a three-year evaluation, graduation rates almost doubled among ASAP students—40 percent of ASAP students had received a degree within three years, compared to 22 percent of the control group. Further, transfer rates to four-year programs were higher among ASAP students compared to control group students.

ASAP students and control group students worked with different advisers. The ASAP advisers had much smaller caseloads, serving an average of 60 to 80 students per semester. At the three colleges in the ASAP study, non-ASAP advisers had caseloads that ranged from 600 to 1,500 students per adviser (p. 26). The report notes that "[while] dedicated, the colleges' non-ASAP advisers managed very large caseloads that typically did not permit the more personalized touch that students experienced in ASAP advising" (p. 28).

ASAP students were also required to visit an ASAP career and employment specialist (CES) once a semester. These specialists discussed topics such as finding part-time jobs, networking, writing resumes, and aligning majors with career paths. Students in the control group were not required to visit a specialist, and survey results indicate that ASAP students used these services more frequently: 80 percent of ASAP survey respondents indicated that they spoke with CES staff in their first year, compared to 29 percent of control group students (p. 31, Table 3.4).

As mentioned above, the program mandated specific requirements of students and provided additional resources beyond advisement and career services, such as financial support, free use of textbooks, and free public transportation. Indeed, the authors of the MDRC report observe that ASAP program is an "uncommonly comprehensive and long-

term program" (p. iii). Furthermore, the MDRC analysis discussed here was not designed to evaluate the impact that individual components of the program had on students' credit accumulation and graduation rates. Rather, the evaluation estimates how the "full package" of ASAP services affected students' academic outcomes (p. 85). Policymakers hoping to learn from and adapt this approach must be aware that it is not necessarily the case that implementing some, but not all, of the ASAP approach will produce the same positive outcomes for students.

Conclusion

Students face substantial structural barriers to college completion when colleges are organized in the traditional "cafeteria-style" model. As the ASAP program convincingly demonstrates, addressing these design flaws can dramatically improve completion rates among students. Admittedly, enacting this entire suite of structural changes in a community college may be a daunting and costly prospect.[20] Nonetheless, the evidence is clear that embracing the guided pathways approach is an essential step toward improving community college completion rates. Section 4 below offers recommendations about steps aligned with the guided pathways approach that community colleges can take to improve their students' experiences and outcomes.

Section 3: The motivational barrier

Community college environments fundamentally shape students' experiences, as the previous section illustrated. In cafeteria-style environments, it can be very difficult for students to identify connections between their coursework and their own lives and future goals. This disconnect is what I refer to as a motivational barrier. Unfortunately, but perhaps unsurprisingly, the structural problems in cafeteria-style colleges contribute to this barrier. For this reason, while this section primarily focuses on the motivational barrier, it also builds on the prior discussion of structural challenges and acknowledges the relationship between structural and motivational barriers.

This section discusses the importance of motivation in educational settings and reflects on how adopting a guided pathways approach and incorporating specific instructional strategies can help address this motivational barrier. It is important to emphasize at the outset that community college students do not have inherent shortcomings that create a motivational barrier. As discussed above, the vast majority of community college students enter college intending to complete a four-year degree. Furthermore, low-income students who attend four-year colleges and universities have "very similar earnings outcomes" compared to high-income students who attend the same school (Chetty et al. 2017, p. 2). However, in cafeteria-style colleges, students face structural barriers that make the road to completion unclear and difficult. Compounding these structural challenges, community college students are more likely than their four-year university peers to experience life circumstances that make navigating academic settings more difficult (Aelenei et al. 2017).

Defining the motivational barrier

The subsequent discussion focuses on a particular aspect of motivation that can have powerful, positive effects on student outcomes, including long-term interest in a subject and academic performance: students' perceptions that their coursework is meaningful in relation to their lives. Maintaining this type of motivation can unfortunately be quite difficult in cafeteria-style college settings. Bailey et al. (2015) note that "without a specific goal to work toward, it can be difficult for students to maintain their motivation to persist in school" (p. 57). They describe how this lack of motivation may be a barrier for students, citing survey results in which current and former community college students indicate that having a goal helps them stay on track in college. Karp (2011) similarly describes how students need to perceive a connection between their coursework and their lives to stay sufficiently motivated: "Students who do not see the value in their coursework often behave in counterproductive ways, for example, by failing to complete assignments or dropping required courses" (p. 12).

This perceived disconnect between coursework and students' own lives may be exacerbated within the cafeteria-style college. Without sufficient knowledge of the programs of study available or how to choose courses related to a particular academic or career path, students may enroll in courses that have little relevance to their career goals.

Even if students are enrolled in courses that are related to their long-term interests, it may be difficult to see how a specific course helps them come closer to earning a credential or degree if program pathways are unclear. Indeed, these are some of the main shortcomings of the cafeteria model as discussed by Holzer and Baum (2017) and Bailey et al. (2015). Perceiving little to no "real-world" application of their coursework, students may decide that remaining enrolled in coursework is a bad investment, opting instead to drop out of college to join the workforce immediately. In other words, for students to stay motivated to persist on their academic trajectory, they need to both see the destination (the careers and earnings an education will provide) *and* the pathway to get there (the connections between what they are doing in school and what they would like to achieve) (Oyserman and Lewis 2017). The motivational barrier is thus an obstacle to degree completion, with negative consequences for students and the workforce more broadly.

For students to stay motivated to persist on their academic trajectory, they need to both see the destination (the careers and earnings an education will provide) *and* the pathway to get there (the connections between what they are doing in school and what they would like to achieve).

I draw on the expectancy-value (EV) framework to define this type of motivational barrier more precisely.[21] Hulleman et al. (2016) explain that since the 1980s, psychologists have applied the EV framework to explain student behavior in educational contexts. According to the EV framework, there are "two critical aspects of motivation that are necessary for students to be optimally engaged. First, students need to believe that they can succeed (i.e. positive expectancies). Second, students need to perceive an important reason to engage in the behavior (i.e. need to have positive values)" (Hulleman et al. 2016, p. 242). Hulleman and colleagues add a third dimension to this framework: cost. "Even if students believe they can do a task and have a reason to do a task, they still might not be motivated if they experience significant cost preventing them from engaging in that task" (Hulleman

et al. 2016, p. 258). Thus, in terms of the EV framework, a motivation barrier may occur if students have low expectancy (do not believe they can succeed), low value (do not perceive value in a particular behavior), or high costs (insufficient time or resources to engage in the behavior).

In the context of community college completion, students may be particularly vulnerable to low expectancy, low value, and high costs. In terms of expectancy, students who enter community college and who have previously struggled in academic settings may not believe that they will be successful in their coursework. In terms of value, particularly in cafeteria-style settings, students may not see a connection between completing current courses and progressing toward academic and/or career goals. Given the demands on many community college students' time, including work and family commitments (Johnson and Rochkind 2009), perceiving value in their coursework may be critically important to sustaining the necessary motivation to stay enrolled. Finally, in terms of cost, community college students may lack sufficient financial resources to stay enrolled (Goldrick-Rab 2016).[22]

Expectancy value interventions

Research on the relationship between students' perceptions of value and their academic outcomes provides insight into the role of motivation in student success. Hulleman et al. (2010) argue that "it is plausible that students who are disengaged from school due to a history of poor performance or low expectations may benefit the most from a utility value intervention" (p. 882). Indeed, a large body of rigorous, experiment-based research on EV interventions in educational settings illustrates the importance of helping students to build motivation. Further, this work suggests that increasing students' perception of the value of their coursework can have powerful, positive effects, particularly for students who initially have low expectancies.

A large body of rigorous, experiment-based research on expectancy-value interventions in educational settings illustrates the importance of helping students to build motivation.

These EV interventions vary, but in general, they prompt students to connect their coursework to their lives–in the words of Hullemen and colleagues, to "generate their own connections and discover for themselves the relevance of course materials to their lives" (Hullemen et al. 2010, p. 881). Several interventions implemented in different educational contexts have demonstrated that increasing students' value in a particular task can positively impact student outcomes, including performance and interest in a course (Hulleman and Harackiewicz 2009; Hulleman et al. 2010; Harackiewicz et al. 2015; Rozek et al. 2015). This type of intervention appears particularly effective for students with low expectations at the beginning of a course (Hulleman et al. 2010). These experiments have been conducted in high school (Hulleman and Harackiewicz 2009; Rozek et al. 2015) and college settings (Hulleman et al. 2010; Harackiewicz et al. 2015; Hullemen et al. 2017).

A brief discussion of a college-level EV intervention helps exemplify what this type of intervention entails and how it can affect student outcomes. Hullemen et al. (2010) conducted two EV interventions via two experiments, one in a laboratory setting and one in an introductory psychology course. This discussion focuses on the latter. Students were randomly assigned to treatment and control groups, and each group received a different writing assignment (the assignments were part of the syllabus and were completed for course credit). These assignments required students to choose a topic covered in the course and write a one to two page essay on the topic; students were required to complete this assignment twice.

In the treatment group, students were either assigned to write a letter to a significant person in their lives "describing the relevance of their topic to this person" or "find a media report … that pertained to their topic and write an essay that discussed the

relevance of the media report to information they were learning in class" (p. 888). Both assignments "asked students to connect the course material to their lives through their social connections or the popular media" (p. 888). In the control group, students were not asked to make this personal connection. Instead, they either summarized a topic from class or searched an online database for abstracts related to the topic and discussed how the abstracts "expanded upon the material they were learning in class" (p. 888). Neither control group prompt encouraged students to identify the relevance of their coursework for their own lives.

The researchers measured students' interest in psychology and their perceptions of the value of the course (utility value) based on their responses to a number of items. For example, one item used to measure perceptions of utility value was: "I think what we are studying in Introductory Psychology is useful for me to know" (p. 888). The researchers also measured students' grades in the course. The study finds that the intervention increased students' perceptions of utility value, and in turn, students were more interested in majoring in psychology. Further, students' grades improved as their utility values increased. These effects were strongest for students with lower prior performance in the course. In short, the intervention increased students' perception of value in the course material, which in turn increased interest in the field of psychology and improved academic performance in the course.[23]

Keep in mind that this intervention only required students to write two short essays reflecting on the relevance of their coursework for their lives. Furthermore, this intervention worked particularly well for students with *low* expectancies. The authors summarize the practical application of these results:

Practically speaking, the relevance intervention is easy and inexpensive to implement, produces effects in as few as one or two trials, can be flexibly implemented during class or on the students' own time, and is applicable to a diverse array of topics or activities. Although the participants in our research only wrote about two topics (mental math and psychology), there is no reason to assume that similar results cannot be obtained in other domains, such as history, English, or chemistry. In fact, some recent research indicates that these results also obtain in high school science and college statistics classes (Hulleman, Hendricks, & Harackiewicz, 2007; Hulleman & Harackiewicz, 2009). Importantly, the students who most often concern teachers—those who perform poorly and have low performance expectations—benefited the most from our intervention, and those with high performance expectations were not harmed by it (p. 892).

In short, EV interventions are promising strategies to help improve student motivation. This research illustrates the positive academic outcomes associated with helping students identify the applicability of their coursework to their lives outside the classroom.

Conclusion

Students benefit from perceiving a connection between their coursework and their lives. The implications for improving community college completion rates are two-fold. First, this research on motivation underscores the urgency of addressing structural barriers that make it difficult for students to identify and complete a course of study. When students, particularly those with low expectations, identify the relevance of their coursework to their lives, they perform better and express more interest in the subject they are studying.

Yet, this is precisely the type of connection that can be difficult to make in cafeteria-style settings, where paths of study are unclear and resources are confusing to navigate. Structural reforms can help students identify and progress along clear pathways from enrollment to graduation. In this environment, it may be easier for students to identify a clear connection between their coursework and their own lives, which may have positive outcomes for their performance and interest in their program of study.

Second, EV interventions may be useful tools for instructors and perhaps advisers in a community college context. These interventions can be tailored to specific courses, and if implemented properly, EV interventions may help students perceive value in their coursework, increase their interest in the course, and improve their performance. These positive outcomes may be building blocks that help students complete the necessary courses to earn a postsecondary credential or degree. As Section 4 discusses at length, this is not to say that including EV interventions within courses can singlehandedly solve the completion problem; far from it. However, these interventions may be valuable components of a broader strategy to create a college environment conducive to student success.

Section 4: Policy recommendations

Community colleges can play a pivotal role in providing individuals with viable pathways into the American middle class, maintaining a strong workforce, and building a competitive 21st-century economy. Delivering on this promise requires innovative solutions to increase the number of community college students who complete a postsecondary credential or degree.

Delivering on the promise of community college requires innovative policy solutions to increase the number of students who complete a postsecondary credential or degree.

The final section of this report offers several policy recommendations about how to address structural and motivational barriers to college completion. These recommendations are designed to help college leaders, employers, researchers, and policymakers identify steps to improve community college completion rates.

Among employers, these lessons may be particularly relevant for those who partner with community colleges to create career pathways (and for those who hope to do so in the future). Challenges that students face in navigating the college environment may extend to identifying and completing education and training programs developed in partnership with employers. In developing these programs with college partners, employers can benefit from the insights discussed in this report and the subsequent recommendations.

Policy recommendation 1: Address both structural and motivational barriers to community college completion.

The structural problems discussed above–such as unclear pathways from enrollment to graduation, enormous student-to-adviser ratios that make it challenging to provide one-on-one support, and a lack of easily navigable support services–are fundamental barriers to college completion. Addressing these issues should be a core component of colleges' strategies to increase completion rates.

In providing clearer pathways from enrollment to graduation, addressing the structural barriers may help to alleviate some of the motivational barriers that students face. On a more granular level, colleges can also address motivational barriers by supporting instructors, employer partners, and advisers in implementing strategies like the EV interventions described in Section 3 that help students draw connections between their coursework and their lives. These interventions may be feasible, relatively low-cost ways to help students find value in their coursework before, during, and after a college's transition from a cafeteria-style model to a guided pathways model. However, without addressing the structural problems inherent in a cafeteria-style model, fundamental barriers to completion remain.

The importance of implementing structural changes bears underscoring. Encouragingly, research suggests that EV interventions that are well tailored to specific courses can produce positive outcomes for students in those courses (Hullemen et al. 2010). At the same time, it is likely that addressing structural barriers is essential to realizing the full potential of EV interventions in a community college context. Take, for example, the proposition of including EV interventions in student orientation. Orientation may be optional, and students do not necessarily take advantage of advising services offered during this process (Bailey et al. 2015, p. 55). Incorporating EV interventions into orientation, while useful in theory, may have limited impact if a small share of incoming students participate. Similarly, in cafeteria-style colleges, this type of intervention may be difficult to implement effectively through advising sessions, as students may not meet regularly enough or long enough with advisers for these interventions to work. As part of a guided pathways model where students meet regularly with advisers for longer sessions, however, implementing EV interventions through advisement services may be feasible. Advisers could assign a writing prompt or incorporate into their conversations questions designed to help students think about the relevance of their coursework to their career and education goals. Overall, structural improvements could facilitate effective incorporation of EV interventions into multiple aspects of students' community college experiences.

Policy recommendation 2: Apply lessons from proven and promising models.

There is a strong and convincing case that the cafeteria-style model impedes students from completing credentials and degrees (Scott-Clayton 2011; Holzer and Baum 2017; Bailey et al. 2015). Fortunately, evidence from the City University of New York's (CUNY) Accelerated Study in Associate Programs (ASAP), discussed in Section 2, illustrates that interventions aligned with the guided pathways approach have resulted in dramatically higher completion rates among program participants. Community colleges interested in adopting a guided pathways model can learn from CUNY's ASAP program. Resources include the evaluation by MDRC discussed in Section 2 of the full report (Scrivener et al. 2015) and a resource guide to ASAP produced by CUNY (Boykin and Prince 2015). Community colleges can also learn from applications of the ASAP approach in other contexts, including elsewhere in New York, California, and Ohio. Results from these

evaluations can provide insight into whether and how to tailor the original ASAP program to community colleges outside the CUNY system. Drawing on this growing research base, colleges can adapt tested models of the guided pathways approach to meet their needs.

In addition, Bailey et al. (2015) offer a comprehensive review of the guided pathways approach, along with examples of ways in which different colleges have pursued these types of reforms. These recommendations can inform pilot programs designed to test new approaches that address the problems inherent in the cafeteria-style model.

Policy recommendation 3: Leverage emerging technologies to reduce structural barriers, particularly in the context of student support services.

One dimension of the guided pathways approach is improving advisement and student support services. The ASAP program, for example, reduced the student-to-adviser ratio. However, similar changes may be impractical for many community college systems given their potential cost. Fortunately, innovative research that leverages emerging technology has identified scalable, cost-effective mechanisms to provide students with targeted support.

Innovative research that leverages emerging technology, like artificial intelligence, has identified scalable, cost-effective mechanisms to provide students with targeted support.

Researchers Benjamin Castleman and Lindsay Page, in their book "Summer Melt: Supporting Low Income Students through the Transition to College," describe the potential to use multiple strategies, including text messaging outreach, to reduce "summer melt," wherein students who were accepted to and intend to enroll in college do not matriculate in the fall (p. 2). They offer detailed guidelines for how to adapt these lessons, which can serve as a starting point for colleges seeking strategies to strengthen their student support services.

More broadly, this work provides a foundation for leveraging emerging technologies to reach many more students than was possible before. Lindsay Page and Hunter Gehlbach recently partnered with Georgia State University and AdmitHub to reduce summer melt using Pounce, an artificial intelligence chatbot that uses individually tailored text message outreach (Page and Gehlbach 2017). They describe the positive results of the program as follows: "Students planning to go to GSU who received Pounce outreach completed their required pre-matriculation tasks and enrolled on-time at significantly higher rates than those who received GSU's standard outreach. Pounce reduced GSU's summer melt by 21%. These impacts mirror previous summer melt interventions but with far fewer staff."

Thus, one viable avenue for improving student support and advisement services is through tailored outreach and support using technological innovations. While these examples focus on reducing summer melt, there is reason to be optimistic that this type of outreach may be valuable in additional areas of student support services. Indeed, Bailey et al. (2015) recommend leveraging technology to improve case management systems and provide feedback to students on their progress. To effectively incorporate "e-advising" innovations, they argue that "colleges must set in place some foundational program structures, encourage end-users to use the tools in their daily lives, and integrate human points of contact into the system" (p. 71).

Policy recommendation 4: Rigorously pilot and evaluate expectancy value interventions.

EV interventions that help students see the relevance of their coursework for their lives can have powerful effects on student outcomes, including increased interest in a subject and improved academic performance. Particularly when paired with a guided pathways approach that helps students navigate the college environment, this type of intervention may help students perceive the relevance between their coursework and their career and education goals. Community colleges, employer partners, and research partners should design evidence-based pilot programs and rigorously evaluate their outcomes to identify the most effective strategies to incorporate EV interventions in students' community college experiences.

Correct implementation of EV interventions is important to obtain the desired results. Recent research on a different type of intervention delivered in an education setting suggests that the level of fidelity matters for student outcomes (Horowitz et al. 2018). Thus, pilot programs should include adequate training for those who implement the intervention. Ideally, these pilot programs will use a randomized control trial approach to assess the effect of these interventions on relevant student outcomes (see Scrivener and Coghlan 2011 for a brief discussion of the benefits of randomization), such as academic performance, interest in the course and the relevant field of study, persistence, and graduation rates.

In addition, colleges, employer partners, and research partners should consider the following questions when developing pilot programs:

- How frequently should instructors include EV assignments in their coursework?
- How long should EV writing assignments be such that they are effective without being overly burdensome in terms of students' and instructors' time?
- How can instructors tailor these assignments to the particular courses they are responsible for?
- What kind of resources, initial training, and/or ongoing professional development is necessary to support instructors in effectively implementing these interventions?

With appropriate attention to program design, professional development, evaluation, and improvement, community colleges could incorporate these interventions into different aspects of students' experiences, including the following:

- Regular coursework
- Employer content delivered as part of public-private partnerships/career pathways
- Developmental coursework
- Student success courses
- Initial orientation and intake sessions
- Advising sessions

Policy recommendation 5: Evaluate innovative efforts and disseminate information widely.

In addition to knowing *how well a program works*, college leaders, employer partners, and policymakers need answers to practical questions about *how to implement effective programs*. Embedding the following types of questions into evaluations of guided pathways reforms would provide valuable insight into *how* to implement these changes:

- What motivated college leaders to implement these changes?
- How did college leaders convince stakeholders to invest in a guided pathways approach?
- How were programs tailored to local contexts without sacrificing the key components?
- What resources were necessary to design and implement these changes?

Furthermore, employers that partner with colleges to provide training and education programs related to career pathways may be interested in drawing on the guided pathways approach in their work with community colleges. Questions that may serve as a starting point for exploring these possibilities include:

- What challenges do existing programs face in terms of retention and completion?
- How can employers and colleges incorporate a guided pathways approach in their career pathways programs to address these issues? What adjustments to existing programs are necessary?
- What steps can the college and employers take to jointly navigate these changes productively?

Research-practice partnerships may be particularly valuable in developing, implementing, and evaluating guided pathways reforms. Programs designed without practitioners' input are unlikely to meet the needs of a college's student population, and researchers can help to ensure that the program design draws on available evidence and allows for rigorous evaluation and policy learning. Ultimately, partnerships between researchers, colleges, and employers can lead to programs based on a deep understanding of the student population, the college system, and the local labor market. Working together, these partners can develop evidence-based innovations, continuously improve their programs,

and share their results with the wider research, policy, and education communities. This work can help create a shared road map to reducing barriers to community college completion.

Conclusion

Improving community college completion rates should be a top priority for policymakers at all levels of government, employers, community colleges, and the philanthropic community. Earning a postsecondary credential or degree provides a gateway to higher average earnings and opens up career pathways for graduates, while higher completion rates help strengthen the American workforce. Yet, far too many students who enroll in community college do not complete a degree. While not the subject of this analysis, academic and financial barriers loom large for many students. Ongoing efforts to improve the quality of public K-12 education and to make college more affordable are essential to improving completion rates.

Improving community college completion rates should be a top priority for policymakers at all levels of government, employers, community colleges, and the philanthropic community.

As discussed at length in this report, improving completion rates also requires addressing structural and motivational barriers that students face. Transitioning from the cafeteria-style model to a guided pathways approach is a promising strategy to reduce structural barriers. These structural changes can pave the way for helping students overcome motivational barriers (Oyserman and Lewis 2017). In addition, through EV interventions, instructors can help students perceive the relevance of their coursework for their lives.

Community colleges hold enormous potential for students across the United States. Realizing this full potential is vital for students to obtain the education and training they need to pursue their career goals, obtain good-paying jobs, and contribute to a vibrant American economy. Moving forward, we must invest in innovative, evidence-based solutions, enable students to complete postsecondary credentials and degrees, and ultimately help them achieve their academic and career goals.

Acknowledgements

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Footnotes

1. <u>1</u> For example, financial aid plays an important role in college enrollment and persistence (Dynarski 2003; Deming and Dynarski 2009). Recently, momentum for "free college" seems to be growing, from Sen. Bernie Sanders's rallying cry during his campaign for the presidency in 2016 to more recent, <u>bipartisan advocacy</u>. While these programs hold promise for increasing access to college among low-income students, recent reports caution that in order to serve the students with the most financial need, promise programs and free college programs should be designed using an equity framework (Jones and Berger 2018; Poutré and Voight 2018). With respect to free college programs, to produce the desired outcomes, policymakers <u>should pay close attention</u> to program design.
2. <u>2</u> Information in this paragraph is from the American Association of Community College Fast Facts.
3. <u>3</u> National Center for Public Policy and Higher Education
4. <u>4</u> From the Community College Research Center at Columbia University Teachers College "Community College FAQs."
5. <u>5</u> See Figure 6.3, p. 121.
6. <u>6</u> These estimates are based on analyses of separate data sets compiled for eight states. The data sets are "large-scale, longitudinal student transcripts merged with individual quarterly earnings records" that allow for the inclusion of individual fixed effects when estimating returns to education (Belfield and Bailey 2017, p. 4).
7. <u>7</u> This data set merges administrative data from the state of Florida with quarterly earnings data (p. 73).
8. <u>8</u> See Figure 3-3a, p. 77.
9. <u>9</u> See Figure 3-3b, p. 76.
10. <u>10</u> Some point to these types of differences in returns across disciplines as justification for shifting public funding for higher education away from the humanities and toward STEM fields. Careful consideration of such proposals is important but is outside the scope of this report. It is worth noting, however, Patricia Cohen's astute observation with respect to these policy proposals: "Informing students better is one thing. Penalizing certain majors in the form of reduced funding is another."
11. <u>11</u> See Figure 3-3a, p. 76.
12. <u>12</u> Compared to only earning a high school diploma, higher average earnings are associated with completing some course credits without finishing a degree. However, these gains are relatively small according to both Belfield and Bailey (2017) and Holzer and Baum (2017). Belfield and Bailey (2017) find the following: "For North Carolina, Liu et al. (2015) estimate that each credit accumulated by male (female) community college students is associated with gains of \$17 (\$29) per quarter (0.4 [0.7] percent higher earnings). For Kentucky, Jepsen et al. (2014, Table 7) estimate returns per credit of \$9 (\$18). However, for California, Bahr (2016, Table 3, Model 3) identifies mixed returns per credit and finds that these returns to credits vary by field of study" (p. 10). In their analysis of Florida, Holzer and Baum (2017) similarly find small average returns for noncompleters. They calculate estimated earnings by multiplying the estimated return per credit hour by the average number of credits completed by those who do not complete a credential or degree, and they find that "average community college noncompleters earn just a 4 percent return over what they would earn with a high school diploma" (p. 81).
13. <u>13</u> For 29 percent of these (14 jobs), the growth rate is predicted to be as fast as average. For another 40 percent of these (19 jobs), the growth rate is supposed to be faster than average.

14. <u>14</u> 30 percent of these (14 jobs) are predicted to grow as fast as average, and another 48 percent (22 jobs) are predicted to grow faster than average.

15. <u>15</u> Under the Workforce Innovation and Opportunity Act (WIOA), states receive funding from the federal government to operate "One-Stop" centers that provide a "central point of service for those seeking employment, training, and related services" (Bradley 2015, p. 6). There are approximately 3,000 of these centers nationwide, and they are one avenue through which prospective or current students may learn about job opportunities and training pathways (Bradley 2015). Unlike the websites discussed in the text, these centers do not only provide information via online publications, but offer more comprehensive services as well.

16. <u>16</u> For a description of Launch My Career websites, see: <u>https://www.air.org/news/press-release/air-research-fuels-launch-my-career-new-website-help-students-envision-return</u>. See more on the Skillful initiative here: http://skillful.com/about.

17. <u>17</u> Additional federal resources include the Bureau of Labor Statistics (BLS) in the Department of Labor, which publishes <u>occupational employment statistics</u> for each state. Another resource, the Occupational Outlook Handbook, includes an <u>occupation finder</u> that provides information by occupation on entry-level education, on-the-job training, projected number of new jobs, projected growth rate, and median pay.

18. <u>18</u> For a full description of the guided pathways model, please see "Redesigning America's Community Colleges" by Thomas Bailey, Shanna Jaggars, and Davis Jenkins.

19. <u>19</u> See Table 3.3 and discussion on pages 27-28 of MDRC report.

20. <u>20</u> Scrivener et al. (2015) report that over three years, "On an annual basis, [the ASAP program] increased the investment in the average program group member by roughly $5,428" (p. 71). However, they also find that the ASAP program *lowers* the "cost per degree earned within three years" (p. 71). Students in the ASAP program were 83.9 percent more likely to earn a degree, which means that "[e]ven though ASAP spent more money overall, this estimated effect actually lowered the cost per degree earned for ASAP students by 11.4 percent compared with students who receive the usual college services" (p. 71).

21. <u>21</u> Notably, other types of motivation theories are also highly relevant to community college students' experiences, such as identity-based motivation (Aelenei et al. 2017). These theories and related interventions that have the potential to improve student outcomes should be considered along with the interventions discussed here.

22. <u>22</u> See discussion p. 78-80 and Figure 9, p. 80 in "Paying the Price."

23. <u>23</u> See p. 890-891 in Hullemen et al. (2010) for a discussion of these results.