

College Readiness for All: The Challenge for Urban High Schools

Melissa Roderick, Jenny Nagaoka, and Vanessa Coca

Summary

Melissa Roderick, Jenny Nagaoka, and Vanessa Coca focus on the importance of improving college access and readiness for low-income and minority students in urban high schools. They stress the aspirations-attainment gap: although the college aspirations of all U.S. high school students, regardless of race, ethnicity, and family income, have increased dramatically over the past several decades, significant disparities remain in college readiness and enrollment.

The authors emphasize the need for researchers and policy makers to be explicit about precisely which sets of knowledge and skills shape college access and performance and about how best to measure those skills. They identify four essential sets of skills: content knowledge and basic skills; core academic skills; non-cognitive, or behavioral, skills; and “college knowledge,” the ability to effectively search for and apply to college. High schools, they say, must stress all four.

The authors also examine different ways of assessing college readiness. The three most commonly recognized indicators used by colleges, they say, are coursework required for college admission, achievement test scores, and grade point averages. Student performance on all of these indicators of readiness reveals significant racial and ethnic disparities.

To turn college aspirations into college attainment, high schools and teachers need clear indicators of college readiness and clear performance standards for those indicators. These standards, say the authors, must be set at the performance level necessary for high school students to have a high probability of gaining access to four-year colleges. The standards must allow schools and districts to assess where their students currently stand and to measure their progress. The standards must also give clear guidance about what students need to do to improve.

College readiness indicators can be developed based on existing data and testing systems. But districts and states will require new data systems that provide information on the college outcomes of their graduates and link their performance during high school with their college outcomes.

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Melissa Roderick is the Hermon Dunlop Smith Professor of Social Service Administration in the School of Social Service Administration, University of Chicago. Jenny Nagaoka is associate director for postsecondary studies at the Consortium on Chicago School Research, University of Chicago. Vanessa Coca is a research analyst at the Consortium on Chicago School Research, University of Chicago.

In 2006, the final report of the Commission on the Future of Higher Education made high school reform a central component in improving access to and success in college.¹ Secretary Margaret Spellings' Action Plan for Higher Education that same year committed the U.S. Department of Education to strengthening K–12 preparation and aligning high school standards with college expectations.² Both the commission's report and the secretary's action plan are a part of the growing consensus that high schools must begin to view the postsecondary performance of their graduates as a key measure of their own performance. This policy direction recognizes that the new economy demands higher skills and that high school graduates who have no postsecondary experience face declining economic prospects.³ "All kids college-ready" and a host of other clarion calls are heralding a new era of high school reform focused on college readiness and access.⁴

But what exactly does college readiness entail? And how can high schools best promote it? In this article, we address those questions by examining different definitions of college readiness and laying out the challenges that a focus on college readiness presents to high school reform. We begin by addressing racial and ethnic and income disparities in college readiness and enrollment among the nation's high school students. Next we explore the different types of skills and knowledge that students need to do well in college, what indicators can be used to assess these skills, and how different benchmarks of college readiness shape the conception of what the policy problem is. Finally, we discuss what policy strategies may best promote a focus on college readiness in high schools.

Today, the most common policy prescriptions for helping high schools promote college readiness are to align high school curricula and graduation requirements with college readiness standards, move larger numbers of students into more rigorous coursework, and increase the rigor of state exit examinations to meet college entrance requirements.⁵ Evaluating how well these policy prescriptions work requires indicators and data that link high school and postsecondary performance. At present, however, no state uses its existing high school assessment system, such as high school exit exams or performance on college entrance examinations, to benchmark college readiness, and only a few states have linked high school student indicators to actual college performance. School districts are just beginning to have the data to track their students into college. Thus for the present, researchers are primarily limited to data sets available from the Department of Education that provide descriptive data but do not allow a rigorous evaluation of the potential efficacy of different approaches to increasing college readiness. To meet the growing emphasis in district, state, and federal policy on building strong indicator and accountability systems around college readiness and enrollment, the Department of Education is now investing in building data sets that connect high school and postsecondary performance and has committed itself to developing college readiness indicators based on student performance on the National Assessment of Educational Progress (NAEP).

Over the past several decades, high school students' college aspirations have increased markedly, and gaps in educational aspirations across race and ethnicity and income have fallen dramatically. But significant, and in some cases widening, gaps remain in college readiness, access, and success across these

groups. For this reason, we focus in particular on the question of what it will take to improve college access and readiness for low-income and minority students in urban high schools.

The Aspirations-Attainment Gap

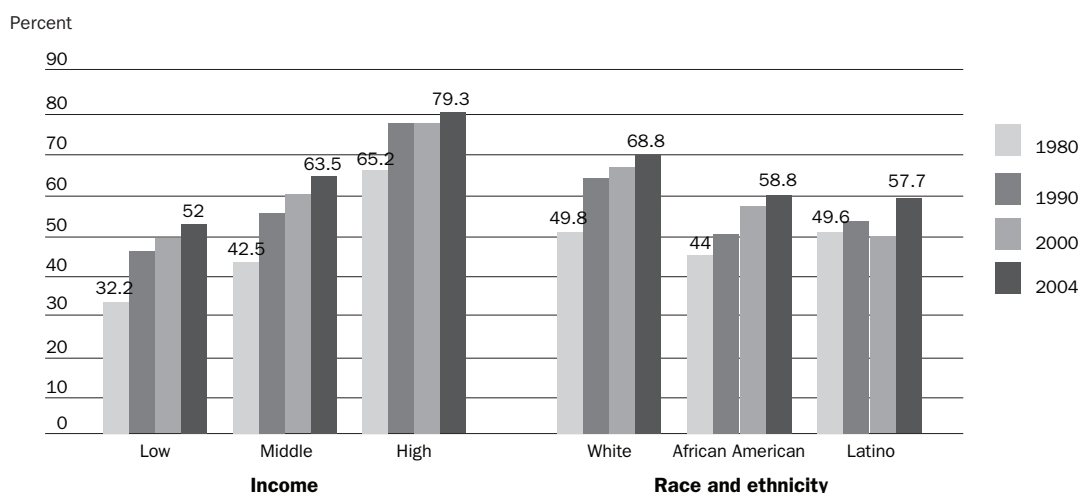
In the final two decades of the twentieth century, a dramatic transformation occurred in high schools. Students' postsecondary aspirations changed, reflecting a new economic reality. Nationally, the share of tenth graders who stated that they hoped to earn a bachelor's degree or higher doubled, from 40 percent in 1980 to 80 percent in 2002.⁶ These rising aspirations were shared across racial and ethnic groups, with low-income students registering the greatest increases.

Not surprisingly, the share of high school graduates making an immediate transition to college has also been rising among all racial and ethnic groups. Figure 1 shows trends in

the share of recent high school graduates who enroll in college in the fall, by family income and race and ethnicity. Although significant racial and ethnic and income gaps remain, all groups have seen dramatic increases in college enrollment after graduation. Recently, enrollment has grown more in four-year institutions than in two-year colleges. Between 2000 and 2005, enrollment in four-year institutions increased by 17.6 percentage points, while enrollment in two-year colleges grew 9 percentage points.⁷ These trends are projected to continue; the National Center for Education Statistics estimates that four-year college enrollment will increase by approximately 16 percent by 2015.⁸

Rising college enrollment, however, has not translated into substantial increases in the share of African American and Latino students who earn four-year college degrees. Table 1 shows national trends in the share of

Figure 1. National Estimates of the Percentage of High School Graduates Who Immediately Enrolled in College, 1980–2004, by Income and Race and Ethnicity



Source: Department of Education, National Center for Education Statistics, *The Condition of Education 2007* (Washington: Department of Education, 2007), table 25-1. Estimates for low-income, African American, and Latino students are based on three-year averages due to small sample sizes in the Current Population Survey.

young adults aged twenty-five to twenty-nine who report having attended some college and having completed a bachelor's degree or higher. We can estimate four-year college completion rates among students who enrolled in a college by dividing the proportion of students with a bachelor's degree by the proportion with some college.

From 1980 to 2005, the share of young adults who report having attended some college increased substantially among all racial and ethnic groups. For example, the share of African American young adults who attended some college increased 18 percentage points, from 32.2 percent to 50.3 percent. However, the very low four-year college completion rate among African Americans means that despite that upward trend in college attendance, the proportion who completed bachelor's degrees rose by less than 6 percentage points. In 2005, only 17.8 percent of African American young adults had earned a bachelor's degree. Latino students lag in both college attendance and completion. In 2005, less than one-third of Latino young adults had attended some college. This proportion will most likely improve given the increase in college enrollment among more recent Latino high school graduates (see figure 1). At the same time, only 10.5 percent of Latino young adults had completed a bachelor's degree or higher in 2005, a rate only slightly higher than that of fifteen years earlier.

The bottom line is that closing the aspirations-attainment gap requires more than increasing the number of students who enroll in college. It ultimately requires improving students' likelihood of completing degrees, and this will require improving college completion rates among students who enroll. As more students go to college, we might expect completion rates to decline on the assumption

that these newer college entrants are less academically prepared. College completion rates did fall somewhat during the 1990s, a decline that has been documented in John Bound, Michael Lovenheim, and Sarah Turner's rigorous analysis of Department of Education longitudinal data, which found that between the 1970s and mid-1990s, four-year college completion rates fell from 51.1 to 45.3 percent. The length of time it takes for students to complete a degree has also been rising.⁹ But, since the 1990s, completion rates have risen. Is the recent rise in completion rates a trend that will continue, and what can we extrapolate about what will happen to more recent high school graduating classes, where we observe increases in the share of students attending four-year colleges? As shown in the bottom section of table 1, we have observed stable and in some cases widening racial gaps in college enrollment and completion despite dramatic reductions in the gaps in educational aspirations by race and ethnicity and income.

Addressing the gap between rising aspirations and college completion is one of the most vexing problems in education today. In our article we focus on the implications for high school reform. Many factors in addition to high school qualifications affect whether students attend college and their chances of persisting to graduation, including rising costs of college and the declining real value of financial aid.¹⁰ But the central strategy to improve college access and performance must be to ensure that students leave high school with the academic skills, coursework, and qualifications they need.¹¹ Simply, high school students who graduate with higher test scores, better grades, and more rigorous coursework are more likely to enroll in and graduate from four-year colleges. And, as we will document, each of these areas of high

Table 1. Trends and Racial and Ethnic Gaps in Educational Attainment of Young Adults (Aged 25–29), by Race and Ethnicity, 1980–2005 (Three-year averages)

| Percent | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 |
|------------------------------------------------------|-------------------------------|---------|---------|---------|---------|---------|
| | High school graduating class: | | | | | |
| | 1970–74 | 1975–79 | 1980–84 | 1985–89 | 1990–94 | 1995–99 |
| Educational attainment and race and ethnicity | | | | | | |
| White | | | | | | |
| Some college or more | 47.9 | 46.3 | 48.3 | 59.6 | 64.3 | 65.1 |
| Bachelor's degree or higher | 24.7 | 24.6 | 26.5 | 29.1 | 33.5 | 34.3 |
| Estimated college completion rate | 51.6 | 53.1 | 54.8 | 48.9 | 52.2 | 52.7 |
| African American | | | | | | |
| Some college or more | 32.2 | 34.5 | 35.7 | 45.0 | 51.5 | 50.3 |
| Bachelor's degree or higher | 11.9 | 11.7 | 12.3 | 14.5 | 16.9 | 17.8 |
| Estimated college completion rate | 36.9 | 33.9 | 34.6 | 32.3 | 32.7 | 35.4 |
| Latino | | | | | | |
| Some college or more | 24.0 | 26.3 | 24.8 | 30.2 | 32.1 | 32.3 |
| Bachelor's degree or higher | 7.5 | 10.2 | 9.1 | 9.0 | 9.9 | 10.5 |
| Estimated college completion rate | 31.3 | 38.8 | 36.8 | 29.6 | 30.9 | 32.6 |
| White-African American gap | | | | | | |
| Some college or more | 15.7 | 11.7 | 12.6 | 14.6 | 12.8 | 16.5 |
| Bachelor's degree or higher | 12.8 | 12.9 | 14.1 | 14.6 | 16.7 | 17.3 |
| White-Latino gap | | | | | | |
| Some college or more | 23.9 | 20.0 | 23.5 | 29.4 | 32.2 | 32.8 |
| Bachelor's degree or higher | 17.2 | 14.3 | 17.3 | 20.2 | 23.6 | 23.8 |

Source: Department of Education, National Center for Education Statistics, *The Condition of Education 2008*, NCES 2008-031 (Washington: Department of Education, 2008), Indicator 25.

Notes: Data are from students' self-reports in the March Current Population Surveys. The estimated completion rate is the estimated proportion of students who had some college who ultimately completed a bachelor's degree or higher. Estimates use a three-year average to account for small sample sizes in the Current Population Survey. For example, the proportion of whites with some college in 1980 represents the three-year average for 1979, 1980, and 1981.

school qualifications is characterized by significant gaps by race and ethnicity and income. In the National Education Longitudinal Study of 1988, 62 percent of African Americans and 63 percent of Latinos who enrolled in college were placed into a developmental (that is, remedial) college course, compared with 36 percent of whites.¹² Differences by socioeconomic status were equally dramatic. Fully 63 percent of students in the lowest socioeconomic quartile took a developmental course in college compared with only 25 percent of students in the highest quartile. Such statistics have led many observers to conclude that high schools have sold their students short and that it is

time for them to raise the bar to ensure that their graduates are “college-ready.”

What Does It Mean to Be College-Ready?

This new emphasis on college readiness requires an understanding of what it means to be “college-ready” and where high school students currently stand on that score. Answering these questions must begin by being more explicit about precisely which sets of knowledge and skills shape college access and performance and how best to measure those skills. In this section, we draw on previous research, particularly David Conley's work on college readiness, to identify

four main areas of skill development that are critical in shaping college readiness: content knowledge and basic skills, core academic skills, non-cognitive skills and norms of performance, and “college knowledge.”¹³

The first two types of skills are commonly recognized as being key components of high school instruction and are frequently used in definitions of what it means to be college-ready. Content knowledge and basic skills are foundational to the understanding of academic disciplines and are often specific to a given subject area, such as knowledge of different literary techniques in the field of English. Core academic skills, such as writing and analytic thinking, are not subject-specific, but rather allow students to engage in work in a range of disciplines. The distinction between core academic skills and content knowledge can be subtle. In the American Diploma Project’s readiness benchmarks, for example, many of the English standards include core academic skills, such as writing, research skills, oral communication, and analytic thinking skills, which are not specific to English.¹⁴ This distinction is important because high school courses, such as algebra, can teach content such as factoring equations by using rote memorization of algorithms rather than engaging students in solving problems that develop both deeper knowledge of the content and more general logic and analytic thinking skills. Core academic skills are highly valued by colleges and are most often cited by college professors and students as the weakest areas of preparation in high school.¹⁵ Indeed, Conley argues that the largest differences in skill demands between high school and college classes are in these core academic skills—particularly in the amount and type of reading and writing required and the analytic and thinking skills emphasized.¹⁶

Although core academic skills and content knowledge are commonly recognized as college readiness skills, other skills also help shape readiness to do college-level work. Economists have characterized skills that determine educational achievement but are not measured readily by standardized tests or directly taught as content as “non-cognitive skills.”¹⁷ Non-cognitive skills include a range of behaviors that reflect greater student self-awareness, self-monitoring, and self-control—study skills, work habits, time management, help-seeking behavior, and social problem-solving skills. Meeting the developmental demands of college requires behavioral, problem-solving, and coping skills that allow students to successfully manage new environments and the new academic and social demands of college.¹⁸

The fourth area of college readiness that we have identified moves beyond academic and behavioral skills to acknowledge the role of social capital in college access and success. “College knowledge” includes the information and skills that allow students to successfully navigate the complex college admissions and financial aid processes, as well as develop an understanding of college norms and culture.¹⁹ We focus on this area of college readiness in detail later.

Measuring College Readiness

Gaining access to and succeeding in college requires students to have high levels of content knowledge, core academic skills, and non-cognitive skills—skills that colleges traditionally assess by looking at students’ high school coursework, their performance on achievement exams, and their relative class rank and grade point average (GPA). Colleges use students’ coursework to identify whether applicants have been exposed to content that prepares them for introductory

college courses. They use achievement tests primarily as standardized indicators of students' cognitive ability, basic skills, content knowledge, and core academic skills. They use course grades to measure whether students have mastered the material in their classes and have developed core academic skills and content knowledge. Grades also measure the third area of college readiness, non-cognitive skills, particularly whether students have demonstrated the work effort and study skills needed to meet the demands of a college environment. Thus, colleges tend to use multiple indicators to assess college readiness.

Over the past decade, however, state and district policy strategies have largely focused on two of these indicators—coursework and test scores. First, many states and districts have raised high school graduation requirements, expanded access to engage more students in college preparatory coursework such as Advanced Placement (AP), and aligned state curricular standards to college expectations.²⁰ Second, many states have adopted minimum competency testing and accountability linked to performance on standardized tests to ensure that students who graduate from high school meet minimum standards of performance. We examine the picture that emerges in both the status and trends for high school graduates in each of these areas—coursework, college admissions exams, and state and national achievement tests. We then ask whether indicators of college readiness should also include student performance in coursework as measured by their GPA—a central indicator used by colleges in admission decisions, but one that has had limited emphasis in the policy discussion around high school reform. The choice of indicators may be particularly important, as different indicators suggest very different strategies

for attacking the problem and very different prospects for more recent high school graduates.

The question of how to measure college readiness depends on what indicators we use and also on what outcome we want to measure—access to any college, access to a minimally selective four-year college, or access to and success in credit-bearing courses. The least useful goal would be to define college readiness as the ability to enroll in any college. In a world of open-admissions, defining college readiness by whether a student can “walk through the door” of a college does not raise the bar for high schools since by that definition graduating from high school makes students “college-ready.” A second approach is to set the goal that students should have the ability to enroll in a four-year college that has minimal admissions standards or higher. Yet a third approach focuses on whether students have a strong likelihood of success in college (for example, placement in credit-bearing courses, freshman year GPA, degree attainment). In summation, measures of college readiness will vary depending on the choice of indicators and what outcome is assessed. Different measures of college readiness, as we discuss in the next section, come to similar conclusions: there are significant racial and ethnic gaps in college readiness.

College Readiness Defined by Minimum Four-Year College Admissions Requirements

Some researchers and policy makers define students as college-ready if they meet the minimum entrance requirements for a four-year college with some admission criteria—meaning that they have taken the necessary courses and have demonstrated basic proficiency skills. Jay Greene and Greg Forster of the Manhattan Institute drew on

Table 2. Trends in College Access Indicators of Graduating High School Seniors, by Race and Ethnicity, 1990–2005

| Indicator and year | White | African American | Latino | Asian | White-African American gap | White-Latino gap |
|-------------------------------------------------------------------------------|-------|------------------|--------|-------|----------------------------|------------------|
| Percentage of students completing mid-level curricula | | | | | | |
| 1990 | 32% | 26% | 23% | 44% | 6% | 9% |
| 1994 | 41% | 30% | 32% | 47% | 11% | 10% |
| 1998 | 45% | 38% | 30% | 53% | 7% | 15% |
| 2000 | 47% | 46% | 38% | 54% | 1% | 9% |
| 2005 | 52% | 51% | 44% | 63% | 1% | 7% |
| NAEP reading scale scores (seventeen-year-olds) | | | | | | |
| 1990 | 297 | 267 | 275 | | 29% | 22% |
| 1994 | 296 | 266 | 263 | | 30% | 33% |
| 1999 | 295 | 264 | 271 | | 31% | 24% |
| 2004 | 293 | 264 | 264 | | 29% | 29% |
| NAEP mathematics scale scores (seventeen-year-olds) | | | | | | |
| 1990 | 309 | 289 | 284 | | 21% | 26% |
| 1994 | 312 | 286 | 291 | | 27% | 22% |
| 1999 | 315 | 283 | 293 | | 31% | 22% |
| 2004 | 313 | 285 | 289 | | 28% | 24% |
| Cumulative GPA | | | | | | |
| 1990 | 2.73 | 2.42 | 2.61 | 2.88 | .31 | .13 |
| 1994 | 2.84 | 2.47 | 2.71 | 3.00 | .37 | .13 |
| 1998 | 2.96 | 2.61 | 2.75 | 3.04 | .36 | .21 |
| 2000 | 3.01 | 2.63 | 2.80 | 3.20 | .38 | .21 |
| 2005 | 3.05 | 2.69 | 2.82 | 3.16 | .36 | .23 |
| Percentage of students taking advanced mathematics (above Algebra II) | | | | | | |
| 2004 | 54% | 42% | 34% | 69% | 8% | 20% |
| Percentage of students taking advanced science (chemistry, physics, or above) | | | | | | |
| 2004 | 71% | 63% | 60% | 84% | 8% | 11% |
| Percentage of students earning any credit in an AP or IB class | | | | | | |
| 2004 | 33% | 16% | 25% | 53% | 17% | 8% |

Source: Results from the NAEP and NAEP high school transcript studies of graduating seniors.

transcripts and test scores from the NAEP to estimate the proportion of high school graduates from the classes of 1991 to 2002 who could be deemed “college-ready” by this standard.²¹ The authors specified college readiness as meaning that students possessed “basic literacy skills” (scoring at or above basic level on the NAEP twelfth-grade reading assessment), had graduated from high school, and had taken and passed the minimum coursework requirements of

four-year colleges with at least some admissions criteria.²² Using this definition of college readiness (a combination of course-taking and measured achievement), they found that only about one-third of 2002 graduates met minimum college readiness criteria. Less than one-quarter (23 percent) of African American and only 20 percent of Latino graduates would be deemed college-ready, compared with 40 percent of whites.

Measures of college readiness such as that developed by Greene and Forster are useful because they combine different indicators, in this case, course-taking and measured achievement. An assessment of what to do about these low levels of college readiness, however, will differ depending on whether one focuses on course-taking, where the national trend is positive, or measured achievement, where the national trend is flat. First, course-taking is most easily influenced by policy and is an area where American students have already begun to show substantial progress. Across the nation, students are taking more advanced coursework in high school, and over the past decade many states have increased graduation requirements.²³ Stephen Planty and his colleagues' recent analysis of Department of Education data documented that in 2004 the average American senior was taking approximately a year more each of mathematics, science, and foreign language than seniors in 1982 and more than one year more of mathematics above the level of Algebra I.²⁴ Similar trends are observed in transcript data from NAEP. The NAEP defines a mid-level high school curriculum as four years of English, three years each of social studies, mathematics, and science, and one year of foreign language. As seen in table 2, increasing shares of high school graduates have taken this core curriculum, which is often deemed the minimal requirement for four-year college admissions. Thus, if we define college readiness on the basis of minimum course-taking alone, we would conclude that over time, more students are meeting college readiness standards.

There remain, however, significant gaps in the shares of minority and white students and in the shares of students at different socioeconomic levels who take advanced mathematics and science courses, particularly

college preparatory courses such as AP. In 2003–04, high school graduates of high socioeconomic status were more than three times more likely (50.9 percent versus 16.3 percent) to have taken an AP course than students of low socioeconomic status.²⁵ As shown in table 2, only 16 percent of African American and one-quarter of Latino graduates had taken an AP course, compared with 33 percent of white graduates.

Looking at the other part of Greene and Forster's college readiness measure, NAEP scores, the picture is not promising. As seen in table 2, trends over time in NAEP scores show relatively flat achievement performance among seventeen-year-olds and significant and consistent gaps across race and ethnicity.

College Readiness Defined by Performance on Achievement Exams

Given these persistent gaps in course-taking and NAEP scores, a second approach to assessing college readiness would be to use scores on achievement exams to identify the skills students need to gain admission into a four-year college and relate those scores to college performance. ACT, for example, has developed "benchmarks of college readiness" by comparing students' scores on subject-matter ACT tests with their grades in introductory college classes.²⁶ The ACT benchmarks indicate the minimum ACT score students would need to have a 50 percent likelihood of getting a B or better in an introductory college class and a 75 percent likelihood of getting a C or better.²⁷ Sixty-nine percent of all test-takers meet ACT benchmarks in English, but only 43 percent do so in mathematics. The gap by race and ethnicity is striking. In mathematics, half (49 percent) of whites but only one-quarter of Latinos and 12 percent of African Americans meet the benchmarks.

ACT's benchmarks show how college readiness can be defined based on linking measured proficiency to college outcomes. But college entrance examinations such as ACT may not be the most useful way to assess college readiness because except in states that have adopted the ACT as their high school accountability test, students who take these exams have already decided to go to college.²⁸ In addition, trends in ACT and Scholastic Aptitude Test (SAT) performance are difficult to interpret because student participation differs across states and across time. Thus, it would seem that better indicators of measured achievement would be state and national assessments that include comparable groups of students across time.

Student performance on high school exit examinations is another possibility for assessing college readiness. Today twenty-two states have such examinations, covering 65 percent of the nation's students.²⁹ Some policy organizations, such as Achieve, have argued that aligning the content of high school exit examinations with college expectations would be an important step in focusing high schools on college readiness.³⁰ But high school exit examinations are generally not intended to measure college readiness. Rather, they set minimum standards for graduation.³¹ Because students may need multiple chances to pass the exit exams, in most states students begin to take these exit exams in tenth grade. As a result, exam standards are lowered to cover only material to which students would have been exposed by tenth grade and are generally aligned with tenth-grade, not twelfth-grade standards. Even with low standards, high school exit examinations may indicate whether students have accumulated enough basic proficiency skills to gain access to a four-year college. There is some evidence that focusing on

basic skills is important in reducing the likelihood of college remediation. For example, more than 41 percent of high school graduates with senior-year test scores in the lowest test quintile in the National Education Longitudinal Study of 1988 who attended college were placed in remedial reading in college compared with only 19.2 percent of students in the next-to-lowest quintile and only 10 percent of students in the third quintile.³² This finding would suggest that if states can identify the lowest-performing students and intervene, they can increase the rates of college readiness of their graduates as measured by meeting the criterion of enrolling in credit-bearing courses.

Exit examinations could be useful as a measure of college readiness, but only if evidence shows that students who pass these examinations have access to or do well in college, or both. So far, research on high school exit examinations has largely focused on whether they influence graduation and labor market outcomes, with findings generally indicating that adding the hurdle of passing an exit examination is linked with greater high school dropout rates.³³

One descriptive study by the Massachusetts Department of Education illustrates both the potential for using exit examinations to assess college readiness as well as the current mismatch between basic high school exit exam standards and outcomes that may indicate college readiness.³⁴ The study followed 2005 graduates of Massachusetts public high schools who enrolled in Massachusetts colleges, including community colleges, as first-time college students in the fall. It examined college enrollment, first-year grades, and placement in developmental courses for students who met various proficiency levels in the tenth grade on the

Massachusetts Comprehensive Assessment System (MCAS), the state exit examinations. Less than one-third of students who passed the MCAS with the lowest passing score of “needing improvement” in mathematics enrolled in four-year colleges, compared with two-thirds of graduates who scored “proficient” and fully 87 percent of graduates who scored “advanced.”³⁵ Moreover, in their first year of college, half of MCAS test takers who were identified as “needing improvement” in mathematics were enrolled in developmental mathematics, compared with 20 percent who scored at “proficient” and 4 percent deemed “advanced.” These findings suggest that if college readiness is defined as having a high likelihood of being able to enroll in credit-bearing courses at a four-year college, “proficient” would be a better standard for minimal college readiness in Massachusetts than simply passing. Using this standard, white high school students in Massachusetts were more than twice as likely as African Americans and Latinos to graduate from high school ready to enroll in credit-bearing coursework at a four-year college. Only 23 percent of African Americans and 21 percent of Latinos scored “proficient” or above in mathematics compared with 57 percent of whites.³⁶ Similar gaps are observed in English Language Arts.³⁷

Clearly, as many researchers and policy advocates have pointed out, merely passing a high school exit exam does not ensure that students are college-ready. Does this mean that states should raise their standards, or does it mean that states need to develop better indicators that delineate the differences between the standards for graduation and “readiness for college”? The possibility that raising standards to align with college expectations could increase the number of high school dropouts poses a problem. One solution would be to make it clear that meeting exit requirements

may be sufficient for graduation, but not for college readiness, by establishing different benchmarks for each. A variation of this approach, one that has not been rigorously studied, has been used in New York where students can receive a Local Diploma, a Regents Diploma, or a Regents Diploma with Advanced Designation.³⁸

Readiness Defined by GPA

One limitation of test scores from high school exit and college entrance exams is that they do not measure the non-cognitive skills that may be critical for meeting the academic and developmental demands of college environments. GPA, which is already used by colleges in making admission decisions, may be an important indicator to assess college readiness. If GPA is a non-cognitive measure of a student’s ability to work hard in college courses and meet the academic and developmental demands of college, then we would expect to see that high school GPA is an important predictor of college performance. Generally, research finds that achievement test scores and GPA are independently associated with college performance, but that high school GPA, even self-reported GPA, is at least as predictive of college grades as college entrance examination scores.³⁹ In the recent College Board validation study of the SAT, for example, self-reported high school GPA explained 54 percent of the variation in freshman-year college GPA in four-year institutions compared with 53 percent for the SAT writing, critical reading, and mathematics sections combined.⁴⁰ Self-reported GPAs in the SAT study were substantially higher than those observed in national studies that used transcript analysis. The College Board reports that studies have found that there is a strong relation between self-reported and actual GPA, usually about a 0.8 correlation.

In a more rigorous study, Saul Geiser and Veronica Santelices of the University of California–Berkeley analyzed the college performance of 80,000 students who attended one of eight University of California campuses from 1996 to 1999.⁴¹ They predicted college GPA and likelihood of graduation on the basis of high school grades, SAT scores, class rank, family background, and a measure of the average test scores of students' high schools using a nested model to adjust for college effects. High school grades emerged as the strongest predictor of college GPA and college graduation. For example, a one standard deviation increase in high school GPA was associated with a 0.34 standard deviation increase in cumulative four-year college GPA, compared with a 0.19 standard deviation for the SAT II writing test, the SAT component that has the strongest association with grades in college.

These findings are quite consistent with our own analysis of the relationship between high school performance and college enrollment and graduation among graduates from the Chicago Public Schools, a predominantly minority system.⁴² We used National Student Clearinghouse data to determine four-year college enrollment and six-year college graduation and estimated enrollment and graduation rates among students who enrolled in a four-year college immediately after graduation on the basis of unweighted high school GPA, the number of honors and AP courses the students took, and eleventh-grade achievement test scores. A one standard deviation increase in GPA, controlling for test scores and participation in advanced coursework, was associated with a 15 percentage point increase in the chances of four-year college graduation, while a one standard deviation increase in achievement test scores was linked with only a 7 percentage point

increase in those chances. The study identified an unweighted GPA of 3.0 as a key benchmark for college readiness—a cutoff that gave students a 50 percent or greater likelihood of graduating from a four-year college within six years.

The Chicago study, moreover, found that low GPAs among African American and Latino graduates, particularly among male graduates, created significant barriers to college access as well as college graduation. GPA was a better predictor than ACT scores of whether students would enroll in a four-year college, particularly a more selective college. Most important, few Chicago graduates left high school able to signal to colleges through their GPA that they had worked hard in high school. Only 25 percent of all Chicago graduates, and even fewer minority male graduates, had a GPA of at least 3.0. Only 8 percent of African American and 13 percent of Latino male graduates had a GPA of 3.0 or higher, as compared with 18 percent of African American female and 25 percent of Latino female graduates. These gender gaps were not observed in students' ACT scores.

These racial and ethnic gaps in GPA are also reflected in national data, which show stable and, in the case of Latinos, widening gaps in college readiness (see table 2). Given the significance of GPA for college outcomes, the national upward trend in high school GPAs is promising. However, as seen in table 2, one of the most significant trends in college readiness is the widening of the racial and ethnic gap in the GPAs of graduating seniors. From 1990 to 2005, the average GPAs of white graduates increased from 2.73 to 3.05. The GPAs of African American and Latino graduates also increased, although not at the same rate, leading to the widening gap in coursework performance. Indeed, the average

GPA for Latino and African American graduates remain lower than the 3.0 benchmark that the research in Chicago found to be critical for giving students a high probability of attaining a four-year college degree.

GPA was a better predictor than ACT scores of whether students would enroll in a four-year college.... Most important, few Chicago graduates left high school able to signal to colleges through their GPA that they had worked hard in high school.

What is driving the increases in GPA? One theory is that the trend reflects grade inflation. At the same time, national trends show that more students are participating in rigorous coursework, such as AP, and are working harder in their courses. Student self-reports suggest that American high school students are spending more time on homework.⁴³ From 1980 to 2002, the proportion of sophomores who report completing ten or more hours of homework a week increased from 6.9 percent to 36 percent. Students are also more likely to report being in a college preparatory track versus a general track, with the largest increases occurring among minority and low-income students.⁴⁴ These statistics are correlational but do suggest that students are working harder in high school, and this increased effort might be reflected in higher grades.

Should college readiness indicators include GPA? Educators and policy makers often discount grades because they believe that grades are not valid measures of student performance and that they are not comparable across high schools. But if grades were not comparable across high schools and were not reliable indicators of performance, they would not be so strongly associated with performance in college. Not including coursework performance, moreover, means that college readiness indicators may not be adequately capturing the non-cognitive skills students need to gain access to and do well in college. In addition, focusing on GPAs does not, like focusing on exit examinations, create a trade-off between high school graduation and college access, because high GPAs are also a central predictor of whether students will graduate from high school. Using only freshman-year GPA, Elaine Allensworth from the Consortium on Chicago School Research at the University of Chicago was able to correctly predict 80 percent of on-time high school graduates. By contrast, eighth-grade test scores and measures of student risk (prior school mobility, being over-age for grade, race and ethnicity, gender, and measures of the socioeconomic status of a student's census block) together predict only 65 percent of graduates.⁴⁵

Readiness Defined by College Knowledge

So far we have examined college readiness as defined by three commonly recognized academic indicators used by colleges to determine access: coursework required for college admission, achievement test scores, and GPA. Sociological researchers emphasize that in addition to measured qualifications, a student's college readiness will be shaped by whether he or she has the information, resources, and skills necessary to effectively navigate the college admission process—what

we are calling “college knowledge.” While college knowledge has not traditionally been discussed as part of college readiness, it may contribute to significant disparities in college readiness by income and race and ethnicity and is an area of particular relevance for high school reform. Even among students who have similar academic qualifications, low-income and minority students are more likely than high-income and white students to attend a two-year institution and less likely to enroll in a selective four-year college.⁴⁶ Such findings suggest that low-income and minority students face barriers to college access beyond their qualifications and point to the importance of understanding the college application process, the financial aid system, and the range of choices within the postsecondary system, as well as being able to navigate these complex processes and systems. Successfully enrolling in college requires such knowledge, which high schools can support by providing norms, information, and guidance about college-going to their students.

Urban students with high postsecondary aspirations often lack information about the college application process and often have difficulty taking the concrete steps needed to apply to and enroll in four-year colleges.⁴⁷ For example, economists Christopher Avery and Thomas Kane found that high school seniors with similar college aspirations in Boston Public Schools and suburban high schools near Boston differed dramatically in the extent to which they took the steps necessary to apply to college.⁴⁸ Among students who planned to attend a four-year college, only slightly more than half of the Boston sample, compared with 91 percent of the suburban sample, had obtained an application from the college they were interested in attending by the fall of their senior year. Only 18 percent of the Boston sample versus 41

percent of the suburban sample had applied to a four-year college by that fall.

Our own recent study in Chicago, *From High School to the Future: Potholes on the Road to College*, provided a more comprehensive look at this problem.⁴⁹ We found that only 41 percent of Chicago seniors who stated that they aspired to complete a four-year degree actually applied to and enrolled in a four-year college.⁵⁰ We identified three critical points where even highly qualified students encountered obstacles on the road to college. First, many students with aspirations to attain a four-year degree instead planned to attend a two-year or vocational school or to delay enrollment. Second, many did not apply to a four-year college by the spring of their senior year. Only 60 percent of seniors who aspired to complete a four-year degree reported that they had applied to a four-year college. Fewer than half of Latino students who aspired to attain a four-year degree applied to at least one four-year college. And, finally, even among students who were accepted at a four-year college, some ultimately did not enroll. Not surprisingly, students with the lowest qualifications were the least likely to plan to attend a four-year college, apply, and enroll. But students with higher qualifications were also at risk of not completing these benchmarks.

Successfully applying to college, particularly for low-income students, also requires applying for financial aid. There is a growing recognition that the complexity of the federal financial aid application creates barriers for students.⁵¹ The American Council on Education estimates that approximately one in five low-income students who are enrolled in college and would likely be eligible for federal Pell Grants never filed a Free Application for Federal Student Aid (FAFSA).⁵² Low-income

students who file a FAFSA, moreover, are more likely than middle-income students to file late, after April 1, which reduces their eligibility for state and institutional aid. In our recent study in Chicago, completing an application for federal financial aid was an important predictor of whether students who had been accepted at a four-year college ultimately enrolled. Even after controlling for differences in students' qualifications, family background, neighborhood characteristics, and reports of support from their parents, teachers, and counselors, we found that students who had been accepted into a four-year college and had completed a federal financial aid application were almost 50 percent more likely to enroll than students who had been accepted but had not completed that application. Although the study adjusts for an array of student characteristics, the estimates may overstate the importance of a student having filled out a financial aid application for college enrollment because students who complete a FAFSA may be more motivated or otherwise differ from those that do not.

Another important strand of research on college access suggests that low-income and first-generation college students do not engage effectively in a college search. They have difficulty identifying the kinds of colleges they might like to attend, as well as the range of options that are available to them and how much they will be expected to pay for college.⁵³ Because of these difficulties, many urban students, who are likely to be first-generation college students, focus their entire college search within the enclave colleges of the traditional feeder patterns—largely public, two-year, or non- and somewhat selective four-year colleges.⁵⁴ For example, economists Amanda Pallais and Sarah Turner, using data from the SAT,

demonstrate that low-income students are much less likely than other students with similar test scores to send those scores to top-tier public and private institutions.⁵⁵ Similarly, a recent study of Harvard University's new Financial Aid Initiative found that the guarantee of free tuition for families with lower incomes led to significant increases in the representation of students with eligible family income (\$60,000 or less) in the application pool and an increase in the proportion of the entering class with eligible family incomes from 14.9 to 16.5 percent.⁵⁶ However, the study found that many low-income academically qualified students still did not apply and these students were concentrated in high schools where few students apply to selective private colleges. These findings suggest that many first-generation college students, particularly in schools without a strong college-going tradition, conduct a constrained college search that often leads them to enroll in colleges that are less selective than they are actually eligible to attend.

Why would college choice matter in defining college readiness? Most important, it may well shape students' likelihood of college graduation. There is evidence that low-income and urban minority students often enroll in colleges, such as two-year colleges and less selective four-year colleges, that provide significantly lower probabilities of completing a four-year degree.⁵⁷ Using multiple data sets and multiple methodologies to address student selection into different colleges, sociologists Sigal Alon and Marta Tienda found that minority students' likelihood of graduating increased as the selectivity of the college increased.⁵⁸ Although Alon and Tienda found a strong association between college graduation rates and college selectivity, they could not offer further

evidence on why more selective institutions produced better outcomes.

Researchers exploring the area of college choice have also found that minority and low-income students are especially dependent on their teachers and other non-familial adults in making educational plans and decisions and that high schools can play a central role in shaping students' college enrollment.⁵⁹ Using data from the National Education Longitudinal Study of 1988, Stephen Plank and Will J. Jordan explored how student support in high school shaped differences in college enrollment and the decision to enroll in a two- versus four-year institution.⁶⁰ Using a multivariate analysis that controlled for student background, test scores, and high school characteristics, Plank and Jordan found that low socioeconomic status students were less likely to enroll in four-year colleges, partly because these students were much less likely to report that they had received support in preparing for college entrance examinations and support in college planning in their schools.

In our work in Chicago, the single most consistent predictor of whether students took steps toward college enrollment (planning to attend a four-year college, applying, being accepted, and enrolling in a four-year college), as well as whether they enrolled in a college that matched their qualifications, was whether their high schools had strong college-going climates measured either by the percentage of prior graduates attending four-year colleges or by teachers' reports of whether they focused their work and curriculum on preparing and planning for college.⁶¹ After controlling for students' ACT scores, GPAs, and demographic and socioeconomic characteristics, we found that a one standard deviation increase in a school's college-going climate

was associated with a 7 to 9 percent increase in the likelihood that a student who aspired to a four-year college degree would take each step in the college enrollment process and a 30 percent increase in the probability that a student would enroll in a college with a selectivity level that matched or exceeded his or her qualifications.

If educators are to use college readiness as a strategy for accomplishing the goal of college access and success, they must couple academic preparedness with the knowledge and skills students need to navigate the college-going process.

College knowledge has not commonly been seen as a part of college readiness or even necessarily as something that high schools are responsible for providing. However, if educators are to use college readiness as a strategy for accomplishing the goal of college access and success, they must couple academic preparedness with the knowledge and skills students need to navigate the college-going process.

Conclusion

The focus of recent high school reforms on college readiness reflects the recognition that most high school students now aspire to attain a four-year degree and will ultimately participate in some form of postsecondary education. These reform efforts also suggest

that high schools should be held accountable for their students' academic performance after high school graduation. The challenge for high schools is how to increase the college readiness of their students.

At present, the K–16 alignment strategy embraces two sets of policy recommendations to improve college readiness. The first is to raise standards. The second is to develop integrated data systems. Raising standards includes making high school graduation requirements more demanding, increasing the rigor of high school exit exams, and aligning state curricular standards to college-level work. These policies, however, have three significant limitations. First, they provide no means of measuring how they affect college readiness; rather, they are based on the assumption that once they are implemented, college readiness will follow. As Valerie Lee and Douglas Ready argue in their article in this volume, however, the benefits of raising high school graduation requirements may have been significantly overstated. Although the aim of more rigorous graduation requirements is to help more students reach minimum college entrance requirements, there is limited evidence that the tougher requirements have delivered on their promise to improve student achievement. Second, any standards-raising approach that is tied to high school graduation may have trade-offs in the form of increased dropout rates. Third, raising standards involves external policy changes that do not build the capacity of schools to teach the skills and knowledge students need to access and succeed in college.

The second policy recommendation—creating data systems to track student progress across educational levels and institutions—holds more promise. In this article, we have demonstrated that making high schools

accountable for their graduates' college performance requires developing clear indicators of college readiness and creating clear standards for those indicators. These college readiness standards must be based on validated measures of the performance level necessary for high school students to have a high probability of gaining access to four-year colleges and credit-bearing courses. The standards must provide schools and districts with a clear assessment of where their students currently stand and allow schools and districts to measure their students' progress. And, finally, the standards must provide educators and students with clear guidance about what students need to do to improve.

Unfortunately, few districts and states now have such a capacity. As noted, no state uses existing measures to benchmark college readiness, and few have linked student indicators to actual college performance. As we have shown, college readiness indicators can be developed based on existing data and testing systems. But districts and states will require new feedback systems that both provide schools information on the college outcomes of their graduates and link their performance during high school with their college outcomes. We simply cannot ask high schools to focus on the college readiness and postsecondary outcomes of their graduates if they do not know what happens to their students after they graduate and do not have measurable indicators of what determines college access and performance.

In this article, we have looked at three approaches to defining college readiness: minimum college admissions criteria, achievement test performance, and GPA. Each of these is a valid approach and comes to similar conclusions—no matter where we

set the bar, there are significant gaps in college readiness for high school graduates, particularly for low-income and minority students. The good news is that students are taking more courses and their GPAs have risen; the bad news is that despite these gains, large gaps by race and ethnicity and income on all college readiness indicators remain, particularly on measures of mathematics achievement. Using the various college readiness indicators we have discussed, about half of white graduates meet college readiness benchmarks, compared with less than one-quarter of Latino and African American graduates. Still, increasing qualifications may not be sufficient; even among students who meet college readiness standards, minority students are less likely to enroll in four-year colleges.

College readiness indicators help focus high schools' attention on postsecondary readiness, but they do not build the capacity of schools to improve. The remaining question is: what policy approaches can lead high schools to bring a singular focus to learning and engagement in coursework while building their capacity to support this focus? High schools will have to do more than raise graduation requirements and align standards. They will have to build instructional environments where students are learning content knowledge and core academic skills, as well as developing the non-cognitive skills that traditionally have not been the domain of most high schools. They will also have to take responsibility for teaching college knowledge and providing support for students in the college-going process. They will have to make a fundamental shift from strategies that focus on credit accumulation, such as increasing graduation requirements, to strategies that focus on preparing students for college.

Policy Strategies for Increasing College Readiness

Our prescriptions for increasing college readiness in urban high schools can be frustrating for a policy audience. State policy makers have a limited number of simple policy levers that can affect college readiness, and these are of limited efficacy. Although this new focus for high schools is not something that can easily be mandated, we next identify four sets of strategies that states and districts can pursue. Although we describe these strategies as distinct, the programs that have been found to be effective often incorporate multiple strategies.

Strategy 1: Develop Valid Indicators of College Readiness and Build Accountability

We have seen that high schools cannot focus on college readiness if they do not know where they stand. A first step in increasing college readiness is for districts and states to hold themselves accountable for students' postsecondary performance, which, as noted, requires building a strong data system and validated indicators of college readiness. Several states have begun to link high school and college data sets together for tracking purposes, but few states and localities have made postsecondary outcomes a core component of their accountability and data reporting systems.

Strategy 2: Help High School Educators Meet the Instructional Challenge

Accountability and data systems may help to focus high schools on postsecondary readiness and performance, but they do not in and of themselves build the capacity of schools and teachers to respond. Increasing college readiness is fundamentally an instructional challenge that will require developing classroom environments that deeply engage

students in acquiring the skills and knowledge they will need to gain access to and succeed in college. Supporting this shift within the classroom will require a serious investment to increase the capacity of high schools by providing teachers the development opportunities to enhance their instructional practice to meet this challenge. (See the article by Tom Corcoran and Megan Silander in this volume.)

Strategy 3: Bridge the Information and Social Capital Gap

A third strategy for increasing college readiness seeks to provide schools with another type of capacity: the resources and supports necessary to help low-income and minority students effectively manage the college application and financial aid processes. This approach focuses on strengthening schools' capacity by providing the resources, strategies, and know-how to counselors and teachers so that they are appropriately equipped to provide support to students throughout the college planning process.

Strategy 4: Use Incentives and Strong Signals for Students

A final strategy is for states and districts to adopt policies that reinforce these efforts by sending clear messages directly to students about what they must do to prepare for college and, in turn, by providing students with incentives for strong performance. Parents and students are both more likely to respond strongly to programs if they receive a clear signal about expectations and if performance is connected to real payoffs, particularly college attainment. Incentives and strong signals can also provide greater focus to the efforts of teachers and school administrators on improving college readiness and supporting the college planning process of their students.

Needed: A Comprehensive Effort

These four strategies provide guidelines for how states and school districts can focus their efforts to increase college readiness. The goal of college readiness, however, will not be attained by simply adopting a promising program or policy in isolation. The evidence is strongest for programs and policies that use multiple strategies for increasing college readiness, particularly if they are a part of an integrated strategy around college access.⁶² Districts and schools must combine the resources and support to increase capacity within schools with the signals and incentives that reinforce both student and teacher behaviors that build college readiness.

The Texas Advanced Placement Incentive Program is one example of such a program that has strong evidence for its efficacy. It combines enhanced professional development and support for teachers in implementing pre-AP and AP curricula with monetary incentives for teachers and students for passing exams. A recent evaluation by C. Kirabo Jackson compared changes in student performance in schools that adopted the program with changes in schools that had not, adjusting for the general demographic characteristics of schools and school effects. Over several cohorts, Jackson found that participating schools saw substantial increases, over and above comparison schools, in the percentage of students scoring high on the ACT (higher than 24) and SAT (higher than 1100) and in the proportion of students who attend college in Texas.⁶³ Jackson's qualitative data suggest that the AP incentive program may have led to improvements in counseling, both in recruiting students for AP and in supporting students in the college search process. What programs such as this one in Texas make clear is that increasing college readiness is not something that happens with

one strategy or one program; it requires a comprehensive effort to build capacity within schools and to give students and teachers

clear signals about what it will take to turn college aspirations into college attainment.

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