COLLEGE READINESS

Mind the Gaps

How College Readiness Narrows Achievement Gaps in College Success

ACT®

ACT is an independent, not-for-profit organization that provides assessment, research, information, and program management services in the broad areas of education and workforce development. Each year we serve millions of people in high schools, colleges, professional associations, businesses, and government agencies, nationally and internationally. Though designed to meet a wide array of needs, all ACT programs and services have one guiding purpose—helping people achieve education and workplace success.

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Executive Summary

A postsecondary credential offers many opportunities and benefits to high school graduates. However, not all students have access to these benefits: while the majority of high school students plan to go on to some form of postsecondary education, there are substantial gaps in college enrollment rates across racial/ethnic groups and annual family income ranges. Worse, students from racial/ethnic minority groups historically underrepresented in higher education are also much less likely than other students to earn a college degree—and this is all too frequently due to lack of preparation for college-level coursework during high school.

In *Mind the Gaps*, we describe the current state of college readiness of high school students and examine the contributions of pre-college indicators to improving college success specifically among underrepresented racial/ethnic minority students and students from lower-income families. Although nonacademic factors also influence college success, this report examines several academic factors—including level of academic achievement, coursework preparation, and educational and career planning in high school—that contribute to students' success during their first year in college and their likelihood of returning to college for a second year.

The table below summarizes some of the academic factors that ACT research shows are directly related to college success: college readiness (defined as meeting or exceeding ACT's College Readiness Benchmarks), taking the ACT-recommended core

Academic Factors Related to Success in College

	College Success Indicators				
Academic Factors	**First-year enrollment**	**First- to second-year retention**	**B or higher grade in first-year courses**	**First-year GPA of 3.0 or higher**	**Decreased need for remedial English or mathematics coursework**
College readiness	✔	✔	✔	✔	✔
Core curriculum	✔	✔	✔	✔	✔
Additional mathematics coursework	✔	✔	✔	✔	✔
Additional science coursework	✔	✔	✔	✔	**N/A**

curriculum in high school, and taking additional high school coursework beyond core in mathematics and science. Success in college was defined in this research by four indicators: first-year enrollment (immediately following high school graduation), first- to second-year retention, earning a grade of B or higher in selected first-year courses, and earning a first-year grade point average (GPA) of 3.0 or higher. In a smaller study, referred to in this report as "Study 2," ACT also showed that college readiness, taking a core curriculum, and taking additional mathematics and science coursework beyond core have the additional benefit of lowering remediation rates in English and mathematics coursework in the first year of college.

This report discusses factors that contribute to lower college success rates among underrepresented racial/ethnic minority students and students from lower-income families. But the report also shows that *racial/ethnic and family income gaps in college success rates narrow substantially among students who are ready for college.*

We need to ensure that all students, including underrepresented racial/ethnic minority students and students from lower-income families, have access to high school coursework that is of sufficient depth and intensity to adequately prepare them for college and career. We also need to ensure that these students receive better guidance to eliminate the discrepancies that exist between their educational aspirations and the high school coursework they plan to complete to be prepared to meet these aspirations.

Policymakers and educators have the power to help these students substantially narrow the achievement gaps that currently prevent students from taking full advantage of the college experience. With this goal in mind, the results of this research suggest the following recommendations:

1. **Close the gap between student aspirations and high school course plans by ensuring that all students take at least a core curriculum in high school.**
2. **Close the gap in the alignment of high school courses with college and career readiness standards by focusing high school core courses on the essential standards for college and career readiness.**
3. **Close the gap in the quality of high school courses across schools by offering all students rigorous high school core courses that cover the essential knowledge and skills needed for college and career readiness in sufficient depth and intensity.**

Racial/ethnic and family income gaps may seem large and persistent, but research offers a straightforward remedy: help to ensure that underrepresented racial/ethnic minority students and students from lower-income families are ready for the challenges of postsecondary education through a rigorous core curriculum that is clearly focused on the essential knowledge and skills for college and career readiness.

Helping to prepare all students to benefit equally from postsecondary education and training should be the mission of every high school in the United States; the research results presented in this report lead to recommendations for making this happen. By making sure that all students become ready for college and career—in particular, by ensuring that high school core course offerings are rigorous and that all students are given the opportunity to take additional, higher-level coursework beyond core in mathematics and science—some of our country's seemingly most intransigent social disparities can be reduced.

Introduction

Whether students aspire to a college degree, plan to acquire a well-paying job, or both, some post–high school training is a necessity. While not every high school graduate plans to attend college, the majority of today's fastest-growing jobs that require a high school diploma, pay a salary above the poverty line for a family of four, and provide opportunities for career advancement require a foundation of academic knowledge and skills comparable to those expected of the first-year college student (ACT, 2006; Ruppert, 2003). Whether high school graduates go on to college or enter workforce training programs, at a minimum they all need the same solid foundation of college- and career-ready knowledge and skills. Existing jobs also require more education and better skills.

Students who are not ready for postsecondary education are less likely to enroll in college, more likely to need remedial coursework during their first year of college, less likely to succeed in their college courses, and less likely to earn a college degree. Students who are not ready for college and career are currently in danger of entering the workforce unprepared for the challenges of competing in a technology-based global economy. If the U.S. is unable to maintain and increase its economic competitiveness throughout the world, then not just the graduates themselves but the nation at large will suffer.

Failure to obtain some post–high school education or training has severe implications for postsecondary institutions, businesses, and of course students—particularly those from racial/ethnic minority groups or lower-income families. If, as a country, we seek to increase diversity in postsecondary institutions and eventually in the workplace, current trends in underrepresentation by certain racial/ethnic groups in postsecondary education—especially African American, American Indian, and Hispanic students—must be reversed.

Although the U.S. currently has one of the highest rates of entry into postsecondary education in the world (Organisation for Economic Co-operation and Development, 2008), it no longer leads the world in the percentage of students earning a college degree. The proportion of four-year college graduates to college entrants in the U.S. was only 56 percent in 2005, and the rate of degree completion at community colleges is typically even lower: about 60 percent of the four-year rate (U.S. Department of Education, National Center for Education Statistics, 2008).

Population growth in the U.S. is occurring largely among underrepresented racial/ethnic minority students and lower-income students. For example, Hispanics are the fastest-growing racial/ethnic group in the U.S., but almost half of the Hispanic population 25 years of age or older lacks a high school diploma, compared to 20 percent of the entire U.S. population (Ruppert, 2003). If current trends hold, sometime between 2020 and 2030 historically underrepresented racial/ethnic minority groups will comprise the majority of U.S. high school graduates (King, 2008; Western Interstate Commission for Higher Education, 2008). Thus, the college completion rates of these groups will need to rise substantially if the U.S. is to compete in a global marketplace.

Unlike other countries such as Canada, Japan, Korea, and Norway, which have made tremendous strides in increasing the college-going rates of young adults, young adults in the U.S. are less likely to graduate from high school or college than their older counterparts (Organisation for Economic Co-operation and Development, 2005). Over the next quarter-century, as college-educated U.S. workers born in the 1940s, 1950s, and 1960s (the so-called "baby boom") retire, there may be insufficient workers with postsecondary training to meet workforce demands (Carnevale & Desrochers, 2003). We have begun to see the effects in the amount of outsourcing to other countries by U.S. companies. More than two-thirds of U.S. companies have expressed concern about the lack of skilled employees, indicating that it poses an obstacle to their corporate growth (Business Roundtable, 2001).

States, postsecondary institutions, and businesses also suffer economic drains due to inadequate preparation of students for college. The cost each year to remediate unprepared students at public two- and four-year institutions has been estimated at $1 to $2 billion (Achieve & National Governors Association, 2005). Greene (2000) estimated that students leaving high school unprepared for post–high school training or work cost the U.S. $16 billion each year in remediation and decreased productivity.

An estimated 559,000 ACT-tested students unprepared in English, mathematics, and/or reading enrolled in college in 2007, the latest year for which ACT has college enrollment and retention data. Assuming that these students must devote one academic year solely to noncredit remedial coursework, they lose one year of potential income as college graduates ($42,623 per student) for each year of remedial coursework, as well as incur an additional year of tuition ($3,638 per student; U.S. Department of Education, National Center

for Education Statistics, 2005), resulting in a total loss of $26 billion. Moreover, it costs postsecondary institutions to remediate unprepared students, and results in losses to the state in income tax revenues and available funding for postsecondary institutions.

What can be done to increase the likelihood that students—underrepresented racial/ethnic minority students and lower-income students in particular—will enroll in college, be successful in their courses, and persist to graduation? What actions can students, teachers, guidance counselors, policymakers, and postsecondary institutions take to increase student success in college?

In this report we describe the current state of college readiness of high school students and examine factors that can improve college success specifically among underrepresented racial/ethnic minority students and students from lower-income families. Although nonacademic factors (e.g., social support, financial support, institutional commitment, and student behaviors such as academic discipline, orderly conduct, and having positive relationships with school personnel) certainly influence college success (e.g., Lotkowski, Robbins, & Noeth, 2004; Allen, Robbins, Casillas, & Oh, 2008), in this study we focus exclusively on academic factors—including level of academic achievement, coursework preparation, and educational and career planning in high school—that contribute to students' success during their first year in college and their likelihood of returning to college for a second year. If we can better understand the academic factors that influence college success, then we will be in a better position to take steps that are likely to improve college success rates for all students.

1.

Unequal Access to the Benefits of a College Education

While the majority of high school students plan on some form of postsecondary education, gaps exist in college enrollment rates across racial/ethnic groups and annual family income ranges. Not surprisingly, gaps in college degree completion rates also exist across these groups and ranges—gaps due in large part to a lack of preparation for college-level coursework during high school.

Earning a college education benefits students in many ways.

In the current economic climate, having a college education creates many opportunities unavailable to students with only a high school education. Occupational projections from 2004 to 2014 indicate that 80 percent of the fastest-growing occupations will require a minimum of an associate's degree and 36 percent will require a bachelor's degree. By comparison, only 37 percent of new jobs will be appropriate for those with a high school diploma or less (Hecker, 2005).

Wage earnings increase sharply with a college education. For workers aged 25 to 34, the average income of those with a bachelor's degree is almost double that of high school graduates ($42,623 vs. $26,278), while an associate's degree increases earnings by 20 to 30 percent (Carnevale & Desrochers, 2003; U.S. Census Bureau, 2006). Even attending college without obtaining a degree increases earnings by 5 to 11 percent over those of students with only a high school diploma.

A college education has other, less tangible benefits to individuals and to society. For example, workers with a college education have a lower risk of unemployment and have greater access to on-the-job training and technology than those with a high school diploma or less. College graduates are also almost twice as likely as high school graduates to receive formal training once they are employed. Post–high school education is also associated with greater

productivity in the workplace; better health; greater civic involvement, trust, tolerance, and ability to cope with stressful situations; and greater likelihood of having a fulfilling job (Organisation for Economic Co-operation and Development, 2005).

Students today have high educational aspirations.

High school students are aware of the importance of a college education. Most plan to enroll in some form of postsecondary education after high school, with goals ranging from military or vocational/technical training to a postgraduate degree. Sixty-eight percent of EXPLORE®-tested 2008–09 8th-grade students nationally and 72 percent of PLAN®-tested 2008–09 10th-grade students nationally planned to attend a two- or four-year institution. Of the subset of PLAN-tested 10th graders who planned to enroll in college, 93 percent planned to earn a bachelor's degree or pursue postgraduate study.

The postsecondary aspirations of high school students have also risen over time. A 2005 survey showed that the percentage of all U.S. 10th graders who expected that their highest level of educational attainment would be a bachelor's degree rose from 23 percent in 1980 to 32 percent in 1990 to 40 percent in 2002, while the percentage of 10th graders who expected that their highest level of educational attainment would be a graduate or professional degree rose from 18 percent to 27 percent to 40 percent in the same years (Fox, Connolly, & Snyder, 2005).

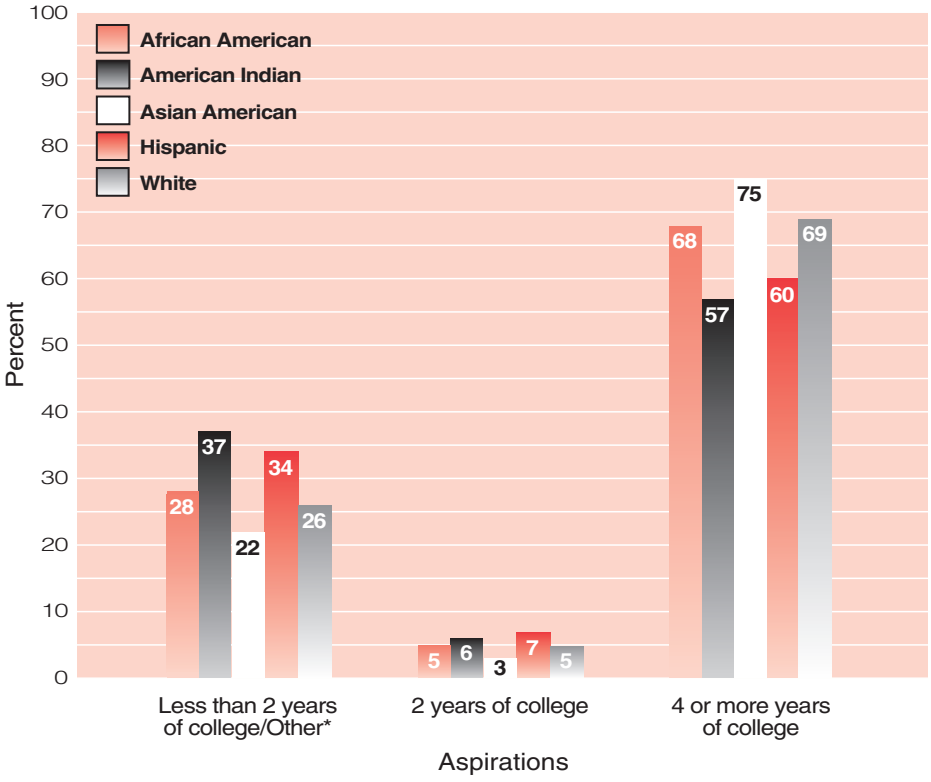
Aspirations for higher education vary by racial/ethnic group, with historically underrepresented minority groups aspiring to lower levels of educational attainment. Among PLAN-tested 10th graders in 2008–09, the percentages of African American, American Indian, and Hispanic students who expected to earn less than an associate's degree were greater than those of Asian American and White students, while the percentages of African American, American Indian, and Hispanic students who expected to earn at least a bachelor's degree were smaller than those of Asian American and White students (Figure 1).

EXPLORE, PLAN, and the ACT

ACT's College and Career Readiness System includes a sequence of three longitudinal college and career readiness assessments: EXPLORE, PLAN, and the ACT® test. Based on extensive research into what postsecondary educators expect from entering college students, each assessment measures what students are able to do with what they have learned in school.

- EXPLORE, for students in grade 8 or 9, provides baseline information on the academic preparation of students that can be used to plan high school coursework.
- PLAN, for students in grade 10, provides a midpoint review of students' progress toward their education and career goals while there is still time to make necessary interventions.
- The ACT, for students in grade 11 or 12, measures students' academic readiness to make successful transitions to college and work after high school.

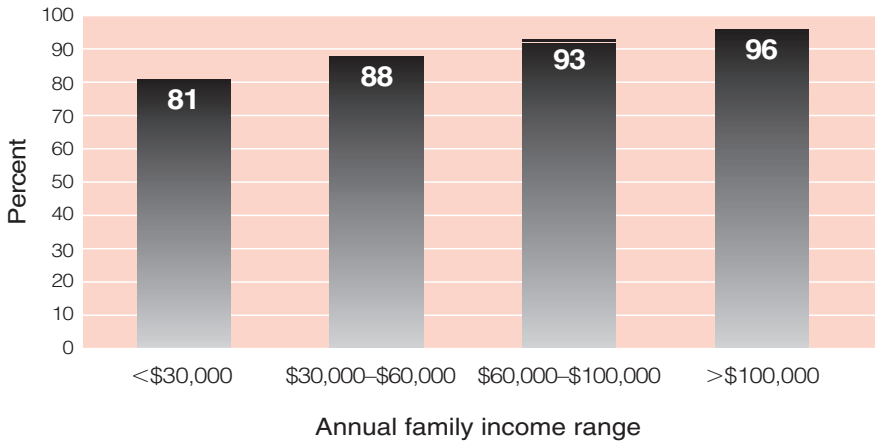
Figure 1: Educational Aspirations of PLAN-tested 2008–09 10th Graders, by Race/Ethnicity



* Other includes military, other, or unknown plans.
Note: Percentages do not sum to 100 due to rounding.

Aspirations for bachelor's or higher-level degrees also vary across annual family income range, with students from lower-income families less likely to aspire to complete a bachelor's degree (Figure 2).[1]

Figure 2: ACT-tested 2009 High School Graduates Aspiring to Earn at Least a Bachelor's Degree, by Annual Family Income Range

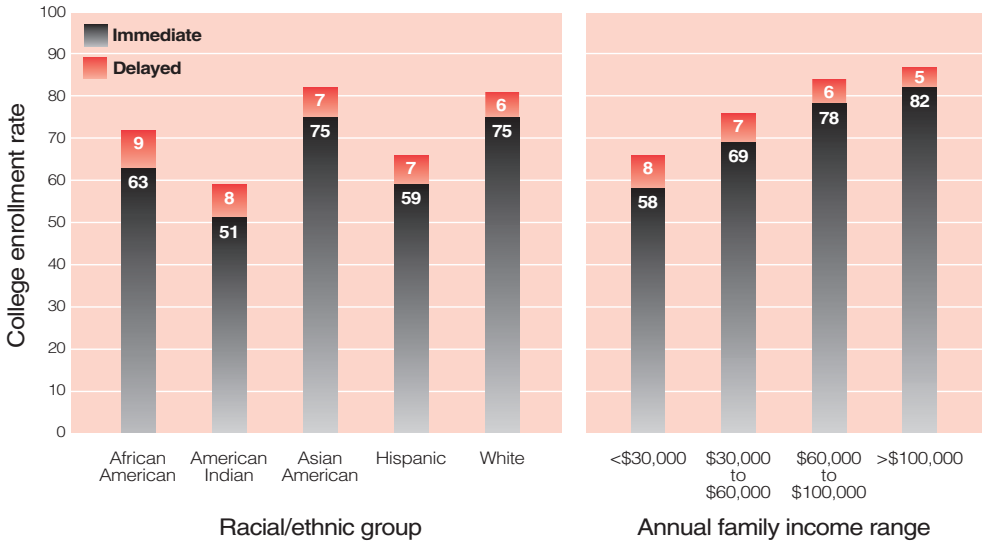


[1] Based on approximately 1.5 million students who took the ACT and indicated that they would graduate from high school in 2009, 1.1 million of whom reported their annual family income range. Among students not reporting this information, 62 percent aspired to earn at least a four-year college degree.

Gaps in college enrollment rates exist between underrepresented racial/ethnic minority students and White students.

Between 57 and 75 percent of all high school graduates nationally enroll in college; the enrollment rate depends on the population under consideration and the length of time between high school graduation and college enrollment (e.g., Adelman, 2004; Ruppert, 2003). Of ACT-tested 2007 high school graduates, 71 percent enrolled in college the fall immediately following high school graduation, with an additional 7 percent of these students delaying enrollment until the following fall. Immediate and delayed enrollment rates for ACT-tested 2007 graduates nationally (by race/ethnicity and annual family income range) are shown in Figure 3.

Figure 3: ACT-tested 2007 High School Graduates Enrolling in College, by Racial/Ethnic Group and Annual Family Income Range

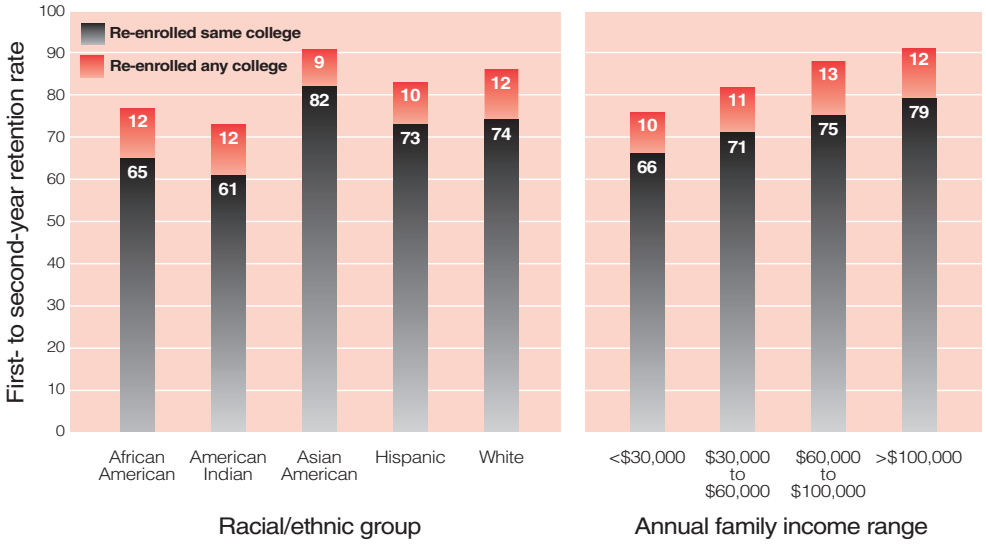


Immediate college enrollment rates are higher for Asian American and White students, and lower for African American, American Indian, and Hispanic students. And as annual family income range increases, the college enrollment rate also increases. Moreover, African American and American Indian high school graduates and students from lower-income families are somewhat more likely to delay enrolling in college. By delaying enrollment, these students are at a greater risk of not completing a postsecondary program. Students who enroll in college immediately after high school graduation have a greater chance of completing their program of study than those who delay enrollment (Horn, Cataldi, & Sikora, 2005).

Although many students enroll in college, substantial numbers do not persist to a college degree, especially students from underrepresented racial/ethnic minority groups.

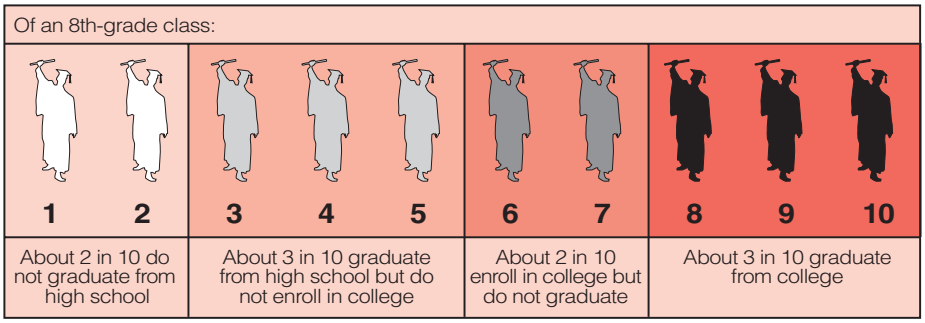
The majority of college students persist to their second year: About three-fourths (74 percent) of ACT-tested first-year college students re-enroll in the same institution their second year, with an additional 11 percent enrolling in a different institution. These statistics are consistent with national retention rates for first- to second-year persistence (88 percent; Adelman, 2004). As shown in Figure 4, Asian American and White students are more likely to persist to their second year than African American and American Indian students, and are slightly more likely than Hispanic students. In addition, as family income increases, the first- to second-year retention rate increases.

Figure 4: ACT-tested 2007 First-Year College Students Returning for a Second Year of College, by Racial/Ethnic Group and Annual Family Income Range



Roughly 50 to 60 percent of entering students graduate from college within six years (Carey, 2004). When examined across the educational pipeline, the outlook is even less positive. Figure 5 shows estimates of the proportions of students lost during key transition periods along the educational pipeline from entrance into high school through college graduation (Adelman, 2006a). Of 8th-grade students nationally in 1988, 78 percent graduated from high school and 53 percent enrolled in college in the summer, fall, or spring terms immediately following high school graduation. However, only 48 percent of the original 8th-grade class persisted to their sophomore year in college, and just 35 percent completed an associate's degree in three years or a four-year degree in six years.

Figure 5: Proportions of Students Lost During Key Transitions along the Educational Pipeline from Entrance into High School through College Graduation

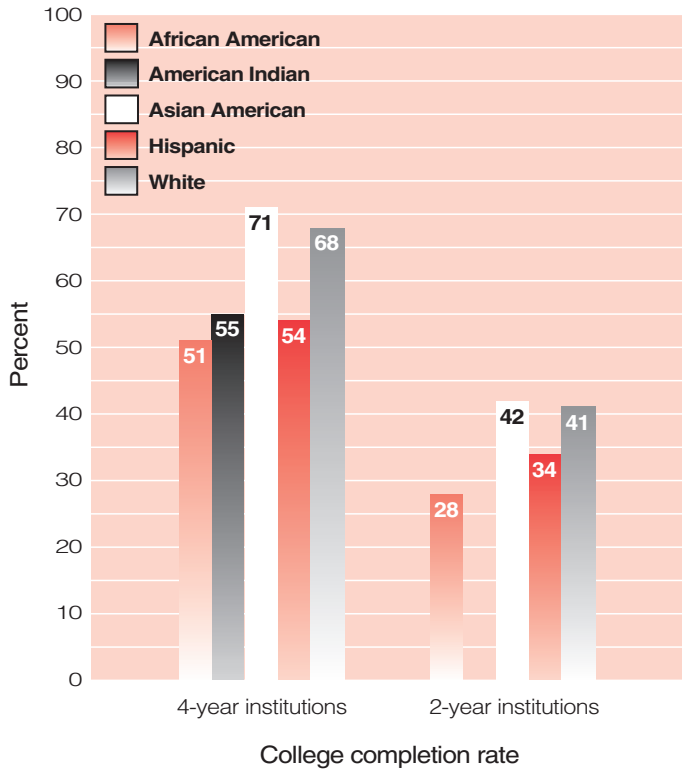


Note. The data in this figure are adapted from "The Propaganda of Numbers," by C. Adelman, 2006, *The Chronicle of Higher Education*, and *The Toolbox Revisited: Paths to Degree Completion from High School through College*, by C. Adelman, 2006, Washington, D.C.: U.S. Department of Education.

Underrepresented racial/ethnic minority students are less likely to earn a college degree: African American, American Indian, and Hispanic students currently enroll in college at lower rates, and from this abbreviated number they are less likely to re-enroll in subsequent years and eventually to complete college. Fewer than 50 percent of entering African American, American Indian, and Hispanic students complete a college degree within six years (Knapp et al., 2005). Adelman (2004) followed a group of 1992 high school graduates for eight years and found relatively high percentages of American Indian graduates with no postsecondary education (51 percent). In addition, college degree completion rates for African American and Hispanic students (18 and 22 percent, respectively) were about half the magnitude of those for Asian American and White students (40 and 48 percent, respectively).

According to the U.S. Department of Education, National Center for Education Statistics (2008), six years after first enrolling in four-year colleges, degree completion rates for Asian American and White students (71 and 68 percent, respectively) exceed those for African American, American Indian, and Hispanic students (51, 55, and 54 percent, respectively; Figure 6). Similarly, for two-year postsecondary institutions, degree completion rates for Asian American and White students (42 and 41 percent, respectively) exceed those for African American and Hispanic students (28 and 34 percent, respectively).

Figure 6: Six-Year Degree Completion Rates for Students Entering College in the 1995–1996 Academic Year, by Type of Institution and Student Race/Ethnicity (2001)



Note. The data in this figure are from *Digest of Education Statistics, 2007*, by the U.S. Department of Education, National Center for Education Statistics, 2008. Data for American Indians attending two-year institutions were unavailable.

Many students don't persist in college because they need substantial remediation.

Nationally, about one-third of high school graduates who enroll in college take remedial coursework. Underrepresented racial/ethnic minority students are almost twice as likely to take one or more remedial courses in college as are Asian American and White students (Parsad & Lewis, 2003).

Of particular concern is that many students who graduate from high school unprepared for first-year college coursework have to take multiple remedial courses, both within and across subject areas. For example, of students who take remedial reading, more than half take four or more remedial reading courses and more than two-thirds also take remedial mathematics; of students who take remedial mathematics, more than 70 percent take two or more remedial mathematics courses (Adelman, 2004; Carey, 2004).

Lack of preparation for college-level coursework militates severely against college success. Because remedial courses are typically not credit-bearing courses, taking remedial coursework delays completion of educational programs and increases the cost of completing these programs. According to Adelman (2004), 70 percent of students who take one or more remedial reading courses fail to earn a college degree or certificate within eight years of enrolling.

Summary

A postsecondary credential offers many opportunities and benefits to high school graduates, including better career opportunities, higher long-term salary and benefits, and greater workplace productivity. While the majority of high school students plan to go on to some form of postsecondary education, there are substantial gaps in college enrollment rates across racial/ethnic groups and annual family income ranges. What's more, underrepresented racial/ethnic minority students are also much less likely than other students to earn a college degree—and this is often due to their lack of preparation for college-level coursework during high school, which puts them into a cycle of remediation that deters them from persisting in college.

If we are to close the gaps in college enrollment and college degree completion, we must understand the effects of high school academic preparation on later success in college. In the next chapter, we examine in detail the positive influence that certain academic factors—aspects of college readiness and high school course-taking in particular—have on college success.

2.

Academic Factors that Affect College Success

ACT research shows that at least three academic factors are directly related to college success: college readiness, taking a core curriculum in high school, and taking additional high school coursework beyond core in mathematics and science.

With the increasing need for all students to acquire postsecondary training, what do we know about the college readiness of current high school graduates? More important, what do we know about students and college success? What increases students' likelihood of enrolling in college? What appears to help keep them there, once they enroll? And what can be done to decrease the chance that they will need to take remedial coursework? In this section we examine the educational preparation of students and the academic factors that affect their success in college.

Students who are ready for college are more likely to be successful in college.

In *Crisis at the Core* (ACT, 2004), ACT showed that many high school graduates are unprepared for college in one or more subject areas. To help determine student readiness for college and career, ACT developed its College Readiness Benchmarks: scores on the ACT that represent the level of achievement required for students to have a high probability of success in selected credit-bearing first-year college courses.

Success is defined as approximately a 75 percent chance that a student will earn a grade of C or better in the course, or a 50 percent chance that a student will earn a grade of B or better in the course. The courses are the ones most commonly taken by first-year college students in the areas of English, mathematics, social science, and natural science.

ACT research demonstrates that, compared to students who are not ready for credit-bearing entry-level college coursework, students who are ready are more likely to:

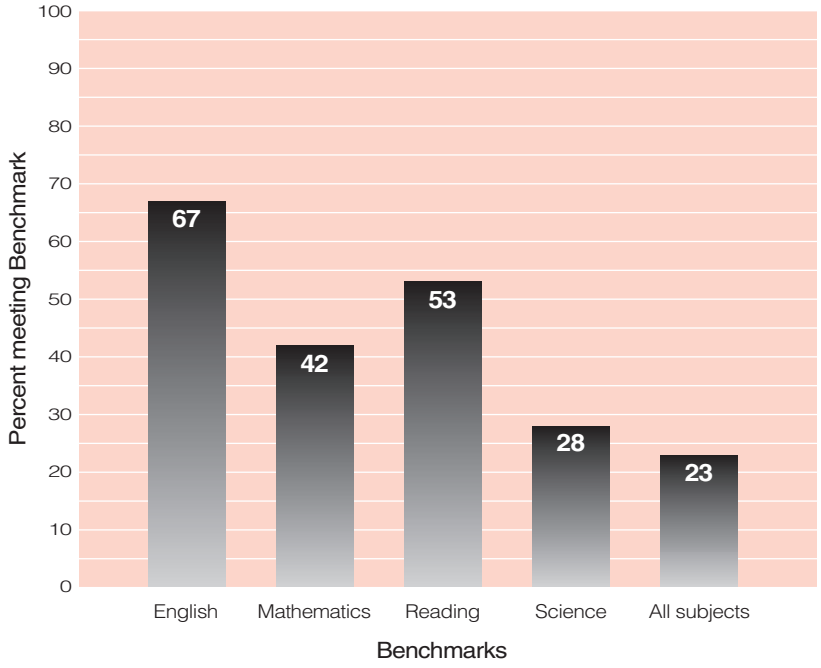
- enroll in college the fall following high school graduation,
- persist to a second year at the same institution,
- earn a grade of B or higher in selected first-year college courses, and
- earn a first-year college grade point average (GPA) of 3.0 or higher.

In addition, based on Study 2, which examined the impact of college and career readiness on college remediation rates, students who meet the English Benchmark are less likely to take remedial English, and students who meet the Mathematics Benchmark are less likely to take remedial mathematics. These findings hold true regardless of race/ethnicity or annual family income range.

As these findings show, high school graduates who are academically prepared for college-level work have a much greater chance of succeeding in their first year of college than those who are not prepared. This is confirmed by another study (Tracey & Robbins, 2006) showing that performance on college entrance tests such as the ACT is a strong predictor of cumulative college GPA across time. Academic preparation also has direct implications for success in the workplace. As noted by the Business Roundtable (2001), "Getting the education and skills that prepare students for lifelong learning is the first step toward getting good jobs that pay decent wages and make . . . other goals attainable."

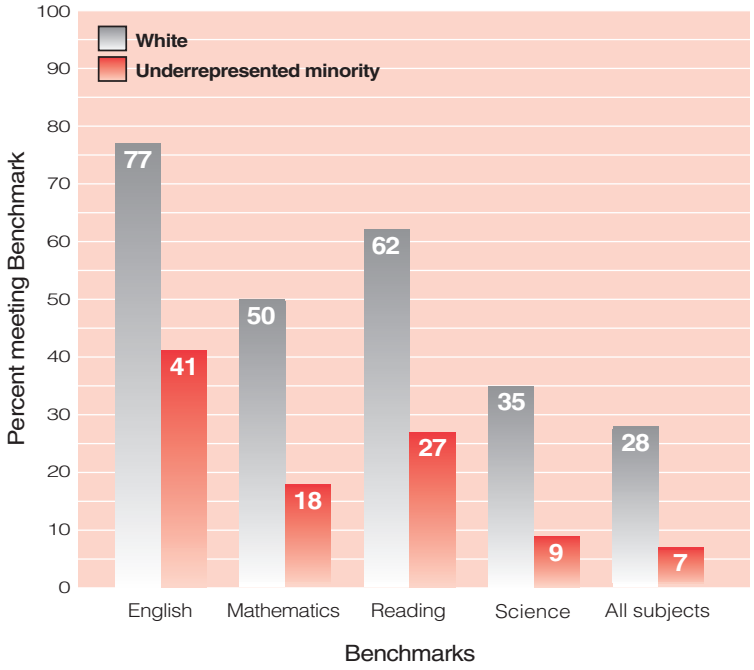
In 2009, 67 percent of ACT-tested high school graduates were ready for first-year college coursework in English Composition, 42 percent were ready for College Algebra, 53 percent were ready for social sciences coursework (i.e., History, Psychology, Sociology, Political Science, and Economics), and 28 percent were ready for Biology (Figure 7). Just 23 percent were ready for college work in all four subject areas (ACT, 2009b).

Figure 7: ACT-tested 2009 High School Graduates Meeting ACT College Readiness Benchmarks[2]



The situation is worse for underrepresented minority groups compared to White students (Figure 8).

Figure 8: ACT-tested 2009 High School Graduates Meeting ACT College Readiness Benchmarks (White and Underrepresented Racial/Ethnic Minority)[3]



[2] Based on approximately 1.5 million high school students who took the ACT and indicated that they would graduate from high school in 2009.

[3] Based on approximately 941,000 White students and 345,000 underrepresented racial/ethnic minority students who took the ACT and indicated that they would graduate from high school in 2009. In the analyses presented throughout this report, underrepresented racial/ethnic minority students include African American, American Indian, and Hispanic students; in the analyses of first-year college course grades, multiracial students were also included.

College readiness rates for underrepresented racial/ethnic minority students are two to four times lower than the rates for White students. Low levels of college readiness are reflected in lower rates of college participation and completion.

A clear relationship between annual family income range and college readiness was also evident among ACT-tested 2009 high school graduates: irrespective of their race/ethnicity, students from higher-income families were more likely to be ready for postsecondary education than students from lower-income families.

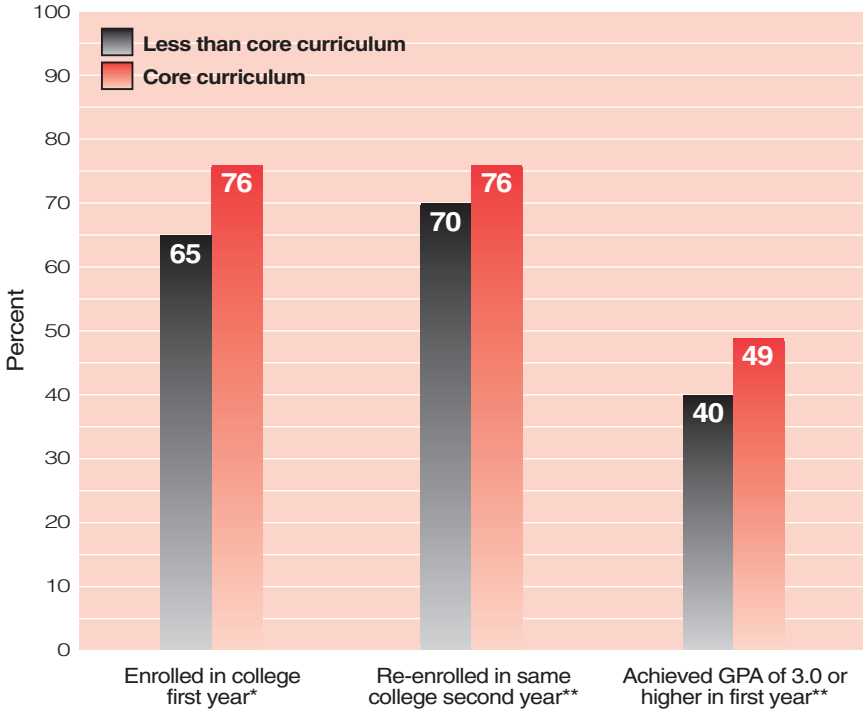
Students who are not ready for college are less likely to enroll in college (and more likely to take remedial coursework if they do), less likely to enroll in the same institution for a second year, less likely to succeed in their college courses, and less likely to earn a college degree. Lack of preparation for college-level coursework undermines students' potential for success by placing them behind from the start.

Students who take challenging courses in high school are more likely to be successful in college.

ACT research demonstrates the importance of high school coursework in preparing students for postsecondary education and training. Students who take or plan to take the ACT-recommended core curriculum[4] in high school increase their probability of college success. For example, as shown in Figure 9, high school graduates who have taken the core curriculum are more likely than other graduates to enroll in college the fall following high school graduation. Moreover, once they enroll, these students are more likely to return for a second year at the same institution, achieve a first-year GPA of at least 3.0, and (as shown in Figure 10) achieve a B or higher grade in first-year college courses.

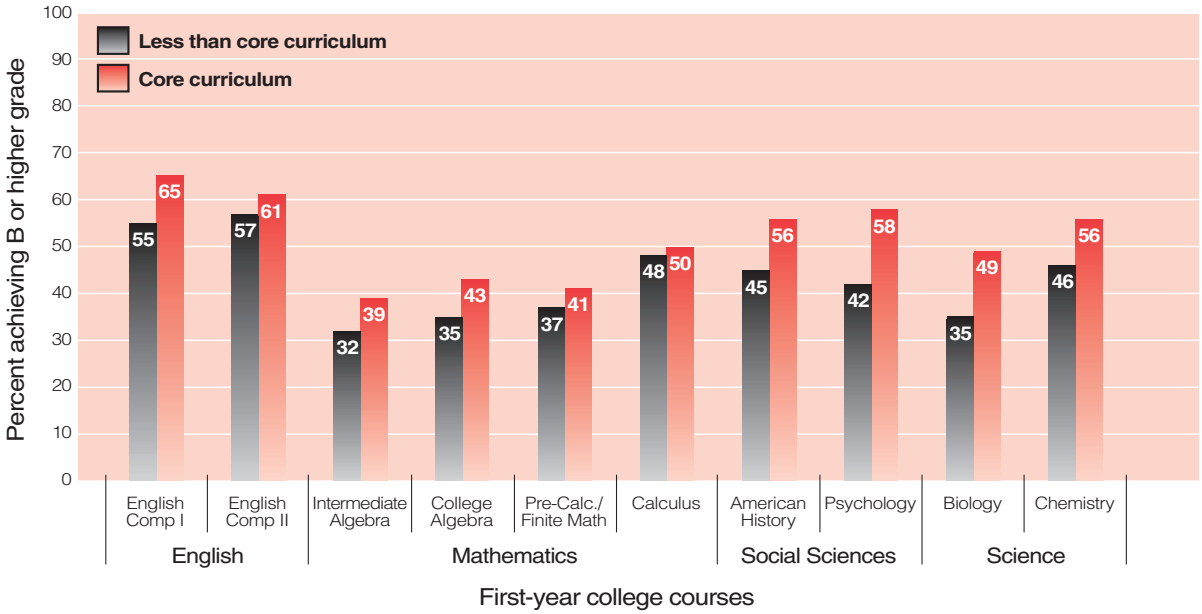
[4] At least four years of English and at least three years each of mathematics, science, and social studies. This curriculum is based on the core curriculum recommended in *A Nation at Risk* (National Commission on Excellence in Education, 1983).

Figure 9: Students Enrolling in College, Returning for a Second Year, or Achieving a First-Year College GPA of 3.0 or Higher, by High School Course Selection



* Based on ACT-tested high school graduates
** Based on students enrolled their first year in postsecondary education

Figure 10: ACT-tested Students Achieving a B or Higher Grade in First-Year College Courses, by High School Course Selection

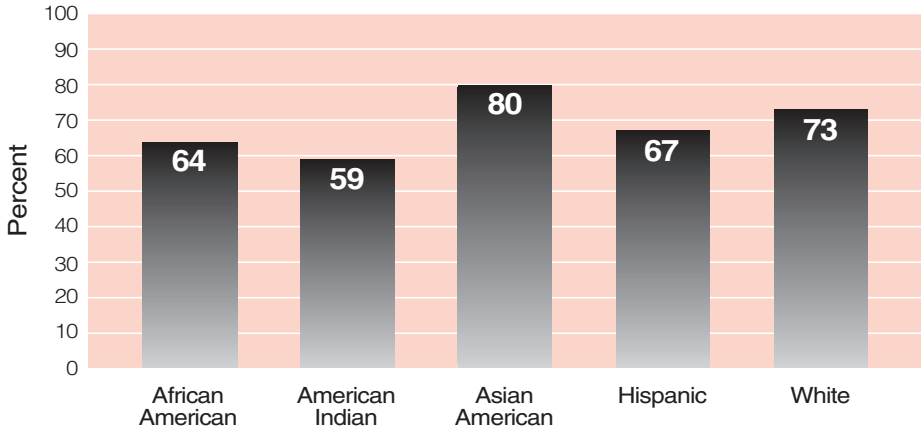


In addition, first-year college students who have taken a high school core curriculum are less likely to take remedial English or mathematics in college.

Unfortunately, many high school students are not preparing themselves academically to succeed in college. Forty-three percent of PLAN-tested 2008–09 10th graders who aspire to earn at least a bachelor's degree have not taken or do not intend to take a college-preparatory core curriculum. Sixty-two percent of EXPLORE-tested 2008–09 8th graders who aspire to earn at least a bachelor's degree do not intend to take a college-preparatory core curriculum in high school.

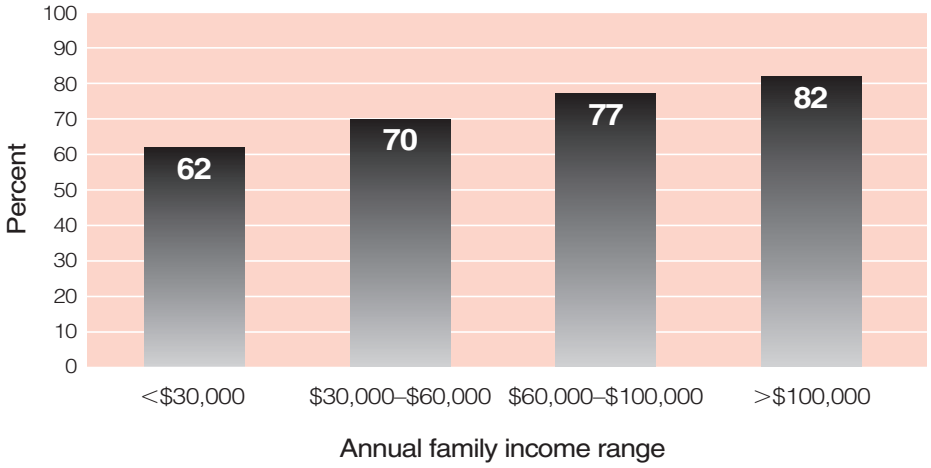
Moreover, levels of preparation for college differ by race/ethnicity and family income range. For example, Asian American and White students are more likely than African American, American Indian, and Hispanic students to take the ACT-recommended core curriculum in high school (ACT, 2009b) (Figure 11).

Figure 11: ACT-tested 2009 High School Graduates Taking a Core Curriculum, by Race/Ethnicity



Among ACT-tested 2009 high school graduates, the higher a student's annual family income range, the more likely that student was to take a core curriculum (Figure 12).

Figure 12: ACT-tested 2009 High School Graduates Taking a Core Curriculum, by Annual Family Income Range

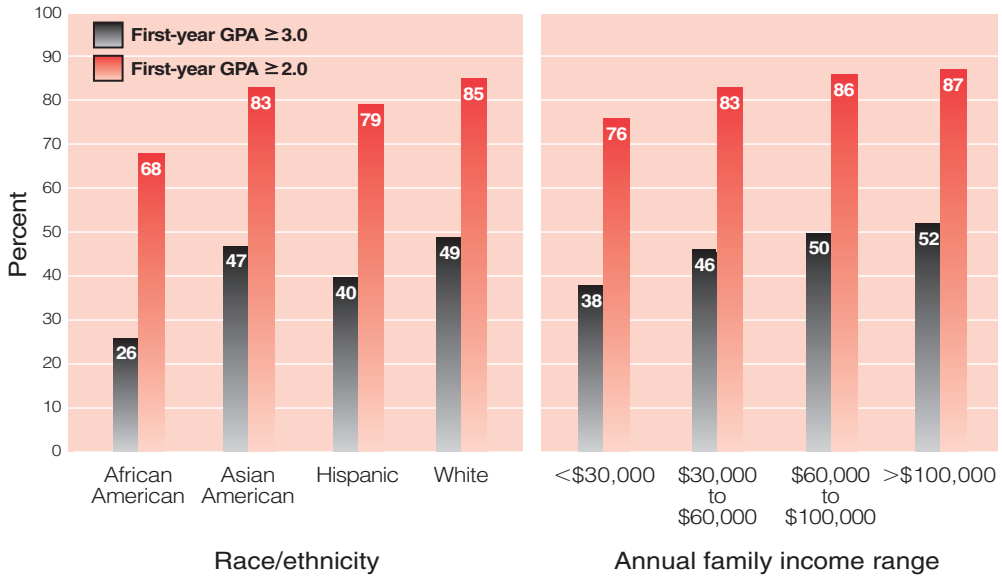


Achievement gaps exist in college enrollment, persistence, grades, and remediation.

Differences persist across racial/ethnic and family income groups in students' chances of succeeding in their first year of college. As we saw in Figures 3 and 4, Asian American and White students have higher enrollment and persistence rates than African American, American Indian, and Hispanic students. Moreover, enrollment and persistence rates increase as annual family income range increases. Gaps also exist among racial/ethnic and family income groups in first-year college course grades and first-year college GPA.

Enrolled African American students are less likely (by about 20 percentage points) than White students to achieve a first-year college GPA of 3.0 or higher (or 2.0 or higher; see Figure 13).

Figure 13: Students Achieving a First-Year College GPA of 3.0 or Higher or 2.0 or Higher, by Race/Ethnicity and Annual Family Income Range



Similarly, underrepresented racial/ethnic minority students are less likely than White students to achieve a B or higher grade in first-year courses in English, mathematics, science, and the social sciences (Figures 14 through 16).

Figure 14: Students Achieving a B or Higher Grade in First-Year College English Composition, by Race/Ethnicity and Annual Family Income Range

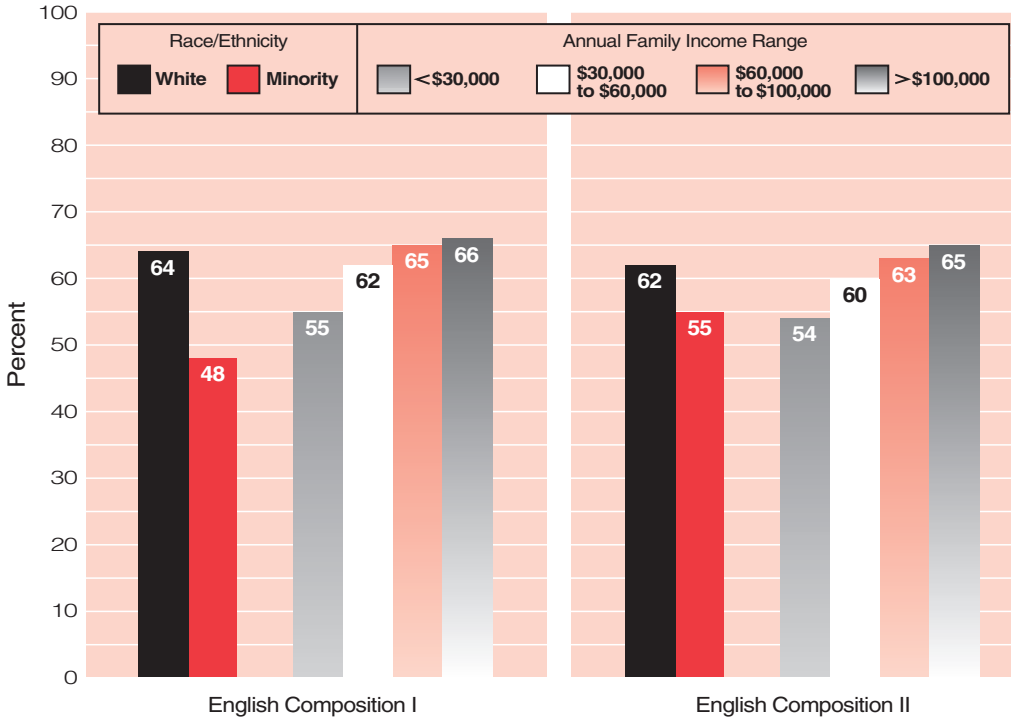


Figure 15: Students Achieving a B or Higher Grade in First-Year College Mathematics Courses, by Race/Ethnicity and Annual Family Income Range

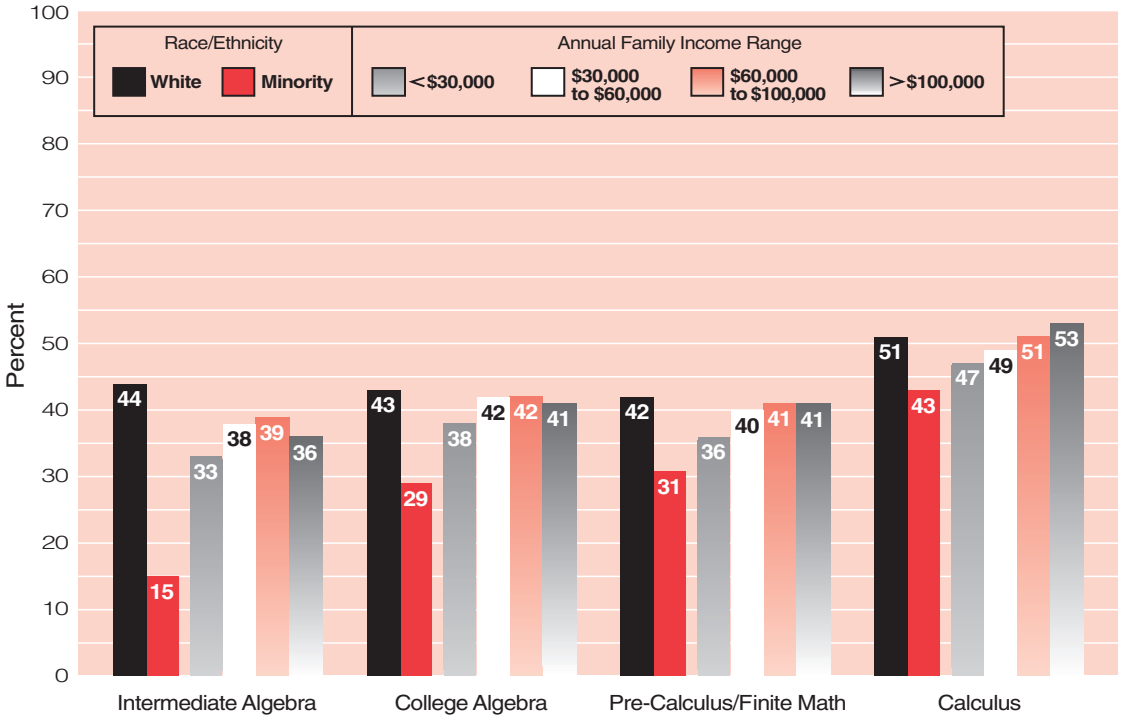
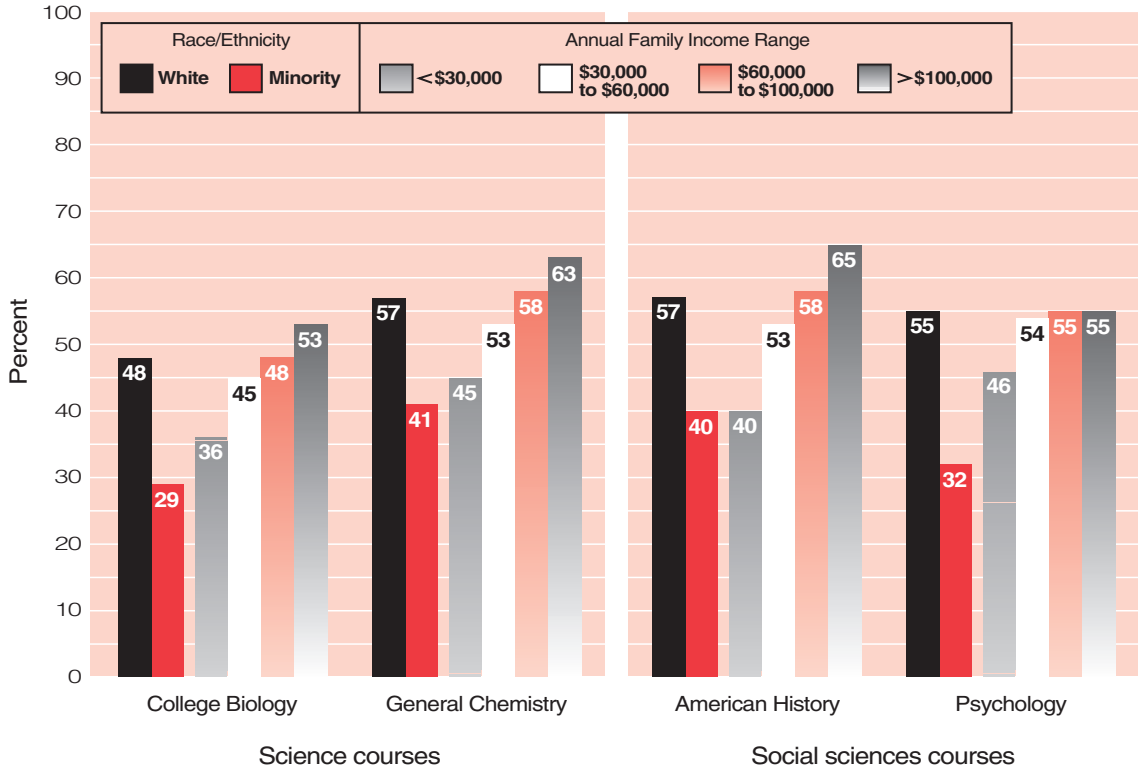


Figure 16: Students Achieving a B or Higher Grade in First-Year College Science and Social Sciences Courses, by Race/Ethnicity and Annual Family Income Range



For example, as shown in Figure 15, enrolled White students are about three times as likely as underrepresented racial/ethnic minority students to achieve a B or higher grade in Intermediate Algebra. Lower-income students are also less likely than higher-income students to achieve a first-year GPA of 3.0 or higher (or 2.0 or higher), or a B or higher grade in specific first-year college courses, by 11 to 14 percentage points and 3 to 25 percentage points, respectively.

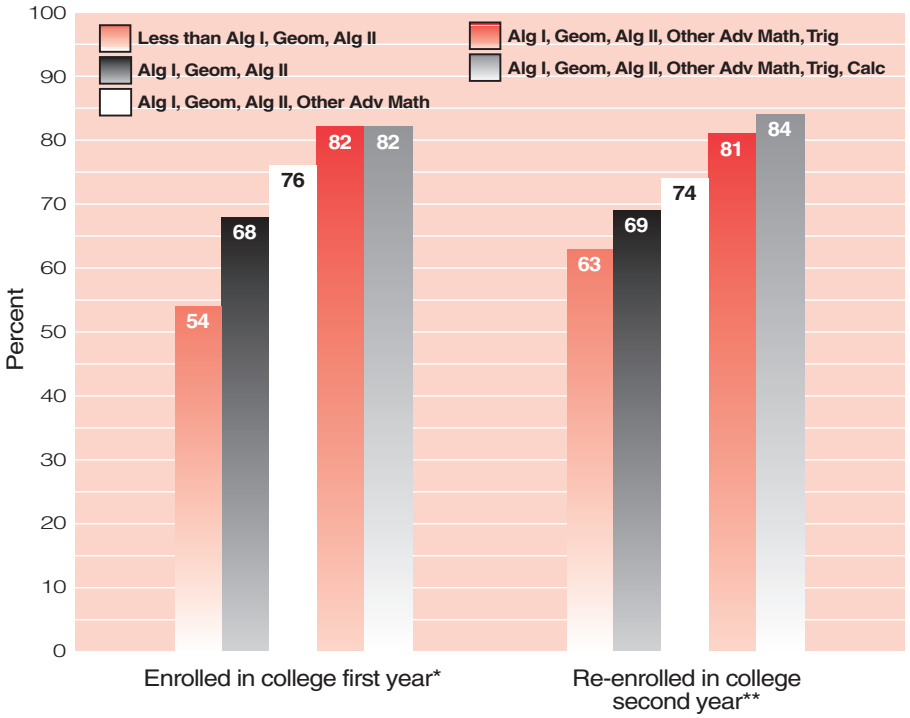
Moreover, based on Study 2, underrepresented racial/ethnic minority and lower-income students are two to four times more likely to take remedial English or remedial mathematics coursework than White students and higher-income students, respectively.

The nature of the courses students take in high school plays a large role in preparing students for college success, especially in mathematics and science.

Adelman (1999, 2006b) noted that mathematics coursework taken in high school is the single most important indicator of likely success in college. ACT research has shown that both mathematics and science courses taken in high school are important indicators of later success in college, as explained below.

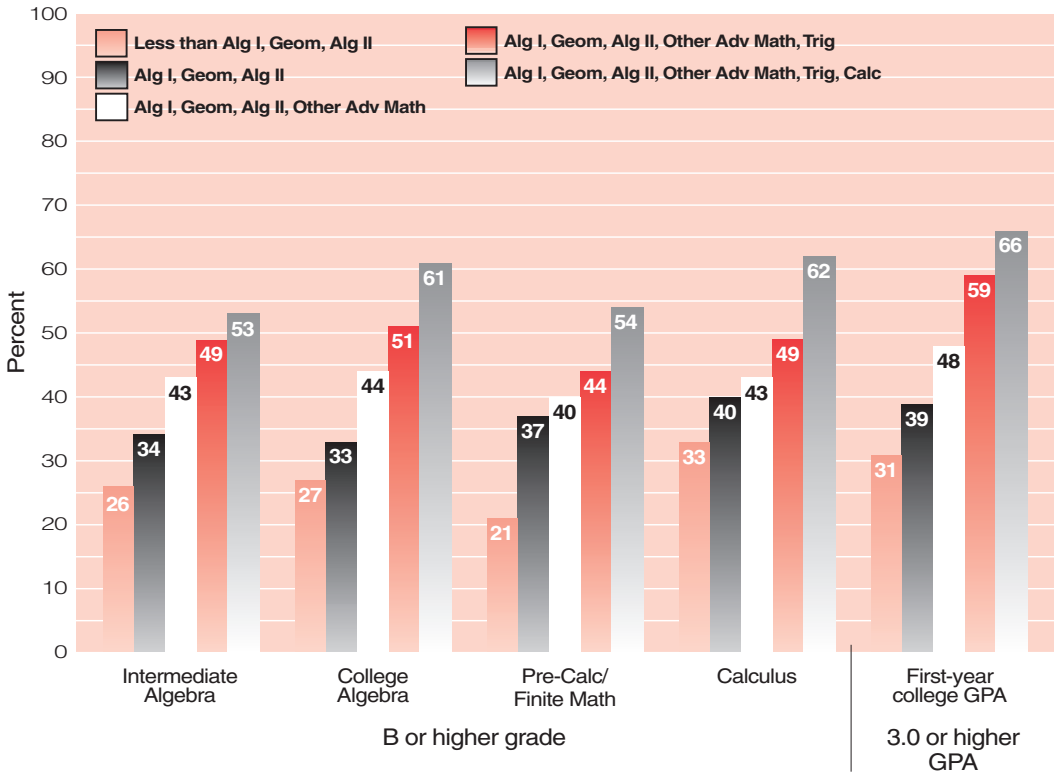
Mathematics. As the complexity of the mathematics course sequence taken in high school increases, the chances of students enrolling in college and persisting to their second year also increase (Figure 17). These same trends are seen for students earning a grade of B or higher in first-year mathematics courses and earning a first-year college GPA of 3.0 or higher (Figure 18).

Figure 17: College Enrollment and Retention Rates by High School Mathematics Course Sequence[5]



* Based on ACT-tested high school graduates
** Based on students enrolled their first year in postsecondary education

Figure 18: Students Achieving a B or Higher Grade in First-Year College Mathematics Courses or a 3.0 or Higher First-Year College GPA, by High School Mathematics Course Sequence[6]

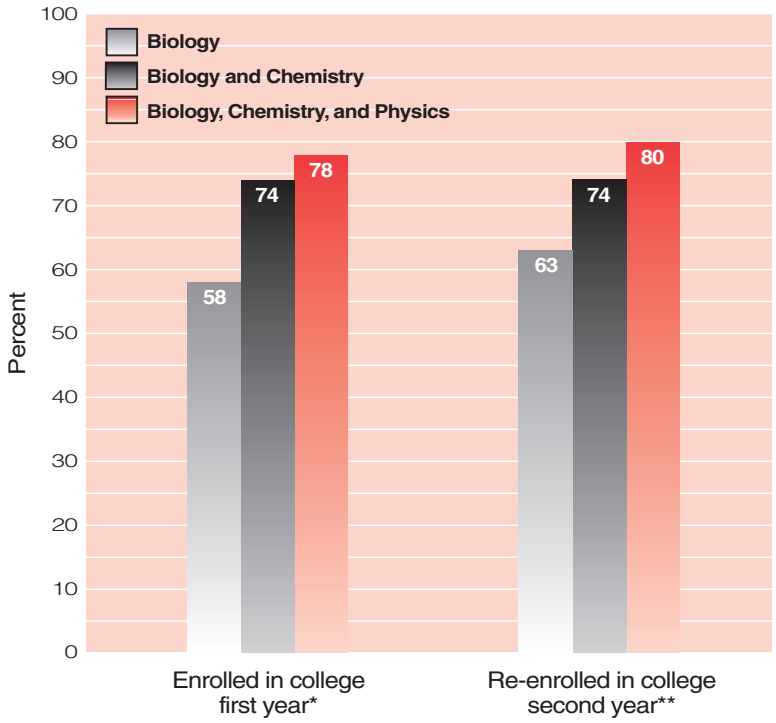


[5] Mathematics course sequence taken at time of ACT testing.
[6] Mathematics course sequence taken at time of ACT testing.

In addition, students who take Algebra I, Geometry, and Algebra II are less likely to require remedial coursework in mathematics than students taking less than these courses (by 14 to 18 percentage points across states). Moreover, students who take higher-level mathematics courses beyond Algebra II are two to three times less likely to need remedial coursework in mathematics than students taking Algebra I, Geometry, and Algebra II.

Science. Students who take Biology, Chemistry, and Physics in high school are more likely to enroll in college the fall following graduation, re-enroll in the same college their second year, earn a B or higher grade in first-year college Biology or Chemistry courses, and earn a first-year college GPA of 3.0 or higher than students who take only Biology and Chemistry or fewer courses in science (Figures 19 and 20).

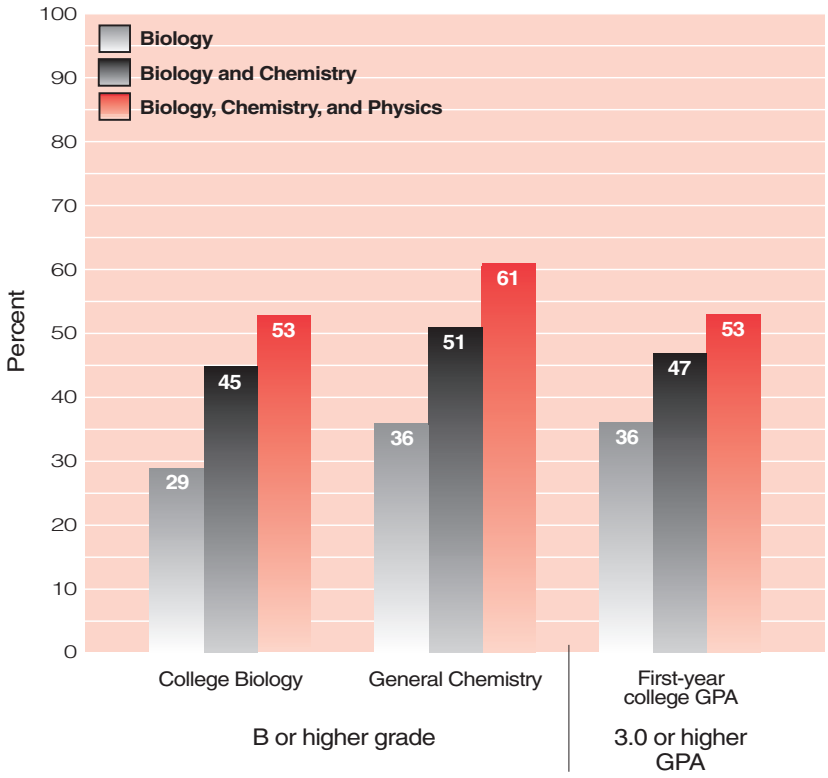
Figure 19: College Enrollment and Retention Rates by High School Science Course Sequence[7]



* Based on ACT-tested high school graduates
** Based on students enrolled their first year in postsecondary education

[7] Science course sequence taken at time of ACT testing.

Figure 20: Students Achieving a B or Higher Grade in First-Year College Science Courses or Achieving a 3.0 or Higher First-Year College GPA, by High School Science Course Sequence[8]



As these findings indicate, students who take challenging courses in high school are more likely to be successful in college. However, many students do not take these courses. Of 2009 ACT-tested high school graduates, 70 percent planned to complete the ACT-recommended core curriculum prior to high school graduation (ACT, 2009b). Less than half of ACT-tested high school graduates planned to take at least one higher-level mathematics course beyond Algebra II or planned to take Physics (37 and 48 percent, respectively). This suggests a discrepancy between students' educational aspirations and the high school coursework they plan to take to be prepared to meet their aspirations. This discrepancy could be due to inadequate guidance provided to students about coursework preparation for their planned educational goals, to state or local high school graduation requirements that demand fewer or less challenging course requirements, or to both.

[8] Science course sequence taken at time of ACT testing.

Underrepresented racial/ethnic minority students and students from lower-income families are less likely to be prepared to achieve their educational goals.

According to Carnevale and Desrochers (2003), there is a significant difference in K–12 preparation and access to colleges among racial/ethnic groups. Underrepresented racial/ethnic minority students and students from lower-income families are more likely to be educated in underresourced, understaffed schools (Carey, 2004). And even though these students plan to go to college, there is a tendency for them to not be assigned to sufficiently rigorous, higher-level college-preparatory coursework (The Education Trust, 1999).

As we saw in Figures 1 and 2, most high school students aspire to baccalaureate degrees. However, many students do not take the courses in high school that they need to be successful in college. Figure 11 showed that while 73 and 80 percent of White and Asian American students, respectively, take the ACT-recommended core curriculum by the time they graduate from high school, only about two-thirds or less of each underrepresented racial/ethnic minority group do so. The percentages are also lower for students from lower-income families.

Students who take higher-level coursework beyond core are more likely to be ready for college than students taking less than core (ACT, 2004, 2005, 2009b). Given that fewer underrepresented racial/ethnic minority students and students from lower-income families are taking college-preparatory courses in high school, it is not surprising that they are also less likely to be ready for postsecondary education when they graduate from high school.

Simply taking higher-level coursework is insufficient to guarantee that students will be successful in college.

Just having the right name does not guarantee that a course will provide students with the skills they need to be ready for college-level work. It is the depth and intensity of the courses taken in high school that dictate the knowledge and skills students acquire (ACT & The Education Trust, 2004; National Commission on the High School Senior Year, 2001). As noted by Adelman (1999) and others (e.g., National Commission on the High School Senior Year, 2001), it is the *rigor* of the students' high school courses that contributes significantly to college success.

Simply taking higher-level coursework is not enough. For example, students who take higher-level coursework but do not meet the level of achievement necessary to be ready for credit-bearing entry-level college coursework are less likely to succeed in college than students who take fewer higher-level courses but do meet this level of achievement. This point is illustrated in Figures 21 through 24. Students who take higher-level mathematics courses beyond Algebra II, or take Physics beyond Biology and Chemistry, but do not meet the ACT College Readiness Benchmarks for Mathematics or Science, are less likely than students who take fewer courses (e.g., mathematics courses through Algebra II or science courses through Chemistry) but do meet the Benchmarks to:

- enroll in college (by 6 percentage points in mathematics and 9 percentage points in science);
- re-enroll for their second year of college at the same institution (by 6 percentage points in mathematics and 7 percentage points in science);
- earn a B or higher grade in first-year college mathematics courses (by 7 to 25 percentage points); and
- earn a B or higher grade in first-year college science courses (by 18 to 26 percentage points).

Figure 21: College Enrollment Rates by ACT College Readiness Benchmark Attainment and High School Coursework in Mathematics and Science

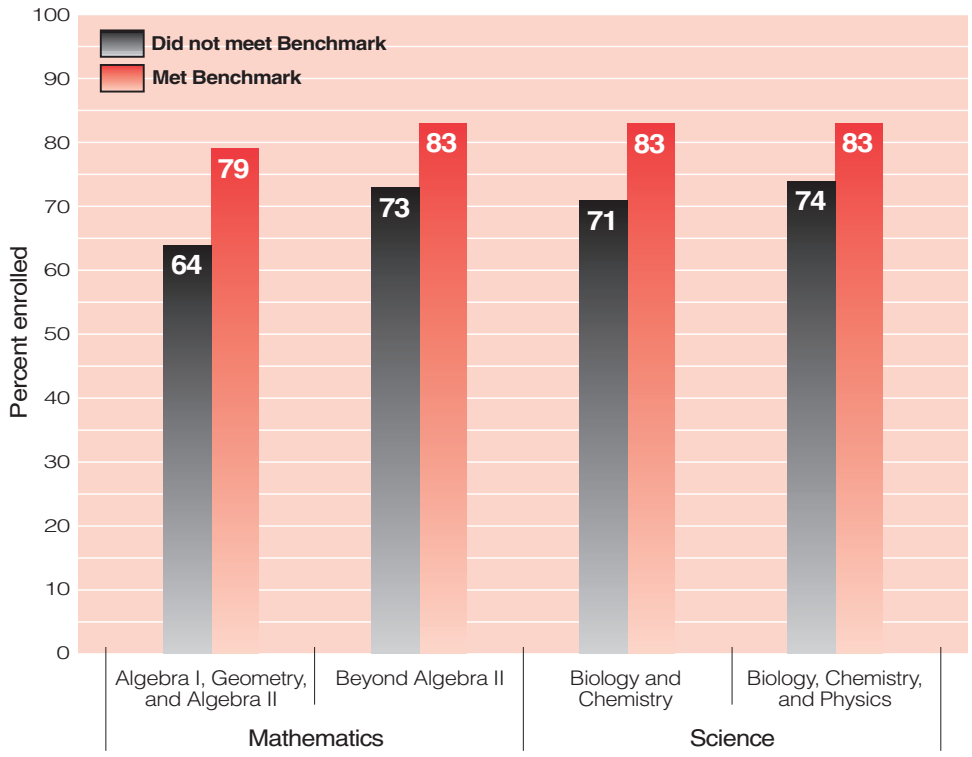


Figure 22: College Retention Rates by ACT College Readiness Benchmark Attainment and High School Coursework in Mathematics and Science

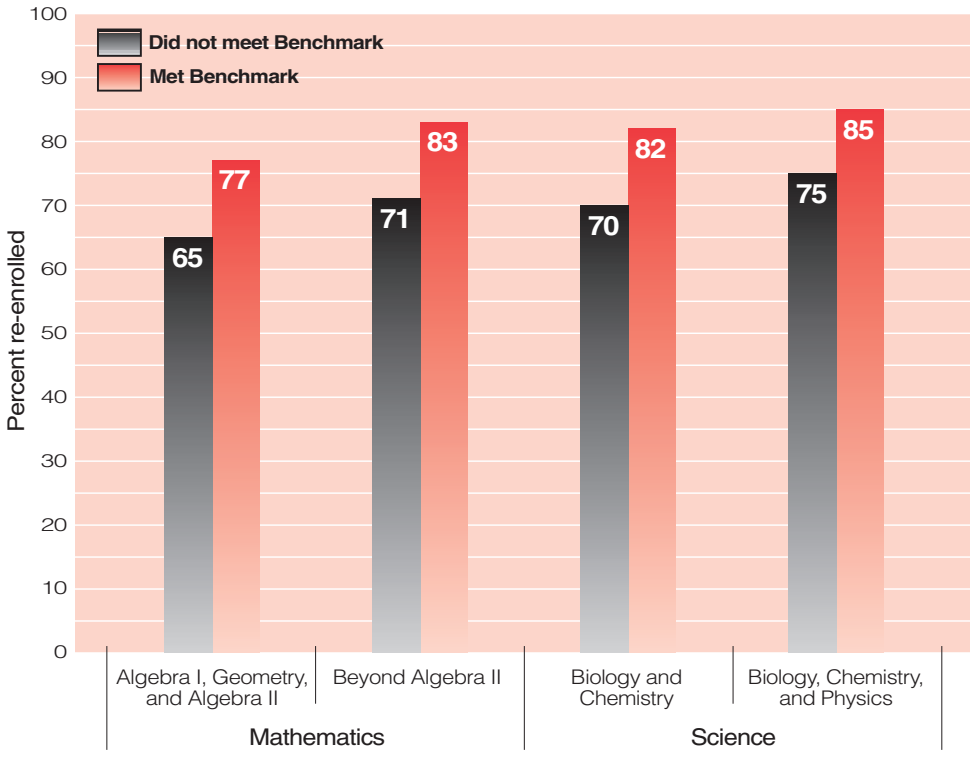


Figure 23: Students Achieving a B or Higher Grade in First-Year College Mathematics Courses, by ACT College Readiness Benchmark Attainment and High School Coursework in Mathematics

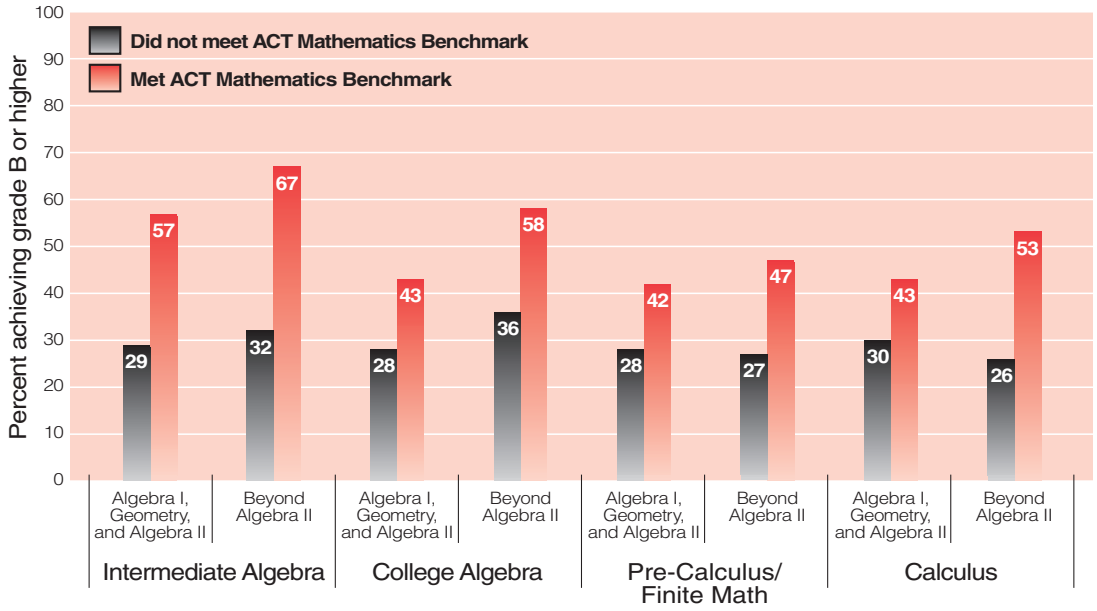
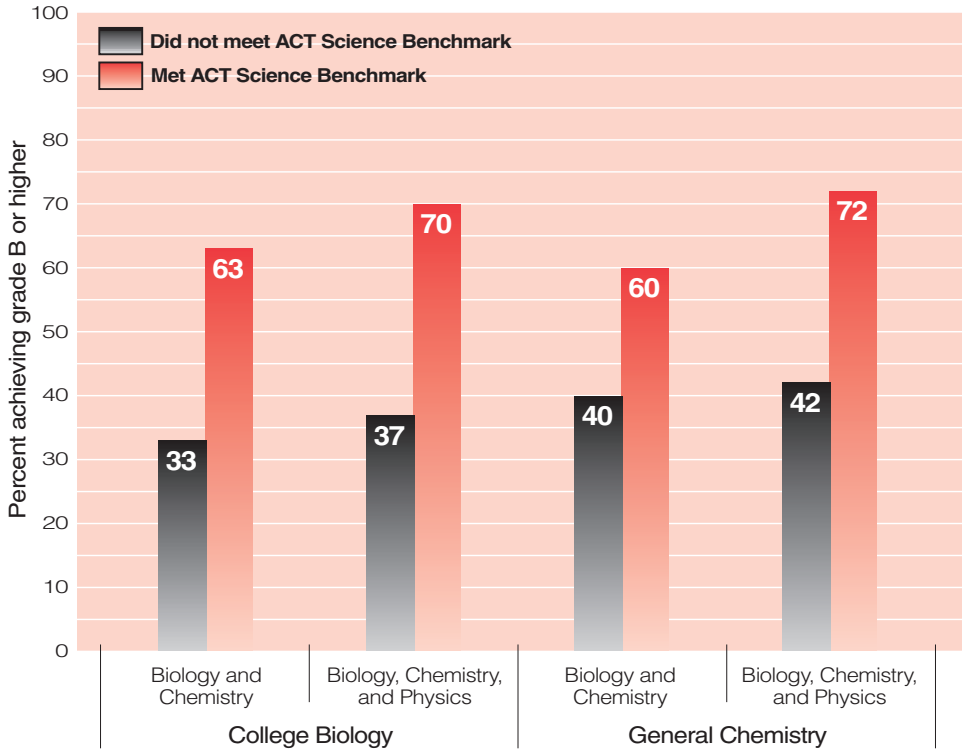


Figure 24: Students Achieving a B or Higher Grade in First-Year College Science Courses, by ACT College Readiness Benchmark Attainment and High School Coursework in Science



Moreover, ACT has found that students from high schools with rigorous Algebra II or Chemistry courses are more likely to be ready for college in mathematics and science than high school graduates nationally (ACT, 2007).[9] Students from these high schools are also more likely to enroll in college the fall following high school graduation and to return to the same institution their second year than high school graduates nationally. Thus, not only is taking the right *number* of courses important, but taking the right *kind* of courses, and doing well in them, are critical to student readiness for college-level work.

Alignment of standards among K–12, postsecondary education, and the workplace and enactment of education policies that support college and career readiness are critical in order for students to succeed after high school.

In most states, current high school curriculum requirements are not aligned with the academic requirements for success in college (U.S. Department of Education, National Center for Education Statistics, 2002). In matching state standards with ACT's College Readiness Standards™, we find that state high school curriculum standards typically lack the complex knowledge and skills needed for postsecondary education. Moreover, state standards often lack the applied standards that people use on the job (Carnevale & Desrochers, 2003). Somerville and Yi (2002) found that there was very little consensus between K–12 and postsecondary systems on the courses and topics students should cover in high school. Results from a new ACT survey support this finding, suggesting that there are perceptual gaps between high school teachers and college instructors regarding the current state of preparedness of high school graduates for college and the skills needed to be adequately prepared to be successful in college.

ACT's latest National Curriculum Survey® (ACT, 2009a) highlights disparities between the knowledge and skills that high school teachers deem important for students to learn in high school and the skills and knowledge that college instructors identify as important in entry-level credit-bearing college courses. High school teachers and college instructors also differ greatly in how well they believe their state's learning standards prepare students for college-level work, with college instructors being about two-and-a-half times less likely to assert that students are "well" or "very well" prepared. In another survey (Sanoff, 2006), 84 percent of college faculty members

[9] Schools with rigorous Algebra II courses were identified as having the largest increases in average ACT Mathematics Test scores among students taking Algebra I, Geometry, and Algebra II as compared to those taking Algebra I and Geometry only. Schools with rigorous Chemistry courses were identified as having the largest increases in average ACT Science Test scores among students taking Biology and Chemistry as compared to those taking Biology only.

indicated that high school graduates are either unprepared or insufficiently prepared to pursue a college degree, compared to 65 percent of high school teachers who indicated this. With discrepancies existing among high school standards, graduation requirements, course content, and workforce expectations, it is not surprising that many students are not acquiring the skills and knowledge they need to enter the workforce or postsecondary education—even though they may meet state requirements for graduation. Secondary and postsecondary institutions need to be consistent about the knowledge and skills required of incoming college students in order for them to be successful (The Education Trust, 1999; Pathways to College Network, 2004).

The Council of Chief State School Officers (CCSSO) and the National Governors Association (NGA) Center for Best Practices recently joined to coordinate the Common Core State Standards Initiative, a state-led effort to develop and adopt a common core of rigorous high school standards that will align with college and work expectations and be internationally benchmarked (Council of Chief State School Officers, 2009). As of September 2009, forty-eight states and the District of Columbia had joined this initiative. In addition, twenty-eight states and the District of Columbia have implemented or will implement a default high school curriculum that is intended to prepare all students for college or work. In six of these latter states and the District of Columbia, course and diploma requirements are mandatory—students are not permitted to opt out of some or all of the default curriculum at their parents' discretion (Achieve, 2009).

Summary

Table 1 summarizes the academic factors discussed in this chapter that ACT research shows are directly related to college success: college readiness (defined as meeting ACT's College Readiness Benchmarks), taking the ACT-recommended core curriculum in high school, and taking additional high school coursework beyond core in mathematics and science. Success in college was defined by four indicators: first-year enrollment (immediately following high school graduation), first- to second-year retention, earning a grade of B or higher in selected first-year courses, and earning a first-year GPA of 3.0 or higher. In Study 2, we also showed that college readiness, taking a core curriculum, and taking additional mathematics and science coursework beyond core all positively influence college readiness and decrease the need for remedial English or mathematics coursework in the first year of college.

Table 1: Academic Factors Related to Success in College

Academic Factors	College Success Indicators				
	First-year enrollment	First- to second-year retention	B or higher grade in first-year courses	First-year GPA of 3.0 or higher	Decreased need for remedial English or mathematics coursework
College readiness	✔	✔	✔	✔	✔
Core curriculum	✔	✔	✔	✔	✔
Additional mathematics coursework	✔	✔	✔	✔	✔
Additional science coursework	✔	✔	✔	✔	N/A

Although much still remains to be done, actions toward better preparation of students for all kinds of postsecondary education appear to be occurring. ACT research clearly shows that students who take the right courses and obtain the knowledge and skills necessary for success in college are more likely to enroll in college immediately following high school graduation and tend to be more successful during their first year of college than students who are unprepared for college.

However, too many students—particularly members of underrepresented racial/ethnic minority groups and students from lower-income families—are not yet taking the right courses, perpetuating achievement gaps in college readiness and college success. In the next chapter we show that, when all students are prepared for college, these gaps can be substantially reduced.

3.

College Readiness: The Key to Closing Achievement Gaps in College Success

Gaps in college enrollment rates, first-year college GPA, college retention rates, and college completion rates narrow substantially among high school students who are academically prepared for postsecondary education.

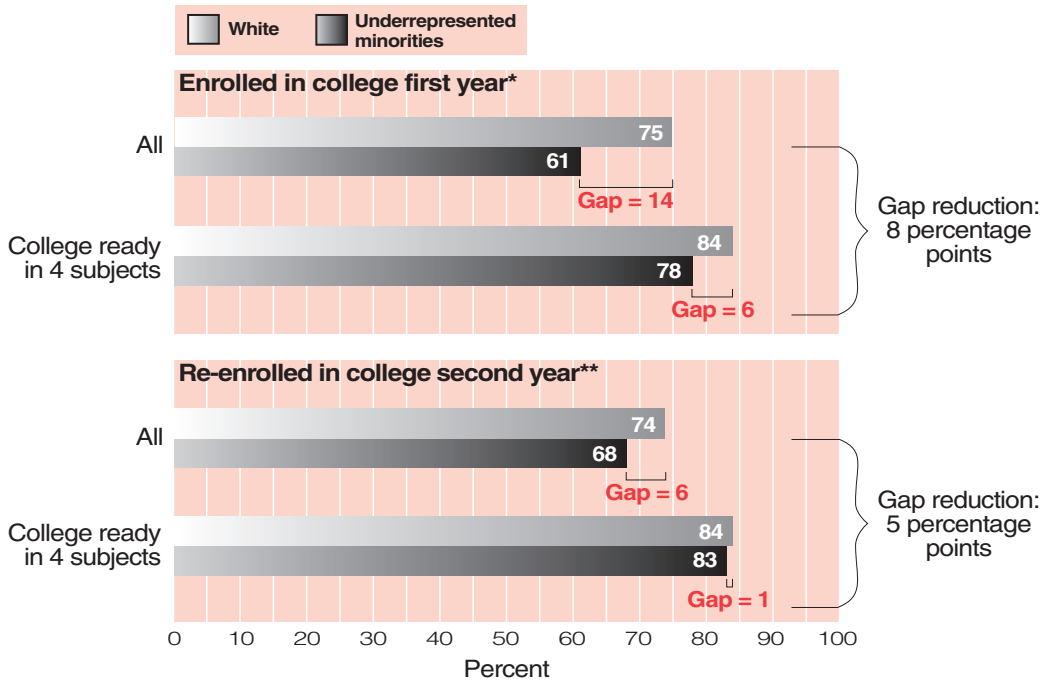
The factors discussed in the previous chapter clearly contribute to the lower college success rates seen among underrepresented racial/ethnic minority students and students from lower-income families. But regardless of race/ethnicity or annual family income range, students who are ready for college are more likely to enroll in college, re-enroll for a second year, succeed academically, and complete a degree than are those who are not ready. In this chapter we show that racial/ethnic and family income gaps in college success rates narrow among students who are ready for college.[10] Finally, we show that taking higher-level high school mathematics and science courses narrows racial/ethnic and family income gaps in college enrollment and retention.

Gaps in enrollment and first-year college success rates among racial/ethnic and family income groups are reduced for students who are ready for college.

The racial/ethnic gap in the percentage of all ACT-tested high school graduates enrolling in college the fall following high school graduation is 14 points; the gap shrinks by more than half to 6 percentage points among those who are ready for college in all four subjects. The racial/ethnic gap in the percentage of all first-year college students re-enrolling for a second year at the same institution is 6 percentage points; among those who are ready for college in all four subjects, this gap narrows to 1 percentage point (Figure 25).

[10] We defined racial/ethnic gaps as the differences in college success rates between White students and underrepresented racial/ethnic minority students, and family income gaps as the differences in college success rates between students whose annual family income is greater than $100,000 and students whose annual family income is less than $30,000.

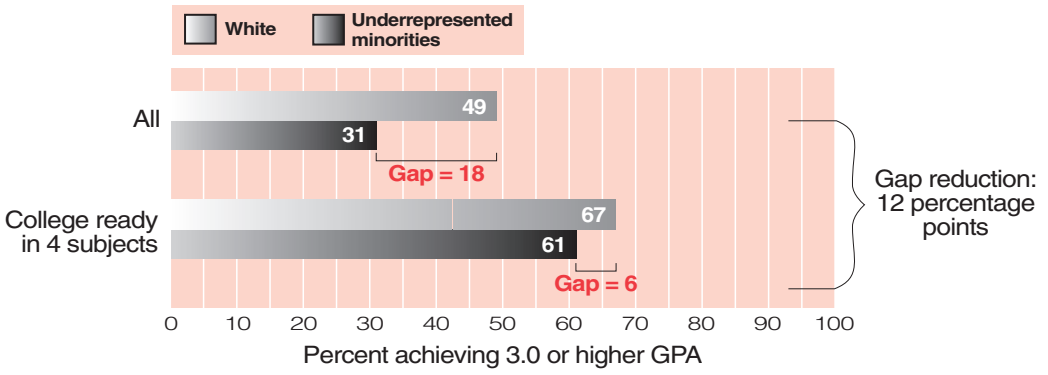
Figure 25: Reductions in Racial/Ethnic Gaps in College Enrollment and Retention Rates Associated with Meeting All Four ACT College Readiness Benchmarks



* Based on ACT-tested high school graduates
** Based on students enrolled their first year in postsecondary education

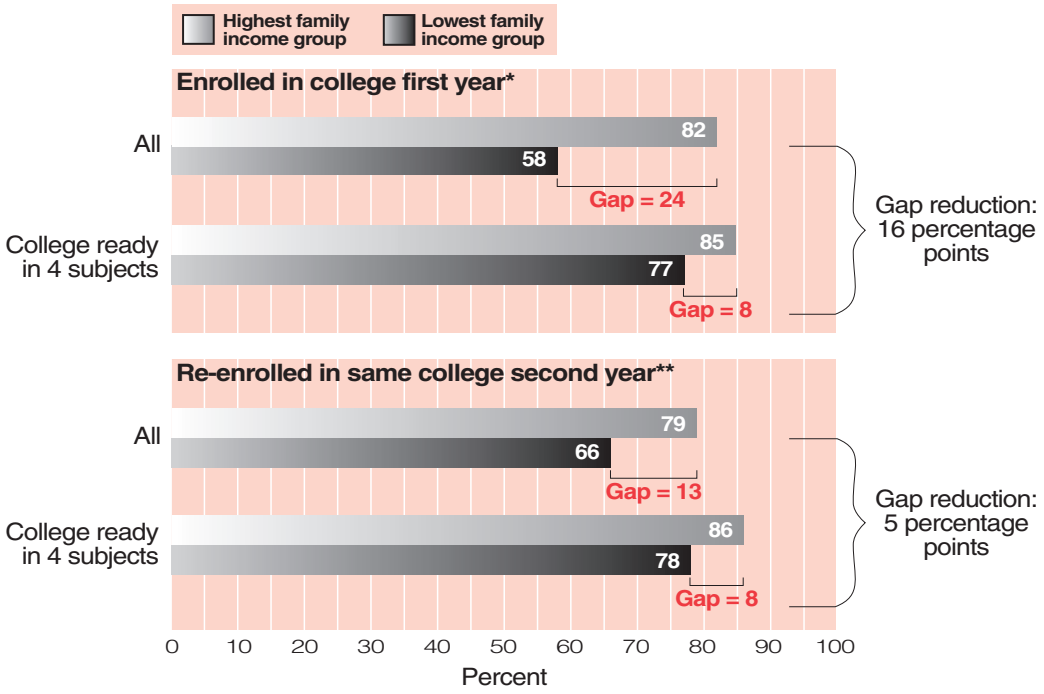
Likewise, the racial/ethnic gap in the percentage of all first-year college students earning a GPA of 3.0 or higher is 18 percentage points; among those who are ready for college in all four subjects, the gap shrinks to 6 percentage points—a reduction of two-thirds (Figure 26).

Figure 26: Reduction in Racial/Ethnic Gap in Percentage of First-Year College Students Achieving a GPA of 3.0 or Higher Associated with Meeting All Four ACT College Readiness Benchmarks



Similarly, family income gaps in college success rates narrow among students who are ready for college in all four subjects. The gap between the highest and lowest annual family income ranges in college enrollment rates is 24 percentage points. This gap narrows by two-thirds to 8 percentage points among students who are ready for college in all four subjects (Figure 27). The family income gap in retention rates also decreases among students who are ready for college in all four subjects, from 13 to 8 percentage points.

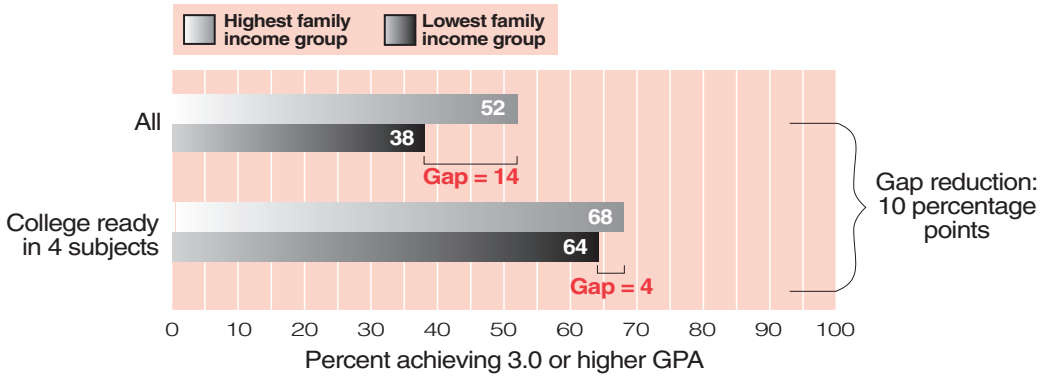
Figure 27: Reductions in Family Income Gaps in College Enrollment and Retention Rates Associated with Meeting All Four ACT College Readiness Benchmarks



* Based on ACT-tested high school graduates
** Based on students enrolled their first year in postsecondary education

Likewise, the family income gap in the percentage of all first-year college students earning a 3.0 GPA or higher is 14 percentage points. This gap is reduced by more than 70 percent to 4 percentage points among students who are ready for college in all four subjects (Figure 28).

Figure 28: Reduction in Family Income Gap in Percentage of First-Year College Students Achieving a GPA of 3.0 or Higher Associated with Meeting All Four ACT College Readiness Benchmarks

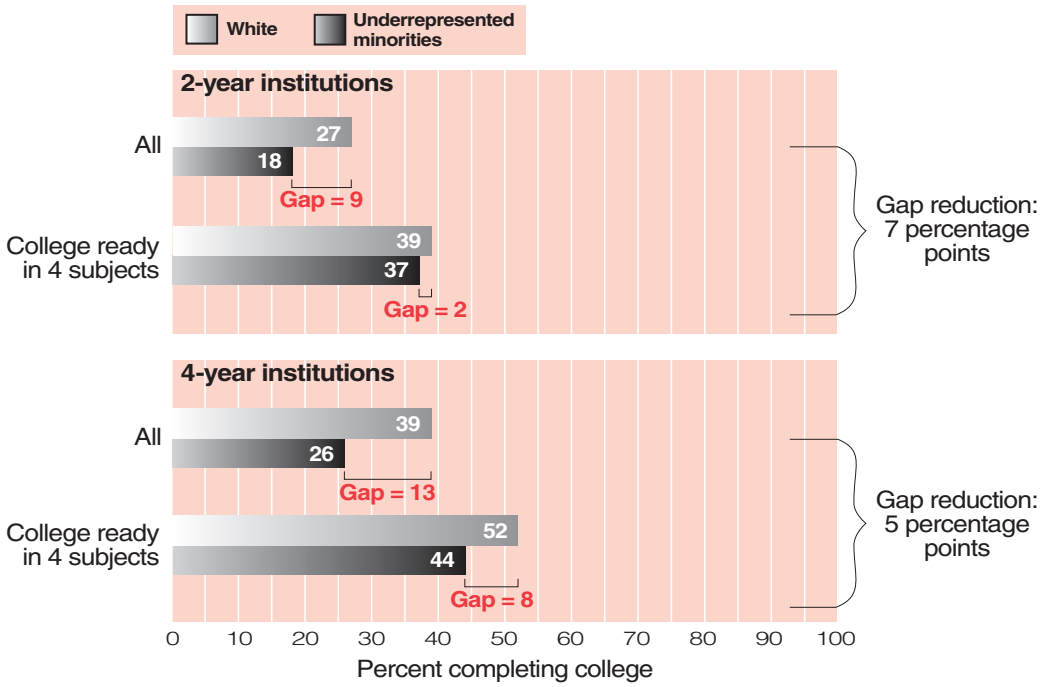


Gaps in college degree completion rates among racial/ethnic groups are reduced among students who are ready for college.

As important as enrollment, persistence, and academic success are, degree completion is the ultimate goal of most college students. We found that students who are ready for college are more likely to earn a college degree, and that racial/ethnic gaps among these students are reduced.

The gap between underrepresented racial/ethnic minority students and White students in college completion rates by year 5 narrows among students who are ready for college. At two-year institutions, the gap in associate's degree completion rates narrows from 9 to 2 percentage points among students who are ready for college in all four subjects (Figure 29). At four-year institutions, the gap for college completion within five years narrows from 13 to 8 percentage points among those who are ready for college in all four subjects.

Figure 29: Reductions in Racial/Ethnic Gaps in College Degree Completion Rates Associated with Meeting All Four ACT College Readiness Benchmarks, by Type of Postsecondary Institution



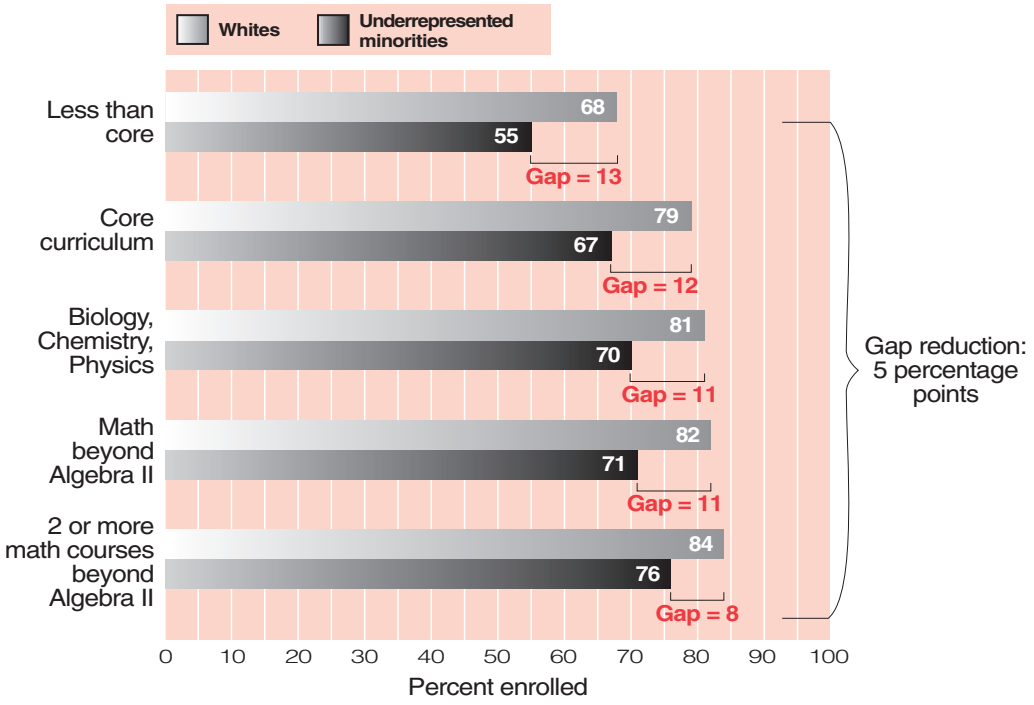
Taking a core curriculum and higher-level mathematics and science courses beyond core reduces racial/ethnic gaps and family income gaps in college enrollment and retention.

According to research at ACT and elsewhere, high school course selection is critical to college preparation (e.g., ACT, 2005; ACT & The Education Trust, 2004). ACT recommends that college-going students take both a core curriculum and higher-level courses in the core subjects (ACT, 2004, 2007).

ACT research confirms that high school students who take more and higher-level mathematics and science courses are more likely to enroll in college the fall after high school graduation, earn a higher first-year GPA, and re-enroll for a second year at the same institution (Noble, Maxey, Radunzel, & Habley, 2006; Noble & Radunzel, 2007). Students who take higher-level high school mathematics courses (e.g., Trigonometry, Calculus) are also two to three times less likely to take college remedial coursework in mathematics than are students who take at most Algebra I, Geometry, and Algebra II. Moreover, racial/ethnic and family income college enrollment gaps narrow among students who take a core curriculum and/or higher-level courses in high school.

The racial/ethnic gap in college enrollment rates narrows from 14 percentage points for all students (Figure 25) to 12 percentage points for high school graduates who took a core curriculum (Figure 30). The racial/ethnic gap further narrows to 11 points among graduates who took higher-level mathematics courses beyond Algebra II or higher-level science courses beyond Chemistry, and to 8 points among students who took two or more higher-level mathematics courses.[11]

Figure 30: Reduction in Racial/Ethnic Gap in College Enrollment Rates, by High School Course Selection

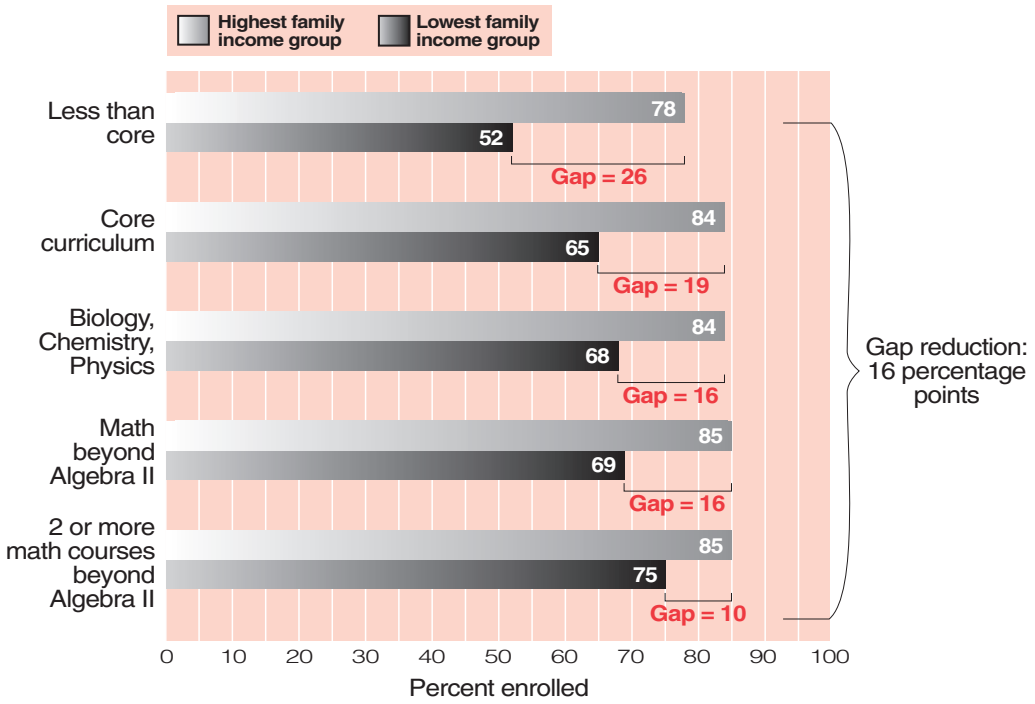


The racial/ethnic gap in retention rates also narrows among high school graduates who took a core curriculum or higher-level mathematics or science courses: a gap of 6 percentage points shrinks to 3 points among those who took two or more higher-level mathematics courses beyond Algebra II.

A similar dynamic occurs across annual family income ranges (Figure 31). Compared to the enrollment and retention gaps for all students, these gaps narrow among high school graduates who took a core curriculum or higher-level mathematics and science courses: from 24 percentage points (Figure 27) to 10 percentage points for enrollment—nearly a 60 percent reduction—and from 13 percentage points to 9 percentage points for retention.

[11] "Beyond Algebra II" includes at least one higher-level course, such as Trigonometry or Calculus; "beyond Chemistry" includes Physics.

Figure 31: Reductions in Family Income Gaps in College Enrollment Rates, by High School Course Selection



Summary

Racial/ethnic and family income gaps in college enrollment, college retention, college course grades, and college degree completion are substantially smaller among students who are ready for college. In addition, taking higher-level high school mathematics and science courses narrows racial/ethnic and family income gaps in college enrollment and retention rates.

A study that examined ten high schools where the student population was at least 40 percent minority and/or at least 50 percent lower-income (ACT & The Education Trust, 2004) found that when students are provided with high-level courses, qualified and experienced teachers, teaching that is flexible and responsive to the students, and extra support when they need it, *all* students—regardless of achievement level—are much better prepared for college and career. We need to ensure that all students, including underrepresented racial/ethnic minority students and students from lower-income families, have access to high school coursework that is of sufficient depth and intensity to adequately prepare them for college and career, and that they are given better guidance to eliminate the discrepancies that exist between their educational aspirations and the high school coursework they plan to complete to be prepared to meet these aspirations.

In the next chapter, based on the research results reported here, we recommend several steps that educators and policymakers can take to help provide these and other benefits to all students in order to begin closing the gaps.

4.

Recommendations

From individual students to the nation as a whole, everyone benefits when students are well prepared for their future goals, regardless of whether they plan to enter workforce training programs immediately after high school or plan to enroll in some other form of postsecondary education. In this report we have shown that there are clear reasons why some underrepresented racial/ethnic minority students and students from lower-income families are not well prepared, and that there are steps we can take to advance their readiness for college.

Policymakers and educators have the power to help these students substantially narrow the achievement gaps that currently prevent them from taking full advantage of the college experience. With this goal in mind, we offer the following recommendations:

1. **Close the gap between student aspirations and high school course plans by ensuring that all students take at least a core curriculum in high school.** Although most students aspire to postsecondary education, aspirations alone are not enough. We need to ensure that all students, especially those from underrepresented racial/ethnic groups and lower-income families, are offered guidance to connect their educational aspirations to solid academic preparation. This can be accomplished by making sure that all students take a core preparatory curriculum in high school, regardless of whether they aspire to college or career directly after high school. Core preparatory work can be academic or career focused, but should be based on the same standards. Since ACT research suggests that the level of mathematics and reading skills needed to be ready for success in workforce training programs is comparable to that needed for success in the first year of college (ACT, 2006), all students need to take a core curriculum in high school that prepares them for college *and* career.

   While academic achievement is foundational to college readiness, certain academic behaviors play a supplemental role in helping students become ready for college. Developing these behaviors (for example, academic discipline, orderly conduct, and having positive relationships with school personnel) can help all students improve their academic achievement and become ready for college and career (ACT, 2008).

Implementation of monitoring and intervention strategies as early as 6th grade offers educators ample time to identify needs and intervene when beneficial academic behaviors need additional support. Waiting until the end of high school to determine if a student has developed habits that will support college and career readiness is too late for effective intervention (Noeth & Wimberly, 2002; Wimberly & Noeth, 2005). Programs such as Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) are aligned with this approach, in that they provide supplemental services to students for improving their academic behaviors beginning no later than the 7th grade (ACT & The National Council for Community and Education Partnerships, 2007).

2. **Close the gap in the alignment of high school courses with college and career readiness standards by focusing high school core courses on the essential standards for college and career readiness.** Not all academic standards are the same. High-quality, empirically derived college and career readiness standards lead students and educators in the right direction because they are anchored by known postsecondary academic and workplace requirements. Moreover, the most important content and performance standards—embedded in the core curriculum—are common to both college and career readiness. They may be taught in different contexts and use different source materials, but to a large degree they comprise the same essential knowledge and skills (ACT, 2006). ACT's College Readiness Standards are precise descriptions of the essential skills and knowledge that students need to become ready for college and career, beginning in grade 8 and continuing through grade 12. Validated by actual student academic performance data, the College Readiness Standards represent a single academic expectation for all students, regardless of whether they go on to college or career after high school. ACT data have also been used in the Common Core State Standards Initiative, which is a promising step in the direction of establishing rigorous college and career readiness standards for the vast majority of students nationwide.

3. **Close the gap in the quality of high school courses across schools by offering all students rigorous high school core courses that cover the essential knowledge and skills needed for college and career in sufficient depth and intensity.** K–12 course titles can be deceiving: courses with the same title can vary widely in quality and intensity across schools (ACT, 2004; Dougherty, Mellor, & Jian, 2006). The more students learn during their K–12 education, however, the better prepared they are for college, and they learn more in rigorous courses, irrespective of

course name (ACT, 2007; ACT & The Education Trust, 2004; Adelman, 1999; National Commission on the High School Senior Year, 2001). All students, even those planning to enter workforce training immediately after high school, need to have the opportunity to take a rigorous core curriculum (ACT, 2006).

We must ensure that all students, including those from underrepresented racial/ethnic minority groups and lower-income families, have access to high-quality high school courses taught by teachers who are qualified to teach courses of sufficient depth and intensity to adequately prepare students for college and career—and that these students are provided with supplemental instruction as needed to succeed in those courses. Students who arrive from middle school already behind academically must get the extra help they need. If they can get this help before and during their first year of high school, they may still be able to fully benefit from a rigorous high school curriculum (ACT, 2008).

Conclusion

Students—especially underrepresented racial/ethnic minority students and students from lower-income families—must be prepared to compete in today's highly technology-based economy, where many of the jobs now being created require at least some postsecondary education training or the skills and knowledge equivalent to those expected of first-year college students. Most students aspire to at least some college, but discrepancies exist between their educational aspirations and the coursework they complete in high school.

With demographic projections indicating that currently underrepresented racial/ethnic minority groups will comprise almost 40 percent of the U.S. population by 2020 and 50 percent by 2050 (U.S. Census Bureau, 2004), persistent gaps in college success among racial/ethnic and family income groups become untenable.

Most Americans believe that all students, regardless of background, can and should have the opportunity to succeed. Narrowing the racial/ethnic and family income gaps in college success will reduce disparities in personal opportunities while simultaneously increasing the number of U.S. college graduates.

To help narrow these gaps, we must ensure that students are academically prepared. Such preparation consists mostly of taking rigorous coursework in high school. The results are clear: students who are ready for college, who take a core curriculum, and who take additional mathematics and science coursework in high school are more likely than those who are not ready for college and do not take challenging high school coursework to enroll in college the fall following high school graduation, to persist to their second year of

college, and to be successful in their first-year college courses, and are also less likely to require remedial English or mathematics coursework in college. This holds true for all students, regardless of their race/ethnicity or annual family income range.

Racial/ethnic and family income gaps may seem large and persistent, but research offers a straightforward remedy: help to ensure that underrepresented racial/ethnic minority students and students from lower-income families are ready for the challenges of postsecondary education through a rigorous core curriculum that is clearly focused on the essential knowledge and skills for college and career readiness. Gaps in several measures of college success across racial/ethnic and family income groups narrow substantially—in some cases by more than half—when all students are ready for college.

We also need to ensure that college and career readiness standards are aligned among K–12, postsecondary education, and the workplace. Education policies at all levels must be enacted to support college and career readiness.

In addition, we need to monitor student readiness for college and career early and often. We also need to provide guidance to students that ensures that they are well informed about the steps they need to take to achieve their career and educational goals.

Helping to prepare all students to benefit equally from postsecondary education and training should be the mission of every high school in the nation. And the research presented in this report leads to recommendations for making this happen. By making sure that all students become ready for college and career—in particular, by ensuring that high school core course offerings are rigorous and that all students are given the opportunity to take additional, higher-level coursework beyond core in mathematics and science—some of our country's seemingly most intransigent social disparities can be reduced.

Appendix

The analysis underlying this report comprises several studies incorporating individual student records collected by ACT through one or more of its assessments. We identified postsecondary outcomes of ACT-tested high school graduates by matching our records to those acquired from various data sources, such as the National Student Clearinghouse. These data sources are described below.

College enrollment analysis. Data are from students from the 2007 ACT-tested high school graduating class who enrolled in a postsecondary institution the fall following graduation, according to the National Student Clearinghouse database. Enrollment rates are based on approximately 152,400 African American students, 14,000 American Indian students, 42,300 Asian American students, 93,100 Hispanic students, and 779,100 White students who took the ACT and indicated that they would graduate from high school in 2007.

A subsample of ACT-tested 2007 high school graduates who provided family income data included approximately 224,300 students whose annual family income was less than $30,000; 285,900 students whose annual family income was between $30,000 and $60,000; 228,900 students whose annual family income was between $60,000 and $100,000; and 130,500 students whose annual family income was greater than $100,000.

College remediation analysis. Data are from multiple years from postsecondary institutions included in ACT's High School to College Success Reports. Approximately 92,500 students from three states were included in the analysis for remedial English, and 101,500 students in the analysis for remedial mathematics. Remediation rates were analyzed by state, due to differing remediation policies across states.

During the 2000–01 academic year, remedial education courses were offered by 98 percent of all public two-year higher education institutions, 80 percent of public four-year institutions, and 59 percent of private four-year institutions. That same year, 21 percent of all postsecondary institutions offered additional remedial education services to local businesses (Parsad & Lewis, 2003).

College first- to second-year retention analysis. Data are from students in the ACT-tested 2007 high school graduating class who enrolled in a postsecondary institution the fall immediately after graduation and then re-enrolled at the same institution the following fall, according to the National Student Clearinghouse database. Retention rates are based on approximately 95,400 African American students, 7,200 American Indian students, 31,500 Asian American students, 55,300 Hispanic students, and 582,200 White students from the ACT-tested 2007 graduating class who enrolled in a postsecondary institution the fall immediately after graduation.

A subsample of ACT-tested 2007 high school graduates who provided family income data and enrolled in a postsecondary institution the fall immediately after graduation included approximately 130,700 students whose annual family income was less than $30,000; 198,300 students whose annual family income was between $30,000 and $60,000; 179,100 students whose annual family income was between $60,000 and $100,000; and 106,600 students whose annual family income was greater than $100,000.

College course grade analysis. Data are from multiple years from postsecondary institutions participating in ACT's Course Placement Service. Approximately 99,000 students were included in the analysis for English Composition I; 10,000 for English Composition II; 6,500 for Intermediate Algebra; 17,500 for College Algebra; 7,500 for Pre-Calculus/Finite Math; 5,500 for Calculus; 6,500 for American History; 7,000 for Psychology; and 4,000 for Biology and Chemistry.

Depending on the college course, the breakdown of racial/ethnic group membership was 500 to 15,000 underrepresented racial/ethnic minority students (i.e., African American, American Indian, Hispanic, and Multiracial students) and 2,700 to 76,400 White students. Depending on the college course, the breakdown of annual family ranges was: 500 to 22,600 students whose annual family income was less than $30,000; 1,200 to 36,300 students whose annual family income was between $30,000 to $60,000; 1,000 to 20,000 students whose annual family income was between $60,000 to $100,000; and 500 to 6,400 students whose annual family income was greater than $100,000.

College GPA analysis. Data are from multiple years from postsecondary institutions included in ACT's High School to College Success Reports. Approximately 302,000 students were included in the GPA analysis, of which approximately 25,000 were African American, 8,700 were American Indian, 6,500 were Asian American, 5,600 were Hispanic, and 220,000 were White.

A family income subsample included approximately 59,000 students whose annual family income was less than $30,000; 100,000 students whose annual family income was between $30,000 and $60,000; 62,000 students whose annual family income was between $60,000 and $100,000; and 24,000 students whose annual family income was greater than $100,000.

College degree completion analysis. Unlike in the other analyses, the methodology used for the college degree completion analysis permitted data censoring and allowed examination of outcomes through year 5 for both two- and four-year institutions. A large majority of both the two- and four-year institutions came from the North Central accreditation region. Moreover, most of the four-year institutions and all of the two-year institutions were public institutions.

Four-year institutions included in the study were required to have at least four years of follow-up data available on their students. Two-year institutions were required to have at least three years of follow-up data available.

Comparisons were made between White students and underrepresented racial/ethnic minority students. For four-year institutions, the composition of the latter group was 68 percent African American, 12 percent Hispanic, and 20 percent American Indian students; for two-year institutions it was 66 percent African American, 10 percent Hispanic, and 24 percent American Indian students. (Note: the number of underrepresented racial/ethnic minority students at two-year institutions who met all four ACT College Readiness Benchmarks was relatively small—fewer than 170 individuals.)

EXPLORE, PLAN, and the ACT

EXPLORE, PLAN, and the ACT, the three programs that make up the longitudinal assessment component of ACT's College and Career Readiness System, each consist of four tests: English, Mathematics, Reading, and Science. Students who take the ACT are also given the option of taking the ACT Writing Test. The skills assessed in each of these five tests are summarized below.

English. The questions in the English tests assess six elements of effective writing in the two broad categories of usage and mechanics (punctuation, grammar and usage, sentence structure) and rhetorical skills (strategy, organization, style). Spelling, vocabulary, and rote recall of rules of grammar are not tested. The revising and editing issues posed by the questions offer a certain richness and complexity. While some questions require students to apply their knowledge of standard written English to the task of deciding the best

way to write a sentence or sentences, the surrounding context makes the overriding issue that of clear and effective communication of meaning.

Mathematics. The questions in the Mathematics tests cover four cognitive levels: Knowledge and Skills, Direct Application, Understanding Concepts, and Integrating Conceptual Understanding. Knowledge and Skills questions require the student to use one or more facts, definitions, formulas, or procedures to solve problems that are presented in purely mathematical terms. Direct Application questions require the student to use one or more facts, definitions, formulas, or procedures to solve straightforward problems set in real-world situations. Understanding Concepts questions test the student's depth of understanding of major concepts by requiring reasoning from a concept to reach an inference or a conclusion. Integrating Conceptual Understanding questions test the student's ability to achieve an integrated understanding of two or more major concepts to solve non-routine problems.

Reading. The questions in the Reading tests require the student to derive meaning from texts by referring to what is explicitly stated and reasoning to determine implicit meanings and to draw conclusions, comparisons, and generalizations. Questions do not test the rote recall of facts from outside the text, isolated vocabulary items, or rules of formal logic. Rather, the test focuses on the complementary and mutually supportive skills that readers must bring to bear in studying written materials across a range of subject areas.

Science. The questions in the Science tests measure students' mastery of the interpretation, analysis, evaluation, reasoning, and problem-solving skills required in the natural sciences. The questions require students to recognize and understand the basic features of, and concepts related to, the provided information; to examine critically the relationships between the information provided and the conclusions drawn or hypotheses developed; and to generalize from given information to gain new information, draw conclusions, or make predictions. The questions emphasize scientific reasoning skills rather than recall of scientific content, skill in mathematics, or pure reading ability. The tests pose the kinds of questions that college students of science must answer in planning, carrying out, and evaluating scientific investigations and in studying scientific theories.

Writing. The ACT Writing Test is an achievement test designed to measure students' writing proficiency. It was developed to reflect the type of writing found in rigorous high school writing curricula and expected of students entering first-year college composition courses. The Writing Test consists of one writing prompt that briefly states an issue and describes two points of view on that issue. Students are

asked to write in response to a question about their position on the issue described in the writing prompt. In doing so, students may adopt one or the other of the perspectives described in the prompt, or they may present a different point of view on the issue. Students' scores are not affected by the point of view they take on the issue. Prompts are designed to be appropriate for response in a 30-minute timed test and to reflect students' interests and experiences.

ACT's College Readiness Benchmarks

We work with colleges to help them develop guidelines that place students in courses that are appropriate for their level of achievement as measured by the ACT. In doing this work, we have gathered course grade and test score data from a large number of first-year students and across a wide range of postsecondary institutions. These data provide an overall measure of what it takes to be successful in a standard first-year college course. Data from 98 institutions and more than 90,000 students were used to establish the ACT College Readiness Benchmarks, which are median course placement scores that are directly reflective of student success in a college course.

ACT's College Readiness Benchmarks

Test	EXPLORE	PLAN	The ACT
English	13	15	18
Mathematics	17	19	22
Reading	15	17	21
Science	20	21	24

Success here is defined as approximately a 75 percent chance that a student will earn a grade of C or better, or a 50 percent chance that a student will earn a grade of B or better. The courses are the ones most commonly taken by first-year college students in the areas of English, mathematics, social sciences, and natural sciences, namely: English Composition; College Algebra; History, Psychology, Sociology, Political Science, and Economics; and Biology, respectively. The ACT scores established as College Readiness Benchmarks are 18 on the English Test, 22 on the Mathematics Test, 21 on the Reading Test, and 24 on the Science Test (ACT, 2005).

The College Readiness Benchmarks were based upon a sample of postsecondary institutions from across the U.S. The data from these institutions were weighted to reflect postsecondary institutions nationally. The Benchmarks are median course placement values for these institutions and as such represent a typical set of expectations; we also work with individual postsecondary institutions, or groups of institutions within a state, to conduct validation studies to establish local benchmarks that take specific institutional and student characteristics into account.

In addition, we have established scores on EXPLORE and PLAN that correspond to the College Readiness Benchmarks for the ACT. These scores indicate, based on their performance on EXPLORE (grades 8 and 9) and PLAN (grade 10), whether students are on target to be ready for college-level work when they graduate from high school. In EXPLORE, these scores are 13 on the English Test, 17 on the Mathematics Test, 15 on the Reading Test, and 20 on the Science Test; in PLAN, the scores are 15 on the English Test, 19 on the Mathematics Test, 17 on the Reading Test, and 21 on the Science Test.

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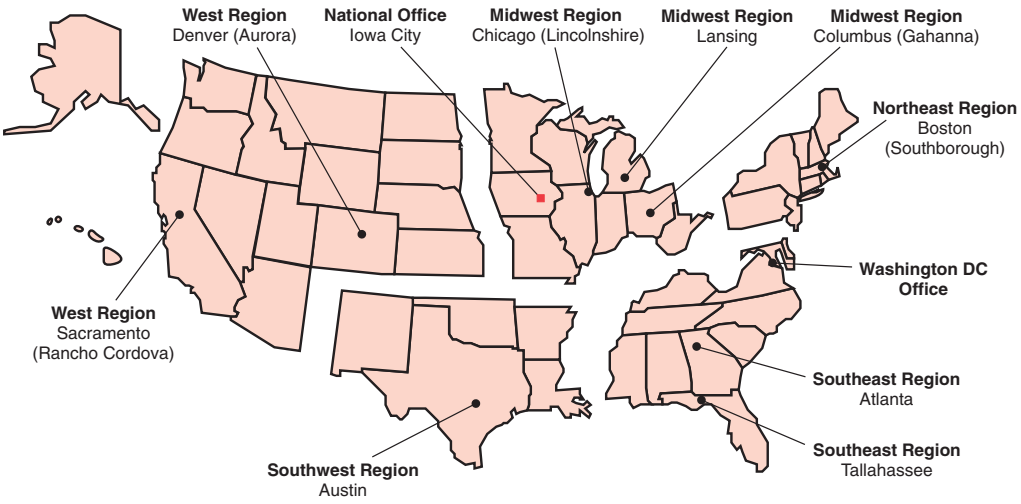

ACT National Office
500 ACT Drive
P.O. Box 168
Iowa City, Iowa 52243-0168
Telephone: 319/337-1000

Washington, DC Office
One Dupont Circle N.W.
Suite 340
Washington, DC 20036-1170
Telephone: 202/223-2318

West Region

Denver Office
3131 South Vaughn Way
Suite 218
Aurora, Colorado 80014-3507
Telephone: 303/337-3273

Sacramento Office
2880 Sunrise Boulevard
Suite 214
Rancho Cordova, California 95742-6103
Telephone: 916/631-9200

Midwest Region

Chicago Office
300 Knightsbridge Parkway
Suite 300
Lincolnshire, Illinois 60069-9498
Telephone: 847/634-2560

Columbus Office
700 Taylor Road
Suite 210
Gahanna, Ohio 43230-3318
Telephone: 614/470-9828

Michigan Office
1001 Centennial Way
Suite 400
Lansing, Michigan 48917-8249
Telephone: 517/327-5919

Southwest Region

Austin Office
8303 MoPac Expressway North
Suite A-110
Austin, Texas 78759-8393
Telephone: 512/345-1949

Northeast Region

Boston Office
144 Turnpike Road
Suite 370
Southborough, Massachusetts 01772-2121
Telephone: 508/229-0111

Southeast Region

Atlanta Office
3355 Lenox Road N.E.
Suite 320
Atlanta, Georgia 30326-1332
Telephone: 404/231-1952

Florida Office
1315 East Lafayette Street
Suite A
Tallahassee, Florida 32301-4757
Telephone: 850/878-2729

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