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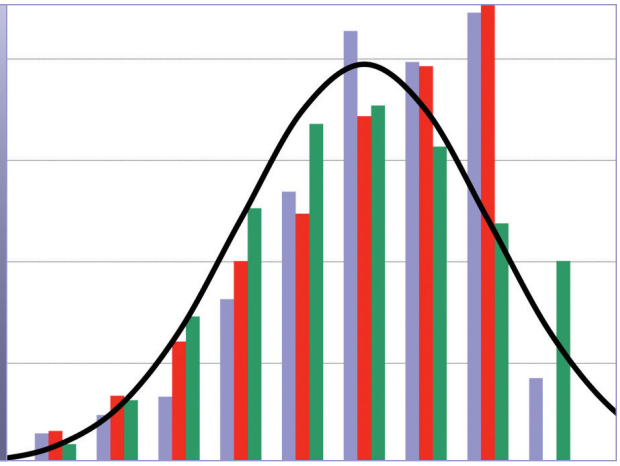

Implications of Educational Attainment Trends for Labor Market Outcomes

Richard Buddin

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Contents

Abstract

Well-educated workers have higher wages, higher wage growth, and lower unemployment rates than workers with lower levels of educational attainment. While earnings have traditionally grown with educational attainment, the gaps have become more pronounced in recent years. While returns to education have increased, this research shows that educational attainment has been stagnant or declining over the past decade. High school graduation rates have fallen from historic highs in the 1970's, college enrollment rates have leveled off, and college graduation rates are stable or declining. The research also examined patterns in educational attainment by race/ethnicity, gender, and 8th grade test scores. At risk minorities, males, and students with low 8th grade test scores had much less secondary and postsecondary success than other students. The achievement gaps persisted over the decade. Low educational attainment will leave many young workers with high unemployment rates, chronically low wages, and low wage growth.

Acknowledgements

The author is grateful to Jeff Allen, Kurt Burkum, Michelle Croft, Justine Radunzel, Richard Sawyer, and Jim Sconing for comments on earlier drafts of this report.

Implications of Educational Attainment Trends for Labor Market Outcomes

Introduction

A major challenge for educators and policymakers is to prepare U.S. youth for the modern labor market. In recent years, educational attainment levels have not kept pace with increased demand for high-skilled workers, so the returns to education have risen sharply (Lemieux, 2006; Autor, 2011). Earnings have traditionally risen with worker educational attainment, but these increases have become more pronounced over the past several decades. Forty years ago high school dropouts earned 64 percent as much as other workers, but current dropouts earn only 37 percent as much as others (Rouse, 2007).

Well-educated workers have much better labor market outcomes than workers with lower levels of educational attainment. In 2010, 23 percent of high school dropouts age 25 to 29 were unemployed as compared with unemployment rates of 15 percent for high school diploma graduates (HSDGs) and 6 percent for workers with a bachelor's degree (see Figure 1). Weekly earnings also differ substantially with education. HSDGs earn 18 percent more than students who leave high school early. Workers with 4-year degrees earn 60 percent more than HSDGs with no postsecondary training.[1] These earnings gaps increase as workers age, because wage growth is positively related to educational attainment. Among 45 to 49 year old workers, HSDGs earn 27 percent more than dropouts, and workers with 4-year degrees earn 95 percent more than HSDGs. These strong returns to secondary and post-secondary training provide strong incentives for students to complete high school, continue on to college, and earn post-secondary degrees.

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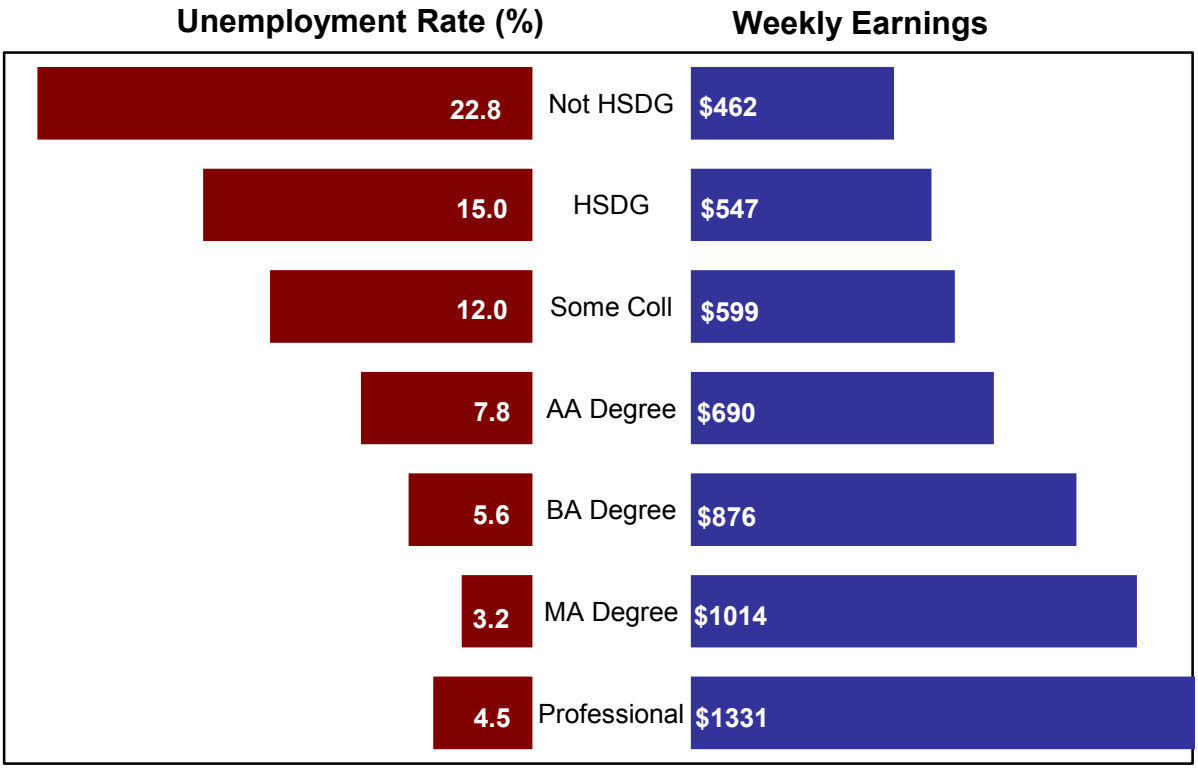
[1] The high unemployment rates in Figure 1 reflect the national recession in 2010. Unemployment rates for high school dropouts, HSDGs, and 4-year college graduates were 14, 9, and 3 percent in 2008. Weekly earnings were stagnant over this period, so the earnings gaps by education varied little between 2008 and 2010.



Source: American Community Survey 2010. Population is civilian nonstudents age 25-29 and in the labor force.

Figure 1. Unemployment rate and weekly earnings by educational attainment.

In addition to the financial advantages for individual workers, education provides substantial nonpecuniary and societal benefits. Several studies have shown that health behaviors and outcomes are positively related to educational attainment (Cutler & Lleras-Muney, 2010; Oreopoulos & Salvanes, 2011). Education also has positive effects on voting participation, community involvement, and crime (Moretti, 2004). A one-percentage point increase in high school completion rate would save about $1.4 billion per year in reduced cost of crime (Lochner & Moretti, 2004).

Despite these benefits, high school graduation rates have remained low, and many graduates lack sufficient skills for college and careers.

- Poor preparation for high school. Many middle school students are not on track to succeed in high school (Allensworth & Easton, 2005; ACT, 2008; Neild, 2009). High school dropouts are often students with multiple course failures, low achievement scores, and low school attendance rates in middle and elementary school (Zau & Betts, 2008).
- Declining high school graduation rates. The high school graduation rate has been about 75 percent for the past decade (Stillwell, Sable, & Plotts, 2011). In contrast, the graduation rate was about 80 percent in the late 1960s, when dropouts faced relatively better job opportunities than they do today (Heckman & LaFontaine, 2008).
- Low proficiency levels. Despite earning a degree, many high school completers are not proficient in basic academic skills needed for postsecondary education and careers, as measured by the National Assessment of Educational Progress. The percentage of twelfth-grade students at or above proficiency levels is 36, 26, 16, and 18 in reading, writing, mathematics, and science, respectively (National Center for Education Statistics, 2007).
- Weak preparation for college. Many college-bound seniors are inadequately prepared for the rigors of college classes. Over the past five years, only about 22 percent of high school graduates have sufficient academic skills to succeed in first-year college courses (ACT, 2011).[2] About 40 and 29 percent of freshman at 2- and 4-year colleges, respectively, take remedial classes each year at a cost of over $1 billion (Martorell & McFarlin, 2011; National Center for Education Statistics, 2011a).

[2] ACT has College Readiness Benchmarks in English, Mathematics, Reading, and Science (ACT, 2011). In 2011, about 22 percent of students met all four benchmarks. About 72 percent of students met at least one Benchmark.

> Students fall behind in college as they complete remedial classes, and this delay and additional enrollment cost is a major reason for many students dropping out of college (Venezia, Kirst, & Antonio, 2003).

Some groups of students have more difficulties than others. African American and Hispanic students have much lower educational attainment than White or Asian/Pacific Islanders. Similarly, students from low-income families are much less likely to persist in high school and college than are students from more affluent families. In recent years, males have had lower high school completion, college enrollment, and college completion rates than have female students.

Purpose

This study examines the levels and trends in educational attainment for recent youth cohorts, focusing on student progression through high school to possible college degree completion.[3] The high school graduation, college enrollment, and college degree completion rates for each age cohort translate into overall educational attainment rates for the future workforce. For example, high school dropouts thin the group of high school students eligible for post-secondary education. The success of educators in helping students navigate the wickets of secondary and post-secondary education will determine whether the future workforce will have sufficient skills to thrive and succeed in the modern economy.

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[3] Various types of cohorts or year groupings are discussed below—eighth grade graduation cohort, high school graduation cohort, college entry cohort, and college graduation cohort. A useful indication of education success is the share of eighth grade graduation cohorts that continue to various transitions like high school graduation, college enrollment, college persistence, and college degree attainment. This cycle from eighth grade through possible graduation from college takes 8 to 10 years, but the progress of students through various stages of the cycle shape the educational composition of each cohort and ultimately the workforce.

The study focuses on changes in high school graduation, college enrollment, and college degree completion rates over the past decade or, more accurately, the most current decade of data available for each measure. Earlier trends in these measures are discussed to provide context for the current trends.

The study does not focus on policies and reform efforts to improve educational attainment. While many initiatives have targeted improvements in high school and college success, our focus here is on the trends in educational attainment and how these trends have differed across various groups of students.

Data Sources

The analysis draws data from several sources. First, the National Center for Education Statistics (NCES) provides ongoing measures of high school graduation, college transition, and college degree completion rates. Second, ACT's Educational Planning and Analysis System (EPAS) is used to measure student-level progress for an 8th grade cohort of students through high school and possible college degree attainment.[4] The EPAS sample includes over 183,000 students from 1,300 schools. The NCES data provides a comprehensive indication of trends in key indicators, and the EPAS data provides more detailed information on student-level factors that affect student outcomes. Finally, labor market outcomes are based on data from the American Community Survey (ACS) and the Current Population Survey (CPS) March Supplement.

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[4] About two-thirds of EPAS students took the EXPLORE achievement test in the spring of their 8th grade term. The remainder took the test in the fall of 9th grade. The students are part of the 2009 high school graduation cohort. The 8th graders took the test in spring of the 2004-05 school year. The 9th graders took the test in the fall of the 2005-06 school year.

Overall Results

Our results show little improvement in educational attainment in recent years, and little progress toward meeting the demands for high skilled labor. High school graduation, college enrollment, and college degree attainment rates have shown little growth. Some groups of students have consistently better outcomes at each educational level. At-risk minority and male students have lower high school graduation, college transition, and college completion rates than do other students. Similarly, students from low socioeconomic status (SES) families or with low 8th grade test scores consistently do worse than other students in both secondary and post-secondary education. The gaps across the various groups have remained stable over the past several age cohorts of students. If these trends continue, many youth will enter the labor force with weak job skills and face careers in low paying jobs.

Study Organization

The remainder of this study is divided into five sections. Sections two, three, and four examine trends and levels of educational progress in terms of high school graduation, college enrollment, and college degree attainment. Each section examines how student outcomes vary with different demographic, background characteristics, and prior academic achievement.[5] The fifth section looks at the implications of current transition rates for the educational attainment levels of current cohorts of students, based on the educational progress trends. The final section draws conclusions and highlights a few promising programs for improving educational attainment.

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[5] The trends are generally on the ten year period of 2000 through 2009. In some cases, data for some of the variables were not available for the entire ten year period. More recent data are reported whenever possible, but many measures are not available for the most recent years.

High School Graduation

High school dropouts have much worse labor market outcomes than high school graduates, and the gaps have grown during the last decade. In 2001, high school graduates earned 23 percent more than dropouts.[6] By 2010, the gap had risen to 41 percent. About 16 percent of dropouts had an unemployment spell in 2001 as compared with 14 percent of high school graduates. In the recession of 2010, the unemployment spells were much more common for both groups, but 28 percent of dropouts had an unemployment spell as compared with 18 percent of high school graduates. The relative labor market success of dropouts is poor relative to high school graduates, and the gap has grown substantially in the past decade.

These comparisons of labor market outcomes are distorted by the fact the CPS counts holders of General Educational Development (GED) certificates as high school graduates. A wide body of research literature has shown that GED holders have labor market outcomes much worse than those of traditional high school diploma graduates and have outcomes similar to those of dropouts (Rouse, 2007; Heckman & LaFontaine, 2008; Tyler & Lofstrom, 2009). This evidence suggests that the labor market rewards for completing high school and earning a diploma are even greater than those suggested in the CPS data.

Why do dropouts earn less than high school graduates? A human capital explanation suggests that education improves skills that are important in the workplace. An alternative explanation is that students self-select their educational level based on their expected returns from additional schooling. This selection hypothesis implies that dropouts would benefit less

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[6] The earnings and unemployment calculations are based on fulltime workers of all ages in the CPS March Supplement for 2001 and 2010. These calculations differ somewhat from similar calculations from the ACS (see Figure 1). ACS has a much larger sample than the CPS, so the calculations in Figure 1 are based on young workers (age 25 through 29). ACS was not fully implemented until 2005, however, so the CPS was used to compare the 10-year changes in earnings and unemployment reported here.

from staying in school than other students, so the gaps would not be closed even if dropouts had continued in school. A variety of studies have attempted to test the human capital and selection hypotheses (Rouse, 2007). The evidence is largely consistent with the human capital hypothesis and suggests that dropouts would have substantial benefits from staying in school and earning a high school diploma.

While the rewards from high school graduation are clear, high schools face continuing problems in reducing the high school dropout rate. In 2009, about 76 percent of high school freshmen graduate in four years, and this rate has shown little movement over the past decade (see Figure 2).[7, 8] Many of these 24 percent that do not complete high school earn a GED degree, but these individuals have labor market outcomes similar to those of dropouts. In addition, GED recipients are much less likely to enroll in post-secondary programs than are similar at-risk students that persist in high school (Tyler & Lofstrom, 2010).[9]

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[7] The high school graduation rate ranged between 72 and 76 percent between 2000 and 2009, with an overall average of 73.9.

[8] There has been considerable debate over the appropriate way to measure the high school graduation rate (Heckman & LaFontaine, 2008; Tyler & Lofstrom, 2009). The issues concern how GEDs are counted as well as difficulties in building graduation rates from available data. The National Center for Education Statistics (NCES) has reviewed various methods for computing the high school graduation rate and chosen the averaged freshman graduation rate (AFGR) as the best measure based on available data (Seastrom, Chapman, Stillwell, McGrath, Peltola, Dinkes, & Xeyu, 2005).

[9] Heckman, Humphries, and Mader (2010) find that 31 percent of GED recipients attend college and 71 percent of those students enrolled for only one semester.

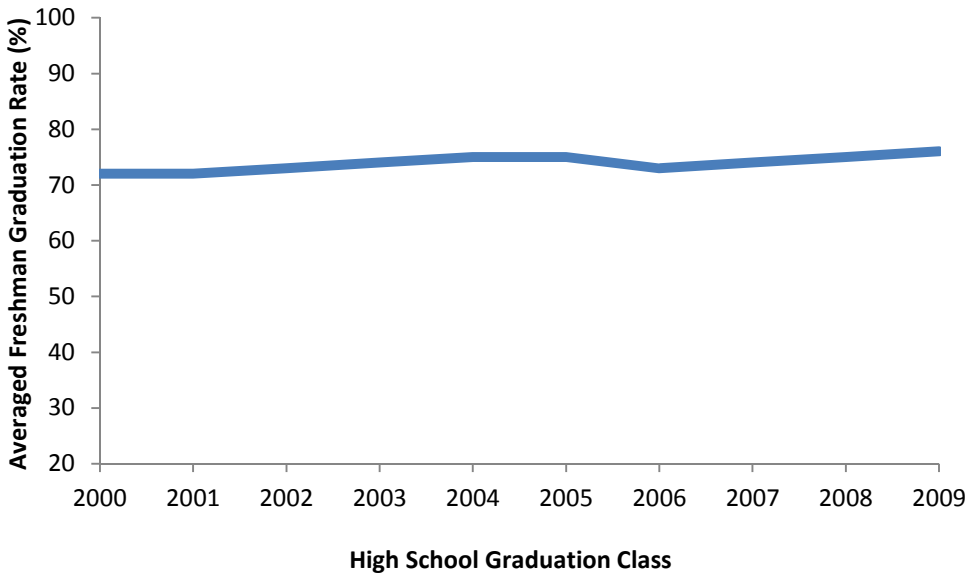

Figure 2. Trends in averaged freshman graduation rate.

The dropout problem is much worse for African American and Hispanic students than for other students (Figure 3). These at-risk minority groups have graduation rates about 18 percentage points lower than White students, while about 93 percent of Asian/Pacific Islander students graduate from high school. The gaps in graduate rates among racial/ethnic groups changed little during the past decade.

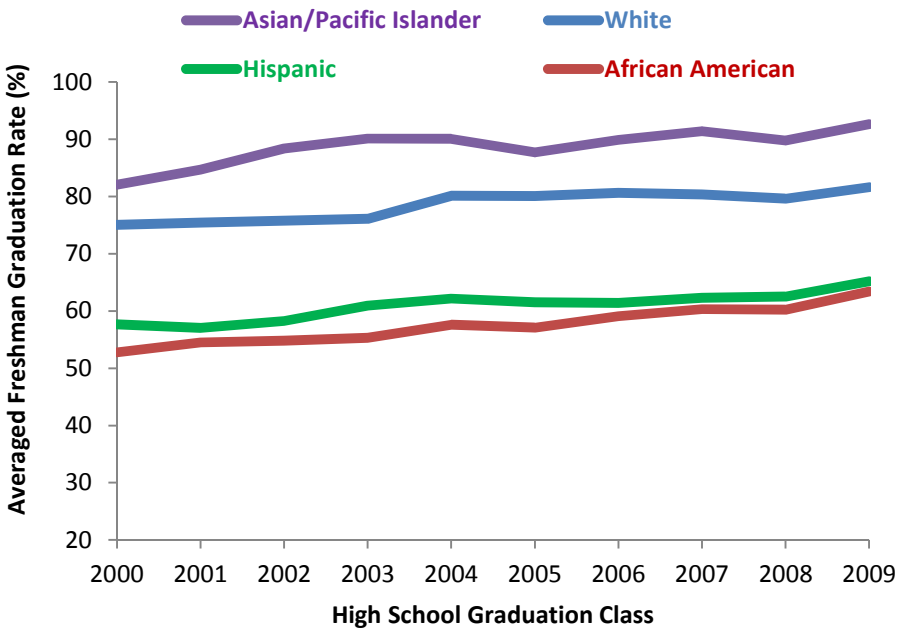

Figure 3. Trends in averaged freshman graduation rates by race/ethnicity.

The high school graduation rate is strongly related to student achievement at the start of high school.[10] The average freshman Composite score is 15 on ACT's EXPLORE test, and about 76 percent of students who score 15 successfully complete high school (see Figure 4). Only about 61 percent of students at the 25th percentile (a score of 13) graduate as compared with 86 percent of students at the 75th percentile (a score of 18). The graduation rate is sharply lower for students that are behind their classmates in school, but the graduation rate for high achievers peaks at about 90 percent.

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[10] The EPAS data does not indicate whether students graduate from high school. The analysis here assumes that students taking the ACT examination in 11th and 12th grade will graduate from high school. In the EPAS data, high school graduation rates are defined as the ratio of ACT test takers in the 2009 high school graduation cohort divided by the number of 8th or 9th grade students taking EXPLORE in the 2004-05 or 2005-06 school years, respectively. The analysis is based on EPAS data from states with statewide adoption of EPAS. As a result, students that remain enrolled in the state should have both an EXPLORE and ACT record. A limitation of this approach is that some students may have left the state, but interstate mobility of high school-aged students is only about 1 percent per year (U.S. Census Bureau, 2011).

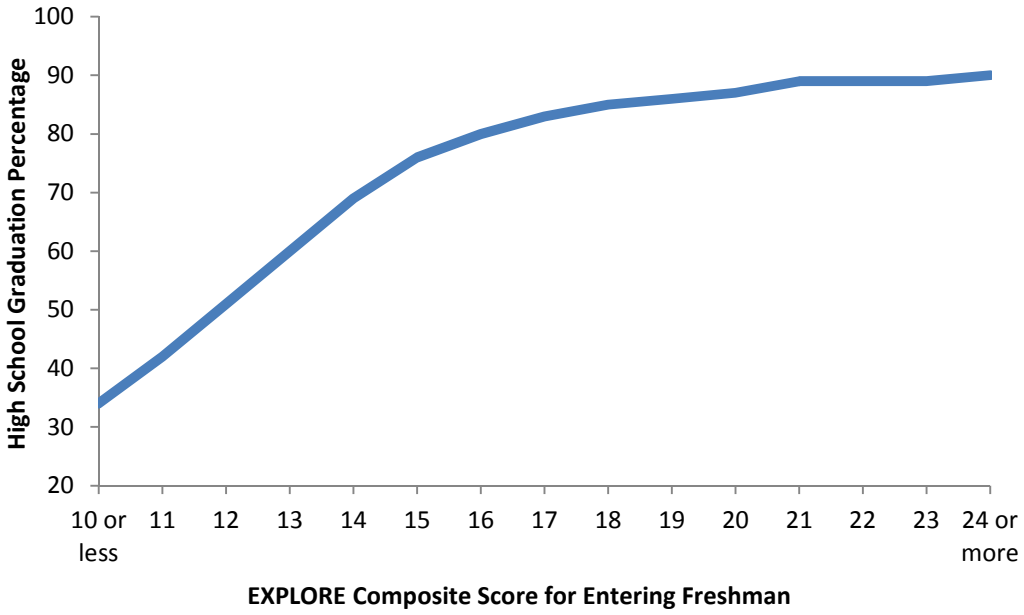

Figure 4. High school graduation by freshman achievement levels.

Dropouts are academically well behind their classmates who subsequently graduate from high school. ACT estimates College Readiness Benchmarks for high school freshmen, and these Benchmarks indicate that students are on-track to succeed in first-year college classes provided they make normal progress in high school.[11] About 81 percent of students that met the Explorer Benchmark in English completed high school as compared with 54 percent of students not meeting this Benchmark. Similarly, about 85 percent of students that met the Explorer Benchmark in Math graduate from high school on time as compared with 62 percent that did not meet the Benchmark.

[11] The EXPLORE Benchmarks for English and Mathematics are 13 and 17, respectively, for 8th grade test takers. The Benchmarks are one point higher for 9th grade test takers.

The relationship between achievement and high school graduation rates are similar across both racial/ethnic and gender groups—graduation rates rise sharply with below average achievement scores and much more slowly with achievement for above average scores. Graduation rates are about 9 percentage points higher for females than for males. The graduation gaps by racial/ethnic groups are large—21 percentage points between White and African American students and 15 percentage points between White and Hispanic students.

Socioeconomic status (SES) explains small portions of the gender and achievement gaps in graduation rates. EPAS includes parental education variables that are indications of family wealth and educational resources in the student's home. The gender gap remains at 9 percentage points even after conditioning on SES. The average increase in graduation rate is about 5 percentage points per 1 point increase in test score (evaluated at the overall mean Composite on EXPLORE of 15). This incremental effect of a 1-pont achievement gain is unaffected by SES.

SES has a much larger effect on differences in graduation rates across racial/ethnic groups. The White-African American gap shrinks from 21 percentage points to 18 points, and the White-Hispanic gap shrinks from 15 percentage points to 9 points.

College Enrollment

The percentage of high school graduates continuing on to college has risen dramatically over the past 40 years, but the gains in recent years have been much more modest (National Center for Education Statistics, 2011b). About 51 percent of 1975 high school graduates continued on to college in the fall. This transition rate rose to 67 percent in 1997, but the rate fell to 66 percent in 1998 and 63 percent in 1999.

Over the past decade, the college transition rate has rebounded slowly (see Figure 5). The 1997 peak rate of 67 percent was reprised in 2004. Since then, the rate has drifted upward to 70 percent in 2009.[12]

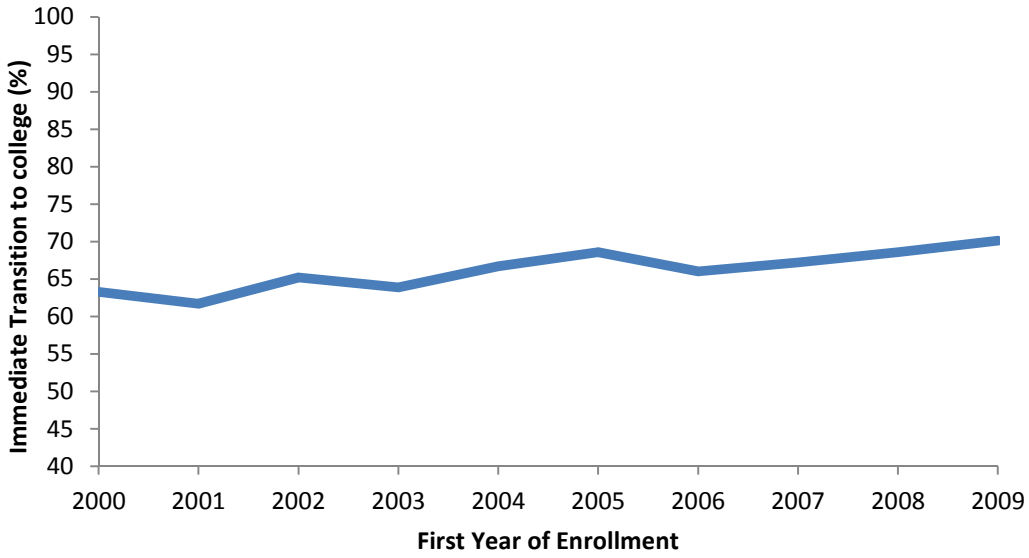

Figure 5. Trend in immediate transition to college for high school graduates.

The trends in college transition have been positive for most groups, but some high school graduates are much more likely to attend college than others. Over the past 25 years, college attendance has grown for both White and African American students (Aud, Hussar, Kena, Bianco, Frohlich, Kemp, & Tahan, 2011). The gap in college attendance rates fell from 15 percentage points in 1989 to 8 percentage points in 2009. Hispanic attendance has risen over time, but it dipped for several years in the 1990's. The gap in college going between White and Hispanic students is 9 percentage points now as compared with 8 percentage points in 1989.

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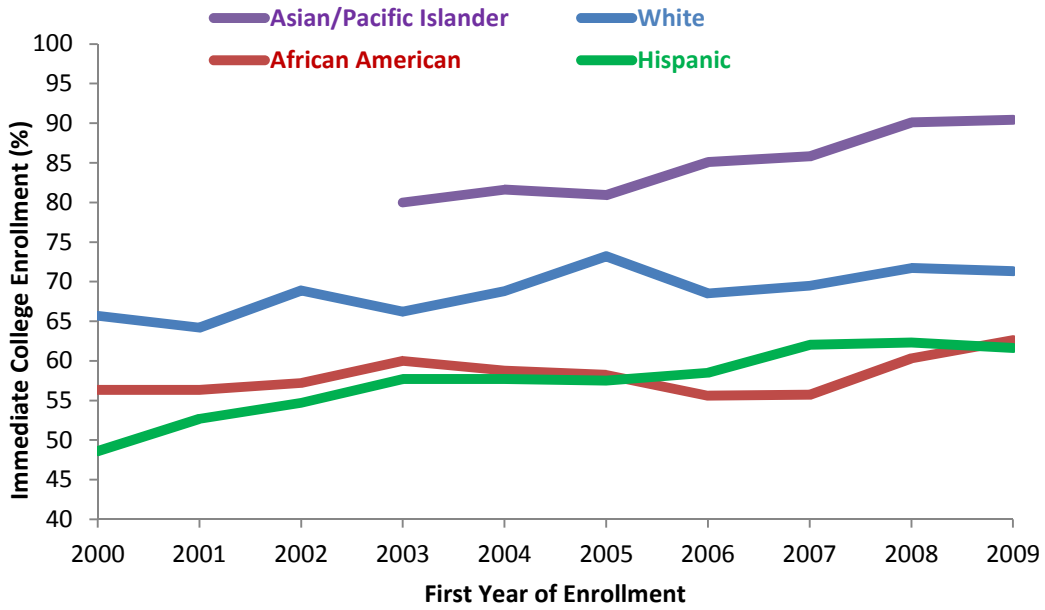
[12] The college enrollment rates in this section are based on the immediate transition to college in the fall after graduating from high school. These transition rates are regularly computed from the October education supplement to the CPS. The bulk of college enrollments for each age cohort come from this group, but we will discuss later college enrollments at the end of the section.

Figure 6 shows the trends in college enrollment by race/ethnicity since 2000. The gap between African American and White college enrollment rates varied somewhat from year to year, but the gap was the same in 2009 as in 2000 (a 9 percentage point difference). The gap between Hispanics and White enrollment rates also varied somewhat from year to year over the decade, but the size of the gap declined from 17 percentage points in 2000 to 10 percentage points in 2009. Separate Asian/Pacific Islander rates were not computed until 2003, but 90 percent of Asian/Pacific Islander went directly to college after graduating from high school in 2009 as compared with 71 percent of White students.



Note:Asian/Pacific Islander enrollment rates are not available until 2003.

Figure 6. Trends in immediate college enrollment by race/ethnicity.

Over the past several decades the college attendance rates for females have been rising faster than for males (Aud, Hussar, Kena, Bianco, Frohlich, Kemp, & Tahan, 2011). In 1975, 53 percent of male high school graduates transitioned immediately to a 2- or 4-year college as

compared with 49 percent of female high school graduates. In 1999, 61 percent of males and 64 percent of females continued on to college. Over this 25 year period, the gender gap shifted from a 4 percentage point advantage for males relative to females to a 3 percentage point disadvantage for males relative to females. While college going increased for both males and females, the female rate grew much faster than the male rate.

Since 2000, the college enrollments have grown (albeit more slowly than in previous years) for both males and females, and the gender gap in college enrollments has increased (see Figure 7). The gender gap in 2000 was 6 percentage points, and it rose to 8 percentage points in 2009. In all demographic groups, women are more likely than men to attend college (Bailey & Dynarski, 2011). The gender gap is largest for high-income families, where females are much more likely to attend college than in previous decades (Bailey & Dynarski, 2011).

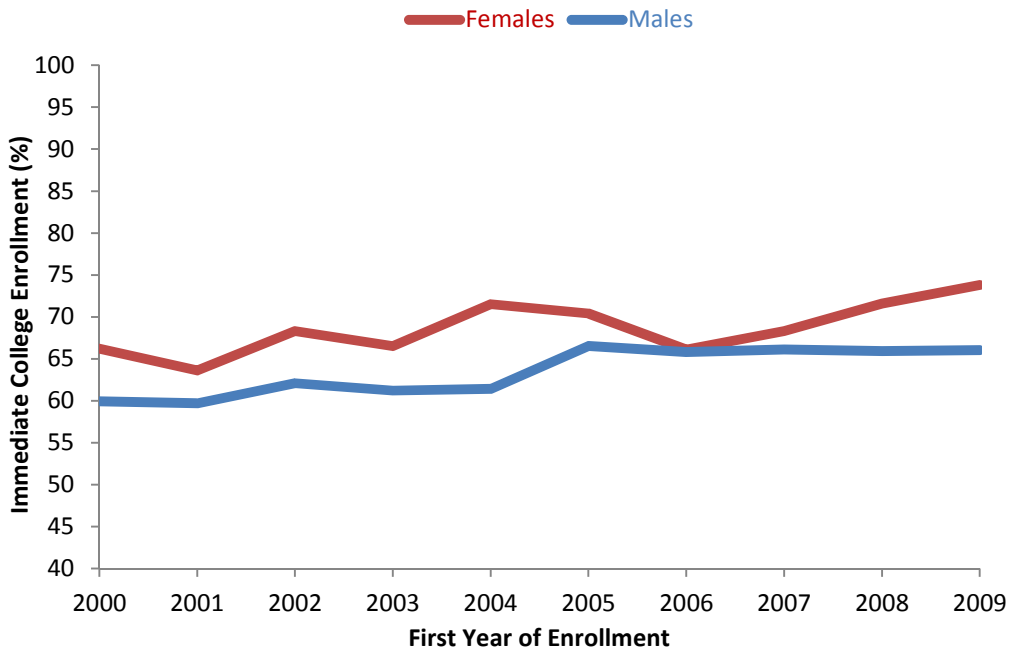


Figure 7. Trends in immediate college enrollment by gender.

College enrollments have risen for all SES groups over the past several decades, but students from low-income families consistently lag behind students from middle- or high-income families (Aud, Hussar, Kena, Bianco, Frohlich, Kemp, & Tahan, 2011).[13] In 1975, 35 percent of high school students from low-income families enrolled in college as compared with 46 and 65 percent of students from middle- and high-income families, respectively. In 1999, the immediate college enrollment rates were 48, 60, and 75 percent for low-, middle-, and high-income families, respectively. Over these 25 years, the gap in college enrollments between high- and low-income students fell slightly from 30 to 27 percentage points. Similarly, the gap between high- and middle-income students fell from 19 to 15 percentage points.

Figure 8 shows the trends in college enrollment rates by SES for the most recent decade. The enrollment rates have continued to rise for all groups, but the gaps in enrollment rates have been largely unchanged. Students from high-income families had enrollment rates about 30 percentage points higher than those for low-income families in 2000 as well as in 2009. The gap between high- and middle-income students was 17 percentage points in both 2000 and 2009.

[13] NCES defines low-income families as those in the lowest quartile of family income for each year. Middle income is defined as family income in the second and third income quartile for each year. High income is defined as family income in the top quartile.

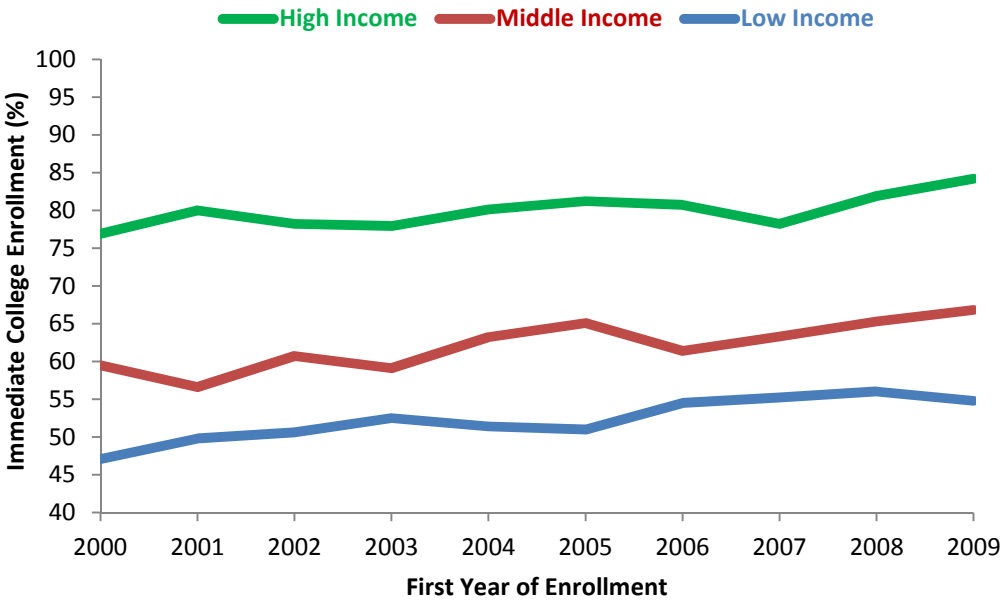


Figure 8. Trends in college enrollment by family income.

The gaps in college enrollment are also reflected in whether students enroll in 2- or 4-year colleges.[14] About 64 percent of immediate college enrollees first enter a 4-year college. The 4-year enrollment rate is 65 percent for female students as compared with 62 percent for males. Among racial/ethnic groups, about 65 percent of White and African American students enter 4-year colleges. In contrast, 45 percent of Hispanics students enroll in a 4-year college, and 76 percent of Asian/Pacific Islanders enter a 4-year program.

College enrollment rates are strongly related to student achievement. The average high school graduate in our EPAS sample received an ACT Composite score of 21, and the college enrollment rate for this group of students was 74 percent (see Figure 9). The college enrollment

[14] These results are based on the EPAS sample of 2009 high school diploma graduates. The college enrollment data are based on matching these graduation records with college enrollment data from the National Student Clearinghouse (NSC). The NSC receives college enrollment data for 3,300 colleges and universities, and these enrollments represent 96 percent of all public and private institutions in the United States.

rate was 46 percent for students with ACT scores of 16 (the 25th percentile for high school graduates), as compared with 83 percent for students with scores of 24 (the 75th percentile for high school graduates). The ACT score reflects student preparation for college, and a score of 21 or better indicates that the student has a good chance of successfully completing first-year college classes without remediation.[15]

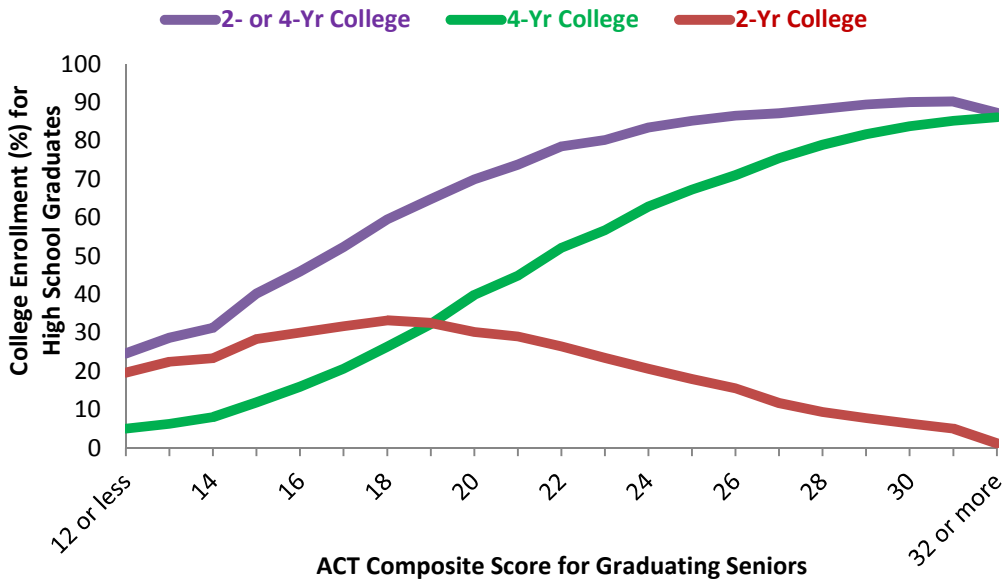


Figure 9. College enrollment rates in 2- and 4-year colleges by ACT Composite score.

[15] The Composite score of 21 as used in this study is the average of the College Readiness Benchmarks in English, Reading, Mathematics, and Science. These subject area Benchmarks represent the level of achievement required for students to have a 50 percent chance of obtaining a B or higher or about a 75 percent chance of obtaining a C or higher in corresponding credit-bearing first-year college courses.

Figure 9 also shows sharp differences in enrollment patterns across 2- and 4-year colleges. Lower scoring students are more likely to attend a 2-year college than students with higher scores.[16] This difference may reflect differences in educational aspirations of students as well as higher admissions standards at 4-year colleges. Students with a score of 19 are about equally likely to attend a 2-year as a 4-year institution.

Students that are doing well in 8th grade as measured on their EXPLORE score are likely to do well on the ACT as well. The correlation between the two exams' Composite scores is 0.80. Figure 10 is a redrawn version of Figure 9 with EXPLORE Composite scores on the horizontal axis. The figure shows the same pattern as Figure 9--college enrollment rises sharply with student achievement and lower scoring students are more likely to enroll in 2-year colleges.

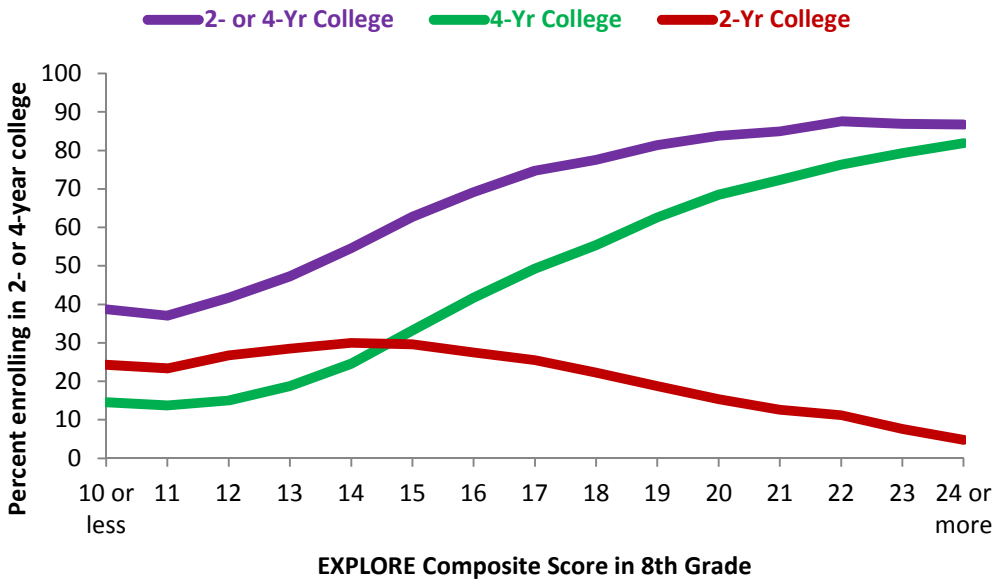


Figure 10. College enrollment rates in 2- and 4-year colleges by EXPLORE Composite score.

[16] Most 2-year college students are enrolled in a publicly supported "community college." These institutions generally attract students from the nearby community and receive some support from local tax revenues. Community college tuition averages about 40 percent of that for 4-year institutions. Many community college students live with their parents and avoid expensive room and board expenses at 4-year institutions.

College Persistence

About 85 percent of EPAS college enrollees remain in school after one year.[17] The persistence patterns across various groups of students are similar to those for college enrollment. Persistence rates are 10 and 13 percentage points lower for Hispanic and African American students than for White students. Asian/Pacific Islanders have persistence rates 5 percent higher than those of Whites. Females have continuation rates 3 percentage points higher than males. Students with stronger high school preparation are more likely to remain in college—about 71 percent of students at the 25th percentile of the ACT Composite score persist as compared with 90 percent of students at the 75th percentile. The second year persistence rate among all students at 2-year colleges is 73 percent as compared with a rate of 91 percent at 4-year colleges.

Some individuals delay college admission and take time off of school for work or other activities. In EPAS, we find about 66 percent of graduating seniors enter college immediately and about 6 percent of seniors enter college after taking a year off from school. At-risk minority, males, low scoring, and low SES students are more likely to delay college entry than other students. Bozick and DeLuca (2006) find that delayed entrants are less likely to complete college than are students that immediately enter college after high school, even after controlling for the background and achievement scores of delayed entrants.

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[17] College persistence rates are somewhat lower if we focus on persistence at the same college. About 73 percent of college freshman enroll at the same school for a 2nd year. The persistence rate is 62 percent at 2-year colleges and 80 percent at 4-year colleges. College persistence rates are often drawn from college records and reflect persistence at each school, because colleges have limited information on college transfers.

High School Dropouts and College Enrollment

An important issue is whether high school dropouts have sufficient academic skills to complete high school and succeed in post-secondary education. In the last section, we saw that most dropouts were academically behind their peers that successfully completed high school, but many were not far behind their peers and some were on-track for college-level work. Ideally, high school reforms would encourage dropouts to stay in school, to improve the motivation for school work, and to improve academically. Even without big improvements, however, our analysis indicates that some dropouts would have continued on to college, if they had simply stayed the course and made normal progress in high school. Using the EPAS data, we predicted the probability that a high school graduate would attend college as a function of their racial/ethnicity, gender, SES, and 8th grade test score. Dropout rates are higher for at-risk minorities, males, students from low-income families, and students with lower 8th grade test scores. The statistical model adjusts for these factors, because the dropout group has features that are likely to reduce college going relative to the typical high school graduate.

Our analysis found that many dropouts had similar background and 8th grade test scores to students that earned a high school degree. The dropout group would be much less likely than then the *average* high school student to pursue postsecondary education, but many dropouts would have continued on to some college-level instruction if they had completed high school. This projection is based on a statistical model that controls for student race/ethnicity, gender, EXPLORE Composite (a quadratic specification), parent's educational attainment, and grade level at time of EXPLORE examination. Based on their background and pre-high school preparation, about 51 percent of dropouts would have continued on to college if they had

successfully completed high school.[18] The projection does not presuppose a Herculean improvement in student achievement for the dropout group, but rather that they progress along an achievement trajectory of similar students that stayed in school. We would not deny that keeping many of the dropouts in school is a major challenge. In particular, the dropouts probably differ from similar prospective graduates on a variety of non-academic factors that are not measured by EPAS, like student motivation, self-regulation, engagement, and discipline.

Among projected college enrollees, about half of the dropout group likely would have attended a 2-year college and half would have attended a 4-year college. This focus on 2-year institutions reflects the fact that the dropout population has larger shares of males, at-risk minorities, low SES, and low achievement students than the population of high school graduates. Among high school graduates that immediately attend college, 36 percent choose a 2-year college.

College Degree Completion

The primary NCES measure of successful completion of a college degree is percentage of first-time, full-time degree seekers that graduate with a bachelor's degree within 150 percent of the expected time to degree. For 2-year colleges, successful completion is based on graduation with an associate's degree within 3 years of enrollment. For 4-year colleges, 6 years are allowed for successful completion. The remainder of this section is divided into two subsections on completion patterns at 4- and 2-year colleges, respectively.

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[18] About 70 percent of all high school graduates in 2009 enrolled in college in the year immediately following high school graduation.

Degree Completion at 4-Year Colleges

The college completion rate at 4-year colleges has been fairly stable over the past several cohorts. Figure 11 shows the percentage of each college freshman class that has graduated after 6 years. The completion rate increased about half a percentage point per year over four consecutive cohorts, but it has declined slightly for the most recent cohorts.

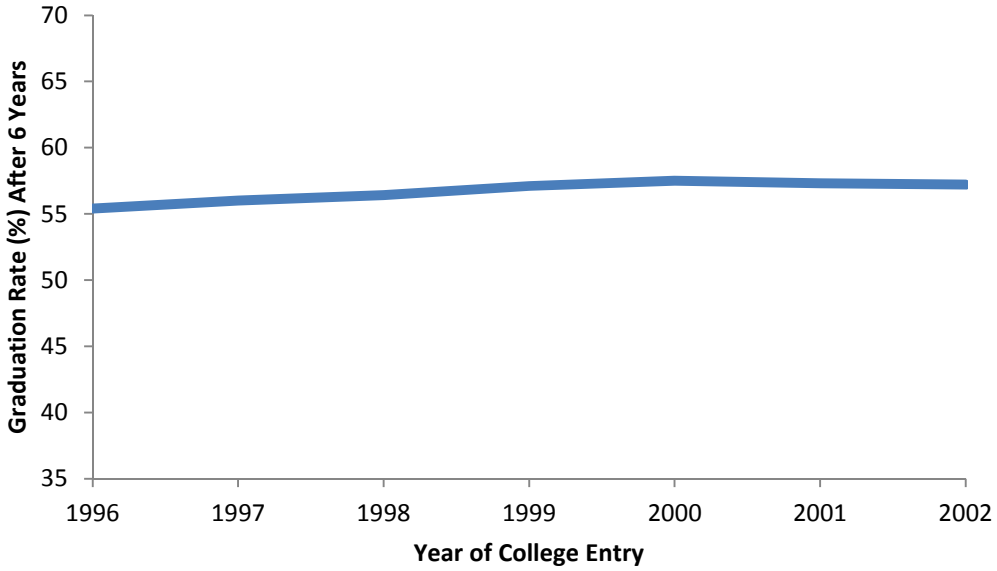

Figure 11. Trends in bachelor's degree completion at 4-year colleges.

Completion rates are 20 and 10 percentage points lower for African American and Hispanic students, respectively, than for White students (see Figure 12). The completion rate for Asian/Pacific Islander students is 7 percentage points higher than for Whites. The completion rate trend for each group of students is slightly positive over the past several cohorts, but the gaps between groups have remained about the same size.

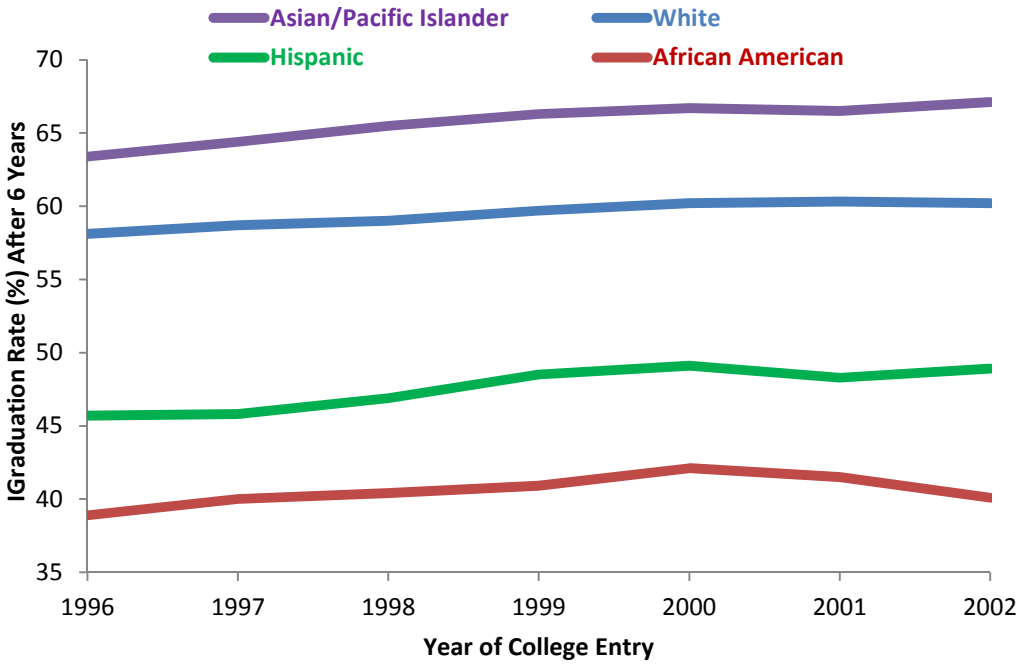

Figure 12. Trends in bachelor's completion at 4-year colleges by race/ethnicity.

The gender gap in college degree completion has been steady for recent cohorts. About 52 percent of males in the 1996 cohort had graduated in 6 years as compared with 58 percent of female students. The male graduation rate had risen to 54 percent for the 2002 cohort, but the rate for females had risen to 60 percent.

Our EPAS sample is drawn from the 2009 high school graduation class, so we will not know what shares of students from this class will earn 4-year degrees until 2015. About 61 percent of EPAS students from the 2002-2003 high school graduating class that attended college had earned a 4-year degree after 6 years (Radunzel & Noble, 2012).

Degree Completion at 2-Year Colleges

The graduation rates for 2-year colleges are much lower than those for 4-year colleges and have hovered around 30 percent for the past several cohorts and have fallen off a few percentage points in the past few years (Figure 13).

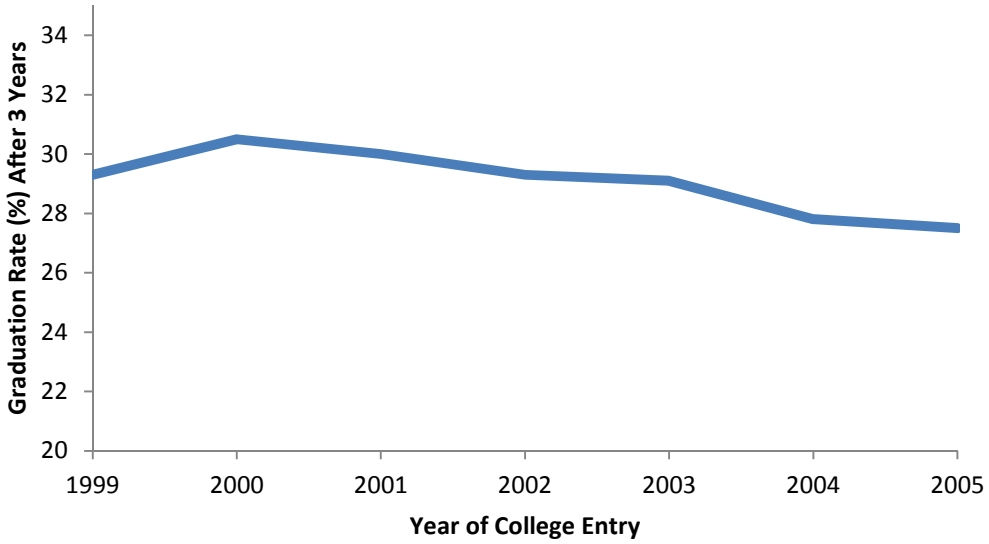

Figure 13. Trends in college completion at 2-year colleges.

Graduation rates at 2-year colleges vary much less by race/ethnicity than at 4-year colleges. Graduation rates are lower for African Americans and Hispanics than for Whites, but the gap is only 6 percentage points for African Americans and 3 percentage points for Hispanics. Graduation rates have declined in recent years for all groups except Asian/Pacific Islanders (see Figure 14).

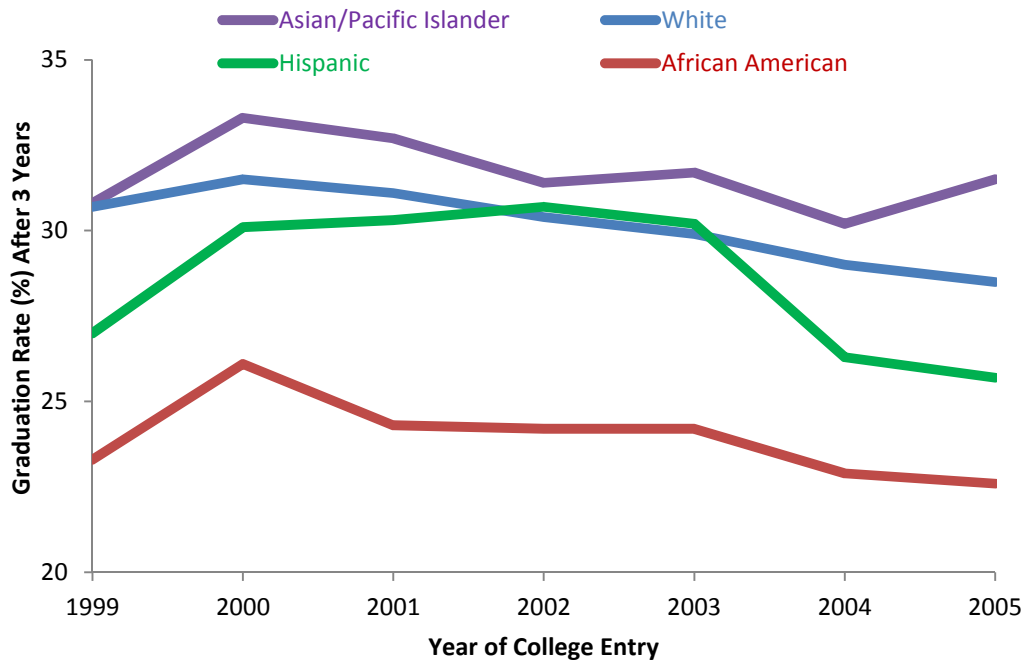

Figure 14. Trends in college completion at 2-year colleges by race/ethnicity.

The gender gap in 2-year college graduation rates grew over the past several years. The graduation rate for females fell from 30 percent to 29 percent. At the same time, the male rate fell from 28 percent to 25 percent.

The lower graduation rates at 2-year colleges reflect a variety of factors. A major goal for community colleges is to improve college access. This goal is reflected in an "open admissions" policy at 95 percent of 2-year colleges (National Center for Education Statistics, 2008). In contrast, only 14 percent of 4-year colleges use open admissions. About 40 percent of community college students need remedial education to prepare them for college work (National

Center for Education Statistics, 2011a).[19] This remedial work increases the monetary and time costs for earning college credits and discourages students from continuing on to degree status (Venezia, Kirst, & Antonio, 2003). In addition, many other students are allowed to take regular college classes without taking recommended remedial course work.

Some community college students do have strong academic backgrounds and use 2-year colleges as a stepping stone to a 4-year institution. Many students pursue this approach because tuition is much cheaper at community colleges and because students may save money living at home. Among incoming 2-year students, about two-thirds hope to earn a 4-year degree ultimately (Skomsvold, Radford, & Berkner, 2011). The evidence shows that only about 11 percent of community college students do transfer to a 4-year college and only 43 percent of those transfers earn a bachelor's degree.[20]

Several studies suggest that students with similar background and preparation are more likely to earn a 4-year degree if they initially enter a 4-year institution than if they start at a 2-year institution.[21] Doyle (2009) finds that students that start at 2-year colleges are less likely to ultimately earn a bachelor's degree than are students with a similar background that start at 4-

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[19] Some evidence suggests that 2-year college remediation rates may be much higher. Bailey (2008) examined remediation rates for a subset of community colleges and found that 59 percent of students took some remedial courses.

[20] The 4-year graduation rates above are based on students that are immediate college enrollees at 4-year colleges. Community college transfers would increase these numbers by a small amount. About 36 percent of high school graduates attend community college, about 11 percent of these students transfer to a 4-year college, and about 43 percent of transfers earn a bachelor's degree. Based on these percentages, the average 4-year college completion rate would rise by about 2 percentage points.

[21] The studies cited here use rigorous quasi-experimental methods to compare 4-year degree completion for students that initially enroll at 2- and 4-year colleges. Doyle (2009) uses propensity score methods to control for the background and preparation of students enrolling at each type of college. This approach examines whether students with similar observable characteristics are more likely to earn a 4-year degree if they initially enroll in a 4-year institution. Long and Kurlaender (2009) conduct a similar propensity score analysis. In addition, they use an instrumental variable approach to control for unobservable student characteristics that might influence the propensity of students that initially chose a 4-year college to persist and earn a 4-year degree. The earlier Rouse study (1995) also uses an instrumental variable approach.

year colleges. Similarly, Long and Kurlaender (2009) find that community college students are about 14 percent less likely to earn a bachelor's degree than similar other students even adjusting for prior student achievement and high school preparation. These studies confirm earlier evidence from Rouse (1995) that students face a "persistent college penalty" for attending a 2-year college, since they are less likely to earn a bachelor's degree than if they had started at a 4-year college.

Educational Progression and Attainment

Low transition rates at various points in the educational life cycle translate into low cohort attainment levels. Figure 15 shows the progression of an 8th grade cohort through high school and college.[22] Given state compulsory education laws, nearly all individuals in a particular age cohort are enrolled in school in 8th grade. By the end of high school, the cohort has thinned sharply with about 24 percent of students leaving early. Among high school graduates, about 65 percent continue immediately on to college, and this constitutes about 49 percent of the initial 8th-grade cohort. About 45 percent of students that enroll in college earn some type of degree.[23] This percentage is pulled down by low graduation rates of 2-year college entrants. On average, about 19 percent of the current 8th grade cohort is expected to earn a bachelor's degree.

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[22] Survey results generally show higher rates of educational attainment for a cohort than the educational progressions in Figure 15. For example, the ACS found that 86 percent of adults age 25 to 29 reported that they had graduated from high school and 27 percent had a bachelor's degree (U.S. Census Bureau, 2009). These higher rates reflect the classification of GEDs as high school graduates and some possible inflation of attainment by respondents. Our career progressions understate the educational outcomes for three groups that are not well measured in current databases. Some GED recipients do enroll in college and some earn degrees. The evidence earlier in this paper suggests that these transition rates are considerably lower than those of comparable high school graduates. Some 2-year college students do transfer to 4-year colleges and earn bachelor's degree. Few transfer, however, and the graduation rate of the transfers is lower than for comparable students that start at 4-year colleges. Finally, some students delay college enrollment for some period after leaving high school. The evidence here suggest that this group is modest in size and has lower college persistence and college graduation rates than for high school graduates that immediately transfer to college.

[23] The college degree rates are forecast from those of the most recent cohorts in Radunzel and Noble (2012).

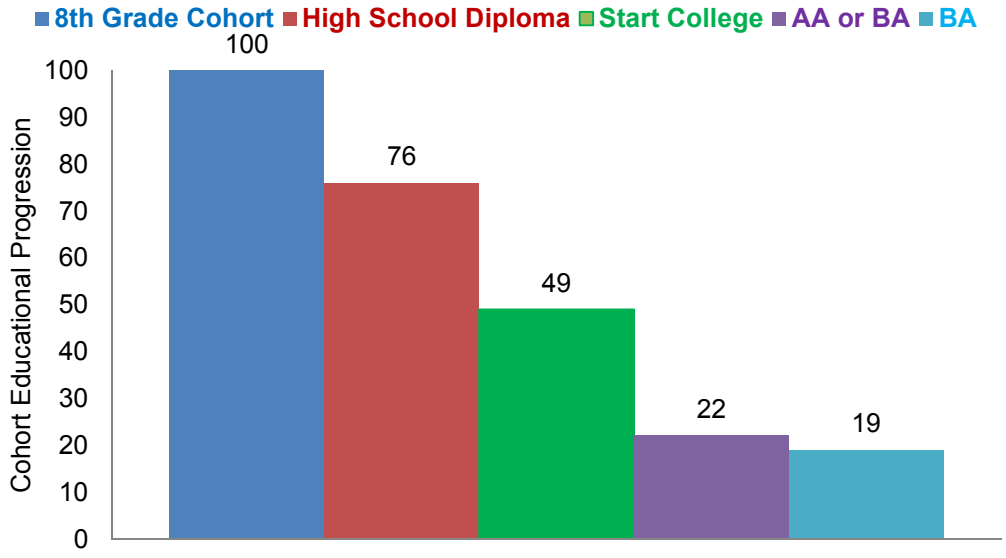

Figure 15. Educational progression of 2009 high school graduating class.

The transition rates at each point of the progression are lower for African Americans and Hispanics than for other students, so these groups consistently have lower overall educational attainment (see Figure 16). High school graduation rates are much lower for African Americans and Hispanics, so the cohort is much thinner for these groups than for others. The college-going rates for these at-risk minority groups are much lower than for other groups. Even conditional on high school graduation, the probability of continuing on to college is much less for African Americans and Hispanics than for either Whites or Asian/Pacific Islanders. The cumulative effect of these differences in transition rates means that only about 10 percent of African Americans and 7 percent of Hispanics earn a bachelor's degree as compared with 24 percent of Whites and 35 percent of Asian/Pacific Islanders.

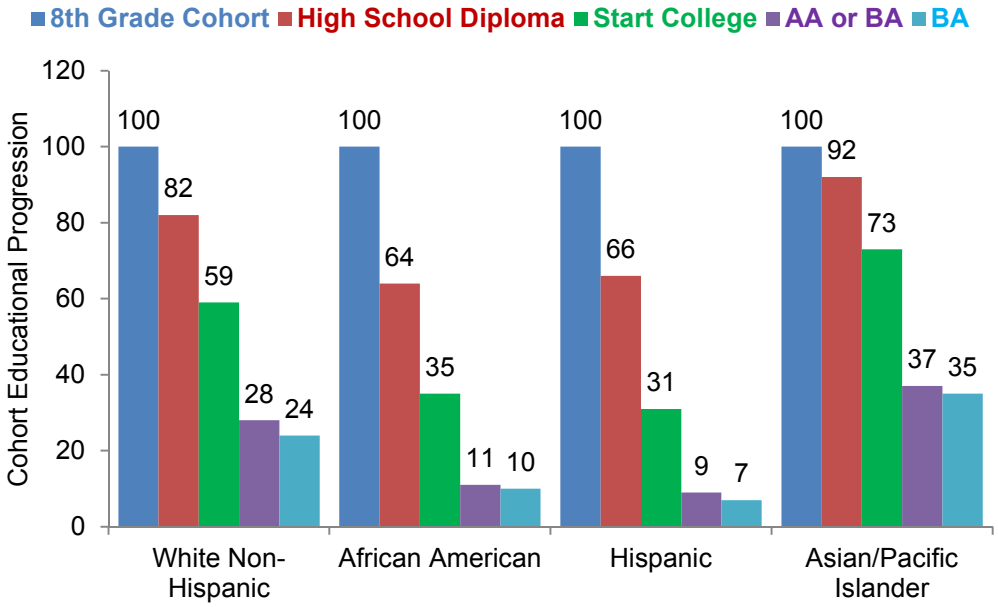

Figure 16. Educational progression of 2009 high school graduating class by race/ethnicity.

The gender gaps in educational attainment are much smaller than the racial/ethnic gaps. Males have lower transition rates than females at each transition point (see Figure 17). As in other comparisons, the largest disparities are for high school graduation rates and college enrollment rates for high school graduates. Fewer males than females complete high school, and fewer male completers continue on to college. The overall educational attainment levels for females exceed those for males—about 22 percent of females earn a bachelor's degree as compared with 15 percent of males.

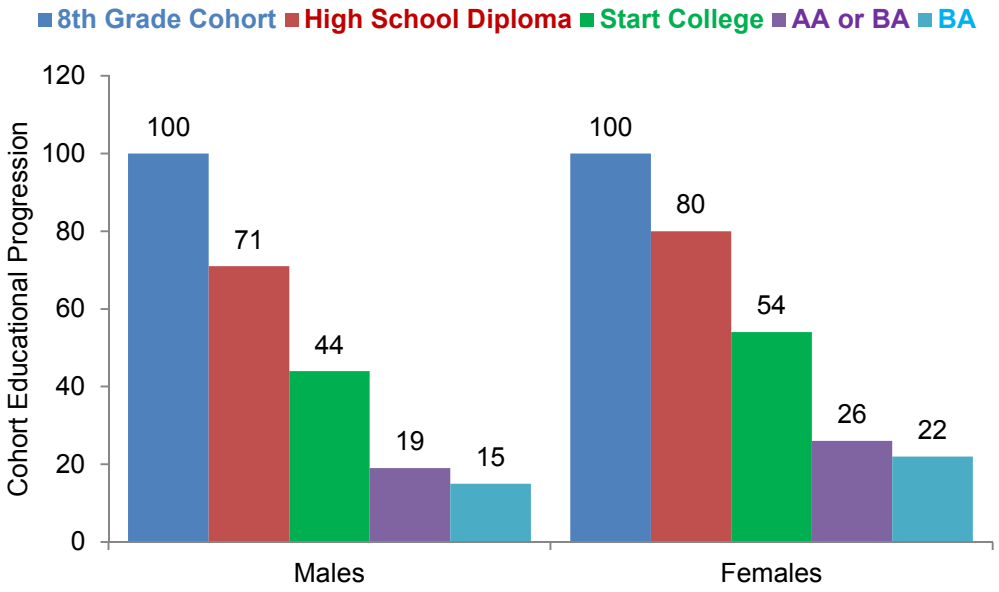

Figure 17. Educational progression of 2009 high school graduating class by gender.

Educational attainment is strongly related to student achievement levels at the start of high school (Figure 18). Students at the 25th percentile of the 8th grade EXPLORE Composite score have much lower transition rates than students at the 75th percentile of the exam. The lower scoring group is much less likely to graduate from high school, to continue on to college, and to earn a college degree. Students scoring at the 75th percentile of the 8th grade exam are six times more likely to earn a bachelor's degree than are students at the 25th percentile of the exam.

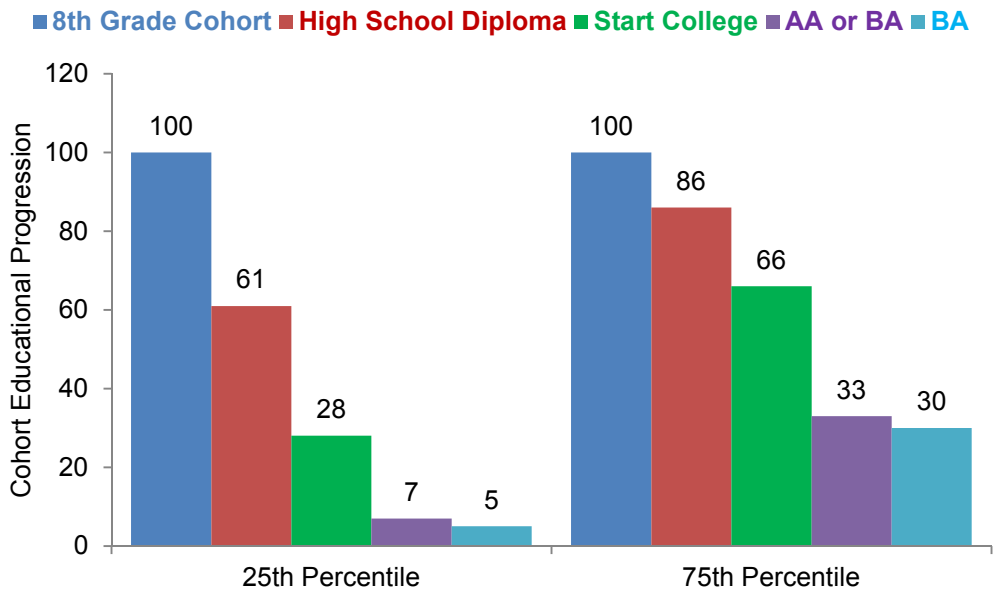

Figure 18. Educational progression of 2009 high school graduating class by 8th grade student achievement percentile.

The evidence suggests that incremental changes in achievement at the lower end of the distribution have larger effects on attainment than changes at the upper end of the distribution. Figure 4 showed that 8th grade EXPLORE score was positively related to high school graduation, but the slope of the curve was much steeper at a score of 13 (25th percentile) than at 18 (75th percentile). Similarly, Figure 10 showed that college enrollment was positively related to EXPLORE scores, but a 1-point increase in test score has a larger effect on enrollment at the 25th test percentile than at the 75th percentile. Prior academic achievement has a positive effect on each transition, but unit increments in test score have diminishing effects on each transition rate. Consequently, a one point score improvement for a student at the 25th achievement percentile would have a much larger effect on educational attainment than a comparable increase at the 75th percentile.

Conclusions and Promising Initiatives

Educational attainment levels reflect the progression of students through secondary and post-secondary institutions. For each cohort of students, some complete high school, some continue on to a 2- or 4-year college, and some earn a 2- or 4-year degree. In general, students that leave school are unlikely to return and fewer still persist if they do return—e.g., few high school dropouts enroll in college and few of these college entrants persist to graduation. With limited lateral entry, educational attainment levels are typically indicated by the time students first leave formal fulltime schooling.

The evidence suggests that the demands for skilled labor are increasing, but educational attainment for youth cohorts is stagnant or declining. High school graduation rates have fallen from historic highs in the 1970's, college enrollment rates have leveled off, and college graduation rates are stable or declining. These overall problems are exacerbated by persistent gaps in educational success by race/ethnicity, gender, and student achievement. If current trends continue, the workforce will be unprepared for the demands of the modern economy.

Promising Initiatives

Broad reforms are needed to improve educational attainment levels and to eliminate (or substantially reduce) the gaps in attainment across population groups. Several recent studies have identified policies that may substantially increase educational attainment levels over the next decade. These studies are based on rigorous empirical analysis that provides strong evidence on how particular policies affect educational outcomes.

- **Boost Noncognitive Skills.** Heckman, Stixrud, and Urzua (2006) show that early childhood education programs increase children's noncognitive skills (e.g., self-esteem, self-control, persistence, motivation, and locus of control), and these skills

play an important role in long-term educational and labor market outcomes. Similarly, Jacob (2002) shows the cognitive skills of adolescents differ little by gender, but high school boys get lower grades, have more behavioral problems, have lower attendance, and lower enjoyment of school than do girls. Conley (2007) argues that high schools should do a better job of addressing behavioral attributes (e.g., study skills, time management, persistence, and ability to work in study groups) that are needed to succeed in college. Finally, a recent program found that individualized student coaching on noncognitive skills like time management, self-advocacy, and study skills improved the college persistence of non-traditional students (Bettinger & Baker, 2011).

- **Improve Teacher Quality.** A large number of recent studies have found substantial variability in teacher quality in elementary and secondary schools (Aaronson, Barrow, & Sander, 2007; Buddin & Zamarro, 2009; Clotfelter, Ladd, & Vigdor, 2007; Kane & Staiger, 2008; Rivkin, Hanushek, & Kain, 2005). These studies find that some teachers are much more effective than others at improving student achievement. In addition, this evidence suggests that high-quality teachers are broadly dispersed across schools--so teacher effectiveness varies substantially from classroom to classroom both in struggling urban schools *and* in highly-regarded suburban schools. Chetty, Friedman, and Rockoff (2011) show that students assigned to high-quality teachers are more likely to subsequently attend college, attend higher-ranked colleges, earn higher wages, and live in higher SES neighborhoods. This evidence suggests that better screening of new teachers and remediation of low-performing teachers could substantially improve the short- and long-term outcomes of students.

- **Access to financial aid information.** A recent study shows that college enrollment rates for low- and medium-income high school students increase when their families receive detailed information on their eligibility for financial aid (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2009). The research indicated that many students were discouraged from applying to college, because they assumed that college costs were prohibitive. The researchers developed a simplified form to clarify how much financial aid would be available, and this information encouraged more students to apply for college and subsequently to enroll.

These new initiatives show promise for improving educational outcomes, but further research is needed to identify additional effective measures to increase high school graduation rates, college persistence, and college graduation rates. Improved educational attainment would help meet the demand for a higher-skilled workforce and ratchet up the career prospects for the next generation of workers.

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