

How College Shapes Lives: Understanding the Issues

Trends in Higher Education Series

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In addition to the figures and tables included in this report, more information and data can be found on the Trends in Higher Education website: trends.collegeboard.org

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Contents

6	Executive Summary
8	Introduction
10	Section 1: What Is College?
13	Section 2: Nonmonetary Benefits to Individuals and Benefits to Society
16	Section 3: The Higher Education Earnings Premium: Defining the Population
20	Section 4: The Earnings Premium for Higher Education: Level and Trends
24	<i>Discussion:</i> The “Option Value” of a College Degree
25	Section 5: Variation in Earnings Within Levels of Education
27	<i>Discussion:</i> Variation in Earnings Across States
28	Section 6: The Focus on Recent College Graduates
31	Section 7: Lifetime Earnings
34	Section 8: Occupation Matters
37	Section 9: The Demand for College-Educated Labor
41	<i>Discussion:</i> Human Capital or Signaling: The Role of Education
42	Section 10: The Rate of Return to Education
45	<i>Discussion:</i> The Average College Student vs. the Marginal College Student
47	Section 11: Degree Completion Matters
52	Section 12: The Question of Student Debt
55	Guest Essays
56	Learning Begets Learning: Implications for Higher Education – <i>Michael McPherson</i>
59	What Is Equity in Higher Education? – <i>Harry Brighouse</i>
62	Messages on My Wall: The Core Features of a Liberal Arts Education – <i>Howard Gardner</i>
64	Higher Education and the Opportunity Gap – <i>Isabel Sawhill</i>
68	Education Policy in an Era of Changing Opportunities – <i>David Autor and David Dorn</i>
71	Conclusion
72	References
75	Acknowledgments

Contents — Continued

LIST OF FIGURES

- 12 Figure 1.1:** Fall Enrollment at Degree-Granting Institutions by Sector, 1970–2010, Selected Years
- 17 Figure 3.1:** Earnings of Individuals Ages 25 and Older Relative to High School Graduates by Education Level and Employment Status, 2011
- 18 Figure 3.2:** Median Earnings of Full-Time Year-Round Workers Ages 25 and Older by Race/Ethnicity, 2011
- 21 Figure 4.1:** Median Earnings of Full-Time Year-Round Workers Ages 25 and Older Relative to Median Earnings of High School Graduates, by Education Level, 1987–2011
- 25 Figure 5.1:** Earnings Distribution of All Income-Earners Ages 35 to 44 by Education Level, 2011
- 26 Figure 5.2:** Distribution of Education Levels Within Earnings Categories, All Income Earners Ages 35 to 44, 2011
- 29 Figure 6.1:** Median Annual Earnings of Full-Time Year-Round Workers Ages 25 to 64 Relative to High School Graduates, by Education Level and Age Group, 2011
- 30 Figure 6.2:** Median Earnings of Full-Time Year-Round Workers by Age and Education Level, 2011
- 32 Figure 7.1:** Median Estimated Lifetime Earnings of Full-Time Workers Relative to High School Graduates, by Education Level, 2011
- 50 Figure 11.1:** Percentage Distribution of Outcomes by High School GPA, Students Who First Enrolled in 2003-04 at Age 24 or Younger
- 50 Figure 11.2:** Percentage Distribution of Outcomes by High School SAT/ACT Scores, Students Who First Enrolled in 2003-04 at Age 24 or Younger

LIST OF TABLES

- 10 Table 1.1:** Postsecondary Institutions and Enrollment, Fall 2011
- 11 Table 1.2:** Enrollment at Degree-Granting Institutions, Fall 2011
- 11 Table 1.3:** Undergraduate Enrollment, Fall 2011
- 11 Table 1.4:** Postsecondary Degrees Awarded, 2010-11
- 12 Table 1.5:** Postsecondary Degrees Awarded, 1970-71 to 2010-11, Selected Years
- 12 Table 1.6:** Percentage Distribution of Undergraduate Degrees Awarded, 1970-71 to 2010-11, Selected Years
- 16 Table 3.1:** Median Annual Earnings and Employment Status of Individuals Ages 25 and Older by Education Level, 2011
- 17 Table 3.2:** Female-to-Male Earnings Ratios for Individuals Ages 25 and Older by Education Level and Employment Status, 2011
- 18 Table 3.3:** Earnings of Full-Time Year-Round Workers Ages 25 and Older Relative to High School Graduates, by Race/Ethnicity, 2011

Contents — Continued

LIST OF TABLES — Continued

- 20 Table 4.1:** Median Earnings of Full-Time Year-Round Workers Ages 25 and Older Relative to Median Earnings of High School Graduates, by Education Level, 1991–2011, Selected Years
- 21 Table 4.2:** Median Earnings of Full-Time Year-Round Workers Whose Highest Degree Is a Bachelor's Degree Relative to High School Graduates, by Gender, 2001 to 2011
- 22 Table 4.3:** Median Earnings of Full-Time Year-Round Workers Ages 25–34 with At Least a Bachelor's Degree Relative to High School Graduates, by Gender, 1971–2011, Selected Years
- 23 Table 4.4:** Median Earnings of Full-Time Year-Round Workers Whose Highest Degree Is a Bachelor's Degree Relative to High School Graduates, by Gender and Age, 1991, 2001, and 2011
- 28 Table 6.1:** Labor Force Participation and Unemployment Rates of Individuals Ages 23 to 26 and Ages 27 to 30 by Education Level, 2012
- 33 Table 7.1:** Median Earnings Relative to Median Earnings of High School Graduates, Full-Time Workers by Age and Educational Attainment, 2011
- 34 Table 8.1:** Occupations Requiring at Least a Bachelor's Degree and Highest Degree of Full-Time Workers, 2011
- 35 Table 8.2:** Largest Occupations of Bachelor's Degree Recipients Ages 25 and Older Employed Full Time, 2011
- 35 Table 8.3:** Earnings and Educational Attainment of Full-Time Workers Ages 25 and Older Employed in Occupations With Large Numbers of Advanced Degree Recipients, 2011
- 36 Table 8.4:** Large Occupations Employing Both High School Graduates and Bachelor's Degree Recipients, 2011
- 38 Table 9.1:** Percentage Distribution of Highest Education Level of Workers Ages 25 and Older in Selected Occupations, 2009
- 40 Table 9.2:** Occupations Projected to Have Most Rapid Growth and Largest Increases in Number of Jobs, 2010 and 2020
- 47 Table 11.1:** Outcomes by Gender, Race/Ethnicity, and Age Group: Students Who First Enrolled in 2003-04
- 48 Table 11.2:** Outcomes by Enrollment Intensity and Continuity of Enrollment, Students Who First Enrolled in 2003-04
- 49 Table 11.3:** Outcomes by Sector, Students Who First Enrolled and Enrolled Full Time in 2003-04
- 51 Table 11.4:** Outcomes by Family Income, Dependent Students Who First Enrolled in 2003-04
- 53 Table 12.1:** Educational Attainment by 2009 of Students First Enrolling in 2003-04, by Total Amount Borrowed (and Overall Percentage of Students in Debt Category)
- 53 Table 12.2:** Amount Borrowed by Students Who First Enrolled in 2003-04 and Left Without Completing a Degree or Certificate by 2009, by Length of Enrollment (with Percentages of Students Within Enrollment Category)

Executive Summary

How College Shapes Lives: Understanding the Issues explains some of the ways the payoff of postsecondary education can be measured and provides insights into why there is confusion about that payoff, despite strong evidence. Focusing on the variation in outcomes across individuals helps to clarify that the existence of the high average payoff, and the reality of significant benefits for most students, is not inconsistent with disappointing outcomes for some. We hope to put the disturbing stories of this relatively small segment of students into context and to direct attention to improving opportunities for all students.

This report explains some of the concepts and complexities that underlie analyses of the benefits of postsecondary education and clarifies the different assumptions and definitions that affect measured outcomes. Our aim is to provide background and context for readers to help them become more active and constructive participants in discussions of the role of higher education in the United States.

How College Shapes Lives provides data to elucidate some of the conflicting statements and views often found in public discussions of the value of postsecondary education.

- Although the gap in average earnings between college graduates and others does not increase every year, it is very high and it continues to grow over time, particularly for bachelor's and advanced degrees.
- Especially for students graduating into weak economies, it frequently takes time to find the path that ensures that going to college was “worth it.” But those with more education tend to experience larger increases in their earnings as they age.
- There is considerable variation in earnings among workers at any one level of education. This variation is attributable to many factors, including differences in occupations and geography.
- Despite the variation in earnings among workers at any one level of education, the chances of being near the bottom of the earnings distribution are much higher for those with no college education and the chances of being closer to the top are much higher for those with at least a four-year degree.

- It is difficult to predict the precise future earnings patterns of today's college students but based on current earnings patterns, if people with bachelor's degrees work full time, over their worklives they will earn about two-thirds more on average than high school graduates.
- Conflicting predictions of the future need for more educated workers result from differing definitions and methodologies. But it is clear that employers seek out and pay a premium for workers with postsecondary credentials, and that in all likelihood, they will continue to do so in the future.
- The benefits for students on the margin of enrolling in college are not necessarily equal to the average benefits among those now enrolled, but there is significant evidence that students on the fence about enrolling gain large benefits from postsecondary education.
- On average, adults with more postsecondary education are more likely than others to be employed and to earn more. There are also nonmonetary benefits and advantages for society at large, including both fiscal and civic benefits.
- Relatively few students actually borrow excessive amounts to fund their undergraduate education, and the majority of students have earnings that allow them to repay their debts. But this reality is small comfort to those whose debt burden is unmanageable.
- The reality that many students enroll but do not complete credentials is central to understanding the costs and benefits of postsecondary education. On average, while there is a high payoff to completion, even “some college” generates financial benefits.

Some of the issues addressed here involve basic concepts and definitions.

- When we hear the word “college,” many of us picture 18-year-olds heading off to residential campuses. However, most analyses of the value of college education define college as the education and training offered at any postsecondary institution, including specific occupational training and short-term certificates, as well as associate and bachelor's degrees.

- The “earnings premium” describes the difference between the average earnings of adults with different levels of education. It is related to, but different from, the “rate of return” to investments in education, which compares the earnings generated by increased education to the cost of acquiring that education.
- If we define the relevant population as all adults or all working adults (including those working part time), the earnings premium is larger than if we take the usual approach of looking only at full-time year-round workers. This is because those with more education are more likely to be employed full time than are those with less education.
- The important idea of the “option value” of a college degree refers to the reality that degrees open doors to further education and other opportunities, even for recipients who have not yet or will not take advantage of those next steps.
- Human capital theory focuses on the ways education makes people more productive, while signaling theory emphasizes the value of credentials as indicators of personal characteristics. But the insights from the two perspectives can be integrated to explain the earnings payoff of higher education.

How College Shapes Lives includes brief essays expressing the views of five eminent scholars on issues relating to the benefits of higher education and how to improve the distribution of those benefits. The authors explore the importance of early-life

experiences in preparing people to benefit from postsecondary education, the role of higher education in reducing the inequality in our society, the value of a liberal education, the importance of recognizing that different paths are appropriate for different people, and the changing nature of the labor market.

The variations in outcomes described here highlight the need to support students in making careful and informed decisions about their educational and career paths, and to provide insurance for students against unforeseen circumstances. But the evidence is clear that some form of postsecondary education is a necessary element of successful, independent lives for most people in today’s economy.

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Introduction

A college education opens the door to many opportunities that would not otherwise be available to most individuals. Adults with postsecondary credentials are more likely to be employed and to earn more than others. Many occupations are open only to those with specific degrees or certificates. Higher levels of education correspond to more access to health care and to pensions; more educated people are more likely to engage in healthy behaviors, to be active and engaged citizens, and to be in positions to provide better opportunities to their children.

Yet questions about whether or not college is really worth it are increasingly widespread. An important explanation is that while *on average* and *for most people* postsecondary education has a high payoff, there is considerable variation in the outcomes. “College” encompasses many different types of institutions and many different types of education and training. The people going to college come with very different levels of preparation, are of a wide range of ages, and have very different motivation and goals. No amount of planning can eliminate all of the risk and uncertainty about future personal and economic circumstances.

How College Shapes Lives: Understanding the Issues is designed to provide background and context to help readers better understand the available information and the debates about the value of college and the need to improve the levels of educational attainment in the population. Much of the current debate centers around concerns that we are spending too much money on education — or that we are not spending enough. Debates between those who argue that we need more college graduates in order to remain competitive with other countries and those who believe that too many people are wasting time and money going to college are not uncommon. Selected data are used to bolster a wide variety of positions, but in-depth and nuanced discussions are harder to come by. Higher education is vitally important to the nation’s future, so it is not surprising that the discourse on educational opportunity has become an ideological battleground.

We hope to increase understanding of the merits of the different data and analyses that underlie many of the simple arguments about “too much” or “not enough.” Our goal is to help focus these discussions on the role education plays in improving people’s lives.

Our companion publication, *Education Pays: The Benefits of Higher Education for Individuals and Society*, provides detailed documentation of many of the benefits associated with postsecondary education both for individuals and for society as a whole. It examines both monetary and nonmonetary benefits and also documents the progress and the persistent gaps in participation and success.

This publication goes behind the averages reported in *Education Pays* and probes some of the concepts, data, assumptions, and methodologies behind conflicting statements appearing in discussions of the importance of higher education. The analyses included here should help readers reach their own conclusions and react knowledgeably and critically to the views of others. Some of the issues addressed involve basic concepts and definitions. What is the difference between an earnings premium and a rate of return? What difference does it make if we compare the earnings of only full-time workers with different levels of education, or if we include all workers or even all individuals? Most fundamentally, what do we mean by “college”?

We also pose larger questions about the interpretation of available data. Is the value of a college education declining as critics charge? Is college worth the investment only for certain technical occupations? Are the problems facing recent young college graduates representative of the opportunities they will face in the future?

How College Shapes Lives explains of some theoretical issues underlying analysis of the benefits of college. Does college help people because they actually learn things (human capital), or is it just the existence of the credential that matters (signaling)? What is meant by the “option value” of a college degree, and how should people who have earned advanced degrees be considered in measuring the value of college?

Acknowledging that not all postsecondary paths are productive for all students (and that some are productive for very few) helps put the stories of unfortunate but atypical students into perspective. Stories of individuals who borrowed thousands of dollars only to learn that their schools did not provide recognized

certification or who graduated with tens of thousands of dollars in debt and have not yet found employment have come to dominate the public psyche and appear to contradict the assertion that a college education *does* pay.

The data included in this report clarify the reality that the very high average payoffs, and the positive payoffs for most students, are not inconsistent with these very real and disturbing — but unusual — individual circumstances. Surely we can solve these problems without undermining the futures of others for whom the investment in college, while carrying some uncertainty, is very likely to pay off well.

To enrich our discussion of these and other issues surrounding the influence of higher education in shaping people's lives — and to underscore that no one has simple answers to these complex and value-laden questions — we have included brief essays from five distinguished scholars of education who bring their own knowledge and perspectives to the issues that concern us.

Most of the information included in this publication focuses on employment and earnings outcomes. It is hard to overemphasize how important we believe it is *not* to measure the value of postsecondary education only in these terms. Many people need to acquire specific skills in order to get jobs that pay a living wage. Some of these skills involve technical knowledge or other concrete information. But many are “soft skills” or “noncognitive” abilities. Developing a positive attitude toward work, the self-confidence required to perform unfamiliar tasks, the capacity to solve new problems, and the ability to work well with others — these are fundamental to success in the labor market, but are not defined by specific programs of study. Even “job training” cannot so easily be defined as limited to specific labor market outcomes.

Education means much more than job training. It means providing people with the opportunity to develop their sense of themselves and their relationship to other people and to their environment. It means supporting intellectual engagement and inquiry to improve our understanding of our history and our capacities for affecting our future. Education prepares people to create successful and meaningful lives, to be active and

engaged citizens in a democratic society, and to make choices that will improve their lives and the lives of those around them. It is about the development of habits of mind, not just the transmission of knowledge.

There are no simple metrics that permit us to measure the precise contribution of education to an individual's employment performance. Even more difficult is measuring the types of personal and intellectual development that are for many the core outcomes of education.

That said, we cannot abandon the effort to measure the economic value and effectiveness of postsecondary education. Both students and society as a whole devote considerable resources to education. Time, effort, and money are not limitless. And as vital as the fundamental goals of education are, the ability to earn a living is a prerequisite for achieving those goals. The benefits of college last a lifetime. But for students who don't have the information they need to make good choices with reasonable probabilities of success, the costs can also last for a good part of that lifetime.

Some form of postsecondary education is, under current circumstances in this country, the best option for most people, but potential students face many options and many choices. Some of these options are likely to transform their lives in very positive ways. But other options may lead to unfortunate outcomes. Understanding the uncertainty and the variation in outcomes even among similar people making similar choices is critical to a reasoned discussion of improving postsecondary opportunities.

How College Shapes Lives is not a guidebook for individuals facing college choices, but it should assist policymakers, policy analysts, journalists, college administrators, and many others who are in positions to influence the direction of public policy and of student decision making. We hope the tools we provide in this report better equip readers to move beyond the black-and-white arguments that so frequently characterize discussions of the value of higher education. Our goal is to strengthen understanding of the issues underlying discussions of the need for more postsecondary education and of the complexities involved in improving opportunities for the next generation.

SECTION 1

What Is College?

“Going to college” includes a wide variety of experiences in the United States today. It includes the image the phrase conjures up in many middle- and upper-income families with teenagers — of recent high school graduates going off to live in dormitories on the leafy green campuses of public and private four-year colleges and universities. But it also includes their classmates who live at home and enroll in nearby community colleges, frequently while working in low-wage jobs to help pay the household bills. Many older adults “go to college” when they decide it’s time to hone their labor market skills and sign up for occupation-specific programs either at community colleges or for-profit institutions.

Understanding the variety of options available is an important prerequisite for evaluating discussions of the potential risks and benefits involved in the decision to go to college. These conversations might be easier if we could draw clearer lines among the options. It might be possible to think of “postsecondary education” as including any institution-based formal education after high school, while reserving the term “higher education” for the academic programs traditionally offered in four-year colleges and universities. It might be convenient to draw a line between “college education” and “occupational training.” But the reality is that the lines are increasingly blurry, students move back and forth across those lines, and the data on which our judgments must be based do not facilitate creating distinct categories.

DEGREE-GRANTING AND NON-DEGREE-GRANTING INSTITUTIONS

Enrollment data from the Department of Education’s National Center for Education Statistics (NCES) are based on the annual Integrated Postsecondary Education Data System (IPEDS) data that all institutions whose students receive federal financial aid are required to provide. NCES separates degree-granting institutions, which award at least some associate degrees and/or bachelor’s degrees, from non-degree-granting institutions, which award certificates requiring up to four years of full-time study, but no degrees.

The terminology is a little confusing, since “degree-seeking” students eligible for student aid include those seeking short-term certificates.

In 2011, 35% of the 7,234 postsecondary institutions included in the IPEDS survey were non-degree-granting (Table 1.1). However, these institutions were very small, enrolling just 3% of all students covered by IPEDS. There are other institutions, primarily for-profit, non-degree-granting institutions, for which we do not have data. Because these institutions do not participate in federal student aid programs, they are not required to report to the federal government.¹

TABLE 1.1
Postsecondary Institutions and Enrollment, Fall 2011

	Number of Institutions	Percentage of Institutions	Fall Enrollment, 2011	Percentage of Fall Enrollment, 2011
Degree-Granting	4,706	65%	20,994,113	97%
Non-Degree-Granting	2,528	35%	563,146	3%
Total	7,234	100%	21,557,259	100%

SOURCE: National Center for Education Statistics, 2013, Tables 222, 306, and 308.

WHO ARE THE STUDENTS?

The annual *Digest of Education Statistics* provides an invaluable set of tables, many based on IPEDS data, about postsecondary institutions and their enrollments and finances. We can characterize students by the type of institution in which they are enrolled, by whether they are enrolled part time or full time, and by their gender, race/ethnicity, or age. Table 1.2 reports on the characteristics of all postsecondary students, including the 14% who already have bachelor’s degrees and are pursuing graduate studies.

1. Cellini and Goldin (2012) estimate that the number of for-profit institutions is about double the official count of 3,285, and the number of students enrolled in the sector is between one-quarter and one-third greater than the 2.4 million reported in IPEDS.

TABLE 1.2

Enrollment at Degree-Granting Institutions, Fall 2011

	Students	Percentage
Total	20,994,113	100%
Level of Enrollment		
Undergraduate	18,063,037	86%
Graduate	2,931,076	14%
Sector		
Public 4-Year	8,047,729	38%
Private Nonprofit 4-Year	3,887,322	19%
Public 2-Year	7,062,467	34%
For-Profit	1,956,731	9%
Enrollment Intensity		
Full-time	13,001,457	62%
Part-time	7,992,656	38%
Gender		
Male	9,026,499	43%
Female	11,967,614	57%
Race/Ethnicity		
Asian	1,216,562	6%
Black	3,067,947	15%
Hispanic	2,890,111	14%
White	12,394,153	59%
Other	1,425,340	7%
Age Group		
Under 18	796,375	4%
18 to 24	11,884,508	57%
25 to 34	4,799,671	23%
35 and Over	3,445,398	16%

NOTE: Percentages may not sum to 100 because of rounding.

SOURCE: National Center for Education Statistics, 2013, Tables 221, 225, 227, and 265.

Graduate students are not usually considered “college students,” but all of the undergraduates are college students. Most of them will not earn four-year degrees. In fact, 43% of undergraduate students are enrolled in institutions that do not grant bachelor’s degrees — in two-year institutions or in non-degree-granting institutions (Table 1.3).

It is no surprise then that 44% of all credentials awarded in 2010-11 were either certificates or associate degrees (Table 1.4). Advanced degrees, which include both master’s and doctoral degrees, accounted for 20% of credentials and bachelor’s degrees accounted for 37%.

TABLE 1.3

Undergraduate Enrollment, Fall 2011

	Number of Students	Percentage of Students
Total Undergraduate	18,600,185	100%
Degree-Granting	18,063,037	97%
4-Year	10,563,055	57%
2-Year	7,499,982	40%
Non-Degree-Granting	537,148	3%

SOURCES: National Center for Education Statistics, 2012, Table 226; unpublished IPEDS data.

TABLE 1.4

Postsecondary Degrees Awarded, 2010-11

Degree	Number	Percentage
Certificates (less than 1 year)	482,947	11%
Certificates (between 1 and 4 years)	546,610	12%
Associate Degrees	942,327	21%
Bachelor’s Degrees	1,715,913	37%
Master’s Degrees	730,635	16%
Doctorate Degrees	163,765	4%
Total	4,582,197	100%

NOTE: Includes certificates and degrees awarded at degree-granting and non-degree-granting Title IV institutions. Percentages may not sum to 100 because of rounding.

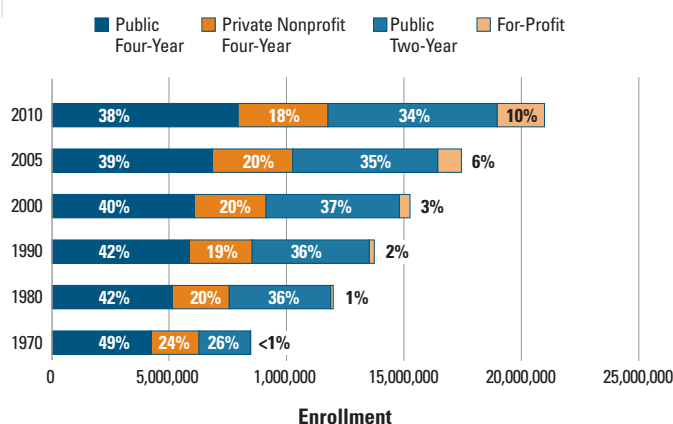
SOURCE: National Center for Education Statistics, 2013, Tables 310 and 311.

CHANGES IN ENROLLMENT AND POSTSECONDARY DEGREES OVER TIME

Over the past 30 years, the composition of the postsecondary student population has changed quite a bit. In 1970, 73% of all students were enrolled in public and private nonprofit four-year colleges and universities (Figure 1.1). That percentage had fallen to 61% by 1990 and to 56% by 2010. Enrollment in these two sectors grew by almost 90% over this 30-year period. But public two-year college enrollment grew by 229%, and the for-profit sector, which enrolled only 18,000 students in 1970, enrolled an additional 2 million students by 2010.²

FIGURE 1.1

Fall Enrollment at Degree-Granting Institutions by Sector, 1970–2010, Selected Years



SOURCE: National Center for Education Statistics, 2013, Table 223.

The change in enrollment patterns over time corresponds to a change in the types of credentials earned. While precise data are not available before 2000, the number of undergraduate certificates almost doubled between 2000-01 and 2010-11 (Table 1.5). They accounted for 28% of undergraduate credentials in 2010-11 (Table 1.6). Bachelor's degrees declined from 77% of undergraduate credentials awarded in 1970-71 to 47% 30 years later.

SUMMARY

“Going to college” is not synonymous with enrolling in a four-year institution and working toward a bachelor's degree. The reality is that 43% of undergraduate students are enrolled in two-year institutions or non-degree-granting institutions — institutions

² These enrollments do not include institutions that are not eligible for federal financial aid and are not participating in IPEDS.

TABLE 1.5

Postsecondary Degrees Awarded, 1970-71 to 2010-11, Selected Years

Year	Certificates	Associate Degrees	Bachelor's Degrees	Master's Degrees	Doctoral Degrees
1970-71	—	252,311	839,730	235,564	64,998
1980-81	—	416,377	935,140	302,637	98,016
1990-91	—	481,720	1,094,538	342,863	105,547
2000-01	552,503	578,865	1,244,171	473,502	119,585
2005-06	715,401	713,066	1,485,242	599,731	138,056
2010-11	1,029,557	942,327	1,715,913	730,635	163,765

NOTE: Certificates existed prior to 2000-01, but reliable data on the number awarded in academic years prior to then are not available.

SOURCE: National Center for Education Statistics, 2013, Tables 310 and 323.

TABLE 1.6

Percentage Distribution of Undergraduate Degrees Awarded, 1970-71 to 2010-11, Selected Years

Year	Certificates	Associate Degrees	Bachelor's Degrees
1970-71	NA	23%	77%
1980-81	NA	31%	69%
1990-91	NA	31%	69%
2000-01	23%	24%	52%
2005-06	25%	24%	51%
2010-11	28%	26%	47%

NOTE: Certificates existed prior to 2000-01, but reliable data on the number awarded in academic years prior to then are not available. Percentages may not sum to 100 because of rounding.

SOURCE: National Center for Education Statistics, 2013, Tables 310 and 323.

that do not grant bachelor's degrees. The students enrolled at these types of institutions are working toward postsecondary certificates or associate degrees, which comprised 44% of the credentials awarded in 2010-11.

Many of the students going to college are adults who have been out of high school for many years. They are in their mid-twenties or older and are likely to be combining part-time enrollment with full-time (or close to full-time) work.

Students go to college with a variety of goals, such as getting a broad general education that will prepare them for a wide range of occupations, experiences, and further education; acquiring knowledge and credentials in particular academic and professional fields; and gaining training for specific occupations.

SECTION 2

Nonmonetary Benefits to Individuals and Benefits to Society

While most of the sections in this report are devoted to the earnings and employment outcomes of higher education, it is important to note that there are many nonfinancial benefits of postsecondary education. Although not as easily quantified, these benefits may be as important. Moreover, not all of the benefits of education go to the individuals who participate. Society as a whole also wins — with greater productivity, higher tax revenues, lowered reliance on social support programs, and perhaps most important, a more informed and involved citizenry. In this section, we discuss several of these benefits including fringe benefits, health, civic participation, and impacts on the public budget.

There is a large body of literature on the economic returns to schooling that goes back several decades, and it is well documented that higher levels of education are associated with both higher levels of earnings and lower rates of unemployment. In recent years, researchers have turned to estimating the impact of education on nonfinancial outcomes. One common challenge in such studies, which is also an issue in measuring the financial returns to education, is to isolate causation. Because outcomes may be correlated with an individual's family background and unobserved characteristics, which themselves may be correlated with the individual's decision to obtain more schooling, it is often difficult to disentangle the true impact of schooling on outcomes.

Researchers have tried to isolate the impact of education using several approaches. For example, Oreopoulos and Salvanes (2011) studied Norwegian siblings and twins with different levels of schooling. Because siblings and twins share many family characteristics, comparing life outcomes of siblings with different levels of schooling provides a useful approach to estimating the impact of education. They found that people with higher levels of schooling are more likely to have spouses with more education, less likely to be divorced or to be receiving disability payments, and less likely to have a teenage birth.

Using other statistical strategies to isolate causation, Dee (2004) studied the impact of educational attainment on adult

civic engagement and attitudes. He found that educational attainment had significant effects on voter participation, support for free speech, and the frequency of newspaper readership.

In this section, we discuss some evidence on the nonpecuniary benefits of education for individuals, as well as on the benefits accruing to society as a whole. Much of the information comes from this report's companion publication, *Education Pays 2013: The Benefits of Higher Education for Individuals and Society*.

FRINGE BENEFITS

While earnings constitute the majority of a worker's total compensation, there are other forms of noncash compensation including retirement benefits and health insurance. Typically, full-time workers are more likely than part-time workers to be offered these fringe benefits.

In addition to having higher earnings, individuals with higher levels of education are more likely to be offered retirement benefits and health insurance. In 2011, when 52% of high school graduates working full time year-round were offered retirement plans by their employers, 65% of those whose highest education level was a bachelor's degree and 73% of those with advanced degrees were offered retirement plans. Among those who were offered a retirement plan, 86% of high school graduates and 93% of bachelor's degree recipients chose to participate in the plan (Baum, Ma, & Payea, 2013, Figures 1.12A and 1.12B).

Individuals with higher levels of education are also more likely to be covered by employer-provided health insurance. In 2011, 55% of high school graduates working full time were covered by employer-provided health insurance, compared to 69% of those with a bachelor's degree and 73% of those with advanced degrees. Health insurance coverage for part-time workers is much lower, ranging from 16% for those without a high school diploma and 27% for those with a high school diploma to 39% for those with a bachelor's degree and 48% for those with advanced degrees (Baum, Ma, & Payea, 2013, Figures 1.13A and 1.13B).

A Congressional Budget Office study indicated that on average, the fringe benefits received by high school graduates employed by the federal government had an estimated value of \$15.50 an hour (in 2010 dollars), compared to \$21.80 an hour for those whose highest education level was a bachelor's degree and more than \$24.00 an hour for those with advanced degrees.³ (Congressional Budget Office, 2012, Table 3.)

HEALTH OUTCOMES

Education is clearly correlated with various health outcomes and behaviors. In 2012, when only 8% of individuals with at least a bachelor's degree smoked, 20% of those with some college or an associate degree and 25% of those with a high school diploma or less smoked (Baum, Ma, & Payea, 2013; Figure 1.16A). Studies have shown that higher education levels are not just correlated with lower rates, but also cause declines in smoking (de Walque, 2004; Grimard & Parent, 2007).

Higher education levels are also associated with higher exercise rates. In 2011, when 63% of individuals with at least a bachelor's degree met the 2008 federal physical activity guidelines for leisure-time aerobic activities, only 38% of high school graduates and 29% of those without a high school diploma met the guidelines (Baum, Ma, & Payea, 2013; Figure 1.17A).

The obesity rates of children and adolescents are negatively related to the highest education level in their households. In 2007–2010, 11% of boys from college graduate households were obese, compared to 19% of those from high school graduate households and 24% of those from households without a high school diploma; 7% of girls from college graduate households were obese, compared to 21% of those from high school graduate households and 22% of those from households without a high school diploma (Baum, Ma, & Payea, 2013; Figure 1.18B).

While the exact mechanism of how education improves health behaviors and outcomes is unclear, numerous studies support the idea that the skills, attitudes, and thought patterns fostered by education lead to more responsible health-related behaviors (Mirowsky & Ross, 2003). In their analysis of the

positive relationship between education and health outcomes, Cutler and Lleras-Muney (2010) find that income, health insurance, and family background account for about 30% of the differences, but knowledge and measures of cognitive ability explain an additional 30%, with social networks explaining another 10% of the differences. The authors argue that “more important than specific knowledge is how one thinks.” They find that much of the difference seems to be driven by the fact that education raises cognition, which in turn improves behavior.

CIVIC PARTICIPATION

There is a strong correlation between educational attainment and civic participation. Higher levels of education are correlated with higher registration and voting rates among citizens. In the 2012 presidential election, 73% of 25- to 44-year-old four-year college graduates voted, compared to 42% of high school graduates in the same age group. In the 2010 Congressional election, 25- to 44-year-old college graduates were twice as likely to vote as high school graduates in the same age group. Within each age group, citizens with higher education levels are also more likely to register to vote. In 2012, the percentage of citizens not registered to vote ranged from 13% for bachelor's degree recipients between the ages of 65 and 74 to 69% for those between the ages of 18 and 24 without a high school diploma (Baum, Ma, & Payea, 2013, Figures 1.22A and 1.22B).

Data from the General Social Survey (GSS) show that individuals with higher educational attainment demonstrate a deeper knowledge of current affairs.⁴ For example, one of the questions in the 2012 GSS asks: “How good is your understanding of the important political issues facing our country?” Data show that among adults ages 25 and older, 45% of those with at least a bachelor's degree, 21% of high school graduates and only 15% of those without a high school diploma responded “quite a bit” or “a great deal” to the question. In contrast, the percentage of adults responding “none” or “a little” ranged from 11% of those with four-year college degrees and 14% of those with some college education or an associate degree to 30% of high school graduates and 54% of those without a high school diploma (Baum, Ma, & Payea, 2013, Figures 1.20A).

3. Because the cost of retirement benefits is often proportional to salaries and wages, some of the differences in the value of benefits can be explained by differences in earnings.

4. The General Social Survey, conducted by the National Opinion Research Center (NORC) since 1972, includes demographic, behavioral, and attitudinal questions.

Higher educational attainment is also associated with higher rates of volunteering (Baum, Ma, & Payea, 2013, Figure 1.20B; Brand, 2010; Dee, 2004). Of particular interest and related to the discussion of average and marginal returns to postsecondary education in Section 10, there is some evidence that those who have a low likelihood of completing college tend to receive the highest civic returns to a college education (Brand, 2010).

PUBLIC BUDGETS

While many of the benefits of a more educated population cannot easily be measured in dollar terms, postsecondary education more than pays for itself in terms of the public budget. A recent Federal Reserve study estimates that the direct extra tax revenues from college graduates are more than six times the gross government cost per college degree (Trostel, 2009).

The simple fact that the total federal, state, and local tax burden on individuals rises as incomes rise means that a portion of the increased earnings associated with higher levels of education goes straight to the public coffers. In 2011, when a high school graduate with median earnings paid about \$6,400 in taxes, a bachelor's degree recipient with median earnings paid about \$11,400 (Baum, Ma, & Payea, 2013, Figure 1.1).

The combination of higher earnings and higher employment rates means that college-educated adults are less likely than others to depend on unemployment insurance, the Supplemental Nutritional Assistance Program (SNAP), Medicaid, and other programs designed to mitigate poverty. As a result, increased education levels save state and federal governments thousands of dollars over the lifetimes of people who attain higher levels of education (Carroll & Erkut, 2009).

Careful analyses have also found that increases in the number of college graduates in a metropolitan area lead to increases in earnings for all workers in the area, not just those with higher levels of education. Moretti (2004) estimated that controlling for other factors, a 1 percentage point increase in the proportion of the population holding a four-year college degree leads to increases of 1 to 2 percentage points in the wages of workers without college degrees, and to positive but smaller increases in the wages of those with at least a bachelor's degree.

SUMMARY

Individuals and society benefit from higher education in a variety of ways. In addition to the well-known association with higher earnings, higher levels of education are also associated with more fringe benefits and better health-related behaviors and outcomes. In addition, people who do not have college degrees benefit from the higher education levels of others. They earn more and face less strained local, state, and federal budgets. Moreover, they live in a society in which more people are well-informed and actively engaged in the community.

Earnings and employment are important outcomes of higher education, but they don't tell the whole story. The nonpecuniary benefits for individuals as well as the broad social benefits improve the quality of life across our society.

SECTION 3

The Higher Education Earnings Premium: Defining the Population

Discussions of the earnings premium accruing to individuals with higher levels of education frequently compare median earnings of full-time workers with advanced degrees, bachelor's degrees, or associate degrees to median earnings of full-time workers with only high school diplomas.

This is a reasonable approach, since it provides insight into how the wages for jobs filled by college graduates compare to the wages for jobs filled by those with lower levels of education. But it is not the only meaningful comparison, and may not, in fact, be the best one.

College graduates don't just have higher hourly earnings than high school graduates; they are also more likely to work full time when they are employed and more likely to be employed at all. As a result, the percentage gap in earnings between workers with different levels of education is larger if all workers — both full-time and part-time — are included. The gap is even larger if all members of the labor force are included. This involves counting adults who are unemployed but actively seeking work, but does not include either those such as homemakers or retirees who choose not to work or those who have become discouraged and have given up on finding work.

As Table 3.1 indicates, including part-time workers lowers median earnings by 17%, from \$34,400 to \$28,700 for high school graduates. Median earnings for bachelor's degree recipients decline by 13%, from \$58,400 to \$50,600 when part-time workers are added. Including those who are unemployed lowers the median for high school graduates by another 9%, from \$28,700 to \$26,200, but by only 4% — from \$50,600 to \$48,600 — for four-year college graduates.

Overall, the earnings premium for education looks lower if the population is defined more narrowly. As Figure 3.1 indicates, associate degree holders earn 30%, 34%, or 39% more than high school graduates, depending on which population is selected. Among full-time workers, median earnings for advanced degree holders are 223% of median earnings for high school graduates. But if all labor force participants are considered, those with advanced degrees earn 250% of the median earnings of high school graduates.

The differences in these measures are the result of differential employment patterns across levels of education. As Table 3.1 shows, the employment rate increases with level of education, with 85% of those with no high school diploma and 89% of high school graduates employed, compared to 95% of those

TABLE 3.1

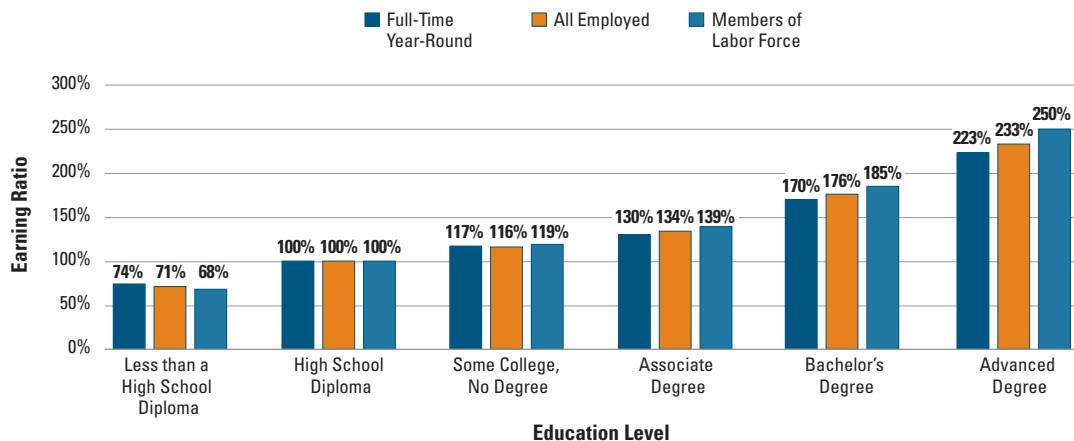
Median Annual Earnings and Employment Status of Individuals Ages 25 and Older by Education Level, 2011

Education Level	Median Earnings			Percentage Employed	Of Those Employed, Percentage Working Full Time
	Full-Time Year-Round Workers	Full-Time and Part-Time Workers	Employed and Unemployed Members of the Labor Force		
Less than a High School Diploma	\$25,300	\$20,400	\$17,700	85%	64%
High School Diploma	\$34,400	\$28,700	\$26,200	89%	72%
Some College, No Degree	\$40,300	\$33,400	\$31,200	90%	73%
Associate Degree	\$44,600	\$38,500	\$36,400	93%	75%
Bachelor's Degree	\$58,400	\$50,600	\$48,600	95%	78%
Advanced Degree	\$76,800	\$66,900	\$65,500	96%	77%

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

FIGURE 3.1

Earnings of Individuals Ages 25 and Older Relative to High School Graduates by Education Level and Employment Status, 2011



SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

with bachelor's degrees and 96% of advanced degree holders. Among the employed, the percentage employed full time ranges from 64% for those with no high school diploma and 72% for high school graduates to 77% for those with advanced degrees and 78% for bachelor's degree recipients.

GENDER DIFFERENCES

The fact that, on average, men earn more than women with similar levels of education is widely known. But again, the population on which the analysis is based makes a difference. Looking only at full-time workers, median earnings for women whose highest degree is a bachelor's degree are 74% of median earnings for men with bachelor's degrees. Because women are more likely than men to work part time, when part-time workers are also included, that ratio falls to 69% (Table 3.2). It remains at 69% when those who are unemployed are added as well. The earnings gaps between males and females are smallest for adults with associate degrees.

TABLE 3.2

Female-to-Male Earnings Ratios for Individuals Ages 25 and Older by Education Level and Employment Status, 2011

Education Level	Median Earnings Females/ Median Earnings Males		
	Full-Time Year-Round	Full-Time and Part-Time	Employed and Unemployed Members of the Labor Force
Less than a High School Diploma	76%	69%	64%
High School Diploma	75%	67%	68%
Some College, No Degree	74%	67%	68%
Associate Degree	79%	72%	73%
Bachelor's Degree	74%	69%	69%
Advanced Degree	69%	68%	67%

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

EARNINGS PREMIUMS BY RACE/ETHNICITY

As indicated in Figure 3.2, higher levels of educational attainment correspond to higher median earnings for members of all racial/ethnic groups.

However, the earnings premium is not the same within each group (Table 3.3). The earnings premium associated with higher levels of education is larger for Asians than for others. Median earnings for Asians with some college but no degree who are working full time year-round are 27% higher than median earnings for Asian high school graduates, but the gap is only 14% for whites (whose median earnings are higher at both levels). Median earnings for Asians with advanced degrees working full time year-round are 198% higher — almost three times as high — as those for Asian high school graduates, but the gap is only 108% — just over twice as high — for blacks.

TABLE 3.3

Earnings of Full-Time Year-Round Workers Ages 25 and Older Relative to High School Graduates, by Race/Ethnicity, 2011

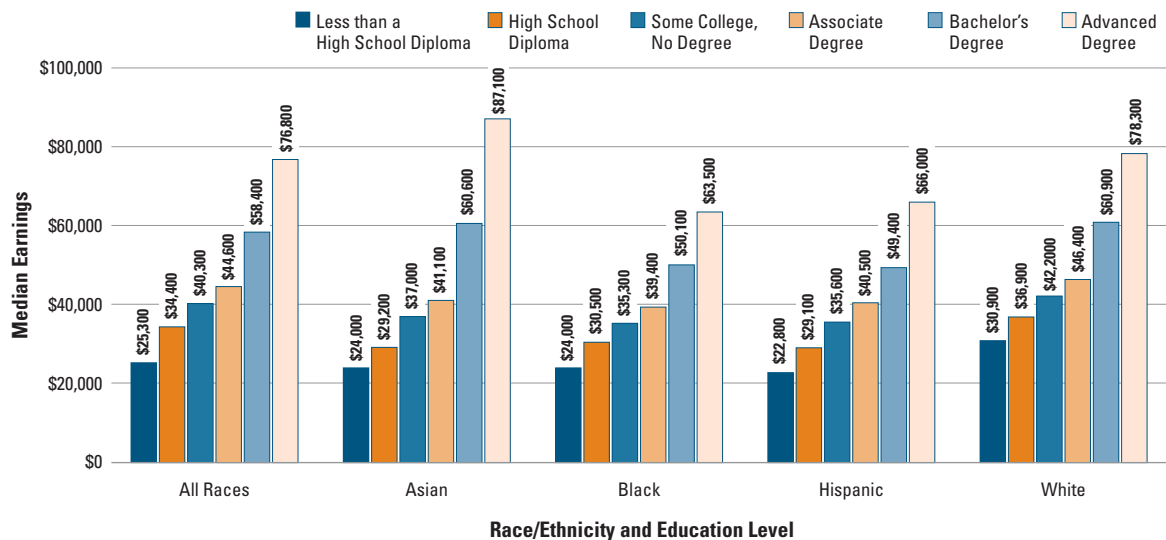
Education Level	Race/Ethnicity				
	All Races	Asian	Black	Hispanic	White
Less than a High School Diploma	74%	82%	79%	78%	84%
High School Diploma	100%	100%	100%	100%	100%
Some College, No Degree	117%	127%	116%	122%	114%
Associate Degree	130%	141%	129%	139%	126%
Bachelor's Degree	170%	208%	164%	170%	165%
Advanced Degree	223%	298%	208%	227%	212%

NOTE: The race categories include individuals who reported non-Hispanic and who reported only one race.

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

FIGURE 3.2

Median Earnings of Full-Time Year-Round Workers Ages 25 and Older by Race/Ethnicity, 2011



SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

The earnings premium for black full-time workers with bachelor's degrees compared to those with high school diplomas is 64% — \$50,100 compared to \$30,500. If all workers, including those employed part time, are counted, the earnings premium is 76% (\$44,900 for black workers with bachelor's degrees compared to \$25,500 for black workers with high school diplomas). And if all members of the labor force are included, the earnings premium for black bachelor's degree holders is 98% — \$41,900 compared to \$21,100. In other words, because of the higher rates of employment and of full-time employment for blacks with college degrees, the earnings premium is higher when those who have not found full-time employment are included (not shown).

The difference in median earnings between black associate degree recipients and black high school graduates rises from 29% to 33% to 50% as the population is expanded to include part-time workers and then all members of the labor force. In contrast, the earnings premium for Hispanic associate degree recipients varies less across population definitions (39%, 41%, and 44%) because median earnings fall similarly for high school graduates and associate degree holders as the population is expanded (not shown).

SUMMARY

There is not one right answer to the question of how much of an earnings premium is associated with higher levels of education. The frequent citing of earnings differences for full-time year-round workers ignores differences in employment patterns by level of education. Because adults with higher levels of education are more likely to be employed and to work full time if they are employed, the earnings premium is larger when those not working full time are included. The impact of the definition of the relevant population is larger for blacks than for other racial/ethnic groups.

SECTION 4

The Earnings Premium for Higher Education: Level and Trends

The idea that the financial return to a college education has been growing over time is well-established in the common wisdom. But some recent stories have questioned whether a college degree is still “worth it.” The Sept. 17, 2012, cover of *Newsweek* asked, “Is College a Lousy Investment?” The article’s author, Megan McArdle, who acknowledged that she has reaped considerable benefits from her education, concludes that for many people it’s really not worth it anymore. Pundits frequently cite declining returns — or, at least, returns that are not growing — to argue that many people should reconsider the decision to go to college.

How can such competing ideas be gaining attention? A closer look at the data provides some insights.

Perhaps the most careful and thorough examination of the time path of the earnings premium for a college education comes from Goldin and Katz (2008), who point out that the earnings gap was very wide in 1915 but then narrowed. It began to widen rapidly after 1980. They find that the interaction of strong secular growth in the demand for skilled labor with fluctuating growth in supply explains most of the changes.

We shouldn’t expect that the gap will be greater every year than it was the year before. Aside from the fact that there is always some measurement error, specific economic circumstances, blips in the birth rate, technological innovations, and numerous other factors will affect earnings (and employment) from year to year. Focusing

on one-year changes is not a reliable way to understand trends. Moreover, whether or not we find an upward trend, what really matters is the *size* of the earnings differential. The payoff doesn’t have to be higher every year to make the return to education more than worth the investment for most people.

EARNINGS DIFFERENTIALS OVER TIME FOR FULL-TIME YEAR-ROUND WORKERS

As Table 4.1 shows, median 2011 earnings of both men and women ages 25 and older with a bachelor’s degree working full time were 64% higher than median earnings for those with a high school diploma. In 1991, the earnings differentials were just over 50%. For women, the earnings premium rose during the first half of the most recent decade and then declined to equal its 2001 level. This does not constitute a “downward trend.”

TABLE 4.1

Median Earnings of Full-Time Year-Round Workers Ages 25 and Older Relative to Median Earnings of High School Graduates, by Education Level, 1991–2011, Selected Years

Gender and Year	Less than a High School Diploma	High School Diploma	Some College, No Degree	Associate Degree	Bachelor’s Degree or Higher	Bachelor’s Degree	Advanced Degree
Men							
1991	0.80	1.00	1.18	1.23	1.62	1.52	1.96
1996	0.74	1.00	1.11	1.20	1.67	1.45	2.06
2001	0.78	1.00	1.22	1.26	1.83	1.61	2.27
2006	0.75	1.00	1.18	1.27	1.81	1.64	2.21
2011	0.75	1.00	1.16	1.26	1.83	1.64	2.26
Women							
1991	0.75	1.00	1.18	1.32	1.68	1.53	1.94
1996	0.79	1.00	1.16	1.31	1.71	1.56	2.04
2001	0.74	1.00	1.19	1.29	1.74	1.64	2.08
2006	0.75	1.00	1.20	1.31	1.85	1.70	2.10
2011	0.70	1.00	1.15	1.31	1.74	1.64	2.07

SOURCES: U.S. Census Bureau, 2012b, Table P-24; U.S. Census Bureau, 1995–2012a, PINC tables; U.S. Census Bureau, 1992–1994; calculations by the authors.

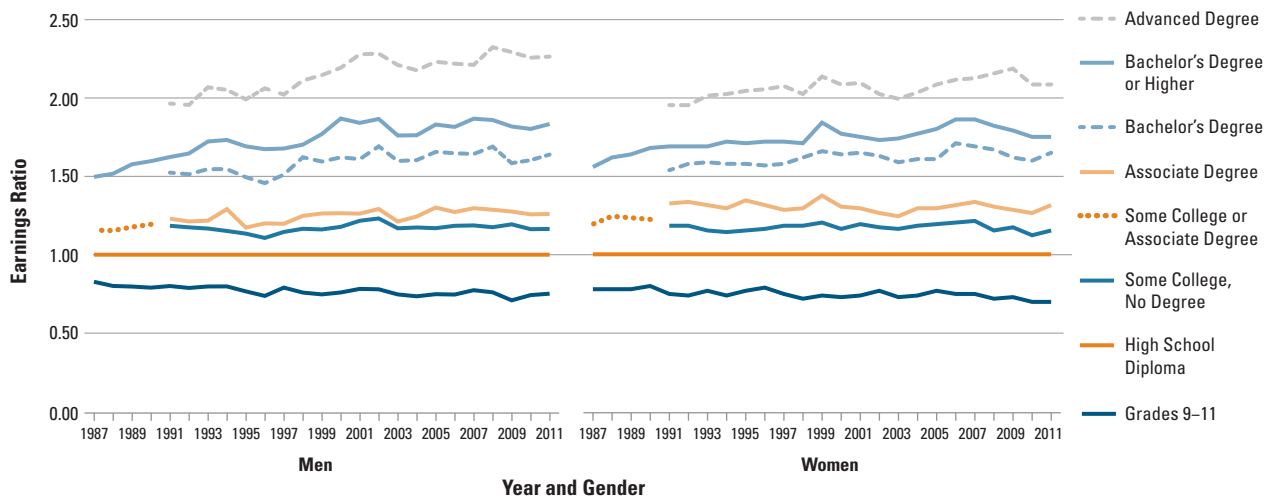
Figure 4.1 shows the trend in earnings differentials among full-time workers with different levels of education. A horizontal line, parallel to the line for workers with high school diplomas, would indicate a constant differential over time. Clearly, for those with bachelor's degrees or higher — and particularly for those with advanced degrees — the earnings premium has increased over time. The trend is less clear for those with associate degrees and the premium for those with “Some College, No Degree” is not increasing; the gap between high school graduates and those without diplomas has increased.

DEFINING THE TIME PERIOD

Focusing on the most recent decade makes it clear how people can tell different stories with the same data. Year-to-year variation frequently does not indicate changing trends. As Table 4.2 indicates, the earnings premium has been fluctuating and there is not much of a trend in these earnings differentials over the past decade.

FIGURE 4.1

Median Earnings of Full-Time Year-Round Workers Ages 25 and Older Relative to Median Earnings of High School Graduates, by Education Level, 1987–2011



NOTE: Because of changes in the question on educational attainment, data for the following education levels are not available for 1990 and prior: some college, no degree; associate degree; bachelor's degree; and advanced degree. The data presented in this figure are based on the Current Population Survey and therefore may not perfectly match median earnings data presented elsewhere in this publication that are based on the American Community Survey.

SOURCES: U.S. Census Bureau, 2012b, Table P-24; U.S. Census Bureau, 1995–2012a, PINC tables; U.S. Census Bureau, 1992–1994; calculations by the authors.

TABLE 4.2

Median Earnings of Full-Time Year-Round Workers Whose Highest Degree Is a Bachelor's Degree Relative to High School Graduates, by Gender, 2001 to 2011

Year	Ratio of Median Earnings: Bachelor's Degree/ High School Diploma		Year	Ratio of Median Earnings: Bachelor's Degree/ High School Diploma	
	Men	Women		Men	Women
2001	1.61	1.64	2007	1.64	1.68
2002	1.69	1.62	2008	1.69	1.66
2003	1.60	1.58	2009	1.58	1.61
2004	1.60	1.60	2010	1.60	1.59
2005	1.65	1.60	2011	1.64	1.64
2006	1.64	1.70			

SOURCES: U.S. Census Bureau, 2012b, Table P-24; calculations by the authors.

– Between 2002 and 2011, the earnings differential between full-time working men with high school diplomas and those whose highest degree is a bachelor’s degree fell from 69% to 64%.

– Between 2004 and 2011, the earnings differential between full-time working men with high school diplomas and those whose highest degree is a bachelor’s degree increased from 60% to 64%.

EARNINGS PREMIUMS FOR SUB-BACCALAUREATE DEGREES

The earnings premium for associate degrees and for some college but no degree has not grown over the past 20 years, as it has for bachelor’s and advanced degrees (Table 4.1). The premium for men with some college but no degree has fluctuated between 11% (in 1996) and 23% (in 2002) and was 16% in 2011; for women, that premium has ranged from 12% (2010) to 21% (2007) and was 15% in 2011.

The earnings premium for men with associate degrees has fluctuated between 17% (1995) and 30% (2005 and 2007) and was 26% in 2011; for women, that premium has ranged from 24% (2003) to 37% (1999) and was 31% in 2011.

In other words, how we define “college degree” makes a difference. (See Section 1 on “What Is College?”) These averages, of course, mask many variables, including the composition of the fields in which degrees are earned and the age distribution within the population of workers covered.

AGE DIFFERENCES

As will be discussed in Section 6 on “The Focus on Recent College Graduates,” earnings differentials by education levels tend to be higher for older workers than for those who have recently entered the labor market. If instead of focusing on full-time workers ages 25 and older, we focus on full-time workers ages 25 to 34, what story do we see over time?

Between 1981 and 1991, the earnings premium for men ages 25 to 34 with a bachelor’s degree or higher increased from 25% to 56%. For young women, the growth was from 40% to 56% (Table 4.3). The growth slowed in later decades, but certainly did not end, rising to 69% for men and to 70% for

TABLE 4.3
Median Earnings of Full-Time Year-Round Workers Ages 25–34 with At Least a Bachelor’s Degree Relative to High School Graduates, by Gender, 1971–2011, Selected Years

Year	Ratio of Median Earnings: Bachelor’s Degree or Higher/ High School Diploma	
	Men	Women
1971	1.25	1.43
1981	1.25	1.40
1991	1.56	1.56
2001	1.64	1.68
2002	1.66	1.71
2003	1.63	1.70
2004	1.66	1.67
2005	1.63	1.70
2006	1.62	1.77
2007	1.65	1.75
2008	1.74	1.79
2009	1.69	1.80
2010	1.61	1.76
2011	1.69	1.70

SOURCES: Data for 1993 and prior: National Center for Education Statistics, 2004, Table 14-1; Data for 1994 and after: U.S. Census Bureau, 1995–2012, PINC tables; calculations by the authors.

women by 2011. Predicting an upward trend for men because the premium rose from 61% to 69% between 2010 and 2011 would be unjustified, as would predicting a downward trend for women because the premium declined from 76% to 70% that year.

For men ages 25 to 34 whose highest degree is a bachelor’s degree, the earnings premium for full-time workers fell slightly between 2001 and 2011, but it rose by 3 percentage points for the whole 25 and older group (Table 4.4). For women, the premium fell by 8 percentage points for those ages 25 to 34, but held steady for all full-time workers ages 25 and older. In other words, the narrative is different if the focus is only on recent entrants to the labor market.

TABLE 4.4

Median Earnings of Full-Time Year-Round Workers Whose Highest Degree Is a Bachelor's Degree Relative to High School Graduates, by Gender and Age, 1991, 2001, and 2011

Year	Men		Women	
	Ages 25–34	Ages 25 and older	Ages 25–34	Ages 25 and Older
1991	1.44	1.52	1.51	1.53
2001	1.57	1.61	1.63	1.64
2011	1.56	1.64	1.55	1.64

SOURCES: National Center for Education Statistics, 2004, Table 14-1; U.S. Census Bureau, 1995–2012, PINC tables; U.S. Census Bureau, 2012b, Table P-24; calculations by the authors.

ADVANCED DEGREES

As explained on page 24 in the discussion of “The Option Value of a College Degree,” including people who went on to earn a master’s, professional, or doctoral degree after completing a four-year degree overestimates the benefit of a bachelor’s degree. But excluding these individuals leads to an underestimate.

For the 25 to 34 age group, the recent growth in the earnings premium has been for those with advanced degrees. For men whose highest degree is a bachelor’s degree, the premium fluctuated between 52% and 62% between 2001 and 2011. For women, it fluctuated between 55% and 70%. While the premium for men ended the decade about where it began, the premium for women declined to match the level for men.

In contrast, the gap between median earnings for men ages 25 to 34 working full time with advanced degrees and those with bachelor’s degrees grew from 94% in 2001 to 112% in 2011. For women, the increase was from 87% to 94%. Advanced degrees are paying off more and more for young people.

FULL-TIME WORKERS OR EARNINGS FOR ALL?

As discussed in Section 3 on “Defining the Population,” it’s not at all clear that the standard practice of comparing full-time year-round workers (followed in much of this report) is the most accurate approach. Higher levels of education correspond not only to higher wages, but also to higher levels of employment and of full-time employment. So excluding unemployed people

and those working part time understates the earnings benefits associated with college education.

For men ages 25 and older working full time, the earnings premium for a bachelor’s degree increased by 3 percentage points (from 61% to 64%) from 2001 to 2011. When the entire male population is included, the premium rose more rapidly — by 8 percentage points, from 76% to 84% over the most recent decade.

For women working full time, the premium for a bachelor’s degree was the same in 2011 as it was in 2001 (64%). But for all women, it increased from 98% to 106%.

SUMMARY

Four-year college degrees have paid off more and more in terms of earnings over the past 40 years and the earnings premium continues to rise. For example, median earnings for women ages 25 and older working full time whose highest degree was a bachelor’s degree were 60% higher than earnings for high school graduates in 1971. They were 94% higher in 1991 and 106% higher in 2011.

What about the most recent decade? The trend has slowed, but it has not reversed. For men, the earnings gap was 75% in 2005 and 84% in 2011. For women it was 100% in 2005 and 106% in 2011.

The story is somewhat different for those with some college but no degree (a category that includes certificate holders) and for those with associate degrees. The earnings gap between these groups and high school graduates grew quite a bit between 1971 and 1991, but has since leveled off.

In the first decade of the 21st century, the earnings premium for advanced degrees rose more rapidly than that for bachelor’s degrees, particularly for young people.

The data on earnings differentials over time are complicated. Choosing a different starting date can make the story look very different. The earnings premium has risen more for all men and all women than for those working full time. But the data are consistent in showing that the earnings benefits of college graduates are secure.

The “Option Value” of a College Degree

The term “option value” is frequently used to refer to the value people place on an asset they haven’t actually used. The idea is that they are willing to pay to preserve, for example, a national park, knowing that if it is abandoned, it would be very expensive to reclaim it. People who don’t rely on public transportation may still value its development and maintenance because it provides them with the option of using it if the need arises (Weisbrod, 1964). In education, the concept is used to refer to the value of achieving a level of education that provides the opportunity to go on to the next level.

Completing a high school diploma opens up the option of going to college. Ignoring the value of this option would be to underestimate the value of graduating from high school. A bachelor’s degree recipient has the option of deciding at a later date to go to graduate school. For a high school graduate to decide at age 25 to become a lawyer would be very difficult and expensive. It would require four years of undergraduate study before there was any chance of getting into law school. An extraordinary amount of uncertainty would be involved in starting down this path.

Heckman, Lochner, and Todd (2006) point out that as students progress through their schooling they acquire more and more information about their personal opportunities for continuing different educational paths. They learn more about themselves and how likely they are to succeed. This information has value that should not be ignored.

So a bachelor’s degree recipient doesn’t just have a bachelor’s degree. He also has the option of entering a variety of professions that require this credential and continuing for a graduate degree.

A practical implication of this idea for the analyses in this report relates to the question of whether we should think of the earnings premium of bachelor’s degrees as just the difference between the average earnings of high school graduates and

those of people whose highest degree is a bachelor’s degree, or whether we should include *all* bachelor’s degree recipients, including those who have also earned advanced degrees.

Most of the comparisons in this report are of the former type. These comparisons do not account for the value of the bachelor’s degree in increasing the probability of earning a higher degree. They also exclude many people who have earned bachelor’s degrees — and were potentially among the most successful students, as evidenced by their decision to continue their studies. Ignoring those who have continued their education yields an underestimate of the financial benefit of a bachelor’s degree.

On the other hand, comparing the earnings of high school graduates to the earnings of people with a bachelor’s degree or higher counts the earnings of professors, doctors, and lawyers as though they were the result of an undergraduate degree.

In 2011, median earnings of full-time workers ages 25 to 34 whose highest degree was a bachelor’s degree were \$46,700. For all full-time workers in this age bracket with a bachelor’s degree or higher, the median was 7% higher — \$50,200. In this group, 23% had master’s degrees and 9% had either doctoral or professional degrees (U.S. Census Bureau, 2011; calculations by the authors).

Moving to the next age group, 35- to 44-year-olds, median earnings for full-time workers whose highest degree was a bachelor’s degree were \$62,700. For all full-time workers in this age bracket with a bachelor’s degree or higher, the median was 12% higher — \$70,100. In this group, 28% had master’s degrees and 12% had either doctoral or professional degrees. If the rate of progression to advanced degrees were constant, about 8% of the bachelor’s degree recipients in the younger group would apparently be on their way to a higher degree. (U.S. Census Bureau, 2011; calculations by the authors.)

SECTION 5

Variation in Earnings Within Levels of Education

Much of the confusion about the high and growing earnings premium for college degrees — and the high rate of return to the investment in postsecondary education — results from the visibility of individuals for whom things have not worked out so well. In 2012, when the unemployment rate for 25- to 34-year-olds with four-year college degrees was 4.1%, 11.2% of high school graduates in this age range were unemployed (Baum, Ma, & Payea, 2013, Figure 1.9B). But this reality was small comfort to the recent college graduate with loans to repay who couldn't find satisfactory employment.

In 2011, median earnings for 35- to 44-year-olds working full time whose highest degree was a bachelor's degree were \$62,700, compared to \$34,900 for high school graduates (U.S. Census Bureau, 2011; calculations by the authors). But for the 16% of four-year college graduates whose earnings were *lower* than \$34,900, the fact that they were outliers among their cohort meant that they didn't have a high financial payoff to *their* college degrees.

Unusual outcomes always attract attention. Moreover, when a minority of people who have put time, energy, and money into education find themselves in difficult financial circumstances, the very real problems they face are a cause for concern — and a potential caution for people following in their footsteps.

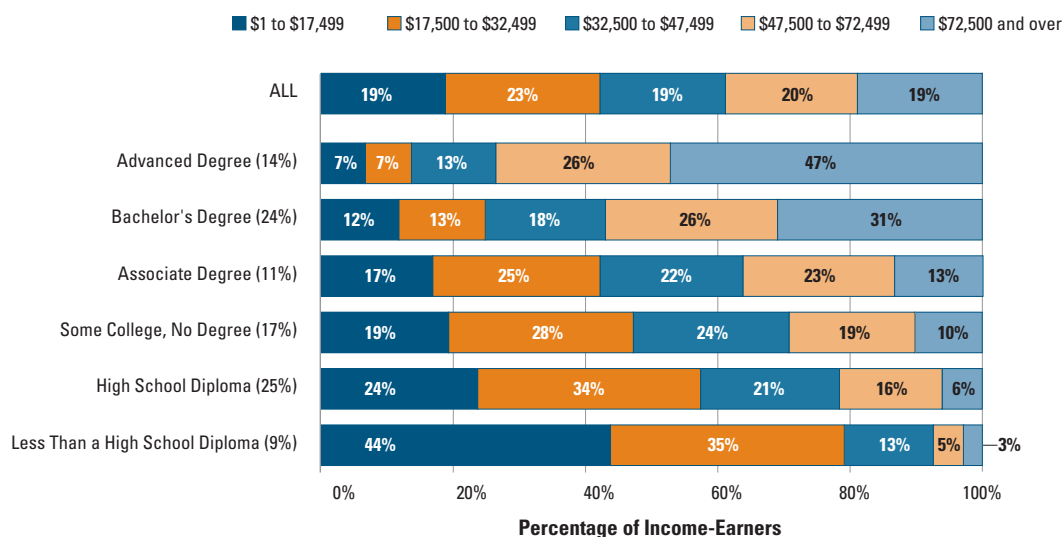
Data on the variation in earnings among people within educational categories and on the probability of ending up at different levels of the income distribution with a given level of education elucidate this issue.

– Median earnings rise with level of education, as does the likelihood of being near the top of the distribution of earnings. In 2011, when about one-fifth of workers ages 35 to 44 earned \$72,500 or more, 47% of advanced degree holders and 31% of bachelor's degree recipients were in this income category, compared to only 6% of high school graduates (Figure 5.1).

– While 19% of all earners ages 35 to 44 earned less than \$17,500, 44% of individuals without a high school diploma and 24% of those with only a high school diploma were in this income category, compared to 12% of those whose

FIGURE 5.1

Earnings Distribution of All Income-Earners Ages 35 to 44 by Education Level, 2011



NOTE: Percentages may not sum to 100 because of rounding.

SOURCES: U.S. Census Bureau, 2012c; calculations by the authors.

highest degree was a bachelor's degree and 7% of individuals with advanced degrees.

Another way of looking at the same data is to examine the education levels of people in each income quintile.

- Overall, 38% of 35- to 44-year-old workers had at least a bachelor's degree (Figure 5.2). In the lowest income quintile, only 20% were four-year college graduates, while 74% of those in the highest quintile, with incomes of \$72,500 or higher, had at least a bachelor's degree.
- Overall, 34% of 35- to 44-year-old workers had a high school diploma or less, but in the highest income quintile, only 9% had no postsecondary education; in the lowest quintile, with earnings less than \$17,500, 53% had no more than a high school education.

SUMMARY

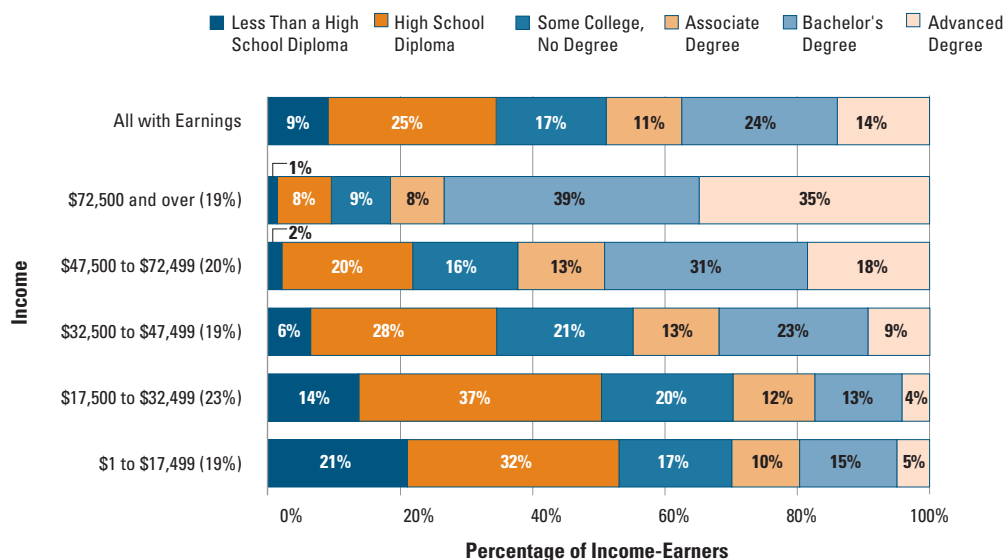
The fact that some individuals who have not gone to college do quite well financially and some who have earned a bachelor's degree or higher are nowhere near the top of the income distribution is not inconsistent with the reality that for most people, postsecondary education leads to higher earnings.

The earnings patterns are very clear. Almost 60% of workers with only a high school diploma (and almost 80% of those without a diploma) are in the bottom 40% of the earnings distribution. This is true of 47% of individuals with some college but no degree, 42% of associate degree holders, 25% of those whose highest degree is a bachelor's degree, and 14% of those with advanced degrees. The vast majority of individuals whose earnings place them in the highest income quintile have earned four-year college degrees.

Nonetheless, the variation in earnings within educational categories means that some people who go to college — including some people who complete degrees — will be less successful financially than they might have hoped. As discussed elsewhere in this report, some of these outcomes are associated with fields of study, occupation, and location. Some of these outcomes are predictable based on academic preparation or personal capacities and preferences. But the reality is that for most people, postsecondary education opens up opportunities and improves outcomes. A system that both supports people in making appropriate choices and protects people for whom this expectation is not realized is likely to be both more efficient and more equitable than a system that prevents people from taking advantage of the educational opportunities from which they could benefit.

FIGURE 5.2

Distribution of Education Levels Within Earnings Categories, All Income Earners Ages 35 to 44, 2011



NOTE: The percentages shown in parentheses on the vertical axis represent the percentage of all earners within each income category. Percentages may not sum to 100 because of rounding.

SOURCES: U.S. Census Bureau, 2012c; calculations by the authors.

Variation in Earnings Across States

Both the earnings levels for full-time workers with different levels of education and the earnings differentials between categories vary considerably across states. It is important to note that these comparisons involve people who *work* in different states — not people who grew up in or went to college in those states.

For example, while median earnings for bachelor's degree recipients ages 25 and older working full time in 2011 were \$58,400 for the nation as a whole, in individual states the median ranged from \$44,200 in Mississippi and less than \$50,000 in five other states, to \$71,700 in Connecticut and more than \$65,000 in six additional states (U.S. Census Bureau, 2011; calculations by the authors).

States with high earnings for bachelor's degree recipients are not necessarily the same as those with a high earnings premium for bachelor's degrees. In fact, in four of the five states with the highest median earnings for those with bachelor's degrees, the earnings differential between high school graduates and four-year college graduates was *less* than the national average of 70% in 2011, because high school graduates also have relatively high earnings in these states.

In three states (Tennessee, Nevada, and California), median earnings for associate degree recipients were at least 35% higher than median earnings for high school graduates. But in three states (Delaware, Iowa, and Louisiana), the earnings premium was 20% or lower, compared to a national average of 30%.

In 2011, median earnings for advanced degree recipients ranged from \$56,300 in Mississippi to \$92,500 in Virginia, with a national median of \$76,800. In the nation as a whole, median earnings for advanced degree holders were 32% higher than median earnings for those whose highest degree was a bachelor's degree. The Mississippi earnings premium was 27%, and in Virginia, it was 48%. In Kentucky, the earnings differential was only 14%.

Massachusetts is among the states with the highest median earnings for full-time workers at all levels of education, but its earnings differentials are lower than average. For example, bachelor's degree recipients had median earnings of \$66,300 in 2011, compared to the national average of \$58,400. High school graduates had median earnings of \$40,400, compared to the national average of \$34,400. But the earnings premium for a bachelor's degree in Massachusetts was 64%, compared to the national average of 70%.

West Virginia, which is among the states with the lowest median earnings for full-time workers at all levels of education, also has lower than average earnings differentials. For example, bachelor's degree recipients had median earnings of \$48,800 in 2011, 56% higher than the median of \$31,200 for high school graduates.

In California, in contrast, median earnings for full-time workers with bachelor's degrees were 86% higher than median earnings for high school graduates in 2011. Median earnings for high school graduates were lower than for the nation as a whole, but median earnings for four-year college graduates were higher.

SECTION 6

The Focus on Recent College Graduates

Many of the questions about the value of a college education emerge from stories of recent graduates. In an environment of high unemployment, rising college tuition levels, and strained family finances, it is not surprising that examples of young people unable to find jobs that use their talents well and pay enough to support student loan obligations are easy to come by.

These stories are not limited to the current weak economy. A 2011 article by Kevin Carey highlights the short-sighted view of this sort of reporting. He tells the story of a young woman with an Ivy League graduate degree in management stuck tending bar. The story was accompanied by expert predictions of the end of high returns to college education. This story first appeared in *The Washington Post* in 1982, and other headlines like “Grimly, Graduates Are Finding Few Jobs” (Singer, 1991), with examples of college graduates unemployed or in unskilled jobs, have appeared regularly over time.

But these are almost always temporary situations. The Ivy League bartender became a senior manager at an international development consulting firm. A young Peace Corps alumna with a master’s degree in international affairs who was featured in a 1982 story in his dead-end file clerk job, living on rice and beans, became a senior research project supervisor at a major university’s school of health. Two young college graduates featured in a 1993 article wandering the country because they couldn’t find jobs became a successful human resources consultant and a think tank scholar. Following up on the young college graduates featured in recent news articles is likely to reveal similar stories.

Evaluating the suggestion that many young people have made bad investments requires comparing the circumstances of those with college degrees to those of their peers entering the labor market with only high school diplomas. It also requires examining the path of earnings over the work lives of individuals with different levels of education.

UNEMPLOYMENT AND LABOR FORCE PARTICIPATION RATES

The labor force participation rate is the percentage of individuals in the population who are either employed or actively seeking work. The unemployment rate is the percentage of people in the labor force who are not employed.

As Table 6.1 shows, among 23- to 26-year-olds, 78.8% were either employed or actively seeking work in 2012. The labor force participation rate rose to 82.1% for those ages 27 to 30. Among the younger group, the unemployment rate was 10.6%, while it was 8.3% for those in their late 20s.

The 5.5% unemployment rate for 23- to 26-year-old bachelor’s degree recipients — the group that includes many of the

TABLE 6.1
Labor Force Participation and Unemployment Rates of Individuals Ages 23 to 26 and Ages 27 to 30, by Education Level, 2012

	Total	Less than a High School Diploma	High School Diploma	Some College, No Degree	Associate Degree	Bachelor’s Degree	Advanced Degree
Ages 23 to 26							
Labor Force Participation Rate	78.8%	65.0%	76.9%	77.2%	85.5%	84.7%	83.4%
Unemployment Rate	10.6%	22.1%	14.6%	9.9%	8.5%	5.5%	5.1%
Ages 27 to 30							
Labor Force Participation Rate	82.1%	67.6%	79.4%	79.6%	86.8%	88.3%	88.4%
Unemployment Rate	8.3%	16.0%	10.8%	10.2%	7.0%	4.8%	2.9%

SOURCES: U.S. Census Bureau, 2012; calculations by the authors.

recent college graduates on whom so much concern is focused — compares to 14.6% for high school graduates in the same age range, 9.9% for those with some college but no degree, and 8.5% for associate degree recipients. It compares to 4.8% for those in their late 20s.

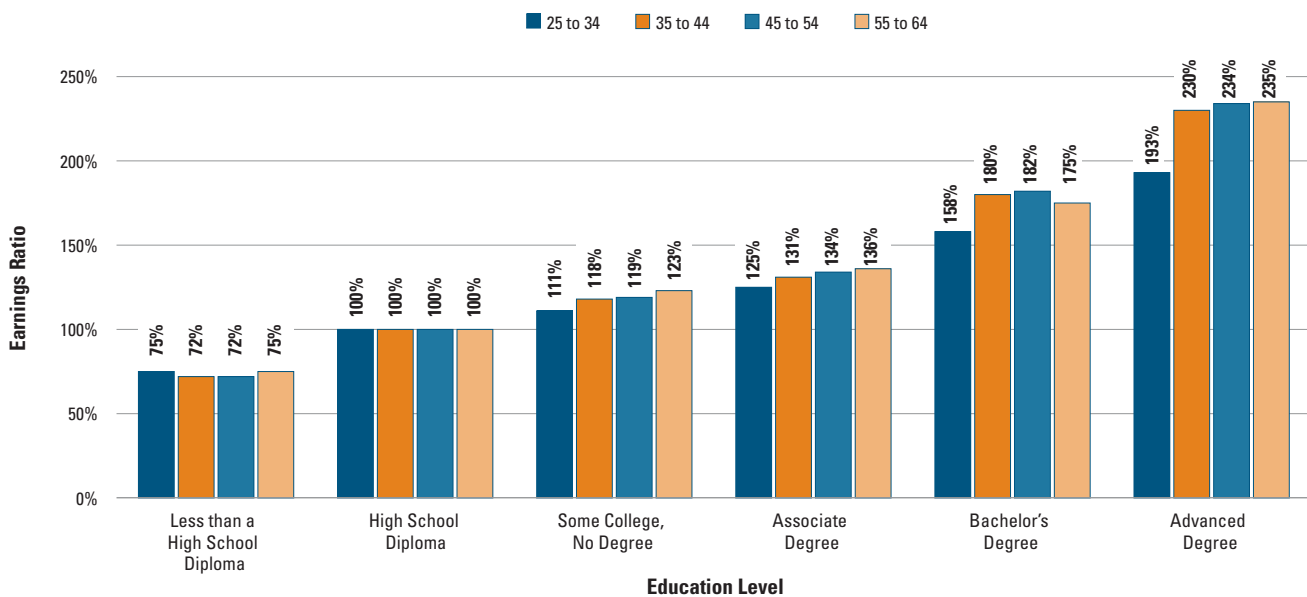
EARNINGS

As Figure 6.1 reveals, the earnings gap between college graduates and high school graduates grows as older age

groups are examined. For example, median earnings for full-time workers between the ages of 25 and 34 with associate degrees are 25% higher than median earnings of high school graduates. This earnings gap rises to 31% for 35- to 44-year-olds, 34% for 45- to 54-year-olds, and 36% for 55- to 64-year-olds. Median earnings for full-time workers between the ages of 25 and 34 with bachelor's degrees are 58% higher than for similar workers with only a high school diploma. The gap rises to 80%, 82%, and 75%, respectively, for older age groups.

FIGURE 6.1

Median Annual Earnings of Full-Time Year-Round Workers Ages 25 to 64 Relative to High School Graduates, by Education Level and Age Group, 2011



SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

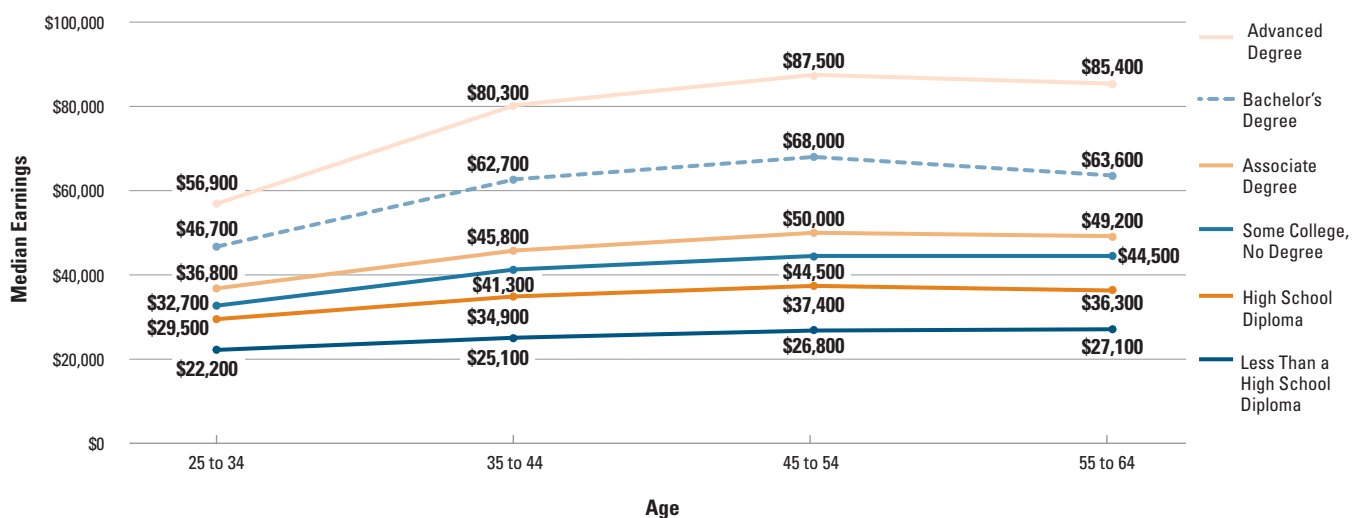
The earnings premium for postsecondary education grows because typical earnings paths are steeper over the careers of people with higher levels of education (Figure 6.2). The \$68,000 median earnings of bachelor's degree recipients between the ages of 45 and 54 are \$21,300 (46%) higher than the median earnings of 25- to 34-year-olds. For high school graduates, the gap between the \$37,400 median earnings of 45- to 54-year-olds with bachelor's degrees and the \$29,500 for high school graduates is just \$7,900 (27%). The path is steepest for those with advanced degrees.

SUMMARY

A college degree is not a guarantee of immediate and well-paid employment. Particularly for students graduating into weak labor markets, it frequently takes time to find the path that will make it clear that going to college was worth it. But focusing on these difficulties obscures the reality that the struggles are usually greatest for young people who have no postsecondary education. Moreover, those with higher levels of education tend to experience larger increases in their earnings as they age.

FIGURE 6.2

Median Earnings of Full-Time Year-Round Workers by Age and Education Level, 2011



SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

SECTION 7

Lifetime Earnings

Most of the analysis in this report focuses on the annual earnings associated with different levels of education. But of course what really matters is how those earnings add up over a lifetime. Predicting lifetime earnings, even on average, is problematic. The different earnings patterns across age groups (Section 6) shed some light on this question. The different employment and unemployment patterns (Section 3) also contribute. Another issue is that the lengths of people's working lives vary.⁵

But the only lifetime patterns we can observe are from past decades, and it seems obvious that the earnings paths of young people entering the workforce today will be quite different from those of members of the previous generation with similar demographic and educational characteristics. Current earnings by age are probably a better starting point, but still not good predictors of the future. Nonetheless, it's worth looking at some approximations.

The "synthetic work life earnings" estimates published by the Census Bureau are not actually predictions of how much people will make over their lifetimes, since no one knows how the world will change over the next 40 years. Rather, they are intended to provide an illustration of how annual earnings differences can add up over the years. The basic methodology employed is to look at current earnings by

age category and add up the earnings that would emerge if those earnings stayed the same over time. The Census Bureau consistently concludes that "educational attainment is by far the most important social characteristic for predicting earnings" (Julian & Kominski, 2011).

These estimates, which do *not* adjust for the reality that earnings in the future are worth less than earnings in the present, are the source of the commonly cited — but somewhat misleading — idea that median lifetime earnings for four-year college graduates exceed those for high school graduates by about a million dollars (Julian, 2012). Taking the important issue of the timing of earnings into account by discounting earnings that will be received in the future reduces this estimate to between \$550,000 and \$600,000 (U.S. Census Bureau, 2011; calculations by the authors).⁶

In order to avoid the discounting issue, it is helpful to look at the ratios of median lifetime earnings associated with different levels of education instead of the dollar differences. Figure 7.1 appears in this report's companion publication, *Education Pays* (Baum, Ma, & Payea, 2013). On average, people with bachelor's degrees who work full time earn about 65% more than high school graduates over a 40-year work life. Those with professional degrees earn almost three times as much as high school graduates.

5. Many students take time out of the labor force to go to school, shortening the number of years they are employed. On the other hand, in 2010, 38% of high school graduates ages 55 and older were in the labor force, compared to 49% of those with some college, 57% of those with bachelor's degrees, and 62% of those with graduate and professional degrees (Copeland, 2012).

6. This estimate, which discounts future earnings at an annual rate of 3%, is slightly higher than some other reported estimates (Greenstone & Looney, 2012; Avery & Turner, 2012).

The estimates in Figure 7.1 incorporate a 3% annual discount rate for future earnings. While, as noted previously, this approach cuts the total estimated dollar lifetime earnings differential by about 50%, it has little impact on most of the ratios. For example, median earnings for bachelor’s degree recipients rise from 65% to 67% of median earnings for high school graduates without discounting. The exception is professional degrees. Simply adding the year-by-year earnings would yield a ratio of 3.01 instead of 2.92. Understanding why this group stands out can provide insight into what lies behind the difference of perspectives on the “million dollar” payoff.

For professional and doctoral degree recipients, unlike other groups, the ratio of earnings relative to high school graduates continues to climb through the 55 to 64 age group (Table 7.1). In other words, people with advanced degrees get a

disproportionate share of their earnings premium later in life, so failing to discount over time has a relatively big impact on the estimated earnings premium for this group.

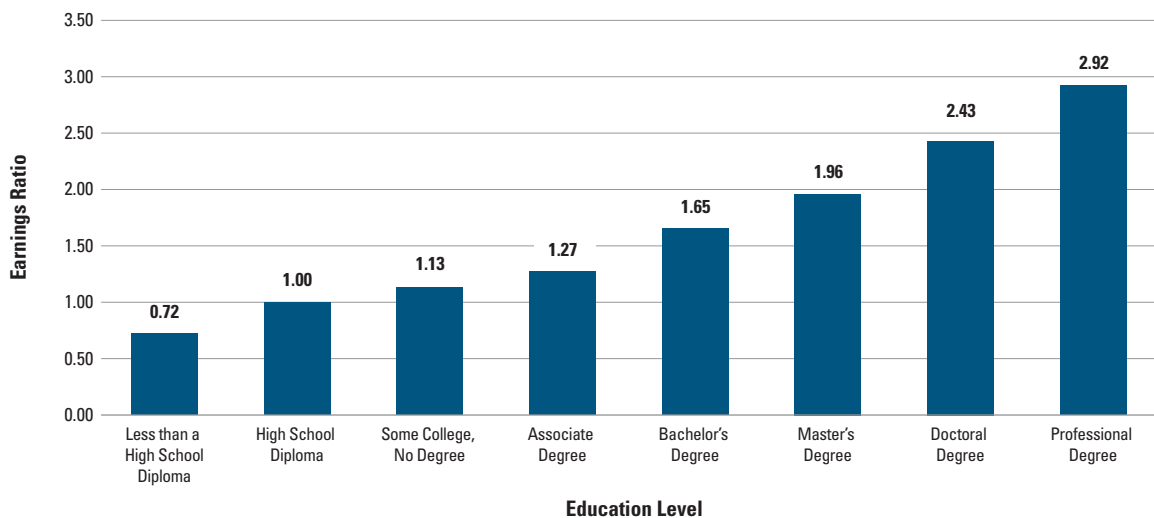
LIFETIME EARNINGS DIFFERENCES BY GENDER, RACE/ETHNICITY, AND WORK PATTERNS

Translating the Census estimates for workers of different race/ethnicity, gender, and employment patterns into ratios — to avoid the discounting issue — adds perspective on lifetime earnings differences. A few representative examples of the comparisons will suffice.

For white non-Hispanic men, median lifetime earnings of bachelor’s degree recipients working full time are an estimated 68% higher than earnings for high school graduates. For all

FIGURE 7.1

Median Estimated Lifetime Earnings of Full-Time Workers Relative to High School Graduates, by Education Level, 2011



NOTE: Estimates are based on 2011 earnings for full-time workers in different age groups. Assumes a 40-year work life, from age 25 to age 65, for all workers.
SOURCE: Baum, Ma, & Payea, 2013, Figure 1.2, based on data from the March 2012 Annual Social and Economic Supplement of the Current Population Survey.

TABLE 7.1

Median Earnings Relative to Median Earnings of High School Graduates, Full-Time Workers by Age and Educational Attainment, 2011

Age	Less than High School Diploma	High School Diploma	Some College, No Degree	Associate Degree	Bachelor's Degree	Master's Degree	Doctoral Degree	Professional Degree
25 to 34	0.74	1.00	1.04	1.21	2.02	1.79	2.15	2.43
35 to 44	0.71	1.00	1.15	1.29	2.43	2.09	2.55	3.14
45 to 54	0.70	1.00	1.23	1.30	2.58	2.07	2.49	3.10
55 to 64	0.69	1.00	1.14	1.30	2.36	1.94	2.70	3.28

SOURCE: Baum, Ma, & Payea, 2013, Figure 1.2, based on data from the March 2012 Annual Social and Economic Supplement of the Current Population Survey.

workers, the ratio increases to 71% and for all adults, it is 90%. These differences are consistent with those discussed in Section 3 on “Defining the Population.”

The lifetime earnings premium for Hispanic men with associate degrees is an estimated 41% for full-time workers, 42% for all workers, and 48% for all adults.

SUMMARY

The idea that college graduates earn a million dollars more over their working lives than those with high school diplomas is based on Census Bureau estimates that sum the median earnings of full-time workers of different ages, without accounting for the fact that earnings in the future are worth less than earnings of the same dollar amount today. Discounting future earnings cuts that number about in half.

A simpler approach is to look at earnings ratios, which show large differences between high school graduates and those with postsecondary education. These estimates should be interpreted with caution, not just because earnings tell far from the whole story of the benefits of college education. It is very difficult to estimate outcomes for individuals, even knowing a lot about their demographic characteristics, their academic preparation, and where and what they study in college. Making long-term predictions requires assumptions about the future economy and society that are really not possible. That said, whether the existing estimates of lifetime earnings differences overstate or understate the realities that will face today's college students, there is little doubt that college degrees will continue to pay off, both financially and otherwise for the vast majority of students.

SECTION 8

Occupation Matters

Discussions of the payoff of a college education frequently point to differences across occupations. It is obvious that some occupations pay better than others, even if they employ people with similar levels of education. These occupational differences do not necessarily correspond to differences in postsecondary fields of study. Students with particular majors enter a wide range of occupations, and workers in most occupations come from a variety of educational backgrounds.

There are occupations that are accessible only to people with bachelor's or advanced degrees, and other occupations that employ people with a range of education levels. In almost all of these occupations, workers with higher levels of education have higher earnings. In some cases, they may have quite similar jobs, but in other cases, those with college degrees may have very different job descriptions from those with lesser credentials.

ARE THERE OCCUPATIONS THAT ARE INACCESSIBLE WITHOUT HIGHER EDUCATION?

There are some occupations for which the question of the earnings differential between those with and without college degrees is meaningless, because it is virtually impossible to enter the occupation without a bachelor's degree or, in some cases, an advanced degree.

Some of the occupations that require bachelor's or advanced degrees pay very well. There is no doubt that many aspiring lawyers and physicians are seeking not just satisfying careers but also the accompanying financial rewards. Other occupations with these requirements — notably teaching — are not so remunerative. While it is important for students to consider the likely earnings in their chosen career paths, focusing only on the financial aspects of these professions is clearly problematic.

As the box, “The ‘Option Value’ of a College Degree,” in Section 4 explains, the fact that graduate study is available only to those who have completed bachelor's degrees is an important part of the return to earning a bachelor's degree, since many desirable occupations require graduate degrees (Table 8.1).

TABLE 8.1

Occupations Requiring at Least a Bachelor's Degree and Highest Degree of Full-Time Workers, 2011

Occupation	Percentage of Full-Time Workers with a Bachelor's Degree, but no Advanced Degree	Percentage of Full-Time Workers with an Advanced Degree	Percentage of Full-Time Workers with a Bachelor's Degree or Higher Degree
Actuaries	60%	39%	99%
Audiologists	11%	88%	99%
Biological Scientist	48%	48%	96%
Chiropractors	4%	93%	97%
Dentists	1%	98%	99%
Economists	20%	79%	99%
Elementary & Middle School Teachers	43%	53%	96%
Environmental Scientists & Geoscientists	25%	74%	99%
Lawyers, Judges, & Magistrates	3%	96%	99%
Medical & Life Scientists	7%	92%	99%
Nurse Practitioners, Nurse Midwives	7%	90%	97%
Optometrists	1%	99%	100%
Pharmacists	37%	61%	98%
Physicians & Surgeons	2%	97%	99%
Podiatrists	0%	100%	100%
Postsecondary Teachers	13%	82%	95%
Psychologists	8%	91%	99%
Secondary School Teachers	43%	54%	97%
Speech-Language Pathologists	10%	89%	99%
Veterinarians	2%	96%	98%

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

HOW MUCH VARIATION IS THERE ACROSS OCCUPATIONS IN THE EARNINGS OF WORKERS WITH FOUR-YEAR COLLEGE DEGREES?

About 18% of full-time workers whose highest degree is a bachelor's degree are in four large occupations. Elementary and middle school teachers — an occupation that is not accessible without a bachelor's degree — had median earnings of about \$44,200 in 2011, compared to \$82,100 for miscellaneous managers (Table 8.2).

Four of the largest occupations for full-time workers with advanced degrees account for about 25% of the employment of all full-time workers with this level of educational attainment. Median earnings for elementary and middle school teachers with advanced degrees are about half of the median earnings for lawyers, judges, and magistrates — occupations in which an advanced degree is essentially a requirement (Table 8.3).

ARE THERE SIGNIFICANT DIFFERENCES IN THE EARNINGS PREMIUM IN DIFFERENT OCCUPATIONS?

The occupations with the highest earnings are not necessarily those with the highest earnings premiums for education. Aside from the reality that some of the highest-paying occupations are accessible only with a degree (so that the notion of comparing earnings for those with and without the required degree makes no sense), there may be occupations with more moderate earnings but with large earnings differences between those with and without degrees.

Occupations employing more than 500,000 people in which at least 15% of full-time workers have only a high school diploma and another 15% or more have a bachelor's degree as their highest degree are listed in Table 8.4.

TABLE 8.2

Largest Occupations of Bachelor's Degree Recipients Ages 25 and Older Employed Full Time, 2011

Occupation	Number of Workers with B.A. as Highest Degree	Median Earnings of Workers with B.A. as Highest Degree	Percentage with B.A. or Higher
Miscellaneous Managers	950,500	\$82,100	55%
Registered Nurses	889,900	\$65,400	56%
Accountants & Auditors	921,200	\$63,200	79%
Elementary & Middle School Teachers	901,400	\$44,200	96%

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

TABLE 8.3

Earnings and Educational Attainment of Full-Time Workers Ages 25 and Older Employed in Occupations with Large Numbers of Advanced Degree Recipients, 2011

Occupation	Number of Workers with B.A. as Highest Degree	Median Earnings of Workers with B.A. as Highest Degree	Percentage with B.A. or Higher	Percentage with an Advanced Degree
Miscellaneous Managers	543,600	\$102,500	55%	20%
Elementary & Middle School Teachers	1,094,900	\$55,200	96%	53%
Lawyers, Judges, & Magistrates	865,000	\$115,600	99%	96%
Postsecondary Teachers	665,200	\$68,300	95%	82%

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

In all of these occupations, including those such as “office clerks” that don't sound like “college-level” jobs, median earnings are higher for bachelor's degree recipients than for high school graduates. However, among office clerks the gap is only 14%, compared to 76% among sales representatives.

TABLE 8.4

Large Occupations Employing Both High School Graduates and Bachelor's Degree Recipients, 2011

Occupation	% H.S.	Median Earnings (H.S.)	% B.A.	Median Earnings (B.A.)	Earnings Ratio B.A./H.S.
Sales Representatives, Wholesale & Manufacturing	17%	\$44,700	41%	\$78,600	1.76
First-Line Supervisors of Nonretail Sales Workers	21%	\$46,000	31%	\$76,700	1.67
Miscellaneous Managers	15%	\$51,600	35%	\$82,100	1.59
Retail Salespersons	31%	\$30,100	23%	\$45,000	1.50
First-Line Supervisors of Retail Sales Workers	31%	\$35,500	21%	\$50,000	1.41
First-Line Supervisors of Office & Administrative Support Workers	24%	\$40,700	25%	\$56,000	1.38
Food Service Managers	27%	\$33,900	23%	\$46,800	1.38
Customer Service Representatives	27%	\$31,200	22%	\$42,000	1.35
Secretaries & Administrative Assistants	30%	\$33,600	15%	\$38,600	1.15
Office Clerks, General	32%	\$32,500	15%	\$37,100	1.14

SOURCES: U.S. Census Bureau, 2011; calculations by the authors.

SUMMARY

One of the sources of variation in earnings among four-year college graduates is the different occupations they enter. The implication is not, however, that we should encourage most college students to study engineering and avoid education and counseling. One critical issue that jumps out from the data is that being an elementary or secondary school teacher requires at least a bachelor's degree. A large number of bachelor's degree recipients enter this profession — and they earn significantly less than other four-year college graduates.

If people well suited to teaching or social work decide to study engineering in order to maximize their earnings, some will succeed, but others will end up either failing at the endeavor or leading unsatisfying lives. The fact that, on average, engineers earn more than nurses does not guarantee that a particular individual will earn more if he enters the former field rather than the latter. Moreover, some of the occupations that pay college graduates less than average have other desirable characteristics. They may, for example, be very personally rewarding, offer flexible schedules, or allow for a variety of activities.

Occupations are far from perfectly correlated with college majors. While being a nurse requires a nursing degree, many occupations lack such a specific requirement. Many business professionals majored in humanities, the social sciences, or the natural sciences. Many of those in computer-related fields had totally unrelated majors. About half of physics majors are almost equally distributed across occupations in computers, management, and engineering. About half of liberal arts majors are similarly distributed across management, sales, and education occupations (Carnevale, Strohl, & Melton, 2011). About 40% of four-year college graduates who were employed in information technology jobs one year after graduation majored in the social sciences or other non-STEM (science, technology, engineering, and math) fields (Salzman, Kuehn, & Lowell, 2013).

Nonetheless, the path to an occupation frequently involves a sequence of decisions, and it is not always easy to change to a new path (Altonji, Blom, & Meghir, 2012). Some fields require the accumulation of particular knowledge and skills over a long period of time. Many require particular abilities and predilections. Understanding the variation in earnings across fields is important for making decisions about investment in postsecondary education. But making earnings the dominant criterion for guiding student decisions could lead to outcomes that are problematic for the future of both individuals and society.

SECTION 9

The Demand for College-Educated Labor

Do we face a shortage of college-educated workers or is there a shortage of jobs that require college-level skills?

The standard approach to determining whether the demand for a good or service is increasing is to follow the price. If the supply is fixed, a rising price indicates an increase in demand, while a declining price indicates the opposite. But attempting to isolate changes in demand from changes in supply can prove to be a complicated task. For example, a rise in the price of oranges could indicate that people have become more interested in vitamin C, or it could be the result of a freeze in Florida that killed part of the supply. What is clear is that the rising price indicates that supply has not kept up with demand.

This simple example holds lessons for the market for college-educated labor. Over time, the wages of college graduates have risen relative to those of high school graduates. As Goldin and Katz (2008) argue, this is a clear signal that the supply of college graduates to the labor market has not kept up with demand. Yet controversy abounds on this issue. Why are there so many unemployed college graduates? Are many college graduates underemployed in jobs that do not require their levels of education and training? Are employers hiring college graduates just because they can, or because they really need them? Does a college degree really correspond to increased knowledge and skill, or is it just a convenient signal for sorting job applicants?

Of particular importance is the question of projecting future demand for college graduates. Do we have to ensure that more people earn postsecondary degrees and certificates in order to have a healthy economy? Or is the push for increased educational attainment unnecessary? Estimates of the need for college-educated workers vary dramatically.

According to Carnevale, Smith, and Strohl (2010), unless we change course, by 2018 the number of jobs in the U.S. economy that require workers with at least an associate degree will exceed the supply of qualified workers by about three million. In contrast, Neumark, Johnson, and Mejia (2013) predict that the rising

demand for highly skilled workers will be met — at least in the near term — by increasing supply. Harrington and Sum (2010) argue that creating jobs that can make use of the skills of highly educated workers and matching those jobs to workers is the biggest challenge we face.

How can we make sense of these different predictions, and what do they mean for efforts to increase the number of Americans with postsecondary credentials?

DEFINING THE COLLEGE LABOR MARKET

The Bureau of Labor Statistics (BLS) assigns an educational requirement to each individual occupation. But many occupations employ people with a wide range of educational backgrounds. Table 9.1 provides examples. In 2009, almost all lawyers had doctoral or professional degrees and only about 1% of speech-language pathologists and pharmacists lacked four-year college degrees. At the other end of the spectrum, less than 2% of paving, surfacing, and tamping equipment operators held bachelor's degrees. But about half of all insurance underwriters had four-year college degrees, over 30% had some college or an associate degree, and 19% had no college experience. So categorization is not so simple.

There is a difference of opinion about whether jobs should be categorized as “college level” because they employ a large number of college graduates, or whether they should be assessed for required skills, regardless of who is employed.

The first approach essentially defines away the idea of people being underemployed. If everyone had a college degree, would all jobs really “require” a college degree? On the other hand, the nature of many occupations changes over time. For example, auto mechanics need much more knowledge of computers and electronics today than they did a generation ago. Executive assistants used to spend much of their time taking dictation and typing. Now they have more organizational and complex communications responsibilities. Moreover, many jobs are not just a fixed set of tasks. If people with more skills and initiatives fill the jobs, they are likely to make greater contributions than others.

TABLE 9.1

Percentage Distribution of Highest Education Level of Workers Ages 25 and Older in Selected Occupations, 2009

Occupation	Highest Education Level of Workers						
	Less than a High School Diploma	High School Diploma	Some College, No Degree	Associate Degree	Bachelor's Degree	Master's Degree	Doctoral or Professional Degree
Lawyers	0%	0%	0%	0%	1%	3%	97%
Speech-Language Pathologists	0%	0%	0%	1%	9%	87%	3%
Pharmacists	0%	0%	1%	1%	46%	7%	45%
Rehabilitation Counselors	1%	7%	11%	6%	25%	46%	5%
Surveyors	0%	0%	14%	11%	60%	13%	2%
Registered Nurses	0%	1%	6%	37%	43%	10%	3%
Advertising Sales Agents	2%	14%	23%	8%	47%	6%	1%
Detectives and Criminal Investigators	0%	10%	26%	12%	41%	10%	2%
Insurance Underwriters	1%	18%	23%	8%	43%	6%	1%
Interpreters and Translators	3%	12%	23%	14%	30%	14%	5%
Electrical and Electronics Drafters	2%	13%	30%	32%	20%	4%	1%
Food Service Managers	10%	30%	27%	9%	20%	3%	1%
Diagnostic Medical Sonographers	1%	9%	22%	45%	19%	2%	2%
Skincare Specialists	20%	38%	24%	8%	9%	1%	1%
Meter Readers, Utilities	6%	44%	32%	10%	7%	1%	0%
Parts Salespersons	10%	49%	27%	7%	6%	1%	0%
Paving, Surfacing, Tamping Equipment Operators	38%	49%	10%	2%	1%	0%	0%

NOTE: Based on data from the 2005–2009 American Community Survey five-year data file. Percentages may not sum to 100 because of rounding.

SOURCE: Bureau of Labor Statistics, 2012b, Table 1.11

WHICH JOBS PAY OFF FOR COLLEGE GRADUATES?

A reasonable approach is to ask whether within occupations that employ people with different levels of education, college graduates are paid more than others. Logically, employers would not pay higher wages to more educated workers if they were not more productive on the job. For some occupations, such as doctors, lawyers, and schoolteachers, certification requires a certain level of education. For some jobs, specific

knowledge that is difficult to obtain outside of a formal learning program is clearly necessary. But for many other occupations, it is possible that the critical thinking, problem solving, quantitative skills, and general literacy developed in college improve job performance.⁷ It is also possible that enrolling in and completing a postsecondary program provides a signal to employers that individuals have characteristics that will make them more productive workers. (See box on

7. There is disagreement about to what extent students actually develop these skills in college. See Arum and Roksa (2011) for one analysis questioning how much students learn.

“Human Capital or Signaling” on a page 41 for a discussion of alternative theories about the role of education.)

The general consensus is that in most occupations, higher levels of education do pay off, but that the returns vary considerably across occupations. (See Section 8 on “Occupation Matters” for more detail.)

Harrington and Sum (2010), who disagree with Carnevale, Smith, and Strohl’s (2010) approach of assuming that all jobs in which college graduates are employed constitute “demand for college graduates,” found that associate degree holders with jobs categorized as requiring this level of education earned 60% more than high school graduates in the same occupation. Those employed in jobs with lower educational requirements enjoyed just a 10% earnings premium. Parallel figures for bachelor’s degree recipients were 88% versus 15%. In other words, while there is almost always an earnings premium for higher levels of education, to reap the full benefit, college graduates must have jobs that are, in a meaningful sense, part of the college labor market.

Neumark et al. (2013) pose a similar question, asking whether there are positive returns to education above the “required” level in an occupation. They contend that “As long as the returns to ‘unnecessary’ education are greater than zero, there is reason to believe that the education is to some extent required, even if it is not as important as for occupations

where it is required” (p. 156). They find that in all occupations, there are positive returns to levels of education beyond those specified by the BLS as required. In management occupations that require only a bachelor’s degree, employers pay those with advanced degrees significantly more. In protective service occupations for which a bachelor’s degree is not specified as necessary, four-year college graduates enjoy an earnings premium over other employees. Carnevale, Rose, and Cheah (2011) reach a similar conclusion.

PROJECTING JOB GROWTH

Projections of the unmet demand for college-educated workers vary. If we assume that no occupations will call for more education and skills than their minimum requirements today, it looks like we will have more than enough college graduates. If we assume that all jobs now filled by college graduates really require college graduates and that there is no “underemployment,” we get much higher estimates of future needs.

Another issue that causes confusion is the difference between the most rapidly growing occupations and those that will create the most new jobs. Small occupations can grow rapidly without creating opportunities for many people. It is also important to distinguish between net growth in jobs and the need for replacement workers. Because low-skill jobs tend to have higher turnover rates, there may be more job openings in these occupations without any growth in the total number of people employed.

Table 9.2 lists the six occupations the BLS projects will grow by more than 50% between 2010 and 2020. It also lists the six occupations projected to grow by more than 350,000 positions over that decade. Only personal care aides and home health aides appear on both lists. The biomedical engineering field — the only occupation on the lists categorized as requiring a bachelor’s degree — will grow rapidly, but will need only 10,000 additional workers. However, we will need many more registered nurses. And while the BLS specifies associate degree as the level of education required for this occupation, 56% of those currently employed have at least a bachelor’s degree.

SUMMARY

Projecting the level of education future workers will have is difficult. Projecting the nature of the jobs that will be available is even more difficult. Both predictions of a failing economy resulting from a lack of educated workers and predictions of millions of educated workers seeing their talents wasted should be greeted with skepticism. What is clear is that most people do better in the labor market if they have higher levels of education. Employers seek out and pay a premium for workers with postsecondary credentials. That premium has grown considerably over time.

TABLE 9.2

Occupations Projected to Have Most Rapid Growth and Largest Increases in Number of Jobs, 2010 and 2020

Occupation	Employment (in Thousands)		Projected Change, 2010 to 2020		BLS Education Requirement	Percent with Associate Degree or Higher
	2010	2020 (Projected)	Number (in Thousands)	Percent		
All Occupations	143,068.1	163,537.1	20,468.9	14%	—	—
Fastest Growing						
Veterinary Technologists & Technicians	80.2	121.9	41.7	52%	Associate Degree	35%
Helpers — Carpenters	46.5	72.4	25.9	56%	Less than a High School Diploma	7%
Helpers — Masons, Tile & Marble Setters	29.4	47.0	17.6	60%	Less than a High School Diploma	7%
Biomedical Engineers	15.7	25.4	9.7	62%	Bachelor’s Degree	88%
Home Health Aides	1,017.7	1,723.9	706.3	69%	Less than a High School Diploma	15%
Personal Care Aides	861.0	1,468.0	607.0	71%	Less than a High School Diploma	18%
Largest Increases						
Retail Salespersons	4,261.6	4,968.4	706.8	17%	Less than a High School Diploma	33%
Registered Nurses	2,737.4	3,449.3	711.9	26%	Associate Degree	93%
Office Clerks, General	2,950.7	3,440.2	489.5	17%	High School Diploma	29%
Combined Food Preparation & Serving Workers	2,682.1	3,080.1	398.0	15%	Less than a High School Diploma	10%
Home Health Aides	1,017.7	1,723.9	706.3	69%	Less than a High School Diploma	15%
Personal Care Aides	861.0	1,468.0	607.0	71%	Less than a High School Diploma	18%

SOURCE: Bureau of Labor Statistics, 2012a, Table 6 and Table 7.

Human Capital or Signaling: The Role of Education

Two distinctive theoretical approaches provide insights into why earnings are highly correlated with level of education. While *human capital theory* and *signaling theory* emphasize different factors contributing to the monetary payoff of postsecondary education, the insights from the two perspectives can be integrated to explain labor market outcomes.

Human capital theory posits that education increases knowledge and skills, making people more productive. Just as machinery (physical capital) increases worker productivity, capital that is embodied within human beings also makes them more productive. Because they are more productive, employers pay them more.⁸

Signaling theory suggests that it is not what people learn in college but the characteristics of the people who earn college degrees that generate earnings differences. Employers see college degrees as a signal that people have the skills and talents required to get into and through college. These include not just intelligence, but also noncognitive factors like motivation and “grit.” Signals may be an efficient way of overcoming the problem of employers having limited information about the characteristics of individual job applicants.⁹

Which explanation is most accurate makes little difference to individuals, since in either case they will likely increase their earnings if they earn postsecondary credentials. However, from society’s perspective, higher education would be a very expensive signal if it were not itself enhancing productivity, and would likely be supplemented or replaced by more efficient screening devices.

Attempts to test these theories empirically have not yielded conclusive results. Both theories are consistent with a positive correlation between education and earnings. Suggestions about how to distinguish the actual causes of this correlation include the search for “sheepskin effects,” with credential completion paying off more than the same number of years of education (Hungerford & Solon, 1987); the idea that signaling would lead to less of an earnings premium for the self-employed (Brown & Sessions, 1999); examination of the impact of time to degree on the payoff (Groot & Oosterbeek, 1994); and testing the impact of controlling for measures of ability in measuring the earnings premium (Chevalier, Harmon, Walker, & Zhu, 2004). No definitive results have emerged, but the finding that added years of education consistently pay off in the labor force is unchallenged (Card, 2001; Brown, Fang, & Gomes, 2012; Autor, Katz, & Kearney, 2008).

Both theories predict that people who go to college will be more productive and will have higher earnings. There is no contradiction between the idea that certain personal characteristics of individuals are associated with higher educational attainment and the idea that postsecondary education develops knowledge and skills — both cognitive and noncognitive.

If college graduates were not more productive than others, the earnings and employment differentials by education level would not persist. Higher education credentials do operate as a positive signal to employers. The evidence is strong that the education behind those credentials also improves the thought processes and capabilities of students.

8. Although the concept of human capital dates back at least to Adam Smith, the foundational works on human capital theory include Becker (1993), Mincer (1958), and Schultz (1961).

9. The origins of signaling theory are generally traced to Spence (1973).

SECTION 10

The Rate of Return to Education

Many discussions of the financial benefits of college education — in this publication, in the companion report, *Education Pays 2013: The Benefits of Higher Education for Individuals and Society*, and elsewhere — focus on comparisons of the earnings of individuals who have completed different educational credentials. On average, people with more education earn more than people with less education.

While these comparisons provide a reasonable first approximation of the earnings gains people can expect if they pursue postsecondary education, there are a number of reasons why they don't actually provide a fully satisfactory measure of the return to investment in education. It is important to keep in mind that the investment in education pays off differently for different people in different circumstances. This is an investment with a high average rate of return, but the decision must be made under conditions of considerable uncertainty. The discussion below highlights some complexities involved in estimating returns to education.

ESTIMATES OF THE RATE OF RETURN TO ADDITIONAL YEARS OF EDUCATION

Numerous statistical studies have attempted more in-depth analyses than just comparisons of earnings. Most of these studies are based on what is known as the Mincer model, based on the seminal work of Jacob Mincer (1958, 1974). As noted in the box on page 41 of this report that discusses human capital theory, Mincer argued that education increases earnings through its contribution to knowledge and skills that increase workers' productivity in the labor market. He quantified this effect by formulating an equation that shows earnings as a function of years of education, in addition to work experience and demographic characteristics. With adequate data, it is possible to estimate *how much* earnings increase with each additional year of education.

Over time, many researchers have focused on different populations, different data, and different time periods to yield

estimates of the "rate of return" to education: the percentage increase in earnings associated with an additional year of education. They use increasingly sophisticated statistical techniques, attempt to control more effectively for individual student characteristics, and seek to come closer to isolating causation, as opposed to just correlation. Although each study reaches a slightly different conclusion, estimates suggest that the average rate of return is about 10% per additional year of study (Psacharopoulos & Patrinos, 2004; Oreopoulos & Petronijevic, 2013). If a typical high school graduate earned \$30,000, a year of college would increase that to about \$33,000, and a second year to about \$36,300. A similar bachelor's degree recipient with similar work experience could expect to earn about \$43,000 — about 44% more. Rates of return are generally somewhat higher for women than for men, and they may be higher for four-year colleges than for two-year colleges.

A recent study from the Hamilton Project estimates that, on average, the benefits of a four-year college degree are equivalent to an investment that returns 15.2% per year. Greenstone and Looney (2011) point out that this is more than double the average return to stock market investments since 1950, and more than five times the returns to corporate bonds, gold, long-term government bonds, or home ownership. This estimate is higher than the average estimates cited above, and it relates only to bachelor's degrees, not to individual years of education that may not lead to bachelor's degrees.

Estimates of rates of return based on Mincer's model are widely recognized to have shortcomings (see, e.g., Heckman, Lochner, & Todd, 2006). The discussion that follows explains some of the issues critics have raised.

DOES EVERY YEAR OF EDUCATION HAVE THE SAME VALUE?

One problem with estimating equations that make earnings a function of years of education, with years a continuous variable equal to the number of years of schooling completed, is that

these models often incorporate the assumption that each year of education is associated with the same percentage increase in earnings as every other year.

As the discussion of human capital and signaling on page 41 suggests, there is considerable evidence that credentials make a difference. Graduating from high school, completing an associate degree, or earning a bachelor's degree makes more difference to labor market opportunities than just the extra year. The credential itself has value in the labor market. Simple estimates of per-year rates of return do not allow for this effect.

Some estimates do attempt to incorporate this reality. Moreover, the problem does not negate the value of the rate-of-return estimates. If these estimates are viewed as averages, they overestimate the value of completing one year of college, but underestimate the value of completing the second year if it involves earning an associate degree, or of the fourth year if it involves earning a bachelor's degree.

ACCOUNTING FOR THE COSTS OF EDUCATION

The rate of return on an investment should compare the present value of earnings flowing from the undertaking with the amount invested. In 2011, median earnings for bachelor's degree recipients working full time were \$56,500, compared to \$35,400 for high school graduates (U.S. Census Bureau, 2011; calculations by the authors). But this 60% earnings premium does not represent a rate of return. We must ask how much people have to invest to acquire this credential. If a student pays \$40,000 in tuition and sacrifices \$80,000 in earnings to earn a bachelor's degree, the question is how that \$120,000 investment pays off. The simple Mincer equation measures the *gross* rate of return, but it is the *net* rate of return that should interest someone deciding whether to invest in higher education or to look for an alternative way of investing these funds in the hope of generating future streams of income.

In this simple example, if the \$120,000 one-time investment yields an earnings premium of \$21,100 per year, the annual return on the investment would be 18% — a very high rate of return.

Many of the questions being raised about the value of a college education cite the high and rising costs. There is obviously a price at which college would be a bad investment for most people. But estimates of the rate of return, and rough calculations of the net rate of return, confirm that today's reality is far from that point for most students.

THE RETURN TO ENTERING COLLEGE VS. THE RETURN TO COMPLETING COLLEGE

As detailed in Section 11, many students who enroll in college never complete a credential. Comparing the earnings of college graduates to those of high school graduates or calculating the average rate of return to a college degree focuses only on those who earn degrees and certificates. Students trying to understand the *expected* return to going to college should incorporate the possibility that they may not get all the way to the other side. The *ex ante* expected return to starting college is lower than the *ex post* return for those who complete degrees (Heckman et al., 2006).

Further research is required to develop reliable estimates of expected rates of return to college, rather than of rates of return for those who actually complete the programs in which they enroll. About 76% of students who enrolled in college for the first time in fall 2006 and attended exclusively full time had earned bachelor's degrees six years later. If those attending exclusively part time or with mixed enrollment patterns are included, that figure drops to 54% (Shapiro et al., 2012). A simple back-of-the-envelope approach might suggest that a student enrolling full time could estimate a 76% chance of completing a college degree and ending up with the \$56,500 earnings cited above, and a 24% chance of dropping out and earning only the \$35,400 typical for high school graduates. The earnings expected from enrolling in college would decline to about \$51,400 after taking this uncertainty into account.

Of course it's not so simple to estimate the *ex ante* rate of return facing a prospective student. Students' academic preparation, their personal characteristics and circumstances, and the institution and program in which they are planning to enroll make it possible to predict their chances of completing their programs more accurately. Both the costs and the

benefits depend on how long the student actually stays in school. What is important is to understand that many students who begin college do not experience the returns associated with those who complete college, although even those who complete a year or more of study without earning a credential are likely to see an earnings benefit.

THE ROLE OF TAXES

Most comparisons of the incomes associated with different levels of educational attainment focus on earnings. As Figure 1.1 in *Education Pays 2013: The Benefits of Higher Education for Individuals and Society* highlights, people with higher incomes pay more in taxes than those who earn less. In 2011, the median high school graduate age 25 or older working full time year-round earned \$35,400 and paid about \$6,400 (18%) in federal, state, and local taxes. The median bachelor's degree recipient earned \$56,500 and paid \$11,400 (20%) in taxes. The pre-tax earnings premium was 60%, but the after-tax premium was 56%. This adjustment would lower the estimated rates of return cited above (Heckman et al., 2006).

CAUSATION OR CORRELATION?

In estimating the financial returns to investing in postsecondary education, it is important to understand how difficult it is to separate causation from correlation. Research attempting to identify causation by relying on sophisticated statistical techniques, while far from perfect, generally suggests that most of the estimated returns are, in fact, caused by participating in postsecondary education (Card, 1999, 2001).

There is little doubt that the higher average earnings of college graduates are, to a great extent, the result of the fact that they attended college. However, the entire earnings differentials may well not be *caused* by college. The question is not just whether

the earnings premium results from what people learn in college or from the credential they are awarded, but also whether the people who earn college degrees are different in systematic ways from those who don't, and whether those differences would lead to earnings differentials, regardless of education level. The discussion in the box on page 45 about whether students on the fence about attending college can expect the same benefit as the average student is related to this question. The empirical estimates of the rate of return to college could be biased either upward or downward, depending on what keeps some high school graduates from continuing their education.

SUMMARY

The issues discussed here point to the need for further research to improve our ability to predict how much individual students can expect to benefit from enrolling in postsecondary education. Clearly, improving degree completion rates would increase the expected rates of return, and if we could provide the same educational opportunities at a lower price to students, their rates of return would be higher.

But the overall message is not in question. Postsecondary education carries a high average rate of return. There is considerable uncertainty involved in predicting that rate of return, particularly for individual students. But even considering the costs of going to college and the higher tax rates on the higher expected earnings, postsecondary education pays off well for most individuals.

This discussion has focused only on earnings and only on individuals. If we consider the benefits to society (including, but not limited to, the higher taxes paid by college graduates noted above) and the array of benefits to individuals not captured by earnings differentials, the picture is even clearer.

The Average College Student vs. the Marginal College Student

Other sections of this report focus on the variation in outcomes among adults with different levels of education. We know that the average man with a bachelor's degree earns more than the average woman with a bachelor's degree, that the average white associate degree recipient earns more than the average black associate degree recipient, and that the average master's degree holder in Massachusetts earns more than the average person with a similar degree in Mississippi. We also know that four-year college graduates employed as engineers earn more, on average, than those employed as social workers.

Some of these differences are related to demographics and to local labor markets. Some of the differences within these groups are related to the differing skills, capacities, and preferences of individuals or to differences in the quality of their educational experiences.

We also know that many people enroll in postsecondary programs but never complete credentials. Of the students who first enrolled in 2003-04, 35% had not earned a degree or certificate and were no longer in school in 2009 (NCES, 2009; calculations by the authors). Another 15% had not earned a degree but were still enrolled. Seventy percent of those who first enrolled in private nonprofit four-year institutions had earned credentials (including 65% with bachelor's degrees), as had 65% from public four-year colleges and universities (including 60% with bachelor's degrees). But only 35% who enrolled in public two-year colleges and 44% from the for-profit sector had earned a credential of any sort. (Twelve percent of community college students and 4% of for-profit students had earned bachelor's degrees.)

An obvious question is whether the additional students who enroll in college as participation rates increase can expect payoffs as high as those experienced by those for whom going to college is not a close call. Students at the margin of postsecondary enrollment differ in significant ways from those for whom college is a foregone conclusion. We should not assume that their outcomes will be the same.

WHO GOES TO COLLEGE AND WHY?

One possibility is that the people who stand to benefit the most from college are the ones who end up actually going to college. In other words, there is "positive selection." If students make rational decisions, considering the costs and benefits of entering or remaining in the labor force as opposed to going to school, it might well be that people who are unlikely to succeed or whose career aspirations don't require postsecondary credentials would be the ones who choose not to enroll (Carneiro, Heckman, & Vytlačil, 2011).

For this rational sorting process to work well, it is important that people who are motivated to go to college and who believe they would benefit do not face insurmountable barriers. If they have no means of financing education or if their family responsibilities make finding the necessary time impossible, they may not be able to enroll even if they are convinced it would be the right choice. Moreover, social and cultural factors may discourage students from some environments from enrolling in college (Brand & Xie, 2010).

The existence of these and other barriers means that there could be some "negative selection." It is possible that some of the students who would benefit most from going to college do not actually enroll. This would not have to mean that the top high school students are missing out on college. There could well be students with weak academic preparation who could avoid ending up near the bottom of the distribution for high school graduates, even if they only reached the lower part of the distribution for college graduates. The benefit would be measured in terms of where they as individuals would end up in either scenario.

If there is positive selection, with those most likely to benefit from college enrolling, then estimates of the benefits of college education are likely to exaggerate the causal effect of college. Simple comparisons of earnings would be comparisons of the most talented people, who are also college graduates, to the least talented people, who do not have postsecondary education. More careful statistical analysis could still overestimate the benefits

of a college degree. Even controlling for test scores, high school grades, and family backgrounds, if people know something about themselves that makes them decide not to go to college because they don't think it will be worth it, and if we are unable to include that "something" in our statistical models, we will overestimate the positive impact of education.

THE EVIDENCE

While precise determination of how much of the differences in earnings between college graduates and those with lower levels of education is really caused by the education and how much of it is the result of other differences between people is not possible, sophisticated statistical techniques do allow considerable insight into the issues. These techniques tend to generate *higher* estimates of the impact of education on earnings, casting doubt on the notion that positive selection describes overall college-going behavior (Card, 2001; Angrist & Krueger, 2001; Kane & Rouse, 1995, Brand & Xie, 2010).

In addition to indicating that the positive correlation between earnings and college completion cannot, by and large, be explained by incoming student characteristics, some of these studies suggest that *if* they complete college, students who start out with a relatively low probability of completing — because of their academic preparation or demographic characteristics, for example — actually see larger-than-average gains from their postsecondary education (Card, 2001; Brand & Xie, 2010; Hout, 2012; Attewell & Lavin, 2007). In their

summary of the evidence on this issue, Oreopoulos and Petronijevic (2013) conclude that: "The majority of the empirical literature actually suggests that the returns to marginal students are at least as high as the average, if not higher."

It is important to note that these findings are based on students who actually complete college. It does nothing to assuage concerns about the students who begin college, invest time and money in the endeavor, and leave without a credential.

IN CONCLUSION

A fundamental question here is *why* students do not enroll. If they face insurmountable financial barriers or if they come from environments that do not create the expectation that they will go to college, it is likely that students are forgoing significant benefits. On the other hand, if they are making rational choices based on good information and with meaningful available options, this might not be the case. The developing field of behavioral economics, building on insights from cognitive psychology about how people actually make decisions and how they react to complexity and excessive choice, should shed some light on this question. It is increasingly obvious that actual financial barriers and careful evaluation of potential outcomes don't tell the whole story (Kahneman, 2011). That said, the issue of the potential returns to education for students on the margin of enrollment must be placed in the context of differences in completion rates. (See Section 11.)

SECTION 11

Degree Completion Matters

Comparisons of the earnings and employment outcomes of adults with different levels of educational attainment do not reflect the reality that many students who enroll in college do not earn credentials. These students are included in the “Some College, No Degree” category, and as Table 3.1 on page 16 shows, on average these adults earn more and are more likely to be employed than those with no college at all.¹⁰ Still, when students are choosing educational paths, they should incorporate the possibility that they will not complete their programs into their decision making.

Relying on data about students who first enrolled in postsecondary education in 2003-04, the following discussion summarizes evidence on the relationship between student

characteristics and student outcomes. The information reported does not reveal the *causes* of differences in completion rates, but it does help to focus attention on some very real problems.

GENDER, RACE/ETHNICITY, AND AGE

Postsecondary outcomes differ by gender, by race, and by the age at which students first enroll (Table 11.1). Women are somewhat more successful than men. Differences by race/ethnicity are sharper. Forty-six percent of Asians and 36% of whites who first enrolled in 2003-04 had earned bachelor’s degrees six years later, compared to only 17% of blacks and Hispanics.

TABLE 11.1

Outcomes by Gender, Race/Ethnicity, and Age Group: Students Who First Enrolled in 2003-04

	Bachelor’s Degree	Associate Degree	Certificate	No Degree, Still Enrolled	No Degree, Left Without Return	Total
Total	31%	9%	9%	15%	36%	100%
Gender						
Male (43%)	30%	9%	8%	16%	37%	100%
Female (57%)	31%	10%	11%	14%	35%	100%
Race/Ethnicity						
White (62%)	36%	10%	8%	13%	33%	100%
Black (14%)	17%	8%	13%	20%	43%	100%
Hispanic (15%)	17%	8%	16%	17%	42%	100%
Asian (5%)	46%	8%	5%	19%	22%	100%
Other (4%)	27%	8%	8%	21%	36%	100%
Age						
18 or Under (43%)	45%	9%	5%	15%	27%	100%
19 to 24 (38%)	28%	10%	9%	16%	37%	100%
25 or Over (19%)	5%	10%	19%	14%	54%	100%

NOTE: Percentages may not sum to 100 because of rounding.

SOURCES: National Center for Education Statistics, 2009; calculations by the authors.

10. People who have earned postsecondary certificates are included in the “Some College, No Degree” category in data from the U.S. Census Bureau, which complicates the determination of the return to some college with no credential in some analyses.

Blacks (13%) and Hispanics (16%) are more likely than average (9%) to earn certificates, but they are also much more likely to have left school without a credential. Forty-three percent of blacks and 42% of Hispanics were in this situation, compared to 33% of whites and 22% of Asians.

Beginning college as an older adult is challenging, partly because of the family responsibilities these students face. Of the 19% of undergraduates who were age 25 or older when they first enrolled in 2003-04, 54% had left school without a credential by 2009. This was the case for only 27% of those who enrolled at age 18 or younger and 37% of those who were ages 19 to 24 when they began their studies.

FULL-TIME ENROLLMENT

Differences in completion rates associated with full-time and part-time enrollment are stark. The chances of completing a degree without at least some periods of full-time enrollment are small. Among those who first enrolled in postsecondary education in 2003-04, 71% of those who enrolled exclusively part time (10% of all students) had left school without a degree six years later (Table 11.2). Only 1% earned bachelor's degrees within six years, and 5% earned associate degrees. Mixing full-time and part-time enrollment is a much more promising approach.

Part-time enrollment is the path taken by some students who have other competing demands on their time, but many students leave school completely for a period of time and then return to try to complete their studies. A third of the students who followed this "stopping out" pattern were still enrolled six years after they began their studies, while another third had left without a credential and not returned.

It is important to note that this association between part-time enrollment and outcomes is not necessarily causal. Some students might choose to enroll part time because they have good job opportunities they don't want to turn down in order to enroll full time or they may be hesitant about committing to postsecondary education. Some may just be seeking some enrichment or specific skills and may have no intention of earning a credential.

A similar argument holds for the association between working full time and completing college.¹¹ On one hand, full-time work may interfere with the success of full-time schooling because full-time employment makes it difficult to devote enough time to studies to facilitate timely degree completion. Yet the causal arrow could point the other way because it is also logical that

TABLE 11.2

Outcomes by Enrollment Intensity and Continuity of Enrollment, Students Who First Enrolled in 2003-04

	Bachelor's Degree	Associate Degree	Certificate	No Degree, Still Enrolled	No Degree, Left Without Return	Total
Total	31%	9%	9%	15%	36%	100%
Enrollment Intensity						
Exclusively Full-Time (50%)	45%	8%	10%	8%	30%	100%
Exclusively Part-Time (10%)	1%*	5%	10%	13%	71%	100%
Part-Time at Least 7 Months (29%)	10%	13%	10%	27%	40%	100%
Mixed Full-Time and Part-Time (40%)	21%	12%	9%	25%	33%	100%
Continuous Enrollment						
Never Stopped Out (61%)	43%	8%	8%	4%	37%	100%
Stopped Out at Least Once (39%)	12%	12%	12%	32%	33%	100%

*Small sample sizes. Interpret with caution.

NOTE: A "stopout" is defined as a break in enrollment of five or more consecutive months. Percentages may not sum to 100 because of rounding.

SOURCES: National Center for Education Statistics, 2009; calculations by the authors.

full-time workers may be more likely to enroll in postsecondary education just to gain some additional knowledge or skills, while those who are not employed are more likely to have earning a degree as their primary goal.

11. Forty-eight percent of 2003-04 beginning students who were employed full time that year left school without a credential and had not returned by 2009. This was the case for 30% of those who were not employed and 32% of those who worked part time (NCES, 2009).

DIFFERENCES ACROSS SECTORS

Public two-year college students are more likely than those in other sectors to enroll part time. For this reason, and because of the different demographics and the different levels of academic preparation of students across types of schools, simple comparisons of completion rates among sectors can be misleading. Even among those who enroll full time, many characteristics of students that have a significant impact on their probability of completing a degree vary systematically across sectors. Public two-year and for-profit institutions are generally open access and do not exclude students who are not yet prepared for college-level work.

Keeping this in mind, it is useful to look at outcomes for students who began in 2003-04 and enrolled full time that year. They may have mixed full-time and part-time enrollment or have stopped out at least once over the next six years, but they began with some apparent intention of moving toward a degree. Overall, 39% of these students had earned bachelor's degrees by 2009, either at the institution in which they first enrolled, or after transferring. But 30% had left school without a credential, while 13% were still enrolled (Table 11.3).

Not surprisingly, only 15% of those who began at public two-year colleges and 4% of those who began at for-profit institutions had earned bachelor's degrees six years later. Sixty-three percent of those who began at public four-year colleges and 68% of those who began at private nonprofit four-year colleges earned bachelor's degrees. Of greater concern is the fact

that 41% of those who first enrolled full time at community colleges and 44% of those who began in the for-profit sector left school without a credential.

ACADEMIC PREPARATION

A major barrier to college success is that many students are simply not prepared to do college-level work. Students who did well in high school have some combination of academic preparation, conscientiousness, and study habits that serve them well in college, and high school grade point average (GPA) is a strong predictor of college success. College entrance examination scores (SAT® and ACT) are also correlated with success, but do not predict as well as GPA (Bowen, Chingos, & McPherson, 2009).

GPA and test score data are generally not available for students who begin their studies at older ages, and they are not available even for many younger students. In particular, students enrolling in associate degree and certificate programs are generally not required to submit test scores and may not be required to submit complete high school transcripts.

TABLE 11.3
Outcomes by Sector, Students Who First Enrolled and Enrolled Full Time in 2003-04

	Bachelor's Degree	Associate Degree	Certificate	No Degree, Still Enrolled	No Degree, Left Without Return	Total
Total (Full-Time)	39%	9%	9%	13%	30%	100%
Sector						
Public Four-Year (86%)	63%	4%	1%	12%	20%	100%
Private Nonprofit Four-Year (89%)	68%	4%	1%	10%	18%	100%
Public Two-Year (or Less) (46%)	15%	17%	10%	17%	41%	100%
For-Profit (84%)	4%	10%	33%	9%	44%	100%

NOTE: In the for-profit sector, 24% of enrollments were in four-year institutions and 76% were in two-year (or less) institutions. These sectors are combined because of small sample sizes. Because some students transferred between 2003-04 and 2008-09, they did not receive their credentials from the institutions at which they began. Percentages may not sum to 100 because of rounding.

SOURCES: National Center for Education Statistics, 2009; calculations by the authors.

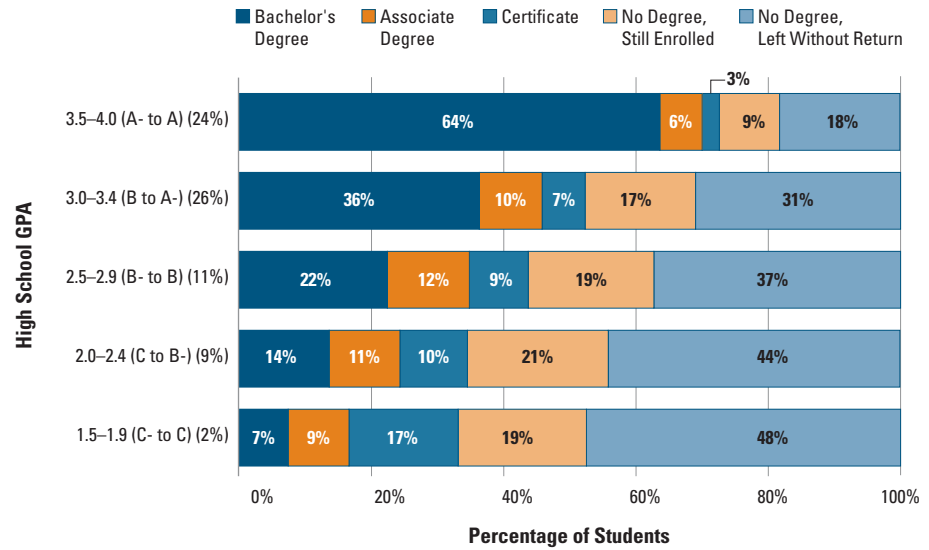
Figures 11.1 and 11.2 report outcomes for students who were age 24 or younger when they enrolled in postsecondary education in 2003-04.

Among the 24% of students age 24 or younger who began college in 2003-04 with a high school GPA of 3.5 or higher, 64% had earned a bachelor's degree six years later, while 18% had left with no credential. In contrast, among enrolling students whose high school GPA was between 2.0 and 2.4, 14% had earned a bachelor's degree, and 44% had left with no credential. Certificates are more common among those with lower high school grades.

Among the two-thirds of enrolling students who submitted entrance examination scores, 71% of those with test scores equivalent to 1140 or higher on the SAT earned bachelor's degrees, compared to 18% of those with scores of 840 or lower. Those with lower scores were more likely than those with higher scores to earn associate degrees or certificates. But 39% of the lowest test quartile left school without a credential, compared to 17% of those with the highest test scores.

FIGURE 11.1

Percentage Distribution of Outcomes by High School GPA, Students Who First Enrolled in 2003-04 at Age 24 or Younger

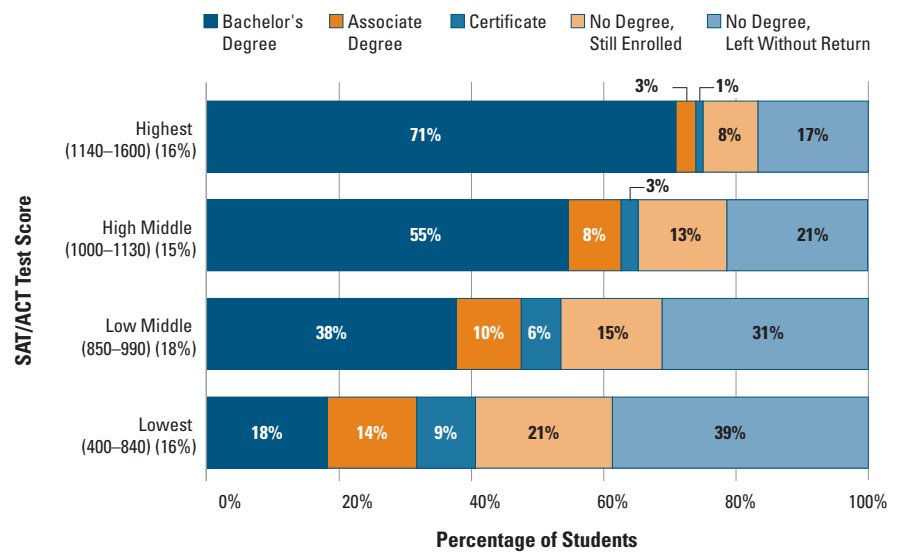


NOTE: High school GPA is unavailable for 27% of enrolling students. The sample size for students with high school GPA lower than 1.5 is too small for reliable reporting. Percentages may not sum to 100 because of rounding.

SOURCES: National Center for Education Statistics, 2009; calculations by the authors.

FIGURE 11.2

Percentage Distribution of Outcomes by High School SAT/ACT Scores, Students Who First Enrolled in 2003-04 at Age 24 or Younger



NOTE: Test scores are unavailable for 36% of enrolling students. Students who took the ACT but not the SAT are included with their scores converted to the SAT scale. Percentages may not sum to 100 because of rounding.

SOURCES: National Center for Education Statistics, 2009; calculations by the authors.

FAMILY INCOME

Many of the factors discussed above are correlated with family income. Students from low-income households tend to have weaker high school records and are more likely to enroll part time. They are less likely to enroll immediately after high school. And black and Hispanic families have lower average incomes than white and Asian families. None of these correlations reveal the *cause* of differences in success rates. But students from the lowest family income quartile are less than half as likely as those from the highest-income quartile to earn bachelor's degrees (Table 11.4). They are almost twice as likely (38% vs. 20%) to leave school without a degree. Lower-income students are more likely than others to complete certificates.

SUMMARY

While about 80% of students who enter college at age 24 or younger and enroll exclusively full time earn a degree or certificate within six years (Shapiro, et al., 2012), many students begin college but leave without credentials. Some of these students may just have been planning to take a few courses and never intended to earn a credential. Some may have decided once they were in school that the costs — financial, psychic, or the demands on their time — were too great

TABLE 11.4

Outcomes by Family Income, Dependent Students Who First Enrolled in 2003-04

	Bachelor's Degree	Associate Degree	Certificate	No Degree, Still Enrolled	No Degree, Left Without Return	Total
Total	41%	9%	6%	15%	29%	100%
Family Income						
1st Quartile (bottom)	26%	9%	11%	16%	38%	100%
2nd Quartile	35%	11%	6%	17%	31%	100%
3rd Quartile	44%	10%	5%	14%	27%	100%
4th Quartile (top)	58%	8%	2%	12%	20%	100%

NOTE: Income quartiles, corresponding to 2002 family income, are (1) Less than \$30,489; (2) \$30,489–\$56,068; (3) \$56,069–\$88,516; (4) \$88,517 or higher.

SOURCES: National Center for Education Statistics, 2009; calculations by the authors.

to make further investment worth it. But others find their aspirations thwarted by inadequate academic preparation or by circumstances beyond their control.

For some students, it may look in retrospect like a mistake to have started college in the first place. They may have accumulated debt, feel that they were misled about the opportunities available to them, and think that they would be better off if they had just focused on the labor force rather than on postsecondary education and training.

But for others, the benefits of “Some College, No Degree” are significant. As other sections in this report document, people in this category are more likely to be employed and earn more than those with no postsecondary experience.

In a thorough review of existing evidence on the benefits of attending community college, Belfield and Bailey (2011) report that almost all studies of the issue have found positive returns to credits earned at community colleges, even when those credits don't lead to a credential. Some evidence suggests that students must earn at least a semester's worth of credits to see these benefits.

Describing the differences between students who are likely to complete their postsecondary programs and those who face lower odds is not difficult. But predicting any individual

student's outcome is more challenging. Encouraging people to invest time, money, and hope in directions that have virtually no chance of leading to positive outcomes, is irresponsible. But many people *do* beat the odds, and promoting those opportunities is a vital component of increasing economic mobility, improving opportunities for this generation and the next, and assuring the strength of our economy.

SECTION 12

The Question of Student Debt

It's no secret that the price of higher education is high and rising, and that for many students, going into debt is the only realistic way to finance their educational pursuits beyond high school. But it is becoming increasingly common for the issue of student debt to be spoken about in crisis proportions. Stories about individuals who had no choice but to accumulate crushing student loan burdens are easy to come by in the news media. The most common data accompanying these anecdotes do not refer to the circumstances of individual students, but to the total amount of outstanding debt accumulated by millions of students over many years.

Much is made of the fact that the combination of all former undergraduate and graduate students and their parents owe more than one trillion dollars, a figure that happens to exceed the amount of outstanding credit card debt (Consumer Financial Protection Bureau, 2013).¹² According to the Federal Reserve Bank of New York (2013), outstanding student loan debt increased by 70% between the first quarter of 2008 and the first quarter of 2013. Less discussed is the reality that this obligation increased at twice that rate over the preceding five years — a period when enrollments were rising at a rate of about 1.9% per year, compared to 3.6% per year between fall 2007 and fall 2011 (National Center for Education Statistics, 2013, Table 223).

Although the sheer magnitude of the total debt owed on student loans can seem startling, the mere fact that a large outstanding student loan burden exists actually does very little to answer the basic question that faces prospective college students, which is whether it's worthwhile to invest in continued education beyond high school. After all, if higher education is a sound investment, then the large volume of student loans could actually be interpreted as a positive sign that students are capitalizing on the rewarding opportunities available to them. As the evidence in this report confirms, investment in higher education usually — but not always —

pays off well in the form of future earnings that provide the means to repay education debt.

Answers to the questions of whether and at what cost it's worth it for a particular individual to go to a particular college and pursue a particular course of study are, of course, far from straightforward. Some form of postsecondary education or training makes sense for most people, but too many people follow paths that do not serve them well. The information presented throughout this publication illustrates that the costs and benefits of postsecondary education vary considerably across individuals.

The need to rely on student debt increases the risk of the investment in college. Paying out of existing personal resources is less expensive only if the forgone financial return on those resources is lower than the interest charged on education loans. But the possibility of being unable to repay is a real issue. Fortunately, the federal government's Income-Based Repayment plan, available since 2009, mitigates this risk.

In an ideal world, financial resources wouldn't constrain anyone's postsecondary choice set, but the reality is that the need to borrow for college can influence the ultimate payoff on an investment in higher education, and it certainly increases the pressure to seek immediate financial rewards. Higher education isn't free, which means that student debt and the attractiveness of college as an investment are intimately connected topics.

But the popular narrative that describes student debt as a broad crisis obscures a number of basic facts. The truth is that for most students, pursuing some form of postsecondary education doesn't require taking on unreasonable amounts of debt. The stories of recent graduates struggling under the pressure of six-figure loan burdens are powerful and concerning, but among the experiences of all postsecondary students, those unfortunate circumstances are actually extremely rare. As Table 12.1 shows, 43% of all students who began their postsecondary education in 2003-04 didn't borrow a single dollar. Over two-thirds of all students borrowed less

12. It is unclear what this comparison reveals. According to the Federal Reserve Bank of New York, outstanding credit card debt declined from \$837 billion in the first quarter of 2008 to \$660 billion in the first quarter of 2013. If student loans were less available, more students would put their college expenses on their high-interest credit cards and these numbers would likely be reversed.

TABLE 12.1

Educational Attainment by 2009 of Students First Enrolling in 2003-04, by Total Amount Borrowed (and Overall Percentage of Students in Debt Category)

	Bachelor's Degree	Associate Degree	Certificate	No Degree, Still Enrolled	No Degree, Left Without Return
Did Not Borrow (43%)	26%	9%	9%	14%	43%
\$1–\$10,000 (25%)	15%	9%	17%	16%	43%
\$10,001–\$20,000 (16%)	42%	10%	7%	17%	24%
\$20,001–\$30,000 (8%)	53%	10%	3%	16%	18%
\$30,001–\$50,000 (5%)	58%	11%	2%	15%	14%
\$50,001–\$75,000 (1%)	65%	9%	1%	15%	10%
\$75,001 or More (1%)	85%	1%	0%	10%	5%
Total	31%	9%	9%	15%	36%

SOURCE: Baum & Payea, *Trends in Student Aid 2012*, Figure 11A.

than \$10,000, and 84% borrowed less than \$20,000. Six years after beginning their studies, only 2% of all students had accumulated student debt in excess of \$50,000.¹³

Moreover, among the students who do take on large amounts of debt, the vast majority are enrolling in programs of longer duration (four years or more) that they hope will culminate in the receipt of a bachelor's degree. Only 1% of all beginning 2003-04 undergraduate students took out student loans in excess of \$75,000, but within that outlying group of students, 85% received a bachelor's degree within six years while another 10% were still enrolled. Only 5% of those students had dropped out of school with no credential to show for their time, effort, and considerable financial investment. So for the rare few who do go deep into debt to pay for college, at least it can be said that most are succeeding in attaining postsecondary credentials that command significant value in the labor market.

13. Headlines about the price of college exceeding \$50,000 per year are also misleading. About 40% of all undergraduates (and 26% of full-time undergraduates) enroll in public two-year colleges, where average tuition and fees for full-time students were \$3,131 in 2012-13. Even at four-year colleges and universities, average tuition and fees in 2012-13 were \$8,655 for full-time in-state students at public institutions and \$29,056 for full-time students at private nonprofit institutions (Baum & Ma, 2012). The \$50,000 figure applies to the sum of tuition, fees, and room and board at a small number of the most expensive private colleges in the country.

Some students, however, drop out of school without having earned any postsecondary credential.¹⁴ The 36% of students who first enrolled in 2003-04 and had left without receiving a credential after six years are the focus of Table 12.2, which provides detail on the borrowing patterns of these students based on how long they were enrolled before dropping out. Of the students who dropped out after 12 or fewer months of enrollment, 70% took on no debt, and

another 27% borrowed less than \$10,000. Among students who enrolled for longer periods of time before dropping out, these percentages are slightly lower, but they still represent the majority of students (84% of students who enrolled for 13 to 24 months either borrowed less than \$10,000 or did not borrow, and for students who enrolled for 24 months or longer, that figure was 69%).

It's clear that for most students who drop out, the student loans they've accumulated (if they've borrowed at all) are

TABLE 12.2

Amount Borrowed by Students Who First Enrolled in 2003-04 and Left Without Completing a Degree or Certificate by 2009, by Length of Enrollment (with Percentages of Students Within Enrollment Category)

Total Months Enrolled	Did Not Borrow	\$1–\$10,000	\$10,001–\$20,000	\$20,001 or More
Up to 12 Months (32%)	70%	27%	3%	1%
13 to 24 Months (31%)	44%	40%	12%	5%
More Than 24 Months (37%)	45%	24%	18%	13%

SOURCE: Baum & Payea, *Trends in Student Aid 2012*, Figure 11C.

14. Although a small number of students enroll without the intention of pursuing a formal credential, the prospect of having borrowed money to pay for school but then leaving without having earned a certificate or degree would represent a suboptimal attainment scenario for almost any student.

relatively modest. Nevertheless, the number of students who do drop out after borrowing amounts in excess of \$10,000 is nontrivial, and the debts these students take with them are very real burdens. The risk of noncompletion should not be overlooked in a discussion of student debt and whether or not higher education is worth the investment.

SUMMARY

The bottom line is that many students must borrow in order to pay for higher education, but this doesn't mean that going to college has become synonymous with accepting an unmanageable amount of student loans. The overwhelming majority of students do not borrow sky-high amounts of money to pay for college, and those who do borrow large sums tend to enroll in programs of longer duration that culminate in the attainment of educational credentials that have widely recognized and long-term value.

The average debt of students who graduated from public four-year institutions in 2010-11 was \$13,600 per student, or \$23,800 per borrower for the 57% with debt. The average debt of students who graduated from private nonprofit four-year institutions in 2010-11 was \$19,700 per student or \$29,900 per borrower for the 66% with debt (Baum & Payea, 2012). Graduate students tend to borrow more, and much of the increase in total education debt in recent years is attributable to rising borrowing for this group.

The debt levels for the students who borrow and either earn associate degrees or certificates or leave school without a credential tend to be much lower. But the story is similar.

On average they are fine. The vast majority have earnings that allow them to repay their debts. But this reality is small comfort to those whose debt burden is unmanageable.

Too many students don't have the information and guidance they need to make good decisions about postsecondary education options and how best to finance those options. For students without the personal or family resources to pay up front — an increasing majority of students — the challenges are great. But for most students, the best answer is not to forgo education or to avoid all debt. The implementation of the federal Income-Based Repayment plan in 2009 was a very important step, and more students and more of those commenting on student debt problems should be aware of this program. Stronger public and institutional policies, including improvements in need-based aid and in student loan repayment systems, could go a long way toward mitigating the problems.

In the absence of adequate protection for those who end up on the lower end of the post-college earnings distribution, student debt can cause serious problems. And for those with debts far above the average, repayment may cause significant financial strain. The small fraction of students who have actually taken on heavy debt burdens and haven't met with much success in higher education or in the labor market are real people who need help. But a misrepresentation of the facts about student debt helps no one. On the contrary, a flawed narrative that portrays college graduates overall as drowning in seas of debt is likely to be damaging in so far as it discourages prospective students from pursuing what might be the best investment opportunity they'll ever see.

Guest Essays

The five essays that follow express the views of five eminent scholars on issues relating to the benefits of higher education and how to improve the distribution of those benefits. We have invited these essays in order to focus more on some of the questions raised by *How College Shapes Lives* that cannot easily be addressed through quantitative analysis or through analysis of earnings and employment outcomes. Our goal is to ensure a broad approach to considering the role of higher education in society.

The authors explore the importance of early-life experiences in preparing people to benefit from postsecondary education, the role of higher education in reducing the inequality in our

society, the value of a liberal education, the importance of recognizing that different paths are appropriate for different people, and the changing nature of the labor market.

In all of its book publishing activities, the College Board endeavors to present the works of authors who are well qualified to write with authority on the subject at hand and to present accurate and timely information. However, the opinions, interpretations, and conclusions of the authors are their own and do not necessarily represent those of the College Board.

Learning Begets Learning: Implications for Higher Education – MICHAEL MCPHERSON

What Is Equity in Higher Education? – HARRY BRIGHOUSE

Messages on My Wall: The Core Features of a Liberal Arts Education – HOWARD GARDNER

Higher Education and the Opportunity Gap – ISABEL SAWHILL

Education Policy in an Era of Changing Opportunities – DAVID AUTOR & DAVID DORN

Learning Begets Learning: Implications for Higher Education

Michael McPherson

President, The Spencer Foundation

Past president of Macalester College, Michael McPherson is an economist and an expert on higher education finance and public policy. He has authored numerous articles and books on these topics. He is the co-author of *The Student Aid Game* (with Morton Schapiro) and of *Crossing the Finish Line: Completing College at America's Public Universities* (with William Bowen and Matthew Chingos).

It takes somewhat over 20 years for a little baby to grow into a well-educated young adult. Despite the marvelous technological advances of the current era, nobody has yet found a way to speed this lengthy production process up. Missteps and failures early on in this process are likely to have bad consequences down the line. This reality has important implications for improving access and success in higher education.

The physiological story is familiar. Poor prenatal and neonatal care can create lasting physical challenges; poor dental care in early life can have serious consequences for general levels of health down the line. Sometimes, but not always, medical interventions can overcome these later difficulties but often only at great effort and expense.

Both intuition and a growing body of evidence suggest that something similar is true in educational terms — that good educational experiences at every stage lay the groundwork for later success. Jim Heckman's evocative phrase "learning begets learning" captures the spirit of this analysis (Heckman, 2000).

"It is instructive — and sobering — to see to what a large extent early experiences predict later school success."

Consider two examples. In elementary education, a crucial educational transition happens around the fourth grade. A major part of the work of the first three years of primary school is learning the mechanics of reading. A solid ability to read text

then underpins the use of texts to help students learn content in the remaining years of elementary school. This is the vital transition from "learning to read" to "reading to learn." Without that solid basis in reading, further progress in grade school and high school becomes difficult and frustrating.

Advances in learning sciences over the last 25 years have led to a much deeper understanding of teaching and learning the mechanics of reading. It is now possible to identify best practices that are capable of enabling more than 90% of all third-graders to master basic reading. In fact, though, only something like 65% of students achieve this mastery, largely because many teachers don't follow these best practices.

A second example derives from work done by the Consortium on Chicago School Research at the University of Chicago. Over a number of years, they have developed a set of "on track" indicators that can reliably predict student success in high school based on measures of freshman performance. It turns out that the most reliable indicators are not test scores, but grades and class attendance (Allensworth & Easton, 2007). It is instructive — and sobering — to see to what a large extent early experiences predict later school success.

It is this conception of educational development as a temporally integrated process that helps make the case for high-quality early education (preschool) for all students, and especially disadvantaged ones. While the case for the lasting impact of good preschool is not ironclad (what social science evidence ever is?), striking evidence in its favor has emerged from longitudinal studies of programs like Highscope (the renowned Perry Preschool Experiment; see Heckman et al., 2010) and the Abecedarian Project (Campbell et al., 2002).

It would be foolish to suppose that good early education is enough to yield later success. But it can lay the necessary foundation on which the system can build.

In the absence of good work at earlier stages of schooling, work at later stages becomes more difficult for teachers and more frustrating for students. Think about sixth-graders who have to take time away from learning science or history to

learn how to read. Or 10th-graders at a high school where teachers are working against the odds to get students who are off the path toward graduation “on track.” This is a wasteful and inefficient way to operate an educational system.

Even more important, this way of operating works against the prospects of disadvantaged students. Affluent parents can provide their children with better schooling experiences at every stage and can supplement school offerings with enrichment opportunities from early education right on through to tutoring for the SAT. In fact, as income inequality has grown in the United States over the last 30 years, the gap in such supplemental spending between rich and poor families has grown substantially, with families from the top income quintile spending over \$8,800 per child in 2006, compared to spending of \$1,300 per child among families in the lowest quintile (Duncan & Murnane, 2011, p. 11). (Compare this to the roughly \$12,000 in total revenues provided to the average public school student in 2006 (NCES, 2013).) The spending gap went from \$2,700 per child in 1973 to more than \$7,500 per child in 2006 (Duncan & Murnane, 2011, p. 11). At the same time, the test score gap between children from high-income and low-income families was 30% to 40% higher for children born in 2001 than for those born in 1976 (Reardon, 2011, p. 91).

What does all this have to do with higher education, which is the focus of this report? The fact is that college comes at a late point in this developmental chain — a stage that many disadvantaged students in fact never reach because they don’t graduate from high school. But students who do complete high school bring their developmental histories with them, and those histories do much to shape the opportunities and the challenges they will face in any further education they pursue.

The developmental perspective suggests that we should think about problems in higher education policy from the standpoint of different temporal perspectives. In the near term, the developmental histories of students entering the higher education system “are what they are.” Many college teachers are faced with their version of the problem of the sixth-grade teachers with students who didn’t learn to read.

There is absolutely no reason to blame these students, and it’s pointless now to complain that the grade school or high school should have done better. Education is important in people’s

lives, for all the reasons developed in this publication and its companion, *Education Pays*, and the task facing teachers and colleges is to help their students face educational challenges and succeed.

But surely we can tackle these difficult near-term challenges and at the same time also step back and acknowledge that this is no way to run a railroad. It is wasteful and inefficient to devote so much effort and energy at every stage of the educational process to overcoming difficulties that originated in earlier stages.

“No doubt we will continue to face the tasks of developmental education and of bringing adults back to college to complete, but with greater success at earlier stages of the educational process, these challenges should be more manageable.”

Consider two different questions at the level of national policy, asked in the current year 2013.

1. What is the best investment we can make to improve the chances of bachelor’s degree completion for disadvantaged students in the year 2025?
2. What is the best investment we can make to improve the chances of bachelor’s degree completion for disadvantaged students in the year 2040?

For the near-term problem, since nobody who is not at least 10 years old now will graduate from college by 2025, we can ignore policies toward preschool and early literacy. They are just irrelevant. Conceivably, we could devote some attention to improving secondary education, but it is unrealistic to believe such efforts will have an impact on that large and messy system so quickly. We might be able to get more students to apply to college and do something to improve placement in colleges that give the students the best chance to succeed. Chances are that the biggest payoff by 2025 will come (a) by improving the chances of at-risk students by finding ways to make developmental (or remedial) education more effective and (b) by finding adults with some college experience and getting

them back into college to try to finish. These are sensible strategies, and they describe much of what the nation is doing to approach these problems.

The longer-term problem looks quite different. The youngest college graduates in 2040 won't be born for another five years. We have seven or eight years to work at expanding the availability of good preschool education, especially for disadvantaged students, who are at the greatest risk of not finishing college (or even high school). We have over a decade that we can devote to spreading the best practices for instruction in early reading into our elementary schools, which will lay the groundwork for greater success for students in the upper elementary years. At the same time, with the more coherent instructional standards provided by the Common Core, we can tackle the more ambitious teaching and learning work in our high schools that will be needed to enable students not merely to enter but to succeed in college. It is optimistic but not utopian to conceive that in 15 years high schools can make significant progress. No doubt we will continue to face the tasks of developmental education and of bringing adults back to college to complete, but with greater success at earlier stages of the educational process, these challenges should be more manageable.

With more time to work, we can envision a much different strategy for achieving college success — one that is both more satisfying and ultimately less costly than the near-term strategy.

To be clear, we *cannot* put aside the near-term 2025 challenge in favor of focusing only on the next generation of college students, yet to be born. The people who can be helped with our 2025 strategy have real needs, and educational success has the potential to make their lives significantly better. They deserve our help.

However, there is also real danger in focusing *only* on the near-term goal and not the longer-term opportunity. It's not hard to picture a future in which every five years we announce another bold 10-year goal, and we keep working at that same set of problems with basically the same set of solutions.

The fact is, we must acquire the political and social capacity to think about near-term and longer-term goals at once. The

problem here is not so different from our problems in relation to climate change: we need to learn to use fossil fuels more efficiently in the near term even as we work with green technologies toward eliminating the use of fossil fuels in the longer term.

I will close by returning to the point I began with. Human beings take a long time to develop. As every parent knows, that process requires enormous patience and consistent attention. Patience is not a leading feature of our nation's public policy conversations. But our future, in education and in other fields, does depend on our ability to focus effectively on both the urgent problems of the present and investments for the future.

References

- Allensworth, E., & Easton, J. Q. (2007, July). What matters for staying on-track and graduating in Chicago Public Schools. Retrieved from <http://ccsr.uchicago.edu/publications/what-matters-staying-track-and-graduating-chicago-public-schools>
- Campbell, F. A., Ramey, C. T., Pungello, E. P., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian project. *Applied Developmental Science, 6*, 42–57.
- Duncan, G. J., & Murnane, R. J. (2011). Introduction: The American dream, then and now. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life chances* (pp. 3–26). New York and Chicago: Russell Sage Foundation and Spencer Foundation.
- Heckman, J. J. (2000). *Invest in the very young*. Chicago: Ounce of Prevention Fund and the University of Chicago Harris School of Public Policy Studies. Retrieved from <http://www.ounceofprevention.org/news/pdfs/HeckmanInvestInVeryYoung.pdf>
- Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P., & Yazitz, A. (2010). *A new cost-benefit and rate of return analysis for the Perry Preschool Program: A summary* (NBER Working Paper 16180). Cambridge, MA: National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w16180>
- National Center for Education Statistics Common Core of Data. (2013). Preliminary revenues and average daily attendance for public elementary and secondary education, fiscal year 2007. Retrieved from http://nces.ed.gov/ccd/tables/state_revenues_FY07.asp
- Reardon, S. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life chances* (pp. 91–116). New York and Chicago: Russell Sage Foundation and Spencer Foundation.

What Is Equity in Higher Education?

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The United States has more socioeconomic inequality now than 40 years ago. The trend seems to be continuing: not only are incomes more unequal than they were, but so, more disturbingly, is the gap in educational achievement between high- and low-income children. According to Sean Reardon of Stanford University (2011), the gap in achievement between children from families in the lowest 10% of incomes and those from families in the highest 10%, as measured by standardized test scores, has doubled in the past 50 years.

It's not just inequality that is increasing. Social mobility, which has never been as robust as Americans say they want it to be, appears to be declining. Because education is such an important influence on life chances, the growing achievement gap, combined with gaps in levels of educational attainment, is associated with an increasingly strong relationship between a child's opportunities and her parents' success.

These facts create dilemmas for higher education policy and practice. College is often seen as a mechanism for maintaining social mobility. Much attention is being directed toward the disturbingly low representation of low-income students in elite institutions. But if higher education is to contribute in meaningful ways to reducing the inequality of opportunities facing Americans based on the circumstances of their birth, we must focus more attention on other segments of higher

education — those in a position to transform the lives of large numbers of students from less privileged backgrounds. We must ask how colleges and universities can help to reduce inequality through the education they provide, rather than just focusing on the sorting and admission processes.

A consensus is forming that lower-income children's prospects of entering elite institutions, and hence of having this direct path to America's elites, are diminishing relative to those from more advantaged backgrounds. Because many policymakers, journalists, and thought-leaders have attended, and know well, selective colleges, they naturally worry about the composition of the student bodies in those colleges. In a perfectly equitable society, the demographics of the graduating classes of Harvard and Haverford and, for that matter, Oxnard Community College, would reflect those in the society as a whole. So it seems wrong that they are so skewed in our society.

The graduating classes of elite institutions could, indeed, resemble America socioeconomically *somewhat* more than they currently do. But not a great deal more, given the realities in K–12 education. According to Amy Gutmann (2010), the president of the University of Pennsylvania, qualified students from the top quintile of the income distribution are greatly overrepresented at Penn. But qualified students from the bottom quintile are represented almost in proportion to their numbers: the problem is that there are not enough qualified bottom quintile students. In the second-lowest quintile, qualified students *are* underrepresented. Wealthy private colleges heavily discount tuition for needy students, so the difficulty of enrolling qualified lower-income students seems not to be because of admission policies or the actual costs to the student and her family. Rather, insufficient numbers apply. The high schools lower-income students attend do not produce many highly qualified students and do not provide adequate college counseling for the highly qualified students they do graduate.

No doubt some admission and financial aid policy changes could help compensate for the current low application rates of high-achieving low-income students, and investing even more

resources in outreach would, presumably, do more. Leaders of elite institutions should certainly make whatever changes they can along these lines.

But elite institutions will not, in fact, ever fully reflect the demographics of a highly unequal society, and we should not demand that they do. The problem is that whereas 36% of children from the top quintile are highly qualified, only about 7% of children from the bottom quintile are.

This should be no surprise in the light of Reardon's findings reported above and what the social sciences tell us. Annette Lareau's (2003) now classic book, *Unequal Childhoods*, observes that more affluent families seem to raise their children differently from lower-income parents, involving them in intensive activities in which they learn to negotiate confidently with authoritative adults from an early age — a practice she calls “concerted cultivation,” as contrasted with the more *laissez-faire* approach taken by lower-income families. Affluent families have more financial resources to devote to enriching the educational experiences of their (fewer) children. In 2005-06, whereas families in the lowest quintile spent an average of \$1,315 per child on enrichment activities such as athletics, tutoring, and field trips, families in the top quintile spent \$8,872 (Duncan & Murnane, 2011). The enrichment spending gap has tripled since the 1970s. Lower-income parents have less secure employment and residence, worse health care and health, fewer resources to advocate for their children when schools or other bureaucracies deny their children the best care, and are, generally, under much more stress. The inequities of the achievement gap, and of the consequent matriculation rates in higher education, reflect, rather than constitute, the inequity in society at large.

“The inequity of the achievement gap, and of the consequent matriculation rates in higher education, reflect, rather than constitute, the inequity in society at large.”

Understanding this helps us to think differently about equity in higher education. Single-mindedly focusing on the idea that higher education should reflect society, which it will not while

that society is unjust, is a mistake. At least as important is asking how higher education can contribute to making society less unjust. Answering that question turns our attention from the issue of access to the unduly neglected issue of what higher education actually produces.

I want to propose two priorities. Both are grounded in a background observation about the economy. Technological change, globalization, and declining levels of unionization have resulted in fewer secure and well-paid jobs for those who exit the education system in their teens. The premium to graduating from college has increased in monetary terms but also in terms of status and control over one's life. Children from very affluent backgrounds may see higher education as the path into elite jobs, but many other children see it simply as a way of avoiding being part of the roughly 25% to 30% of the workforce in insecure, low-paying jobs. During their working hours, many of these individuals are under the control of clients or managers who do not have high regard for them and have little incentive to mentor them or care about their well-being. And their children have increasingly poor educational prospects.

The first priority should be building the human capital of the college students who are most likely to be the spouses, children, parents, cousins, co-workers, or neighbors of people in this part of our society. Most of these students are not at Harvard, or Penn, or even at my institution, University of Wisconsin, Madison. They are at the nonselective, regional four-year and two-year institutions that enroll the vast majority of America's undergraduates. We should focus on *these* institutions, ensuring that they have the right kinds of incentives, supports, and capacities to ensure that their students graduate in a timely fashion and, whether or not they graduate, that they learn the valuable skills and reflective abilities to contribute to the well-being of the communities they inhabit. This goal is more urgent, and will be more cost-effective in ameliorating the effects of inequity than will getting demographic parity in elite institutions.

The second priority is emphasizing high-quality training of those students who will become the professionals most likely to influence the quality of life of the disadvantaged — for example, future teachers, social workers, nurses, managers,

and human resources professionals in the private sector. Regardless of the social strata from which they are drawn, these students choose to enter professions that position them to have immediate influence on the lives of those who gain the least from the wealth our society produces. Some — such as most social workers — do this self-consciously, but others — such as many private sector managers — often do so accidentally.

Many of these important students *are* in highly selective institutions. But many such universities (Penn is an exception) regard professional training as a sideshow to their main educational mission. Most professors in the more traditional disciplines do not mentor or encourage students who enter those professions. For example, few English, math, and history professors could tell you much about the secondary teacher education majors who attend their classes, or maintain contact with them as they enter the teaching profession. But given the numbers, even small gains in the overall quality of education, mentoring, and training of professionals who will serve low-income populations, and their managers and leaders, can have high impact on the disadvantaged people they serve. The quality of the public service professionals that universities turn out should be more central than the composition of the student body they bring in (though these are not unrelated).

Higher education — and elite higher education in particular — is not a promising vehicle for fully remedying unjust inequality of opportunity; and, the worse the inequalities are, the less promising a vehicle it is. What policymakers, higher education leaders, and even individual professors can do well is to invest better in the development of those students who are most likely to improve the lives of those on the receiving end of the unjust inequalities which, as a society, we should eliminate by more effective means.

References

- Duncan, G. J., & Murnane, R. J. (2011). Introduction: The American dream, then and now. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life chances* (pp. 3–26). New York and Chicago: Russell Sage Foundation and Spencer Foundation.
- Gutmann, A. (2010). Leading universities in the 21st century: Chances and challenges. James A. Moffett lecture. Center for Human Values. Princeton University. Retrieved from <http://www.upenn.edu/president/meet-president/moffett-lecture-2010>.
- Lareau, A. (2003). *Unequal childhoods: Class, race and family life*. Berkeley, CA: University of California Press.
- Reardon, S. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In G. J. Duncan & R. J. Murnane (Eds.), *Whither opportunity? Rising inequality, schools, and children's life chances* (pp. 91–116). New York and Chicago: Russell Sage Foundation and Spencer Foundation.

Messages on My Wall: The Core Features of a Liberal Arts Education

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Howard Gardner is the author of many books, including, most recently, *The App Generation: How Today's Youth Navigate Identity, Intimacy and Imagination in a Digital World* (with Katie Davis). Gardner's many awards include a MacArthur Prize Fellowship in 1981. He is best known in educational circles for his theory of multiple intelligences. With Richard Light, he has recently embarked on a study of "liberal arts and sciences in the 21st century."

A few years ago, upon moving to a new office at the Harvard Graduate School of Education, I had to decide whether and, if so, how to decorate it. Much of my time is spent meeting with students — prospective students at all levels, current undergraduates and graduate students, my own doctoral students, and former students who have now moved on to "the real world." I decided that I would like to send to these students, via the décor, a message about the process of education — a message that they might not have arrived at on their own. And so I chose to retrieve and frame letters from my own teachers, and from other scholars who had influenced me significantly. These letters were always substantive — about their work, about my work, about the connections — and, sometimes, disjunctions — between these endeavors. I added photos of some of the teachers, as well as the perhaps predictable pictures of children and, more recently, grandchildren.

"Liberal arts colleges and universities exist to preserve significant old knowledge, convey it effectively to succeeding generations of students, and discover or produce new knowledge that, it is hoped, will be significant."

It's now decades after most of these letters were received, and most of the scholars have long since been forgotten ... except

perhaps by a few students and remaining family members. Why the display? Not simply to suggest "teachers I've known, whom I've photographed, and who have written letters to me." Rather I want to communicate a message: A liberal arts education features *ideas* — ones that come out of research, or thinking deeply, or synthesizing broadly; *scholars*, who devote years, even decades to puzzling about these ideas and trying to achieve clarity; and *communication*, through writing, speaking, conversing, dialoguing, debating, and even occasionally changing one's mind and correcting the record.

For millennia, human beings have thought about ideas, sometimes for lengthy periods of time, and communicated about them to others, both near and far. Such intellectual activity has happened in many places, but for centuries, the special homes of such activities have been educational institutions. Liberal arts colleges and universities exist to preserve significant old knowledge, convey it effectively to succeeding generations of students, and discover or produce new knowledge that, it is hoped, will be significant.

Just how this happens — and what makes it happen well — is not easy to determine. But it does happen — as I can attest. When I, as a son of immigrants, arrived at Harvard College in 1961, I was the first member of my extended family to go to college. At the time I honestly believed that anyone whose books I would encounter was already dead; and that the purpose of writing papers was just to spew back what the teacher had said or what I had read in (though not copied from) an encyclopedia. I was also quite certain that I would become a lawyer — since I was the proverbial "Jewish boy who hates the sight of blood." I never imagined that I would become a teacher and researcher in the social sciences; indeed, I'd never run into *anyone* who had made the choice of becoming a scholar.

Pretty soon, I was weaned from these misconceptions. A similar thing happened to many of my classmates. To be sure, we were not all affected in the same way by our years at college, and after college, we pursued different career paths. But almost everyone I know with a liberal arts education can point to teachers, books (and, occasionally to other media), projects, experiments, discussions in class, outside of class, or via late

night bull sessions, where our minds were enriched, expanded, changed, challenged, even remade. To paraphrase historian Andrew Delbanco, our minds became more interesting places. By the time I'd finished college, I had elected to join the ranks of teacher-scholars. And even as I enter my eighth decade, I hope — and believe — that this process can continue for me and for my age mates.

The world changes. Fifty years ago we took it on faith that a liberal arts education was worthwhile, but no longer is most of the world willing to make that assumption. And so we need “measures” to prove, or at least to bolster the case, that this form of education has merit, and that its fruits can be demonstrated to a skeptic. Of course, the easy way to achieve this effect is to arrive at a number — for example, the average salary of a liberal arts-educated individual, five or 10 years post college. But I believe that it would be disastrous to embrace such a ham-handed index.

Rather, it seems far preferable to make the case by triangulating a number of different indices: how students themselves believe that they are changed (and not changed) by such an education; how teachers and other administrators and recruiters respond to the same question of continuity and change. We should identify (and seek to multiply) the classes, teachers, and experiences that have in some way made a significant positive difference and eliminate those experiences whose impact, now or later, seems minimal or even harmful. We should be open to delivery and assessment by digital means, but we should not assume that digital forms are necessarily preferable to those that involve face-to-face, or pen-to-paper forms of communication.

You might wonder whether my letters convey these ideas and if so, how. Sometimes, a student will say “Oh, my goodness, you knew art historian E. H. Gombrich — what did you say that so irritated him?” (Answer: “I said that there was such a thing as ‘the spirit of an age’ — a notion that drove him to distraction.”) Another will say “What does this letter in French say? And how old were you when you received it?” (Answer: “It is from psychologist Jean Piaget and I was a 26-year-old graduate student who had written a critical essay about his work.”) In other words, the letters serve as a pretext and catalyst, for conversation about what it means to work as a scholar, researcher, and teacher and how members of those callings sometimes communicate with one another.

College provides an opportunity to seek passionate faculty members and form a relationship with them; delve deeply into a research project; have a transformational experience; and learn to take chances, cope with and bounce back from failures; and create something new.¹⁵ While my conversations with students take many paths, often unpredictable ones, I believe that conversations that take off from this gallery of correspondence help to effect such experiences and changes.

“Fifty years ago we took it on faith that a liberal arts education was worthwhile, but no longer is most of the world willing to make that assumption. And so we need “measures” to prove, or at least to bolster the case, that this form of education has merit, and that its fruits can be demonstrated to a skeptic.”

Complementing my gallery of personal letters, let me close with two anecdotes that capture my thinking about education in the liberal arts.

A couple of years ago, after I had given a talk on education, a self-confident student came up to me, wielding his smartphone, and said, “I don’t know why we will need school in the future when the answers to all questions will be contained in this device.” I thought for a moment and responded, “Yes, the answers to all questions ... except the important ones.”

Many years ago, a self-confident young person attempted to ingratiate himself with the redoubtable poet T. S. Eliot. That person remarked to Eliot that modern people know so much more than ancients. Eliot nodded and said, “and *they* are what we know.” In a nutshell, that’s the message of those letters on my office wall.

References

Selingo, J. (2013). *College (un)bound: The future of higher education and what it means for students*. New York: Houghton Mifflin Harcourt Publishing Company.

15. Jeffrey Selingo makes similar points in his recently published *College (Un)bound: The Future of Higher Education and What It Means for Students* (2013).

Higher Education and the Opportunity Gap¹⁶

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America faces an opportunity gap. Those born in the bottom ranks have difficulty moving up. Although the United States has long thought of itself as a meritocracy, a place where anyone who gets an education and works hard can make it, the facts tell a somewhat different story. Children born into the top fifth of the income distribution have about twice as much of a chance of becoming middle class or better in their adult years as those born into the bottom fifth (Isaacs, Sawhill, & Haskins, 2008).

One way that lower-income children can beat the odds is by getting a college degree.¹⁷ Those who complete four-year degrees have a much better chance of becoming middle class than those who don't — although still not as good of a chance as their more affluent peers. But the even bigger problem is that few actually

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16. I am indebted to Sandy Baum, Tom Brock, Ben Wildavsky, Kerry Grannis, and Adam Looney for comments on an earlier version.

17. For an excellent overview of the higher education system, see the articles in, *The Future of Children: Postsecondary Education in the United States*, 2013, especially the chapters by Lisa Barrow, Tom Brock, and Cecelia Rouse and by Sandy Baum, Charles Kurose, and Michael McPherson.

manage to get the degree. Moreover, the link between parental income and college-going has increased in recent decades (Bailey & Dynarski, 2011). In short, higher education is not the kind of mobility-enhancing vehicle that it could be.

The obvious solution would seem to be this: First, encourage more low-income children to go to college; and second, finance their education in order to narrow the opportunity gap — a strategy that policymakers have been pursuing for the past few decades. This prescription is fine as far as it goes, and indeed some success has been achieved in both motivating the less advantaged to aspire to college and in providing the financial assistance enabling them to do so. Most high school graduates say that they plan on getting a degree, and spending on Pell grants has risen sharply in recent years, even as deficits have constrained other types of spending (U.S. Department of Treasury, 2012).

The flaw in this simple argument is that the primary problem is no longer enrollment, it is completion. Almost half of all college students and much higher proportions of poor and minority students drop out before they complete a degree. Community colleges, the sector that enrolls the majority of less advantaged and older students, have experienced staggering dropout rates. About 54% of their students don't complete a degree, receive a certificate, or transfer to a four-year institution within six years (NCES, 2011).

The reasons for lack of completion are many, including rising tuition costs that have only partially been offset by increased government aid and are especially burdensome for the least well off; a lack of information about what aid is available, particularly at more selective schools; and the demands of work and family that may make full-time attendance difficult or impossible. But probably the most important factor explaining lack of completion is inadequate preparation for college in the K–12 years. According to the 2009 National Assessment of Educational Progress (NAEP), only a small fraction of high school seniors are at or above proficiency in math and reading: 26% and 38%, respectively (U.S. Department of Education, 2009). Yet roughly two-thirds of high school graduates enroll in college.¹⁸

18. In fall 2012, 66.2% of 2012 high school graduates were enrolled in college (U.S. Census Bureau, 2012).

This lack of preparation is not the fault of institutions of higher education. Most colleges, especially the less selective schools at the community college level, have poured time and money into providing remedial courses to help underprepared students succeed, but the effort has done little to overcome the dropout problem. There have also been experiments with providing community college students with various supports such as counseling, the creation of “learning communities” that keep students together for mutual support, or providing extra financial resources to help meet living costs. However, these programs are costly and have had only modest success (Bettinger, Boatman, & Long, 2013).

It is not as if the incentives for completion don’t exist. The wage premium for a college degree has skyrocketed in recent decades, nearly doubling since 1980. When compared to simply graduating from high school, a bachelor’s degree produces an increase in earnings over one’s career of nearly \$600,000, even after accounting for the fact that college graduates tend to be more able than noncollege graduates for reasons that have nothing to do with going to college. An associate degree produces a smaller, but still highly significant gain.

It is clear that different segments of the high school population need different postsecondary opportunities. Some are academically able and should be applying to selective schools. Others are much less well prepared and might benefit more from a one-year certificate in a high-demand field such as health, computers, or welding. One size doesn’t fit all.

A more academic literature has shown that there is a small but significant number of low-income, high-achieving students who do not apply to more selective schools but instead enter the community college system or other less selective institutions where they are less likely to graduate. They are often unaware of the fact that many top-tier universities are seeking a more diverse student body and would provide generous financial aid enabling them to attend. Although there are far more high achievers from wealthier families than among those who are less well off, this “undermatching” of talent with available resources is another indicator that class matters in the U.S. (Hoxby & Avery, 2013; Bowen, Chingos, & McPherson, 2009).

At the other end of the spectrum are a large number of high school students who are simply not prepared for the rigors of college-level work. In an earlier paper, co-authored with Stephanie Owen and entitled “Should Everyone Go to College?” we argued that a college degree is a very good investment, on average, but not for every high school student. The benefits depend not only on whether one completes a degree or certificate, but also on the selectivity of the school, the student’s major, and the type of occupation in which she ends up. For example, the rate of return on a bachelor’s degree from a noncompetitive four-year private institution is under 6% while the rate of return on a bachelor’s degree at our most competitive public institutions is over 12%. The difference in lifetime earnings between someone majoring in engineering vs. someone majoring in the arts is a whopping \$1.5 million.

“It is clear that different segments of the high school population need different postsecondary opportunities. ... One size doesn’t fit all.”

Of course, the value of a college degree should not be measured solely in terms of the payoff in the labor market. Higher education creates more informed citizens, better health, better parents, more job satisfaction, and other noneconomic benefits. Still, students would do well to carefully consider their objectives and expectations before choosing an institution or a major. Efforts to make more information available and to help high school graduates and their parents navigate the complexity of the financial aid system — as well as the multitude of institutional choices available to them — should be increased.¹⁹

More fundamentally, for a lower-income family, higher education is simply not affordable without heavy subsidies from the government or scholarship aid. Faced with messages that a college degree is the ticket to the middle class, and tuition levels that are beyond their reach, borrowing by students and their families has soared. In part this reflects an increase in the number of borrowers (Greenstone & Looney, 2013). But the levels of debt are both worrisome and inconsistent with the idea that higher education should be accessible to all those able to benefit from it.

¹⁹ The College Scorecard, the Department of Education’s new tool for informing potential students about graduation rates, costs, and loan default rates at different colleges, is a step in the right direction as is a more simplified process for applying for financial aid.

In the meantime, the federal government is spending \$136 billion a year on Pell grants, student loans, tax credits, and other forms of assistance for undergraduate students. While Pell grants are aimed at providing help to low-income students, loans and tax credits are heavily tilted toward middle-class families (Dynarski & Scott-Clayton, 2013).²⁰ Some reallocation of funding from the middle class to the poor would probably help to close the opportunity gap. But more money for Pell grants, by itself, will not solve the dropout problem. There is no evidence that Pell grants have increased graduation rates, as opposed to enrollments.

A higher level of assistance for low-income students but one also tied more closely to performance might help to level the playing field in a more cost-effective way while simultaneously providing stronger incentives for better preparation at the K–12 level. For example, West Virginia’s PROMISE scholarships provide free tuition and fees for up to four years to academically qualified students who maintain a minimum GPA and course load in college. Research has shown that the program increased on-time graduation rates by 7 percentage points (Dynarski & Scott-Clayton, 2013).

“There is no question that the workforce of the future will need more education, but some of that education may be more effectively provided in high school, in career and technical education programs customized to provide the skills that employers need, and through inexpensive online learning rather than in traditional college classrooms.”

More controversially, it may be time to consider an approach that is common in European and Asian countries. These countries require students to demonstrate that they are prepared before they are admitted to a university, using national testing systems. Some countries, such as Germany, also provide far more opportunities for nonuniversity bound students to acquire valuable skills. For those with the requisite ability, the cost of higher education is free or highly subsidized. These systems

20. Roughly 40% of undergraduates receiving federal assistance are from families with income above \$30,000 (National Association of Student Financial Aid Administrators, 2013).

provide an incentive for students to study hard in secondary school and for the schools to work hard to prepare them for the rigors of college-level work. Universities can then concentrate on educating those most able to benefit, and taxpayers don’t end up subsidizing students to learn in college what they should have learned earlier in their school careers. The European and Asian systems are often more meritocratic than the U.S. system and far more cost-effective from a societal perspective (NCES, 2013).

With the advent of the Common Core standards, a version of this approach could be gradually introduced in the U.S. and financial assistance tied more strongly to performance in high school and college. Because of our tradition of not tracking students and of providing open access to community colleges, and because it would take time for the K–12 system as well as individuals to respond to new incentives, any such modifications would need to be introduced very slowly, and careful attention would need to be paid to how performance is measured.

Even then, critics will charge that such a system would limit access to higher education. They would note that even a year or two of college that ends with the student dropping out has some value in the labor market. They would also argue that access is critical and that our system with its great diversity of institutions from open-access community colleges to elite private schools is designed to promote choice and opportunity. That said, the U.S. is falling behind in international rankings of what students know and how many graduate from college, and it is not clear that we can continue to compete using our current “open-access” model. European countries spend far less per capita on higher education than does the U.S. but get a much greater bang for the buck in terms of college completion rates. To those who worry that this is because they only educate a select few, it is worth pointing out that European levels of income inequality and social mobility compare favorably with those in the U.S.

There is no question that the workforce of the future will need more education, but some of that education may be more effectively provided in high school, in career and technical education programs customized to provide the skills that employers need, and through inexpensive online learning rather than in traditional college classrooms. Community colleges are, of course, providing a great deal of career and technical education, and especially where that education leads to a certification or skill with value in the market place (nursing is

a good example), they are providing a vitally important service and deserve more resources for this purpose.

Over the longer term, the focus needs to be on improved productivity in the higher education system.²¹ There is a burgeoning interest in online learning combined with more personalized approaches in the classroom. Real innovation and more cost-effective forms of education will require measuring what students learn and not just counting credit hours accumulated. These kinds of innovations will remain controversial within some portions of the higher education community, but they should be welcomed by taxpayers, families, and administrators looking for a way to broaden access without bankrupting either families or state and federal governments. By bringing college-level learning within the reach of the less advantaged and older, nontraditional students looking for ways to retool their skills, innovation can be one solution to America's opportunity gap.

In summary, I have argued that, despite our dedication to the idea of a higher education system open to all, we are not doing a very good job of leveling the playing field. The result is that opportunity is still linked too strongly to class. In the longer term, the solution needs to involve improving the K–12 system. It also needs to involve making learning and access to skills beyond this level a less costly process and one that does not necessarily require four to six years of college. In the near term, more could be done to better inform students and their families about available options, including the availability of financial aid for well-prepared students from low-income families; the importance of matching one's interests and skills with what different institutions have to offer; and the availability of more work-focused career and technical training for those most likely to drop out of college saddled with too much debt.

References

Bailey, M., & Dynarski, S. (2011). *Gains and gaps: Changing inequality in U.S. college entry and completion* (NBER Working Paper No. 17633). Cambridge, MA: National Bureau of Economic Research.

21. In their volume entitled *Reinventing Higher Education*, Ben Wildavsky, Andrew Kelly, and Kevin Carey argue that there is plenty of low-hanging fruit to be plucked here. Colleges such as the University of Minnesota at Rochester and organizations such as the National Center for Academic Transformation (NCAT) are showing the way, as are some for-profits.

Barrow, L., Brock, T., & Rouse, C. (2013). Postsecondary education in the United States: Introducing the issue. *The Future of Children: Postsecondary Education in the United States*, 23(1), 3–16.

Baum, S., Kurose, C., & McPherson, M. S. (2013). An overview of American higher education. *The Future of Children: Postsecondary Education in the United States*, 23(1), 17–39.

Bettinger, E., Boatman, A., & Long, B. (2013). Student supports: Developmental education and other academic programs. *The Future of Children: Postsecondary Education in the United States*, 23(1), 93–115.

Bowen, W., Chingos, M., & McPherson, M. (2009). *Crossing the finish line: Completing college at America's public universities*. Princeton, NJ: Princeton University Press.

Dynarski, S., & Scott-Clayton, J. (2013). Financial aid policy: Lessons from research. *The Future of Children: Postsecondary Education in the United States*, 23(1), 67–91.

Greenstone, M., & Looney, A. (2013). Rising student debt burdens: Factors behind the phenomenon. Washington, DC: The Hamilton Project, Brookings Institution.

Hoxby, C., & Avery, C. (2013). The missing one-offs: The hidden supply of high-achieving, low-income students. Conference draft. Brookings Panel on Economic Activity.

Isaacs, J., Sawhill, I., & Haskins, R. (2008). *Getting ahead or losing ground: Economic mobility in America*. Washington, DC: Brookings and Pew Economic Mobility Project.

National Association of Student Financial Aid Administrators. (2013). National student aid profile: *Overview of 2013 federal programs*. Retrieved from <http://www.nasfaa.org/national-profile/>

National Center for Education Statistics. (2011). *Community college student outcomes: 1994–2009*. NCES 2012-253.

National Center for Education Statistics. (2013). Education expenditures by country. *The Condition of Education*. Retrieved from http://nces.ed.gov/programs/coe/indicator_cmd.asp

Owen, S., & Sawhill, I. (2013). *Should everyone go to college?* (CCF Brief #50). Washington, DC: Center on Children and Families at Brookings.

U.S. Department of Education. (2009). National Assessment of Educational Progress, 2009 Reading Assessment. Institute of Education Sciences.

U.S. Department of Treasury. (2012). *The economics of higher education*. Retrieved from http://www.treasury.gov/connect/blog/Documents/20121212_Economics%20of%20Higher%20Ed_vFINAL.pdf

U.S. Census Bureau. (2012). *Current population survey*. Retrieved from <http://www.bls.gov/news.release/hsgec.nr0.htm>

Wildavsky, B., Kelly, A., & Carey, K. (2011). *Reinventing higher education: The promise of innovation*. Cambridge, MA: Harvard University Press.

Education Policy in an Era of Changing Opportunities²²

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For the first several decades after World War II, the skill demands of the U.S. economy followed a simple forward march. Employment shares rose in white collar clerical, technical, managerial, and professional occupations, while they contracted in blue collar work. Most pronounced was the shrinkage of traditional production, craft, operator, and laborer jobs. The share of employment in low education in-person services such as food service, cleaning, and personal care, roughly held steady.

The forward march of job-skill demands offered a simple narrative for educators and policymakers advising successive cohorts of students: because more education equals more opportunity, students should set their sights on college or post-college education. Those who fell short of this target could take heart that the more education they attained, the more likely they would be to benefit from the forward march of skill demands (e.g., an administrative assistant if not a manager).

But over the last 25 years, the realities of the U.S. labor market have not adhered to this simple narrative. Job growth in the U.S. economy has become increasingly concentrated at the tails of occupational skill distribution — both in high-education, high-wage occupations and in low-education, low-wage occupations — while job growth in the middle has sagged. It's no longer a truism that occupational growth follows a forward march. Figuratively, the frontward and rearward troops are marching in opposite directions, and there are fewer and fewer infantry left in the middle.

What has changed? While there are many forces shaping the U.S. labor market, one of the most broadly important is the rapid advance of information technology, which is remaking the division of labor between workers and machines. In the workplace, computers accomplish countless data processing and clerical activities, such as sorting, filing, calculating, storing, retrieving, and manipulating information. Similarly, computers now handle many of the repetitive assembly and monitoring tasks on the factory floor. What makes these job tasks especially well suited to automation is that they are, from a machine's perspective, "routine." That is, they follow well-described rules that can be readily codified in computer software and executed by accurate, tireless, inexpensive machines. Routine tasks are endemic in many middle-skilled cognitive and manual occupations, such as bookkeeping, clerical work, and repetitive production tasks because the core job tasks of these occupations follow precise, well-understood procedures. As these tasks are increasingly delegated to machines — or, alternatively, sent electronically to foreign worksites — the pace of domestic job creation in these occupations has slackened or reversed course. Over the past two decades, blue collar production and operative occupations — and white collar office — clerical, administrative support and sales occupations — have seen substantial declines, the pace of which has only quickened through the Great Recession.

As computers have displaced workers from routine tasks, they have simultaneously boosted demand for workers who perform "nonroutine" tasks that are complementary to the automated activities. What are these tasks? They can usefully be subdivided into two broad categories that happen to lie on opposite ends of the occupational skill distribution. On one side are so-called

22. A version of this essay appeared in *The New York Times* on Saturday, August 24, 2013.

“abstract” tasks, which require problem solving, intuition, persuasion, and creativity. These tasks are characteristic of professional, managerial, technical, and creative occupations, such as law, medicine, science, engineering, marketing, and design. Workers who are most adept at these tasks typically have high levels of education and analytical capability, and they benefit from computers that facilitate the transmission, organization, and processing of information.

On the other side of the occupational skill spectrum are so-called “manual” tasks, which require situational adaptability, visual and language recognition, and in-person interaction. Tasks like preparing a meal, driving a truck through city traffic, or cleaning a hotel room present mind-bogglingly complex challenges for software engineering. But from the human perspective, these manual tasks are straightforward, requiring primarily innate abilities like dexterity, sightedness, and language recognition, and perhaps a modest amount of training. Thus, ironically, information technology has increased workers’ comparative advantage in traditionally low-skill service tasks, such as food preparation and personal care, relative to their value in traditional middle-skill tasks such as computation, information processing, and repetitive production activities.

What does the changing shape of the U.S. occupational distribution mean for education policy? A facile inference that economists and policymakers frequently draw from this pattern of occupational change is that the U.S. should give up on “middle-skill” education because there is no future for middle-skill jobs. This category includes, for example, medical occupations such as radiology technicians and skilled trades such as plumbers and electricians. This view says that for all but the top strata of current students attaining elite college and post-college degrees, there is little point in filing into the middle of the troop procession because the ranks there are increasingly empty.

But is this inference warranted? I would say not. In my view, there are three reasons to believe that giving up on “middle skills” is precisely the wrong response to the occupational challenges we are facing.

A first flaw in this reasoning is that it fails to make the key economic distinction between quantity and price. Low education, manual-task-intensive jobs are indeed expanding numerically. Jobs in in-person

services, personal care, cleaning and maintenance, for example, are likely to remain numerous because people are adept at performing these manual tasks while robots are not — and probably will not become so for many years to come. That’s the good news. The bad news is that the skills required to accomplish these tasks are not scarce. Workers with a bit of education, modest spoken language skills, and typical physical dexterity can be productive in these jobs within days. This abundance of potential labor supply means that manual-task-intensive jobs will likely continue to pay relatively low wages in the foreseeable future, even while they expand as a share of employment. Workers will therefore need to educate themselves for better opportunities to obtain higher wages — that is, they will need to reach beyond a high school education to obtain scarce skills. In many cases, this means pursuing a bachelor’s degree, a two-year vocational degree, or a certificate.

What about the supposed futility of mastering “middle skills” — aren’t they obsolete? Not at all. Education is cumulative: students cannot attain high skills (e.g., proving theorems) without first mastering middle skills (e.g., arithmetic). Investing universally in students’ middle skills provides them the option to seek higher skills; not making these investments forecloses that opportunity. The efficiency case for these investments is complemented by an equity case. Choosing against universally investing in students’ “middle skills” would imply foreclosing the economic horizons of many citizens at an early age — an idea that few citizens would want to embrace.

“Investing universally in students’ middle skills provides them the option to seek higher skills; not making these investments forecloses that opportunity.”

But perhaps the central reason not to give up on “middle skills” is that middle-skill jobs are not, in fact, slated to disappear. While many middle-skill tasks are susceptible to automation, many middle-skill jobs demand a mixture of tasks from across the skills spectrum. To take one prominent example, medical paraprofessional positions — radiology technicians, phlebotomists, nurse practitioners, etc. — are a numerically significant and rapidly growing category of

relatively well-remunerated, middle-skill occupations. While these paraprofessions do not require a four-year college degree, they do demand one to two years of postsecondary vocational training. Significantly, mastery of “middle-skill” mathematics, life sciences, and analytical reasoning is indispensable for success in this training.

Why are these middle-skill jobs likely to persist and, potentially, to grow? My conjecture is that many of the tasks currently bundled into these jobs cannot readily be unbundled — with machines performing the middle-skill tasks and workers performing the residual — without a substantial drop in quality. Consider, for example, the commonplace frustration of calling a computer vendor for technical support only to discover that the support technician knows nothing more than what is on his or her computer screen — that is, the technician is a mouthpiece, not a problem solver. This example captures one feasible division of labor: machines performing routine technical tasks, such as looking up known issues in a support database, and workers performing the manual task of making polite conversation while reading aloud from a script. But this is not generally a productive form of work organization because it fails to harness the complementarities between technical and interpersonal skills. Stated in positive terms, routine and nonroutine tasks will generally coexist within an occupation to the degree that the quality of service improves when the worker combines technical expertise and human flexibility.

“[M]any of the middle-skill jobs that do persist into the future will combine routine technical tasks with the set of nonroutine tasks in which workers hold comparative advantage — interpersonal interaction, flexibility, adaptability, and problem solving.”

This reasoning suggests that many of the middle-skill jobs that do persist into the future will combine routine technical tasks with the set of nonroutine tasks in which workers hold comparative

advantage — interpersonal interaction, flexibility, adaptability, and problem solving. Lawrence Katz of Harvard University memorably titles workers who virtuously combine technical and interpersonal tasks as “the new artisans.” Medical paraprofessions are one leading example of this virtuous combination, but their example is not a singularity. This broad description also fits numerous skilled trade and repair occupations — plumbers, builders, electricians, HVAC installers, automotive technicians — as well as marketing occupations, and even modern clerical occupations that provide coordination and decision-making functions rather than simply typing and filing. Indeed, even as some formerly middle-skill occupations are stripped of their routine technical tasks and arguably deskilled — for example the stockbroking occupation — other formerly high-end technical occupations are made accessible to workers with less esoteric technical mastery — for example, the nurse practitioner occupation that increasingly performs diagnosing and prescribing tasks in lieu of physicians. I expect that a significant stratum of middle-skill jobs combining specific vocational skills with foundational middle skills — literacy, numeracy, adaptability, problem solving, and common sense — will persist in coming decades.²³

What does this new terrain of occupational change mean for education policy? The answer is perhaps surprisingly traditional. The best opportunities for workers will harness the unique capabilities of humans — flexibility, problem solving, creativity — in jobs that are augmented by advancing technology. Professional, technical, and managerial workers will continue to be in demand, of course. These jobs require a bachelor’s degree. And there will continue to be job opportunities in middle-skill jobs as well. But not in the traditional blue-collar production and white-collar office jobs of the past. Rather, we should expect to see growing employment among the ranks of the “new artisans,” workers who complement their technical skills — often gained in postsecondary vocational training — with interpersonal interaction, flexibility, and adaptability to offer a bundle of services that are uniquely human.

23. In general, these same demands for interaction frequently privilege face-to-face interactions over remote performance, meaning that these same middle-skill occupations may have relatively low susceptibility to offshoring.

Conclusion

This report introduces readers to some of the nuances and complexities that arise in thinking about the ways that higher education influences people's lives in present-day America.

The focus in these pages has been mainly — but not solely — on the economic benefits of higher education. As our companion volume *Education Pays* stresses, higher education benefits individuals and society as a whole in many ways that are not reflected in earnings and employment. Education is about much more than getting a well-paying job, even though that is a very important goal. It is about living a full and satisfying life, about contributing to society, and about understanding oneself, one's history, and one's environment.

Too much of the current discussion of higher education ignores this reality. The strains on family finances, the difficulties some students have repaying their education loans, and the tight budgets and competing priorities facing both state and federal governments have narrowed the conversation. In a period of high unemployment and stagnant wages, there is a great temptation to focus on the rising price of college and on the unfortunate circumstances of the minority of individuals who have made questionable choices and of people who are for the time being victims of the weak economy.

The fact is that although there are exceptions, over time, higher education pays off very well in financial terms, and in social and personal terms as well.

Higher education takes many forms, and students in higher education are a diverse group in terms of background, age, aspirations, and many other characteristics. It is vital that we increase public understanding of the many roles of higher education in our society. Going to college does not just mean enrolling in a university in pursuit of a bachelor's degree.

It includes a wide variety of degree and certificate programs in many different types of institutions. It includes training for specific occupations as well as broad, deep education designed to transform the way people think and the way they perceive themselves and the world around them.

Providing postsecondary education in all of its forms costs money. If we are to succeed in ensuring that appropriate, high-quality educational opportunities are available to everyone who can benefit from them, we must have a frank and thorough conversation about the costs and benefits of education, about the vital role postsecondary education plays in the future of our nation and our economy — and about the uncertainties involved in individual decisions about investing in that education.

How College Shapes Lives addresses only some of the issues that make understanding and assessing discussions about the best approaches to improving postsecondary educational opportunities and outcomes difficult. Clarifying the concepts underlying analyses of the benefits of education and elucidating the different assumptions and definitions that affect measured outcomes is a critical step. We hope that the data, the concepts, and the explanations included here lay the groundwork for more constructive debates about improving the lives of this generation and the next.

The variations described here highlight the need for supporting careful and informed decision making and for providing insurance against unforeseen circumstances. But they do not undermine the clear evidence that postsecondary education of some form is a necessary component of successful, independent lives for most people in today's economy.

References

- Altonji, J., Blom, E., & Meghir, C. (2012). Heterogeneity in human capital investments: High school curriculum, college major, and careers. *Annual Review of Economics*, 4(1), 185–223.
- Angrist, J. D., & Krueger, A. B. (2001). Instrumental variables and the search for identification: From supply and demand to natural experiments. *Journal of Economic Perspectives*, 15(4), 69–85.
- Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago: University of Chicago Press.
- Attewell, P., & Lavin, D. E. (2007). *Passing the torch: Does higher education for the disadvantaged pay off across the generation?* New York: Russell Sage Foundation.
- Autor, D., Katz, L., & Kearney, M. (2008). Trends in U.S. wage inequality: Revising the revisionists. *The Review of Economics and Statistics*, 90(2), 300–323.
- Avery, C., & Turner, S. (2012). Student loans: Do college students borrow too much — or not enough? *Journal of Economic Perspectives*, 26(1), 165–192.
- Baum, S., & Ma, J. (2012). *Trends in college pricing 2012*. New York: The College Board.
- Baum, S., & Payea, K. (2012). *Trends in student aid 2012*. New York: The College Board.
- Baum, S., Ma, J., & Payea, K. (2013). *Education pays 2013: The benefits of higher education for individuals and society*. New York: The College Board.
- Becker, G. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). Chicago: University of Chicago Press and National Bureau of Economic Research.
- Belfield, C., & Bailey, T. (2011). The benefits of attending community college: A review of the evidence. *Community College Review*, 39(1), 46–68.
- Bowen, W. G., Chingos, M. M., & McPherson, M. S. (2009). *Crossing the finish line: Completing college at America's public universities*. Princeton, NJ: Princeton University Press.
- Brand, J. E. (2010). Civic returns to higher education: A note on heterogeneous effects. *Social Forces*, 89(2), 417–433.
- Brand, J. E., & Xie, Y. (2010). Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American Sociological Review*, 75(2), 185–204.
- Brown, J., Fang, C., & Gomes, F. (2012). *Risk and returns to education* (NBER Working Paper No. 18300). Cambridge, MA: National Bureau of Economic Research.
- Brown, S., & Sessions, J. (1999). Education and employment status: A test of the screening hypothesis for Italy. *Economics of Education Review*, 18, 397–404.
- Bureau of Labor Statistics. (2012a). Economic news release: Economic and employment projections. Retrieved from <http://www.bls.gov/news.release/ecopro.toc.htm>
- Bureau of Labor Statistics. (2012b). Employment projections: Educational attainment for workers 25 years and older by detailed occupation. Retrieved from http://www.bls.gov/emp/ep_table_111.htm
- Card, D. (1999). The causal effect of education on earnings. *Handbook of Labor Economics*, 3A, 1801–1863.
- Card, D. (2001). Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica*, 69(5), 1127–1160.
- Carey, K. (2011, June 9). Bad job market: Why the media is always wrong about the value of a college degree. *Education Sector*. Retrieved from <http://www.educationsector.org/publications/bad-job-market-why-media-always-wrong-about-value-college-degree>
- Carneiro, P., Heckman, J. J., & Vytlacil, E. J. (2011). Estimating marginal returns to education. *American Economic Review*, 101(6), 2754–2781.
- Carnevale, A., Rose, S., & Cheah, B. (2011). *The college payoff: Education, occupations, lifetime earnings*. Washington, DC: Georgetown University Center on Education and the Workforce.
- Carnevale, A., Smith, N., & Strohl, J. (2010). *Help wanted: Projections of jobs and education requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce.
- Carnevale, A., Strohl, J., & Melton, N. (2011). *What's it worth? The economic value of college majors*. Washington, DC: Georgetown University Center on Education and the Workforce.
- Carroll, S., & Erkut, E. (2009). *The benefits to taxpayers from students' educational attainment*. Santa Monica, CA: RAND Corporation.
- Cellini, S., & Goldin, C. (2012). *Does federal student aid raise tuition? New evidence on for-profit colleges* (NBER Working Paper No. 17827). Cambridge, MA: National Bureau of Economic Research.
- Chevalier, A., Harmon, C., Walker, I., & Zhu, Y. (2004). Does education raise productivity, or just reflect it? *The Economic Journal*, 114, 499–517.
- Congressional Budget Office. (2012). *Comparing the compensation of federal and private-sector employees*. Retrieved from <http://www.cbo.gov/sites/default/files/cbofiles/attachments/01-30-FedPay.pdf>

- Consumer Financial Protection Bureau. (2013). *Student debt swells, federal loans now top a trillion*. Retrieved from <http://www.consumerfinance.gov/speeches/student-debt-swells-federal-loans-now-top-a-trillion/>
- Copeland, C. (2012). Labor force participation rates of the population age 55 and older, 2011: After the economic downturn. *Employee Benefit Research Institute Notes*, 33(2), 2–8.
- Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of Health Economics*, 29(1), 1–28.
- Dee, T. S. (2004). Are there civic returns to education? *Journal of Public Economics*, 88(9), 1697–1720.
- de Walque, D. (2004). *Education, information, and smoking decisions: Evidence from smoking histories, 1940–2000* (World Bank Policy Research Working Paper 3362).
- Federal Reserve Bank of New York. (2013). *Household debt and credit report*. Retrieved from <http://www.newyorkfed.org/householdcredit/index.html>
- Goldin, C., & Katz, L. (2008). *The race between education and technology*. Cambridge, MA: The Belknap Press of Harvard University.
- Greenstone, M., & Looney, A. (2011). *Where is the best place to invest \$102,000—In stocks, bonds, or a college degree?* Washington, DC: Hamilton Project, Brookings Institution.
- Greenstone, M., & Looney, A. (2012, October 5). Regardless of the cost, college still matters [Blog post]. Retrieved from <http://www.brookings.edu/blogs/jobs/posts/2012/10/05-jobs-greenstone-looney>
- Grimard, F., & Parent, D. (2007). Education and smoking: Were Vietnam war draft avoiders also more likely to avoid smoking? *Journal of Health Economics*, 26, 896–926.
- Groot, W., & Oosterbeek, H. (1994). Earnings effects of different components of human capital vs. screening. *Review of Economics and Statistics*, 76(2), 317–321.
- Harrington, P., & Sum, A. (2010, November 8). College labor shortages in 2018? *The New England Journal of Higher Education*. Retrieved from <http://www.nebhe.org/thejournal/college-labor-shortages-in-2018/>
- Heckman, J. J., Lochner, L. J., & Todd, P. E. (2006). Earnings functions, rates of return and treatment effects: The Mincer equation and beyond. *Handbook of the Economics of Education*, 1, 307–458.
- Hout, M. (2012). Social and economics returns to college education in the United States. *Annual Review of Sociology*, 38, 379–400.
- Hungerford, T., & Solon, G. (1987). Sheepskin effects in the returns to education. *Review of Economics and Statistics*, 69, 175–177.
- Julian, T. (2012). *Work-life earnings by field of degree and occupation for people with a bachelor's degree: 2011* (American Community Survey Brief). Washington, DC: U.S. Census Bureau. Retrieved from <http://www.census.gov/prod/2012pubs/acsbr11-04.pdf>
- Julian, T., & Kominski, R. (2011). *Education and synthetic work-life earnings estimates* (American Community Survey Report). Washington, DC: U.S. Census Bureau. Retrieved from <http://www.census.gov/prod/2011pubs/acs-14.pdf>
- Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Straus, and Giroux.
- Kane, T. J., & Rouse, C. E. (1995). Labor-market returns to two- and four-year college. *American Economic Review*, 85(3), 600–614.
- McArdle, M. (2013, September 17). Is college a lousy investment? *Newsweek*.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *The Journal of Political Economy*, 66(4), 281–302.
- Mincer, J. (1974). *Schooling, experience, and earnings*. New York: Columbia University Press.
- Mirowsky, J., & Ross, C. E. (2003). *Education, social status, and health*. Somerset, NY: Aldine de Gruyter.
- Moretti, E. (2004). Estimating the social return to higher education: Evidence from longitudinal and repeated cross-sectional data. *Journal of Econometrics*, 121, 175–212.
- National Center for Education Statistics. (2004). *The condition of education 2004* (NCES 2004-077). Washington, DC: U.S. Department of Education.
- National Center for Education Statistics. (2009). *2003-04 Beginning postsecondary students longitudinal study, second follow up* (BPS:04/09) [Data file]. Retrieved from <http://nces.ed.gov/datalab>
- National Center for Education Statistics. (2013). *Digest of education statistics, 2012*. Washington, DC: U.S. Department of Education. Retrieved from http://nces.ed.gov/programs/digest/2012menu_tables.asp
- Neumark, D., Johnson, H., & Mejia, M. (2013). Future skill shortages in the U.S. economy? *Economics of Education Review*, 32, 151–167.
- Oreopoulos, P., & Petronijevic, U. (2013). Making college worth it: A review of the returns to higher education. *The Future of Children*, 23(1), 41–65.
- Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling. *Journal of Economic Perspectives*, 25(1), 159–184.
- Ptschakopoulos, G., & Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics*, 12(2), 111–134.

- Salzman, H., Kuehn, D., & Lowell, B. (2013). *Guestworkers in the high-skill U.S. labor market* (EPI Briefing Paper #359). Washington, DC: Economic Policy Institute.
- Schultz, T. W. (1961). Investment in human capital. *American Economic Review*, 51(1), 1–17.
- Shapiro, D., Dundar, A., Chen, J., Ziskin, M., Park, E., Torres, V., & Chiang, Y. C. (2012). *Completing college: A national view of student attainment rates*. Signature Report. Herndon, VA: National Student Clearinghouse Research Center.
- Singer, P. (1991, June 23). Grimly, graduates are finding few jobs. *The New York Times*. Retrieved from <http://www.nytimes.com/1991/06/23/nyregion/grimly-graduates-are-finding-few-jobs.html>
- Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, 87(3), 355–374.
- Trostel, P. A. (2009). *The effects of public support on college attainment* (WISCAPE Working Paper). Madison, WI: Wisconsin Center for the Advancement of Postsecondary Education.
- U.S. Census Bureau. (1992–1994). *Current population survey, annual social and economic supplement* [Data file]. Retrieved from <http://dataferrett.census.gov>
- U.S. Census Bureau. (1995–2012). *Income, poverty and health insurance in the United States, various years* [Data file]. Retrieved from <http://www.census.gov/hhes/www/income/data/index.html>
- U.S. Census Bureau. (2011). *2011 American community survey (ACS) 1-year public use microdata sample (PUMS)* [Data file]. Retrieved from http://www.census.gov/acs/www/data_documentation/public_use_microdata_sample/
- U.S. Census Bureau. (2012a). *Basic monthly current population survey, January through December* [Data file]. Retrieved from <http://dataferrett.census.gov/>
- U.S. Census Bureau. (2012b). *Historical income tables: People* [Data file]. Retrieved from <http://www.census.gov/hhes/www/income/data/historical/people/>
- U.S. Census Bureau. (2012c). *Person income tables 2011: PINC-03* [Data file]. Retrieved from <http://www.census.gov/hhes/www/cpstables/032012/perinc/toc.htm>
- Weisbrod, B. A. (1964). Collective-consumption services of individual-consumption goods. *Quarterly Journal of Economics*, 78(3), 471–477.

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