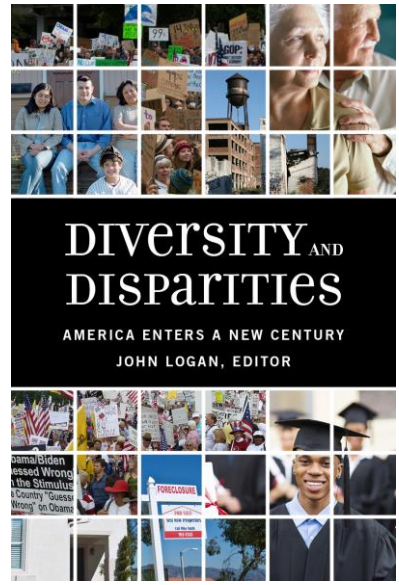

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Chapter 12

Gender Disparities in Educational Attainment in the New Century: Trends, Causes, and Consequences

Thomas A. DiPrete and Claudia Buchmann

In a long-standing ritual, each spring tasseled graduates march across the stages of American colleges and universities, clutching diplomas—bachelor's, master's, doctorates.[1] Over time, women have come to dominate that throng.

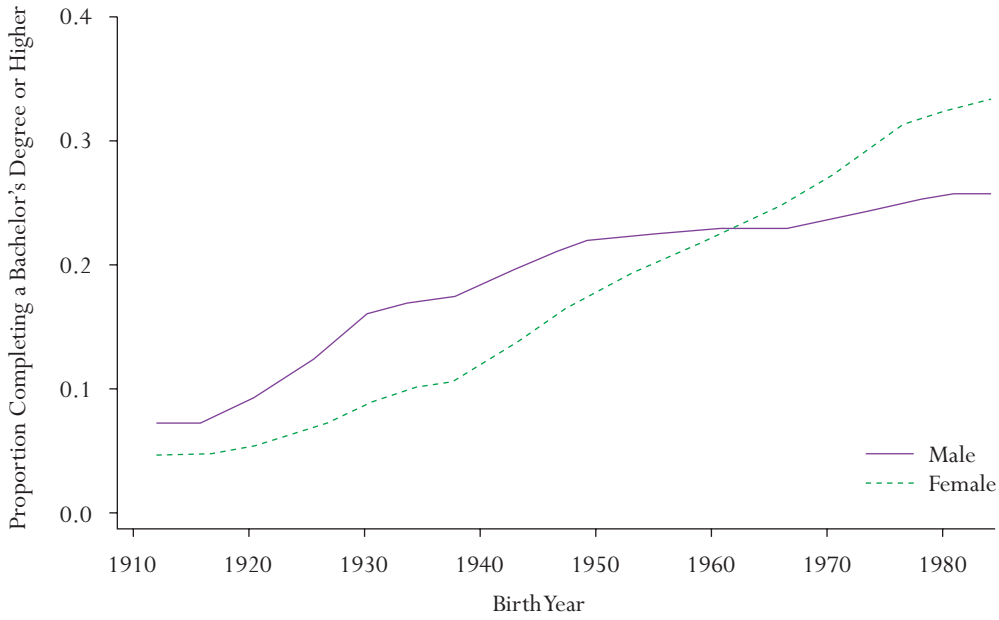
Consider the statistics. In 1970, 58 percent of college students were men; in 2010, 57 percent were women (National Center for Education Statistics 2012). By all predictions, women will gain in college enrollment and graduation over the next decade, widening the gender gap, albeit more slowly than in recent decades (National Center for Education Statistics 2012, table 283). The "feminization" of higher education is not unique to the United States but rather has occurred in most industrialized societies. College administrators, policymakers, and the media have noted the trend.[2] Researchers are trying to understand it.

This report analyzes women's educational gains in the United States and places them within the broader international context. We describe changes in the relative educational attainment of females and males in the United States over the twentieth and early twenty-first centuries and consider the explanations for the reversal of the gender gap in college completion during these years. We show that the same trend is found for every main racial-ethnic group, with the exception of African Americans, among whom women always completed more degrees. It coincides with a substantial reduction in segregation across fields of study in the early 1970s, though this equalization has leveled off in recent years. We find that as early as the 1928 birth cohort, men tended to delay college graduation. At the youngest age (twenty-two), they lagged slightly behind white women but surpassed them at older ages, but for more recent cohorts they are further behind at twenty-two and do not catch up with age. In the quest to understand why women have overtaken men in their rates of college degree receipt, this report considers macro-societal changes as well as gender differences in academic performance. The female advantage in college completion emerged out of the combination of a long-standing female advantage in academic performance and the development of a more egalitarian society that raised the incentive for girls to obtain higher education.

GENDER GAPS IN EDUCATIONAL ATTAINMENT: 1940–2010

In the twentieth century, America's high schools, then its colleges and universities, expanded dramatically. In 1900 most people had only primary schooling. By 1920 high school graduation was widespread, and by 1960 most high school graduates had attended college (Fischer and Hout 2006, 10). In the latter part of the twentieth century, college graduation supplanted high

FIGURE 12.1 *Proportion of Twenty-Six- to Twenty-Eight-Year-Olds in the 1912–1984 Birth Cohorts with a Bachelor's Degree, by Birth Year and Age, 1910 to 1980*



Source: Authors' compilation based on IPUMS census data 1940–2000 (Ruggles et al. 2010); American Community Survey (U.S. Census Bureau 2010).

school graduation as the educational watershed. While fewer than 7 percent of people born in 1915 graduated from college, 28 percent of those born in 1975 had graduated from college by the age of twenty-five (Bailey and Dynarski 2009). The expansion of higher education reflected a public commitment, manifested through the creation of state college systems and direct federal aid to students (first with the GI Bill and later with grant and loan programs) (Fischer and Hout 2006, 14). Of course, although the education of the population rose overall, the trend varied by gender and race.

Trends in bachelor's degrees for men and women based on U.S. census data from 1940 to 2000 and American Community Survey (ACS) data from 2010 are shown in figure 12.1. In 1940 (when cohorts born in 1912–1914 were twenty-six to twenty-eight years old), only about 5 percent of women and 7 percent of men had completed a bachelor's degree by ages twenty-six to twenty-eight.[3] By 2010, 36 percent of women and 28 percent of men in this age range had completed a bachelor's degree. How did this reversal happen? The male-female gap in degrees was relatively small in 1940. But from 1940 onward, men earned more bachelor's degrees than women; by 1960 (when cohorts born in 1932–1934 were twenty-six to twenty-eight years old), 15 percent of men had earned bachelor's degrees, compared to 8 percent of women. Over the next decade, the rate of degree receipt increased for men and women, but 1950 marked a watershed: men's rate of BA completion stopped growing. That stagnation persisted for years: men born in the mid-1960s had virtually the same rate of graduation as men born fifteen years earlier.

The Vietnam War draft contributed to the stagnation: many men stayed in school to take advantage of student exemptions and avoid serving in the military (Card and Lemieux 2001; Freeman 1976). Also, during this time the wage premium for a college degree declined. (Economists blame the large supply of new college-educated job-seekers from the Early Baby Boom cohorts; see, for example, Freeman 1976). However, the persistent stagnation in men's college completion rates has deeper causes. As of 1980, the proportion of twenty-six- to twenty-eight-year-old men completing a bachelor's degree was still 25 percent, and it had reached only 26 percent by 2000 and 28 percent by 2010.

In contrast, more women were entering and graduating from college. Their rate of graduation continued to rise after the birth cohorts of 1950 even as male rates stagnated. By the time the 1960 birth cohorts had moved through the college enrollment years, the gender gap had closed. In the past thirty years, the proportion of twenty-six- to twenty-eight-year-old women earning at least a bachelor's degree rose from 21 percent (1980) to 30 percent (2000) to 36 percent (2010). Two factors are crucial: (1) the stable growth in the proportion of American women who earn college degrees, and (2) the prolonged stagnation in the comparable rates for American men.

Race and Ethnic Differences in Gender Disparities in Educational Attainment

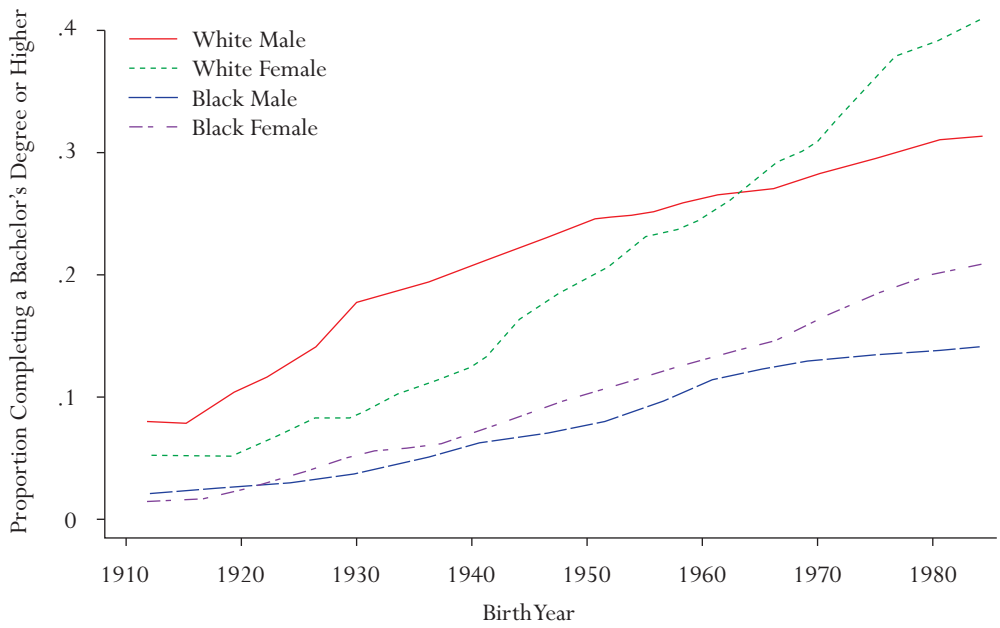
In the educational arena, women predominate, but the size of the male-female gap varies by race and ethnicity. It is largest for African Americans, but it is also large for Hispanics and Native Americans. In 2010 women earned 66 percent of all bachelor's degrees awarded to blacks, 61 percent to Hispanics, 60 percent to Native Americans, 55 percent to Asians, and 56 percent to whites (National Center for Education Statistics 2012). Consider the trends in college completion for much of the past century. Figure 12.2 presents the proportion of twenty-six- to twenty-eight-year-old blacks and non-Hispanic whites with at least a bachelor's degree by gender and race across the birth cohorts covered by the census and ACS data from 1940 to 2010. The trend for the two groups differs. With whites, the gender gap reversed. However, black men never led black women in rates of graduation. In 1940 only 1.3 percent of twenty-six- to twenty-eight-year-old black men and 1.6 percent of black women earned a college degree.[4] Since then, black women have advanced faster.

The trends for Asians, Hispanics, and Native Americans are similar to those for whites. Despite the large racial and ethnic differences in the proportion of the population completing a bachelor's degree, women outperform men within each racial and ethnic group. Data for these groups from 1980 to the present are shown in figure 12.3.[5] (Note that Hispanics and Native Americans are placed on a different scale from Asians, whose college graduation rates are higher than those of any other ethnic group.) Among Hispanics, Asians, and Native Americans, women were passing men in their rate of BA completion for twenty-six- to twenty-eight-year-olds born in the early 1960s. By 2010, among birth cohorts of the early 1980s, the female lead had widened for all three groups: for Hispanics (17 percent of women versus 12 percent of men), for Asians (62 percent of women versus 58 percent of men), and for Native Americans (14 percent of women versus 11 percent of men).

Gender Gaps in Graduate and Professional Degrees

Master's degrees show the same gender gap. Figure 12.4 displays trends in men's and women's completion of master's degrees from the 1969–1970 school year to the 2009–2010 school year.

FIGURE 12.2 *Proportion of Black and Non-Hispanic White Twenty-Six- to Twenty-Eight-Year-Olds with a Bachelor's Degree or Higher in the 1912–1984 Birth Cohorts, by Birth Year and Gender*



Source: Authors' compilation based on IPUMS census data 1940–2000 (Ruggles et al. 2010); American Community Survey (U.S. Census Bureau 2010).

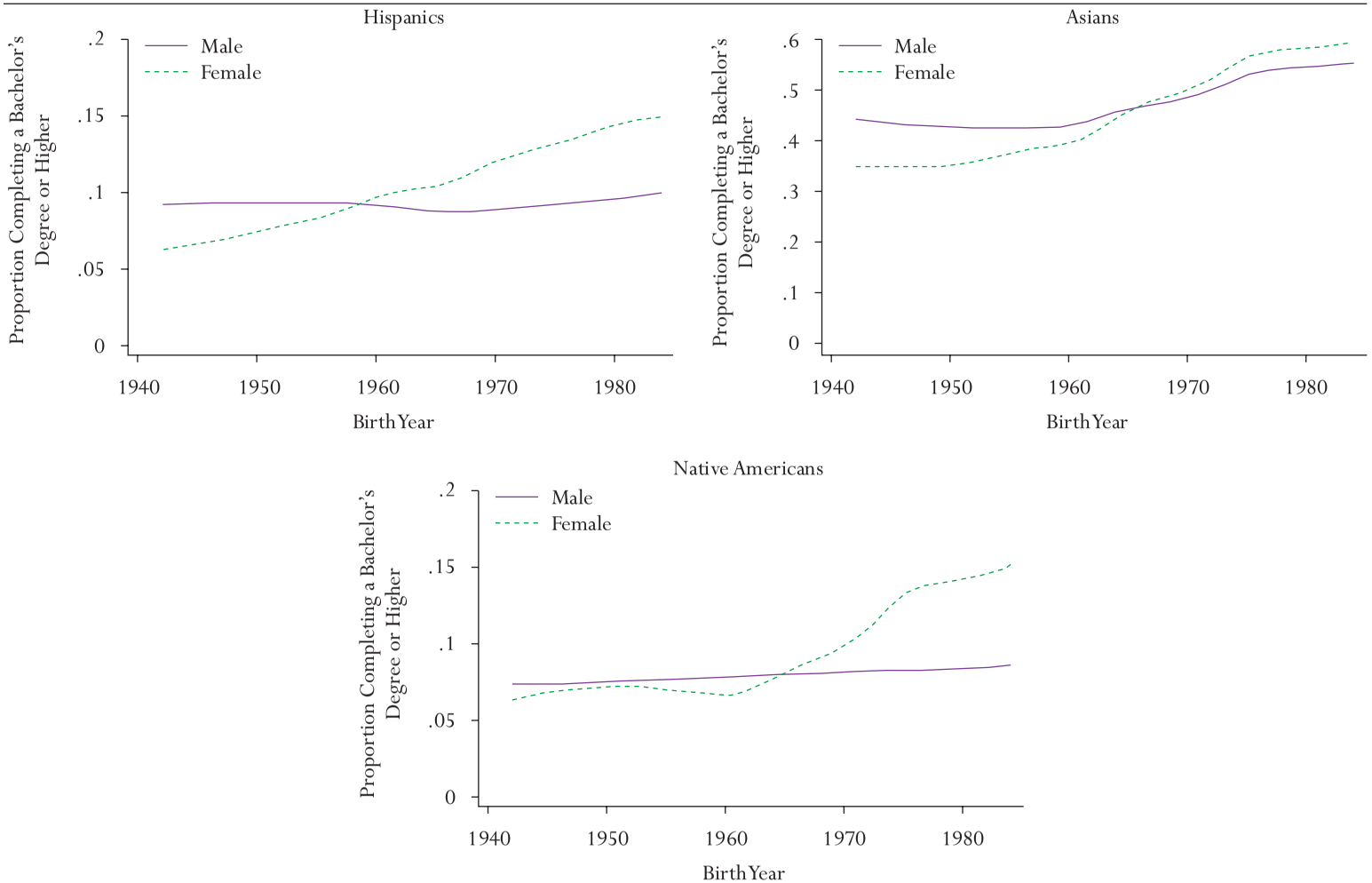
Just over three decades ago, in 1969–1970, more men earned master's degrees than women (143,083 master's degrees awarded to men versus 92,481 to women). But from 1980 onward, women outpaced men. By 2009–2010, women were awarded roughly 50 percent more master's degrees than men (417,828 degrees versus 275,197) (National Center for Education Statistics 2012).

Women's growth in professional and doctoral degrees has been slower than that for bachelor's or master's degrees (figure 12.5), and women have only recently reached parity with men in professional and doctoral degrees. In 1970 men completed sixteen times more professional degrees (such as medical, dentistry, or law degrees) than women. Since 1982, the number of professional degrees completed by men has declined slightly (from 40,229 in 1982 to 34,661 in 2010), while women again outpaced men—from 1,534 professional degrees in 1970 to 30,289 in 2010.

The pattern for doctoral degrees is similar: men completed almost eight times as many doctoral degrees as women in 1969–1970 (58,137 doctoral degrees awarded to men versus 6,861 to women). By 2009–2010, women received more doctoral degrees (81,953 versus 76,605). If these trends continue, the gender gap in professional and doctoral degrees may soon resemble the female-favorable gender gap in bachelor's and master's degrees.

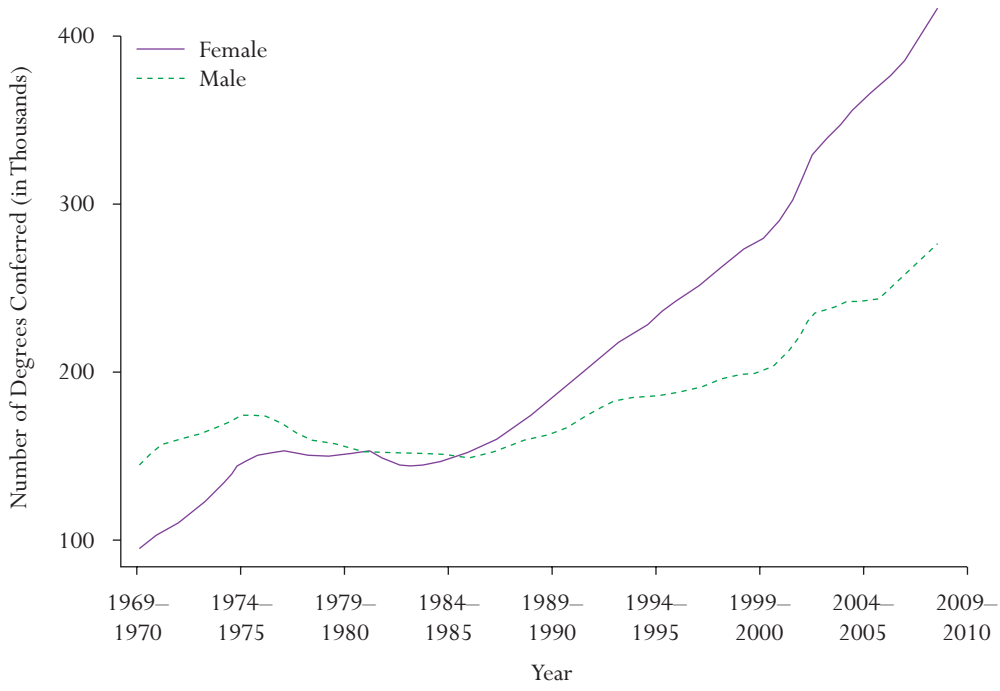
Figure 12.6 presents the data from figures 12.4 and 12.5 in terms of women's share of degrees. In 1969–1970, almost 40 percent of master's degree recipients were women, but only 11 percent of doctoral recipients and 6 percent of professional degree recipients were women.

FIGURE 12.3 *Proportion of Twenty-Six- to Twenty-Eight-Year-Olds in the 1942–1984 Birth Cohorts with a Bachelor's Degree or Higher, by Birth Year, Gender, and Hispanic, Asian, and Native American Status*



Source: Authors' compilation based on IPUMS, 1940–2000; ACS, 2010.

FIGURE 12.4 *Number of Master's Degrees Conferred (in Thousands), by Gender, 1969–1970 to 2009–2010*



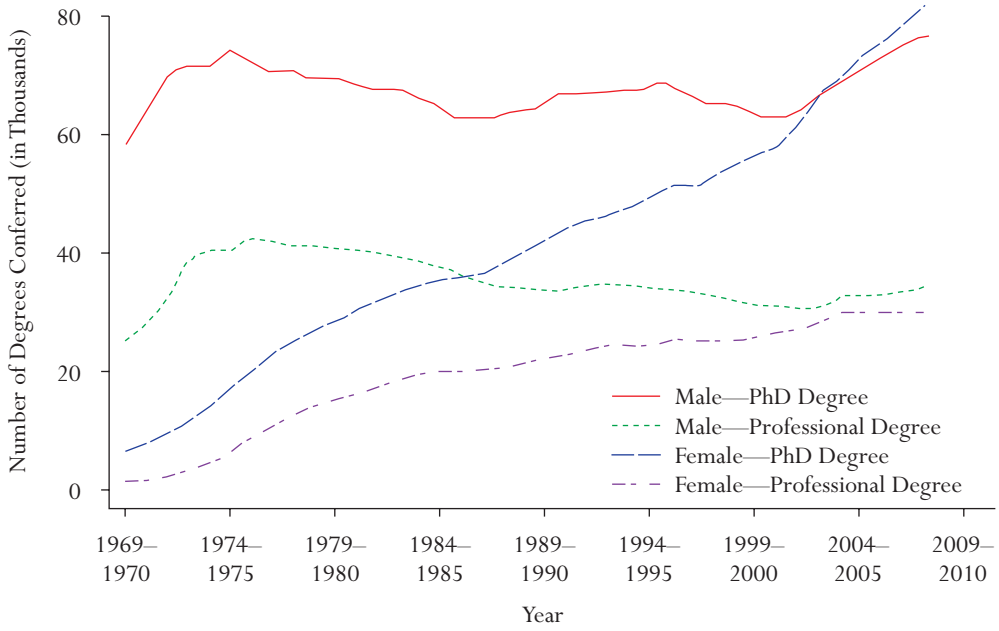
Source: Authors' compilation based on Snyder and Dillow (2012).

Women's share of master's degrees has grown: today 60 percent of master's degrees are awarded to women. Their share of professional and doctoral degrees has increased as well: women now earn 47 percent of professional degrees and 52 percent of doctoral degrees. At every level of education, women have achieved equality or surpassed men in the number of degrees earned.

Gender Segregation in Fields of Study

Gender differences in the type of institution attended (elite versus non-elite, public versus private) and the field of study pursued (major) also matter. These factors mark what Maria Charles and Karen Bradley (2002) have termed the "horizontal" dimensions of educational sex segregation (for a review, see Gerber and Cheung 2008). In contrast to the rapid advancement of women in educational attainment, the gender composition of fields of study has changed far more slowly (England and Li 2006). Figure 12.7 displays changes in the dissimilarity index over the past forty years for bachelor's degree recipients, as calculated by Allison Mann and Thomas DiPrete (2013) using fifty-three field-of-study categories in the National Science Foundation's WebCASPAR database. The figure combines the fields into three general categories: arts and sciences, sciences, and "education-business-other."[6] The dissimilarity index shows a pronounced decline in gender segregation through the mid-1990s, when the decline began to stagnate. Over a decade ago, Jerry Jacobs (1995) and Sarah Turner and William Bowen (1999) identified this

FIGURE 12.5 *Number of Doctoral and Professional Degrees Conferred (in Thousands), by Gender, 1969–1970 to 2009–2010*



Source: Authors' compilation based on Snyder and Dillow (2012).

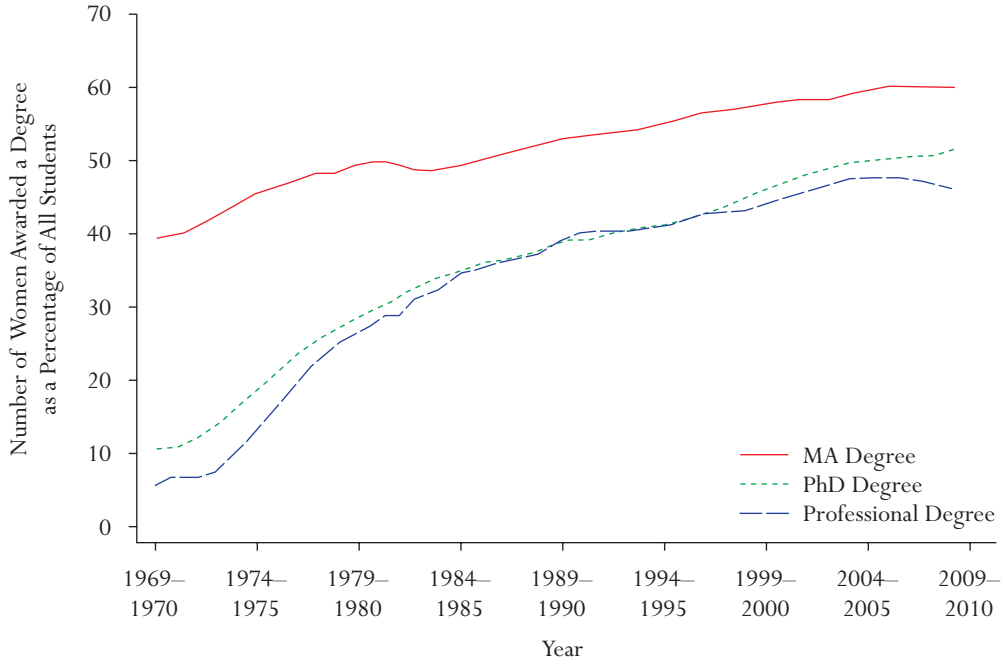
slowdown in gender integration. The key factor, however, was the decline in the education-business-other index through the mid-1980s. Gender segregation in fields within the arts and sciences has been more uneven. As for the sciences, the overall level of segregation has been much higher and appears to be rising.

Mann and DiPrete (2013) also computed trends in the index of association using Web CASPAR data. The index of association measures the factor by which women are underrepresented in the average field of study (Charles and Grusky 1995); it is not affected by changes in the share of students in particular fields. This is important because the overall attractiveness of many science, technology, engineering, and mathematics (STEM) fields has changed. With this measure, the gender segregation trends become more pronounced. The index decreased for all fields (total) before 1980, dropping from more than 6 in the late 1960s to about 3 in 1980. In terms of the broad subfields, gender segregation in education-business-other majors has diminished, albeit more slowly than in the 1980s, but segregation in the arts and sciences (especially in the sciences) has risen slightly over the past decade.

THE PATHWAYS TO COLLEGE COMPLETION IN CONTEMPORARY AMERICA

Before graduating from college, students must complete primary and secondary education. Children usually start first grade at age six, complete high school by age eighteen, and college by age twenty-two. Many events can disrupt this normative trajectory, including late entry into

FIGURE 12.6 *Women's Share of Master's, Doctoral, and Professional Degrees Awarded, 1969–1970 to 2009–2010*



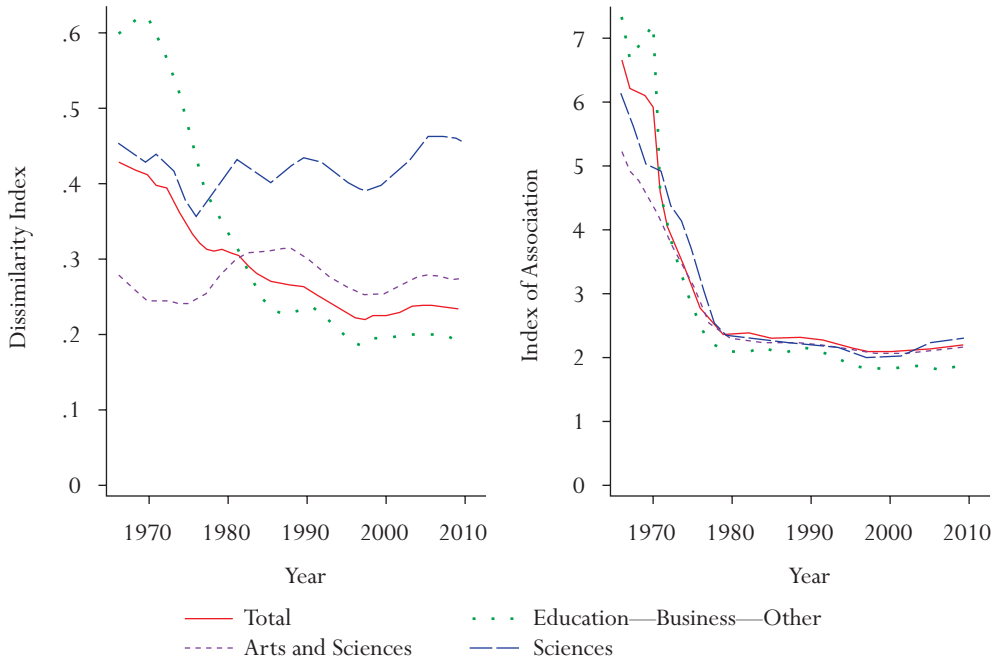
Source: Authors' compilation based on data from the National Center for Education Statistics (NCES) (Snyder and Dillow 2012).

elementary school, grade retentions, and delayed entry into college. In addition, students may matriculate first at a community college, attend school part-time, or exit and reenter college. Here we delve into the impact of some of these factors on gender differences in graduation among blacks and whites. First, we examine age-specific four-year college completion rates; then we examine trends in the educational transitions preceding college graduation.

Age and Cohort Differences

Table 12.1 highlights the importance of age in the gender gap. Across the birth cohorts covered by the 1940–2000 census data, men consistently delayed their school transitions. Over time, the magnitude and the direction of the age-specific gender gap have changed. For the 1918 cohort, white men and women both completed college by age twenty-two at almost the same rates (1.02), but men quickly surpassed women; by age twenty-eight, white women had only two-thirds the odds of completing college as did men (0.63).[7] In the 1928 cohort, white men were at a distinct disadvantage at age twenty-two, but they caught up, and by age twenty-eight white women had only half (0.48) the chance of completing college that men did. The 1938 and 1948 cohorts mark the nadir for white women: they lagged behind men at age twenty-two and continued to fall behind. But by the 1968 cohort, women had higher odds of graduating at age twenty-two, and they maintained an advantage at age twenty-eight. Women's advantage was even greater for the 1974 cohort.

FIGURE 12.7 *Gender Segregation in Fields of Study, 1966–2009*



Source: Mann and DiPrete (2013); data drawn from National Science Foundation Web-CASPAR database.
Note: The first graph displays the index of dissimilarity from the years 1966 to 2009. The second displays the index of association for the same years. Each contains a total all-fields index and subfield indices, as indicated in the legend.

The pattern is somewhat different among blacks, although here also we find the tendency for men to delay graduation. As shown in table 12.1, black women had higher odds of completing college across all time points and most ages. Among the 1938 birth cohort, the odds of completing college by age twenty-two for black women were 2.6 times higher than for black men. In this 1938 birth cohort, black men gradually reduced their education deficit: by ages twenty-six to twenty-eight, they lagged only slightly behind black women in their likelihood of finishing four years of college. The 1948 cohort of black men was similar to the 1938 cohort: they lagged well behind black women in rates of college completion during their early twenties, but achieved near-parity with black women by their late twenties. Across subsequent cohorts, however, black men, like white men, fell back. The female-to-male odds ratio at age twenty-six grew from 1.12 for the 1938 birth cohort to 1.17 for the 1948 birth cohort, 1.24 for the 1958 birth cohort, and 1.40 for the 1968 birth cohort. It remained roughly at this level for the 1974 birth cohort as well.

These statistics can be looked at in another way: comparing blacks and whites within each gender. Figure 12.8 presents the changing odds ratio in the education of twenty-six- to twenty-eight-year-old men (white to black) and women (white to black). The relative odds of a white man versus a black man completing college declined from nearly five times as high in 1940 to only twice as high in 2000, with black males making strong gains until 1980 and slower gains thereafter. In contrast, black women have not shown the same progress. Since about 1960, there

TABLE 12.1 *Female-to-Male Odds Ratios for the 1918–1974 Birth Cohorts of Completing Four-Year College, by Age, Year, and Race, 1940–1996*

	Census Year / Birth Cohort						
	1940/ 1918	1950/ 1928	1960/ 1938	1970/ 1948	1980/ 1958	1990/ 1968	1996/ 1974
Whites							
Twenty-two	1.02	1.58	0.82	0.86	1.19	1.41	1.56
Twenty-three	0.85	1.18	0.71	0.81	1.08	1.38	1.57
Twenty-four	0.76	0.75	0.69	0.81	0.98	1.20	1.42
Twenty-five	0.65	0.57	0.59	0.77	0.99	1.21	1.39
Twenty-six	0.58	0.51	0.58	0.74	0.95	1.15	1.24
Twenty-seven	0.58	0.51	0.55	0.70	0.91	1.15	1.29[a]
Twenty-eight	0.63	0.48	0.52	0.69	0.89	1.12	1.25[a]
Blacks							
Twenty-two	1.70	3.15	2.63	1.41	1.79	1.34	1.67
Twenty-three	1.49	2.33	1.72	1.35	1.61	1.57	1.65
Twenty-four	1.70	1.22	1.41	1.56	1.34	1.41	1.43
Twenty-five	1.54	1.47	1.53	1.30	1.27	1.48	1.59
Twenty-six	1.14	0.92	1.12	1.17	1.24	1.40	1.39
Twenty-seven	1.55	1.66	1.36	1.32	1.27	1.42	1.61[a]
Twenty-eight	1.54	1.21	0.95	0.95	1.31	1.53	1.47[a]

Source: McDaniel et al. (2011).
[a]Computed based on extrapolating 1990–2000 results into the future.

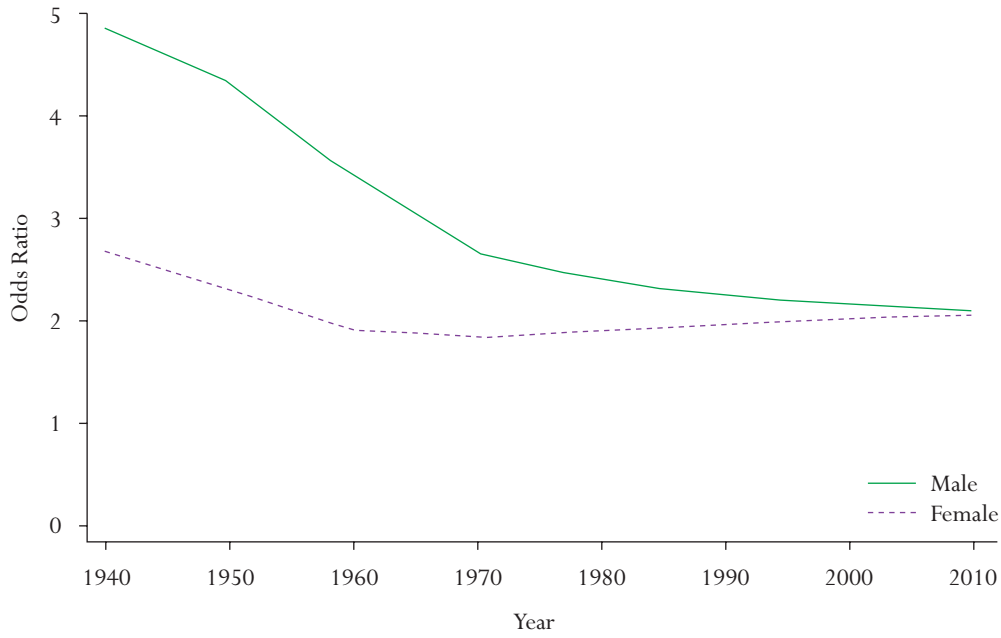
has been little or no trend in the relative odds of a black woman versus a white woman graduating from college. Black women have not gained in relative terms on white women because both groups have made comparably large strides in their rates of graduation. But because white men have made relatively little progress in their rates of college completion, it has been easier for black men to reduce their disadvantage. The differing trajectories of white men and women, not of black men and women, have driven the convergence.

Steps Toward Higher Education

While American students take many different pathways to college (Goldrick-Rab 2006; Mare 1981; Pallas 2003), high school graduation is the common first step. Many youth do not complete high school. High school graduates who opt for college must then apply, be admitted, and matriculate before they become college students. Then they must graduate. American college students, especially men, frequently do not get that crucial post-secondary degree. Consequently, to understand mean gender differences in college completion, we examine gender and racial differences in the transitions that lead to college graduation.[8]

Figure 12.9 shows the trend in rates of black male and female entry into postsecondary education for census respondents ages twenty-six to twenty-eight, by birth year.[9] Figure 12.10 shows the trend in the probability of completing four-year college, given some postsecondary education for the same samples. The growing black gender gap largely reflects the differential in rates of entering postsecondary education. This rise in postsecondary education involved

FIGURE 12.8 *White Versus Black Odds of Completing a Bachelor's Degree by Ages Twenty-Six to Twenty-Eight, by Gender, 1940–2010*

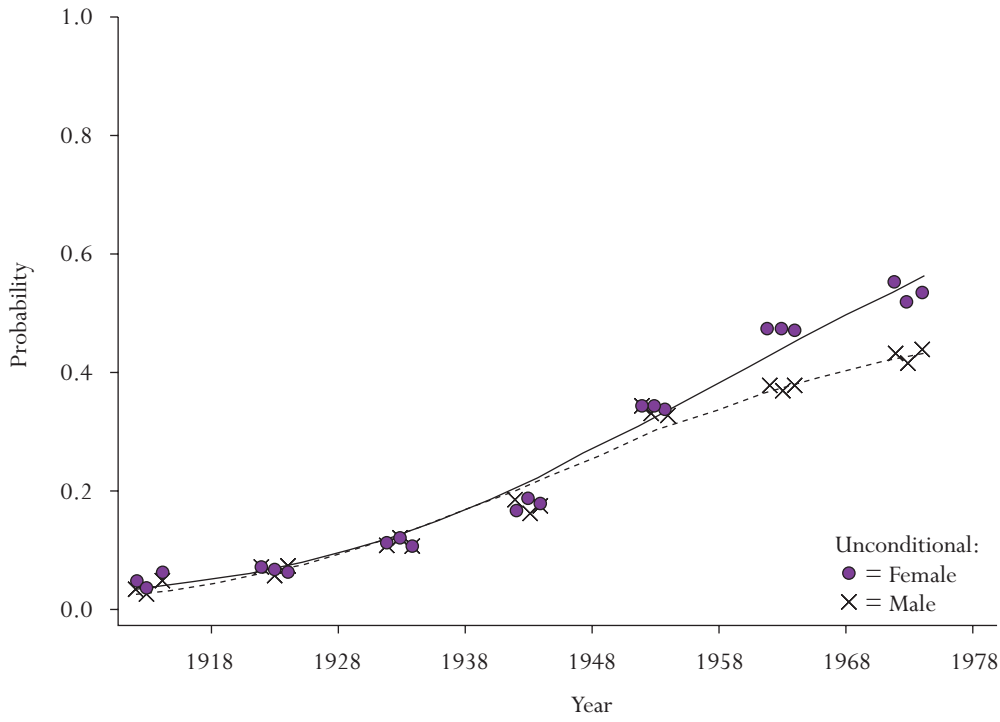


Source: Authors' compilation based on IPUMS, 1940–2000; ACS, 2010.

both increased rates of enrollment in community colleges (Snyder and Dillow 2007) and a more academically diverse population opting to enroll in higher education. Both processes probably contributed to the declining odds of completing four-year college, given college entry, for men and women. The decline in the odds of completing four-year college, given college entry, was actually greater for black women than black men, but this greater decline was not enough to offset the advantage that stemmed from women's more rapid rise in postsecondary enrollment.

Figures 12.11 and 12.12 present the corresponding graphs for whites. In qualitative terms, the story is the same: whites also experienced rising rates of college entry. The white male rate of completing a bachelor's degree, conditional on college enrollment, was constant or declining over the past thirty years. This pattern is similar to that for blacks and probably arises for the same reasons: the increasing share of postsecondary students in community college and the wider academic diversity of students entering postsecondary education. Just as for blacks, the rising female advantage in college completion for whites is largely due to rising rates of college entry. However, the gender gap in completing college, given some postsecondary education, is larger for whites, and where the black female line trends slightly downward, the white female line trends upward. In combination with the strong gender gap among whites in trends in college entry, the gender gap in trends in graduation contributes to the strong female-favorable trend in the probability of completing college by age twenty-six to twenty-eight for whites.

FIGURE 12.9 *Probability for Blacks Ages Twenty-Six to Twenty-Eight of Attaining Some College, by Birth Year*



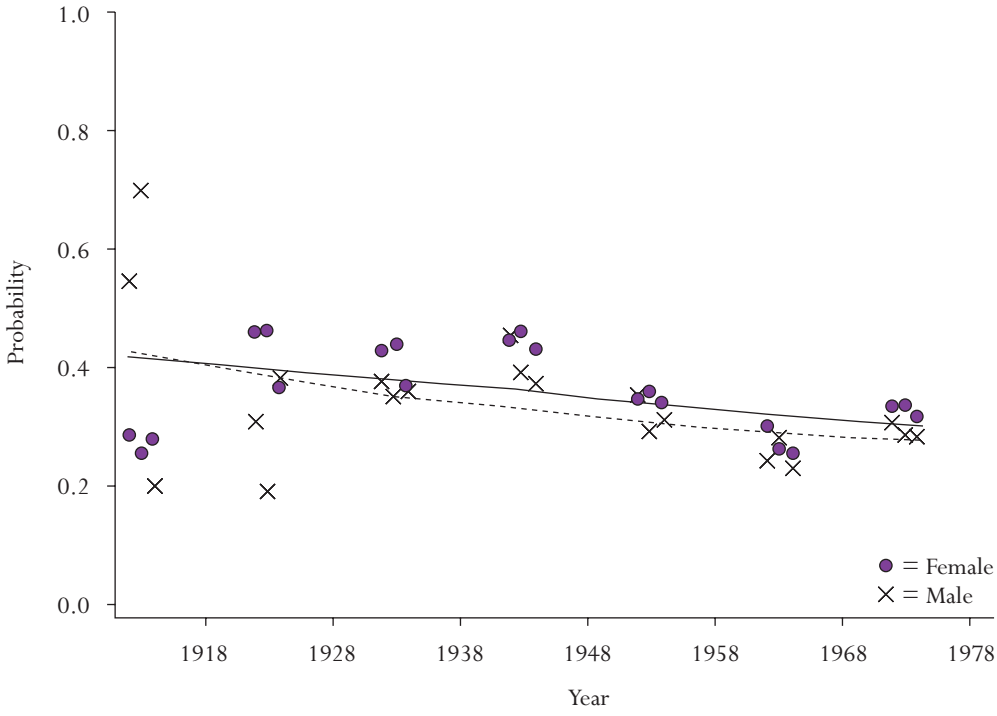
Source: McDaniel et al. (2011); data are from the 1940–2000 IPUMS.

GENDER TRENDS IN EDUCATIONAL TRANSITIONS

Gender differences emerge in the transition rates between high school and postsecondary education, between two-year and four-year college, and between college entry and graduation (Buchmann and DiPrete 2006). From a statistical perspective, the probability of graduating from four-year college can be expressed as the probability of transitioning to postsecondary education multiplied by the probability of completing four-year college, given that one has some postsecondary education. Women have shown a faster increase in the probability of making a transition to postsecondary education, given high school graduation. The fact that women's gains have occurred largely through higher rates of transition from high school to college does not mean, however, that increasing men's rates of transitioning to college is the best way to increase their college graduation rates.

Although the rate of transition to postsecondary education is already very high in the United States, many students who begin college do not graduate by age twenty-six. Table 12.2, taken from our analysis of the National Education Longitudinal Study (NELS) data (Buchmann and DiPrete 2006), breaks down each cohort of men and women according to their route through the educational system. Twenty-two percent of male high school graduates and 19 percent of female high school graduates attended four-year college but did not graduate by age twenty-five

FIGURE 12.10 *Probability for Blacks Ages Twenty-Six to Twenty-Eight of Attaining a Bachelor's Degree, Given Some College, by Birth Year*

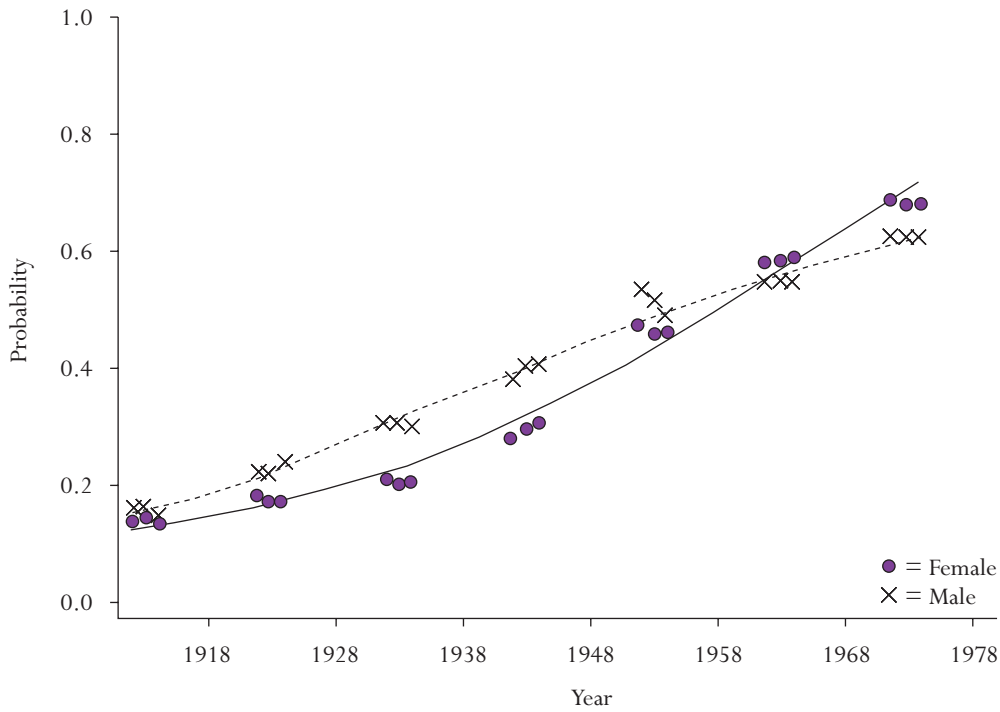


Source: McDaniel et al. (2011); data are from the 1940–2000 IPUMS.

to twenty-six. Focusing only on students who made the transition from high school directly to four-year college, 9 percent of men who attended only four-year college had not completed a degree by age twenty-five to twenty-six, compared with only 7 percent of women. To put it another way, 68 percent of men and 77 percent of women who attended only four-year college had completed a BA, while only 39 percent of males and 47 percent of females who spent any time in community colleges had completed a BA by age twenty-five to twenty-six. As William Bowen, Matthew Chingos, and Michael McPherson (2009) have highlighted, the most straightforward way to increase college completion rates would be to ensure that more of the students who start four-year college—whether via a transition from two-year college or directly from high school—complete a bachelor's degree. While both men and women have a problem with starting but not completing college, it is a greater problem for men. Moreover, this gender gap in completion rates, given a transition to four-year college, is related to educational performance.

Analysis of NELS data confirms that the primary reason for the growing gender gap is males' weaker academic performance (Buchmann and DiPrete 2006). For the NELS cohort, the gender gap in the probability of completing a BA by age twenty-five to twenty-six was about five percentage points (33 percent for women and 28 percent for men). As table 12.3 shows, this gap can be statistically broken down into that part due to different rates of transition into postsec-

FIGURE 12.11 *Probability for Whites Ages Twenty-Six to Twenty-Eight of Attaining Some College, by Birth Year*



Source: McDaniel et al. (2011); data are from the 1940–2000 IPUMS.

ondary education and that part due to different rates of completing a BA, given a particular transition into postsecondary education. Relatively little of the gap (13 percent) is due to women's higher rates of transition into two-year college, and even less is explained (6 percent) when we take account of men's higher rate of making a transition from two-year college to four-year college (because this factor advantages men). Table 12.3 shows that 0.47 × 0.48 × 0.39 = about nine percentage points of the 0.28 male BA completion rate comes from students who had some two-year college. For women, the corresponding figure (0.50 × 0.46 × 0.47) is a higher eleven percentage points, which accounts for 46 percent of the overall gender gap in BA completion. Table 12.3 further shows that most of this explanatory power (0.33 of the 0.46) comes from the fact that women get better grades than men in college. Another 45 percent of the overall gender gap comes from the higher grades that women who go directly to a four-year college receive in college. Thus, the gender gap comes predominantly from higher educational performance and the advantages it conveys in college graduation rates as opposed to higher transition rates into college. Since 1988, when the NELS cohort was in eighth grade, women have opened up a larger lead in transition rates to postsecondary education. For more recent cohorts of young men and women, the combination of this higher rate of transition to college and women's higher educational performance accounts for the growing gender gap in the rate of BA completion.

FIGURE 12.12 *Probability for Whites Ages Twenty-Six to Twenty-Eight of Attaining a Bachelor's Degree, Given Some College, by Birth Year*

Source: McDaniel et al. (2011); data are from the 1940–2000 IPUMS.

TABLE 12.2 *Route Through the Educational System by Ages Twenty-Five to Twenty-Six*

	High School Graduates Only		All Students	
	Males	Females	Males	Females
No high school diploma	N/A	N/A	9%	8%
High school diploma, but no college	24%	21%	22	19
Two-year college only	24	27	22	25
Two-year plus four-year college				
BA	9	11	8	10
No BA	14	12	13	11
Four-year college only				
BA	20	22	18	20
No BA	9	7	8	6
Total	100	100	100	100

Source: Data are from NELS; see Buchmann and DiPrete (2006) for further details.

TABLE 12.3 *Probability of Completing a BA Degree for Men and Women by Ages Twenty-Five to Twenty-Six Given Various Pathways and Performances*

Probability of Completing:	Men	Women	Men if They Had Women's Grades	Fraction of Total Gap
Any two-year college	47%	50%		13%
Any four-year college, conditional on some two-year college	48	46		6
BA, given both four-year and two-year college	39	47	–46	46
Only four-year college	29	29		49
BA, given only four-year college	68	77	–76	100

Source: Data are from NELS; see Buchmann and DiPrete (2006) for more details.

WHY DID WOMEN OVERTAKE MEN IN COMPLETING COLLEGE?

The data are clear: women have overtaken men in the educational arena. The reasons include increasing educational and labor market opportunities for women and their incentives to seize them. Additionally, girls have performed better academically, showing better social and behavioral skills (also known as "noncognitive" skills) than boys. As for men, successive cohorts have lagged in their adaptive response to the changing labor market. Researchers do not fully understand this inertial force that resists adaptive change, although we have important insights. Each of these components is central to understanding the growing female advantage in college graduation.

Changes in the Labor Market, Families, and Incentives for More Education

In the twentieth century, the position of women shifted in both the labor market and the family. From 1900 to 2000, the labor participation rate of American women soared from 20 percent to 60 percent (Fischer and Hout 2006; Goldin 1990; U.S. Department of Labor 2010). Briefly, over the course of the twentieth century, the expanding opportunity for clerical jobs along with women's large-scale entry into occupations that favored or required some form of higher education—teaching, nursing, and even some white-collar clerical work—increased their incentives to seek schooling beyond high school. In the early decades of the twentieth century, women entered the teaching profession and school administrators wanted to hire only unmarried women; consequently, as women left the profession upon marriage, younger women stepped in to fill their ranks (Rury 2008, 110). By the early 1940s, when the pervasive workplace bans on married women were almost completely eliminated and wartime demands for female labor were escalating, women entered the labor force in greater numbers (Goldin, Katz, and Kuziemko 2006). In the two decades after World War II, the U.S. economy expanded, and productivity, living standards, and college enrollments all rose. This economic growth increased the demand for labor and raised women's wages. Women saw a higher opportunity cost in remaining full-time homemakers (Bergmann 2005). Not surprisingly, more women entered the workforce and remained there for longer periods. For example, before World War II most women worked only until they married and had children. After the war, women often returned to work after their children were school age or older (Goldin 1990; Thistle 2006). In the 1960s and 1970s,

the civil rights movement and the women's rights movement spurred "equal opportunity" legislation in education and employment.[10] Finally, advances in birth control (specifically the pill and the intrauterine device) made it easier for women to control their fertility—which in turn made it easier for women to get advanced skills and work outside the home, even combining a career with child-rearing.

The fact that women and men tend to segregate in different occupations is one reason for the continuing gender wage gap. But women's gains in the high-skill sectors have not solely been due to "demand shifts" favoring traditionally female occupations. Women have also gained by entering high-status, previously male-dominated occupations like law, business, and life sciences (Goldin et al. 2006). In 2009, for the first time in history, the majority (51 percent) of workers in highly paid managerial and professional occupation positions were women, even though they made up only 47 percent of the total workforce (U.S. Department of Labor 2010, 1). Women have also gained skills and experience on the job through higher rates of labor force attachment. Conversely, the share of women in traditional female careers such as teaching and nursing has declined. The net effect has been that women adapted more successfully to the shifts in demand that eroded employment opportunities in middle-skill clerical, administrative, and production jobs (Autor 2010). Importantly, because of occupational sex segregation, this job polarization has had different impacts on men and women. As the economist David Autor (2010, 10) has written: "The decline of middle-skill jobs has clearly displaced males toward the tails of the occupational distribution and the net effect is an increase in the share of males in low-skill occupations compared to the share of males in high-skill occupations. Women's losses in middle skill occupations were substantially offset by employment gains in high-skill occupations, and this is true for both high school- and some-college-educated females." These changes in women's labor market experiences have encouraged them to complete college.

Women's rapid educational gains are certainly linked with gains in women's real wages as well as their wages relative to men. A substantial gender gap in wages still exists. In 2012 women working full-time earned 81 percent of what men working full-time earned. But this gap is far smaller than it was in 1978, when women earned 62 percent of what men earned. The gender wage gap has shrunk in part because women have entered well-paying managerial and professional occupations. As Francine Blau and Lawrence Kahn (2007) note, women's earnings gains are particularly remarkable in light of the fact that they occurred during a period of rising overall wage inequality.[11] In fact, in many metropolitan labor markets today, young women earn more on average than their male counterparts.[12] The reason? Women's quantitative advantage in education outweighs their disadvantage from gender segregation in the labor market.

Ironically, men's college graduation rates stagnated even while wages for high school–educated males declined—the result of both technological change and the decline of blue-collar unions. It is unclear why, in the face of these changes, more men did not complete college. Moreover, men's stagnant graduation rates exacerbated the wage decline for high school–educated workers and increased the worth of a college degree (Goldin and Katz 2008). Also, while real wages for high school–educated men were falling, the wages for high school–educated women remained stable (Appelbaum, Bernhardt, and Murnane 2003), yet women, not men, rapidly increased their rates of college enrollment and graduation. Men's failure to respond, as women have, to the economic incentives arising from the stagnant wages of high school–educated workers and the rising relative wages of college-educated workers is puzzling and demands examination.

For African Americans, legal and de facto discrimination and segregation muted the impact of these labor market shifts. The much lower rate of college completion for blacks was due in

part to the meager educational resources devoted to blacks, especially in the South (Rury 2008). Even the GI bill, which was race-neutral in statutory terms, did not help Southern black men very much. The combination of state-supported segregation and minimal state investment in the "black" colleges kept many Southern black men from using the GI bill to obtain a college degree (Turner and Bound 2003). At the same time, different structures of occupational opportunities for blacks and whites and for men and women (for example, the unwillingness of American businesses to hire blacks into the male-dominated managerial and engineering occupations) created different incentive structures for each group.

The small but prolonged female advantage in college graduation for blacks prior to 1980 may also have been related to the high labor force participation rates of educated black women. Employment rates were higher for college-educated black women in all the decennial censuses from 1940 through 2000 (McDaniel et al. 2011). They were far more likely than white college-educated women to be employed until the 1980s. In 1930 black women were three times more likely to work than white women. By 1970 black women were 1.3 times more likely than white women to work (Goldin 1990). Historically, black women worked to bolster their family's income, in part to offset black men's high unemployment rates and low education levels. Claudia Goldin (1977) found, however, that black women worked more than white women even if they had the same education, family income, and number of children. One legacy of slavery, Goldin points out, was that black women who worked outside the home were less likely to feel a social stigma than white women. As a consequence, the employment gap among college-educated women and men was much smaller for blacks than for whites. Historical differences in the labor force participation rates of black and white women arguably contributed to the higher rate of college graduation of black women relative to black men.

Even while job opportunities expanded, women confronted a new family dynamic. The same institutional and technological forces that made college education an economic asset put a financial strain on families headed by high school (or lower)–educated men. As we discussed in DiPrete and Buchmann (2006), highly educated women had better prospects and gained financially from the combination of educational homogamy and the increasingly strong earnings gains of highly educated men. These women were also less likely to divorce because their marriages suffered fewer financial strains, even as their own earnings gave them the freedom to leave unattractive marriages. Finally, their higher earnings protected them from poverty even if their marriages did dissolve. These family-based incentives for greater education were generally stronger for women than for men even if, as several studies have reported (Averett and Burton 1996; Charles and Luoh 2003; DiPrete and Buchmann 2006; Goldin and Katz 2000; see also Hubbard 2011), women's economic returns to education were not growing faster than men's.

Military Service

Because men are more likely than women to serve in the military, it is reasonable to ask whether military service competes with higher education and contributes to the gender gap. The U.S. military recruits about 200,000 enlisted personnel each year, almost all of whom are high school graduates. Since 1973, the military has comprised less than 1 percent of the total population. In fiscal year 2010, almost 1.2 million people served on active duty; most (85 percent) were men (Office of the Under Secretary for Personnel and Readiness 2012). The median age of enlistees is twenty-seven, so it is possible that military service competes with college as a destination for young adults. The GI bill offset some of these potentially negative effects of military service. Starting in 1944, it offered educational benefits to veterans of World War II and later the Korean War (Stanley 2003; Turner and Bound 2003). Marcus Stanley (2003) shows that the trend in

male BAs after World War II was along the same trajectory established in the 1936–1940 period, a finding consistent with an interpretation that the GI bill offset the direct negative effect on educational attainment during the years when some GIs otherwise would have attended college. Indeed, many people who enlist after high school cite the subsidies for college during or after their military service (Kleykamp 2006). Thus, for some, military service may have made college enrollment possible, albeit at a later point in life, and may be one explanation for men's delayed college enrollment. Of the 20,000 officers commissioned by the armed forces each year, nearly all are college graduates, and about 40 percent received their commission through their university's Reserve Officers' Training Corps (ROTC) (Segal and Segal 2004, 8). This group enlists after graduation.

On the whole, men who serve in the military receive less education than those who do not serve. Among high school graduates, veterans serving during the peacetime Cold War period were less likely to attain a college education than nonveterans at all levels of socioeconomic status (MacLean 2005). This difference held even among those who reported plans to attend college. Perhaps veterans who delay college are less likely to attend or complete college because they feel they are "too old" for college, or because they have found a romantic partner (Hogan 1981). It is not known whether military service reduces the likelihood of attaining a college degree or whether the military differentially selects young people who are less committed to postsecondary education (MacLean and Elder 2007). Alair MacLean and Glen Elder's findings are at least consistent with the idea that military service competes with higher education for young men. Similarly, Meredith Kleykamp (2010) finds that the downsizing of military jobs in the 1990s was associated with substantial increases in college attendance, especially among black men. To the best of our knowledge, no research has examined the relationship between military service and college graduation for women or whether the effects of military service found in the past remain the same today. These are important questions for future research.

Incarceration and the Gender Gap in College Completion

The IPUMS data used to report education trends in figure 12.2 are representative of the entire population, including prisoners (in jail or prison). Incarceration rates in the United States held stable between 1925 and 1975 at roughly 100 per 100,000 of the resident population, but after 1975 the incarceration rate increased rapidly. By 2001, it was 472 per 100,000, nearly five times its historical average (Langan 1991; Pettit and Western 2004).

Did this statistic skew either the gender gap or the racial gap in college completion? It is important to distinguish between the arithmetic impact of accounting for the incarcerated population in the computation of college completion rates and the causal impact of incarceration on the size of the changing gender gap, especially for blacks.[13] The addition of the prison and jail data to the CPS data has a noticeable effect on the computed rates of college graduation for black men in particular, both because a considerable number were in prison or jail in these years and because the incarcerated population had relatively low levels of education. The black gender gap is noticeably larger when the incarcerated population is taken into account (McDaniel et al. 2011). Moreover, the impact of the incarceration adjustment grows larger for blacks over time because the size of the incarcerated black population grows as a fraction of the total black population over time.

It is more difficult to determine the causal effect of the rise in the incarceration of young men, especially young black men, on the growing gender gap in college completion in the 1980s and 1990s. In one respect, our adjustment understates the magnitude of the prison experience of black men because it pertains only to current inmates at the time of the survey. Many other

individuals interviewed in the CPS in each of these years had been in jail or prison in the past. We do not know how much education these young men would have achieved if they had not been incarcerated. However, other considerations suggest that the sharp rise in the prison population has had a relatively small impact on the gender gap. Our analysis of the prisons and jails surveys confirms that the young people sentenced to jail or prison were disproportionately high school dropouts; other evidence shows that they were performing poorly in school at the time of their arrest (Laub and Sampson 1993). In other words, if these individuals are drawn disproportionately from the bottom of the educational achievement distribution, we can conclude that very few would have gone to college even if they had never been incarcerated. From this perspective, the rising rates of incarceration contributed relatively little to the rise in the gender gap in educational attainment. As noted earlier, the gender gap for blacks is now more similar to that for whites than it was in 1960, even as young black men's experiences with incarceration diverged from young white men's experiences. Indisputably, incarceration has skewed the lives of young black men, affecting their work, cohabitation, and marriage as well as, very probably, their rates of high school and postsecondary education. However, incarceration's direct effect on rates of college graduation may be relatively small. This question is difficult to answer with certainty and requires further research.

Grades and Courses in School

Despite the scientific consensus that girls and boys have similar levels of academic aptitude, women have led in college graduation. In fact, girls generally outperform boys on verbal tests and lag behind boys on math tests, especially in the population at the lower end of the test score distribution. But gender differences in mental ability as measured by test scores are too small to explain the current gender gap in college completion. Moreover, these small gender differences in test scores have remained fairly stable, while the gender gap in educational attainment has reversed from a male advantage to a female advantage that continues to grow.

In contrast to their similar performance on standardized tests, girls have outperformed boys in grades since the turn of the century. (Because course performance is less standardized, there is less consensus on trends in gender differences in this measure.) In the middle of the nineteenth century, girls enrolled in coeducational schools at roughly the same rate as boys and, for the most part, took the same classes with the same teachers. Even then, girls earned higher grades and were promoted to the next grade more readily (Clarke 1875; Hansot and Tyack 1988).[14] Writing in 1910, J. E. Armstrong from the Englewood High School in Chicago, reading before the Central Association of Science and Mathematics Teachers at the University of Chicago in November 1909, reported that "the first three primary grades of the schools of the whole United States show that a larger number of boys than girls have to repeat grades. The census shows that the sexes are born in very nearly equal numbers and yet the boys are four per cent more numerous in the first grade" (Armstrong 1910, 347–48). As early as 1870, when rates of high school completion were extremely low (only 2 percent of seventeen-year-olds completed high school), more girls graduated (Newcomer 1959; Solomon 1985).

Nevertheless, many colleges barred young women from matriculating for much of the nineteenth century. In 1837, Oberlin College began admitting women, "ostensibly to provide ministers with intelligent, cultivated and thoroughly schooled wives," and it is generally considered the first coeducational college to admit women (Graham 1978). When the Civil War led to a shortage of male students, more colleges became willing to enroll tuition-paying female students. By 1870, women comprised 21 percent of undergraduates in U.S. colleges and universities. Of course, this figure includes the many women who were enrolled in women's colleges or

the "coordinate colleges" adjacent to men's colleges (including Radcliffe at Harvard, Barnard at Columbia, Evelyn at Princeton, Pembroke at Brown, and Jackson at Tufts). By 1900, however, more than twice as many women were enrolled in coeducational institutions as in women's colleges (Solomon 1985). In the first decade of the twentieth century, the rapid rise of women in coeducational institutions precipitated a fear that women would take them over. As the women's historian Barbara Miller Solomon (1985, 58) wrote:

> Chicago, Stanford, California, Wisconsin, Boston University, and even Oberlin had qualms; the impact on male enrollments was the central issue and complaints by some male students were noted. Academic achievement was held against females when they surpassed males in either sheer numbers or academic honors. Faculty members echoed the views of disgruntled or perhaps envious male students and charged that women interfered with male academic performance.[15]

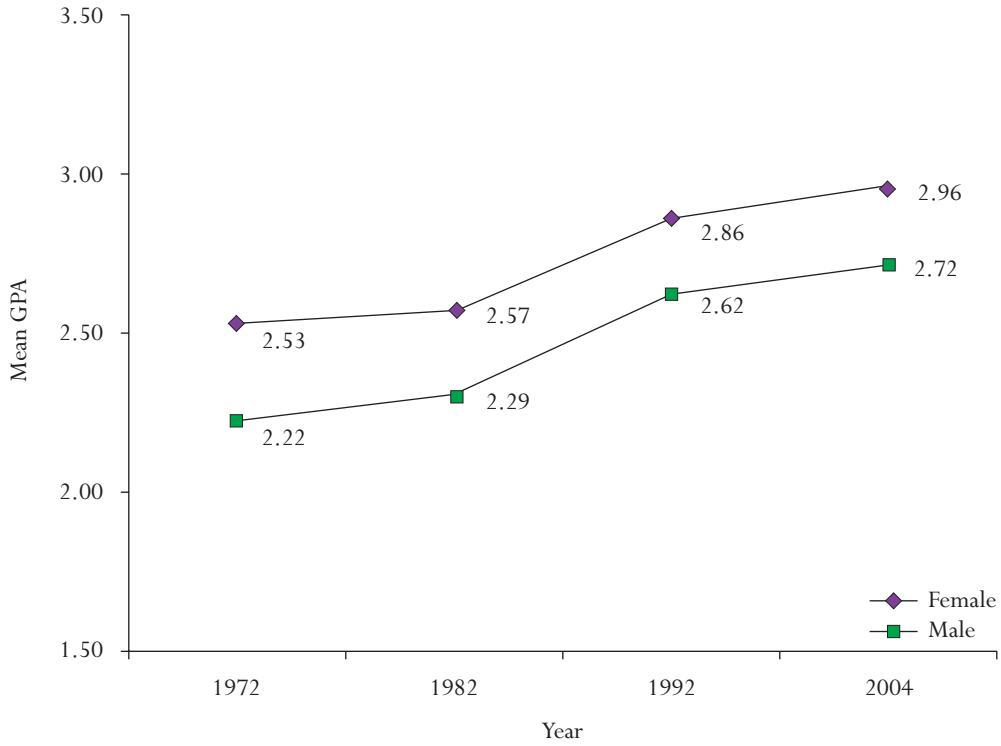
Fast-forward to the current era, when the female advantage in academic performance at all levels of education is indisputable. As early as kindergarten, girls demonstrate more advanced reading skills than boys (Tach and Farkas 2006; West, Denton, and Reaney 2000), and boys have more problems with reading in elementary school (Trzesniewski et al. 2006). From kindergarten through high school and into college, girls get better grades than boys in all major subjects, including math and science (Perkins et al. 2004). To dig deeper into the gender gap in the grades of high school students, we analyzed data from four panel data sets derived from surveys designed to study the educational, vocational, and personal development of young people in the United States as they transition from high school into adulthood: the National Longitudinal Study of the High School Class of 1972 (NLS-72), the High School and Beyond (HSB) high school class of 1982 (first surveyed as sophomores in 1980), the National Education Longitudinal Study (NELS) of 1988, which surveyed the high school class of 1992, and the Education Longitudinal Study (ELS), which surveyed the high school class of 2004 in 2002.

We examined overall high school grade point average (GPA) for male and female high school seniors and gender gaps in GPA across the four decades represented by the surveys with data drawn from the high school transcripts included in these data sets. Because the NLS-72 does not include transcript data, we relied on student self-reports of their overall high school GPA for the seniors in 1972.[16] Figure 12.13 reports trends in GPA over time for boys and girls in the graduating cohort from each survey. Several points are noteworthy. First, overall GPA increased between 1972 and 2004 by about 0.4 to 0.5 on a 4.0 GPA scale. This increase is in line with the rise in high school grades documented in some prior research.[17] A statistically significant female-favorable grade gap exists for each time point, and the size of these gaps remains relatively constant, ranging from about 0.24 to 0.30 over the period.

In the 1950s, boys had a clear advantage over girls in the average rigor of their high school math and science coursework. For example, using data from the state of Wisconsin, Goldin and her colleagues (2006) found that boys in the 1957 high school graduating class took, on average, over a semester more math than did girls (4.02 semesters versus 2.89 semesters) and nearly a semester more science, which was largely concentrated in physics (1.01 semesters versus 0.30 semesters).[18]

Using the panel data sets, we compared boys and girls in their high school courses over the last four decades. Particularly striking is the clear pattern of a gender reversal from a statistically significant male advantage in mean number of math and science courses taken in 1972 (not shown) to a statistically significant female advantage by 2004 (see figure 12.14). In 1972 boys reported taking 0.29 more math courses and 0.19 more science courses than girls reported. This male advantage had declined by 1982. By 1992 high school transcripts revealed virtual parity in

FIGURE 12.13 *Mean Grade Point Average for High School Seniors, 1972–2004*



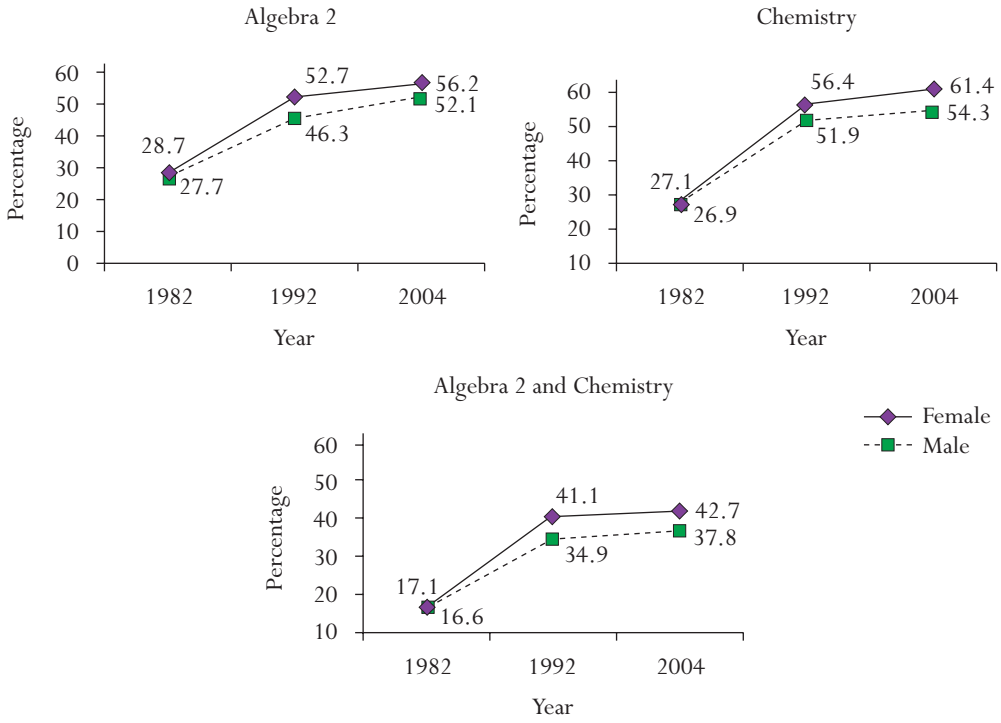
Source: Authors' compilation based on data from NLS-72, HSB, NELS, and ELS.

the mean number of math and science courses. Over the next twelve years, the mean number of math and science courses reported on the transcripts of girls exceeded the mean for boys—a statistically significant gap. Moreover, a female advantage in foreign language courses has persisted and appears to have grown over time (from a 0.28 female advantage in 1972 to a 0.34 female advantage in 2004).

Also, a higher percentage of students reported taking middle- to advanced-level math and science coursework in 2004 than in 1982 (figure 12.14). In 1982 fewer than 30 percent of graduating high school students had taken algebra 2 or chemistry and only 17 percent had completed both; by 2004 more than half of all students had completed either of these courses and more than one-third had completed both. Crucially, more girls completed middle- to advanced-level coursework in math and science (see Cho 2007). In 2004, 56 percent of girls completed algebra 2 (compared to 52 percent of boys); 61 percent completed chemistry (54 percent of boys), and almost 43 percent completed both of these advanced courses (37.8 percent of boys).

Figure 12.15 compares the GPAs of girls and boys in two categories: those who completed advanced courses (algebra 2 and chemistry) and those who did not. In both categories, girls earned higher average GPAs, and these gender gaps in GPA were stable over time. Among students enrolled in advanced courses, the average GPA for girls was roughly 0.20 points higher than boys' average GPA in 2004; for students not enrolled in advanced courses, the female-

FIGURE 12.14 *Female and Male High School Students Completing Advanced Courses, 1982–2004*



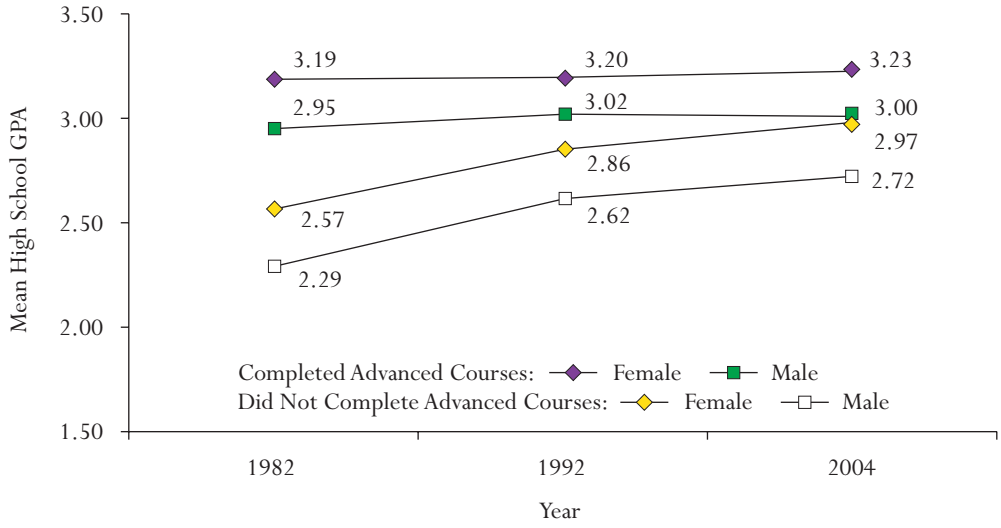
Source: Authors' compilation based on data from HSB, NELS, and ELS.

favorable GPA gap was slightly higher at 0.25. This finding underscores the stability of the female advantage in high school grades even when the rigor of coursework is held constant. In the next section, we consider how the higher average grades of girls relate to their advantage in college graduation.

Male Academic Underperformance

Why do boys underperform relative to their potential? We argue that the causes lie in the sociocultural environment rather than in anatomy, hormones, or brain structure. Three facts are salient: First, boys disengage from school more easily than girls, and their disengagement seems to be connected with their masculine identity. Second, academically richer environments—whether at home or school—benefit all students, but appear to offer especially large benefits for boys. Third, the messages that parents give their children about the importance of school vary little by parental class or gender or by the gender of the student. Both boys and girls report that parents pressure them to perform well in school. Almost 99 percent of eighth-graders in the Early Childhood Longitudinal Study: Kindergarten Class of 1998–1999 (ECLS-K) reported that "good grades" were "important" to their parents, and 80 percent reported that "good grades" were "very important," with no significant variation by gender, parental education, or parents'

FIGURE 12.15 *High School Grade Point Average, by Advanced Course-Taking and Gender, 1982–2004*



Source: Authors' compilation based on data from NLS-72, HSB, NELS, and ELS.
Note: Data are weighted and pertain to high school seniors who subsequently graduated from high school.

educational expectations. Parents, meanwhile, overtly supported academic success for their children in their answers to ECLS-K survey questions: parents thought it more important for their sons than their daughters to be "brilliant" (as opposed to school leaders, athletic stars, or most popular); in fact, more parents without a college education preferred for their sons to be "nerdy" than did college-educated parents.

A clue to understanding male disengagement from school may lie in extracurricular activities. Boys who participated regularly in music, art, drama, and foreign languages were more similar to girls in their level of school engagement. Not coincidentally, ethnographic research finds that preadolescent and adolescent boys, especially those from working- or lower-class backgrounds, often denigrate these activities as unmasculine. The fact that girls' and boys' expressive attachment toward school differs so markedly even for middle schoolers with similar academic performance suggests that these differences are tied to gender identity. Ethnographic research supports survey data to the effect that at least certain aspects of the adolescent masculine culture devalues academic engagement. In *Learning the Hard Way: Masculinity, Place, and the Gender Gap in Education* (2012), the sociologist Edward Morris reports that in one rural high school, "nerdy" boys—defined as those who put substantial effort into school and who participate in musical activities like band—were more likely to be labeled as "gay" or "pussies."[19] In contrast to intellectual activities like reading or cultural activities like playing a musical instrument, working-class boys in Morris's ethnography perceived their fathers' activities, like woodworking or construction, as more manly, even relative to professional and office work, which these boys recognized as being more lucrative. Similarly, Michael Kimmel (2008) reported that his male informants used "*any* taste in art and music" as an example of "stereotypically effeminate behavior."

Not all boys act this way. Masculinity takes different forms, and boys enact masculinity in different ways. This fact is key to understanding both the problem of male underachievement and possible policy prescriptions. The different models for masculinity in the adolescent world correspond to the models of masculinity in the adult world. On the one hand, one conception of masculine power features manual labor, strenuous team sports, and symbolically masculine pursuits, like hunting and fishing, in which men exert their dominance over animals and nature. On the other hand, in the workaday world of adults, successful (hence powerful) men are those who earn money and status from prestigious, well-paid jobs that allow a middle- or upper-middle-class lifestyle, especially when—as a consequence of educational homogamy—their partners also have prestigious, well-paid jobs.[20] These men attained their success through education, and they provide a powerful model to adolescent boys. Boys who have adopted this model of masculinity, whether from the media, teachers, peers, or parents, can see modern masculine power emerging from academic engagement, not from disengagement or oppositional behavior. Not all boys encounter this model. Social class–related disengagement can be explained as an individual and collective determination that the promise of labor market success through academic success, like the Powerball lottery, is a game where the odds of a rich payoff are against you. But class-based theories of disengagement do not imply that boys need to disengage at greater rates than girls.

Success in academics, like success in sports, requires a considerable investment of time and effort. In general, the more you practice, the better you become. Boys do not universally accept this connection. Witness the relatively low grades and very high educational aspirations of the middle third of the boys in the academic hierarchy who expect to complete college but are unlikely to do so. Middle school girls likewise do not fully understand the connection between performance and educational attainment. After all, they overpredict their educational attainment to about the same extent as do boys. But even if their lack of understanding matches boys' (which we doubt), it is arguably less consequential because girls show greater expressive attachment to school. This attachment seems to arise more readily through the gratification they get from close relationships with their teachers and the greater satisfaction they get from pleasing their parents. Girls, in other words, probably work harder in school in part because they get greater intrinsic satisfaction from high academic performance than do boys.

Many boys, of course, succeed in school despite a deficit in expressive attachment. These boys often live in households that either attach high value to academic success or promote instrumental attachment to school. These households understand that school is like sports or music: one has to train for years to be a top performer as an adult. We find that boys who live in households with a biological father present as well as highly educated parents experience larger gains than girls in both their academically relevant social and behavioral skills and their academic performance. Research by Joscha Legewie and Thomas DiPrete (2012) demonstrates that boys receive especially large benefits from a strong academic climate at school. Boys in these environments may better understand the marathon character of education and therefore train harder to achieve long-term goals. But enhanced short-term motivation to perform well produces long-run benefits even for those who do not fully understand the extent to which academic excellence requires years of training. In other words, engagement does not flow from an individual calculus of means and ends. Like New Year's resolutions, engagement reflects not just personal goals and strategies but the social support for these strategies.

In a changing world, the old sources of masculine power—the power that comes from physical labor—are ebbing. So why do some boys still embrace the nostalgic model of masculine power, even with its deleterious effects on academic performance? One force, we suggest, is the continuing cultural power of the gender-segregated labor market of the 1960s and before. His-

torically, many American men worked in well-paid, blue-collar jobs. Some involved apprenticeship training as an entry into construction or a trade; others involved semiskilled factory work or truck driving. Thanks in part to the once-countervailing power of labor unions (Galbraith 1956), these jobs generally paid better than the jobs available to women without a college degree and even many of the professional jobs held by women college graduates. This world, which flourished into the 1960s and persisted through much of the 1970s, gradually faded during the 1980s and 1990s as the Baby Boomers worked through their prime years and had children of their own. This world transitioned to an era of deindustrialization, globalization, and the decline of union-supported blue-collar employment. In this new era, less-educated Baby Boomers increasingly struggled to achieve an acceptable standard of living. High school graduates could see that college graduates got the well-paying jobs. Yet even in these years, many high school graduates saw no "bright line" difference between the standard of living of those without and those with college degrees, especially degrees from local and state colleges or universities. Even when their own wages failed to keep pace, less-educated men often relied on their wives' working increased hours. That extra income sustained the household standard of living for these men, while they hoped that their future prospects would brighten through an upturn in the broader economy.

Americans tend to be optimistic about the future. In "Is This a Great Country? Upward Mobility and the Chance for Riches in Contemporary America," Thomas DiPrete (2007) analyzes Gallup survey data collected in 2003, more than two decades after the onset of a new era of deindustrialization, the decline of union power, the decline of real wages for high school–educated men, and the stagnation of market income for households at the median of the American income distribution (Burkhauser 2012). A generation of young people had grown up during this transformative economic period. Many, especially those without a college degree, should have been pessimistic about their future standard of living. Gallup interviewers asked: "Looking ahead, how likely is it that you will ever be rich?" The answers were surprising. Even though fewer than 30 percent of young American men at this time were earning bachelor's or advanced degrees, 58 percent of eighteen- to twenty-nine-year-old men thought it was somewhat or very likely that they would be rich someday. The extent of the over-optimism among these men was striking. As for their female counterparts, only 43 percent of them expected to ever be rich, even though as a group they were better educated and had a greater chance than men of improving their standard of living through marriage (because husbands still make more money on average than do wives). The gender gap is even larger than these numbers imply, considering that the 2003 Gallup poll found that men thought one needed a higher income (a median of $150,000 versus $100,000 for women) and greater assets (a median of $1,000,000 versus $500,000 for women) to be considered "rich." Clearly, many young men with only a high school diploma, who grew up during the decades when the wage returns to a high school diploma were falling, nonetheless believed that they had a good chance of earning a lot of money. Their misplaced optimism recalls Ely Chinoy's (1955) sample of autoworkers in the 1950s who dreamed of saving enough to start a successful business, even though they rarely realized that American dream.

These Gallup poll data underscore that it can take more than one generation of durable change in the environment before parents absorb the implications and communicate them to children effectively. Why do attitudes take such a long time to catch up to reality? First, most people know less about the connection between labor markets and education than do specialists. Second, Americans know that individual outcomes can depend on many factors beyond education, making them overly optimistic. Compounding this inertia is the arguably tight connection between gender stereotypes in the workplace and the process of gender socialization in the family. Many blue-collar jobs in construction, transportation, and manufacturing have a strongly

masculine identity. Fathers in these jobs convey their masculinity to their sons in part through the physical aspects of their work lives. Sons internalize stereotypes as they develop their own masculine identity. This process can strengthen a boy's attachment to the career path of his blue-collar father, thereby slowing the rate of generational adaptation to a changing labor market that has increasingly devalued blue-collar work. When sons of blue-collar and lower-middle-class fathers recognize that financial success requires a different career path than the path taken by their fathers, these boys lack role models to chart an educational path toward occupations that would allow them to fulfill these financial goals. The regressive cultural force of the old male-dominated manufacturing economy may eventually lose its power to disengage adolescent boys from school, but we speculate that it will take at least another generation or two to die away.

INCENTIVES, PERFORMANCE, AND PARENTAL INVESTMENT

Although girls have long earned better average grades than boys, for much of the twentieth century young women (specifically young white women) had lower levels of educational attainment than did young men. From a global perspective, this gap can be attributed to a gendered culture that associated masculinity with labor market success and femininity with domestic work. In such a world, the link between education and status for most women ran through marriage; the exceptions were the relatively small number of women who entered professional occupations like teaching, nursing, or social work. In that world, it was plausible to expect class variation in the size of the gender gap. Families with fewer resources might "rationally" concentrate their educational investment in their sons. In contrast, higher-status families might spread their resources more equally among sons and daughters both because they had more resources to invest in their children and because highly educated adults generally had more egalitarian gender-role attitudes in the second half of the twentieth century (Cherlin and Walters 1981; Thornton, Alwin, and Camburn 1983; Thornton and Freedman 1979). These considerations might have produced differences in the educational gender gap by parental education or socioeconomic status. This relationship, moreover, might have changed over time in response to the growing labor market opportunities for women and the continuing spread of gender-egalitarian values.

To determine whether the relationship between gender differences in college graduation and core family characteristics were changing, we analyzed data from the cumulative cross-sectional General Social Surveys (GSS) from 1972 through 2008.[21] The twenty-seven annual General Social Surveys provide information on the educational attainment of respondents and their fathers and mothers, the socioeconomic status of the fathers, and several other measures of family background. We restricted the analysis of college completion to white respondents between the ages of twenty-five and thirty-four who were born between 1938 and 1977. (The black GSS sample is too small to support a similar analysis.) The dependent variable, college completion, is operationalized as the completion of at least sixteen years of education.

We examined the relationship between parents' education, fathers' absence, and rates of male and female college completion for two specific historical periods.[22] The first period, which covers birth cohorts born between 1938 and 1965, includes people who grew up before the point at which women overtook men in their rates of college graduation. The second period, which covers birth cohorts between 1966 and 1981, includes those who grew up when women began to overtake men in their college graduation rates. These results are presented in table 12.4.

For cohorts born in 1965 or earlier, men were more likely than women to have completed college in all except one of the family types displayed (table 12.4). Only when both parents had

TABLE 12.4 *Rates of U.S. College Completion for Males and Females by Ages Twenty-Five to Thirty-Four, by Parents' Education, Presence of Father, and Birth Cohort*

	Father's Education					
	High School or Less		Some College or Higher		Father Not Present	
Mother's Education	Male	Female	Male	Female	Male	Female
1938–1965 birth cohorts						
High school or less						
Percentage	20	15	44	36	21	15
N	1,341	1,639	325	363	193	277
Some college or higher						
Percentage	39	26	62	66	37	31
N	182	238	373	427	77	70
1966–1981 birth cohorts						
High school or less						
Percentage	15	20	50	40	11	14
N	349	416	155	171	109	130
Some college or higher						
Percentage	34	42	67	66	32	42
N	104	135	301	320	77	89

Source: Cumulative General Social Surveys, 1972–2008.

at least some college education were women as likely as men to have completed college. When either fathers or mothers had a high school education or less, sons were more likely to complete college than daughters. If no father was in the household when the youth were sixteen years old, sons still were more likely to complete college than daughters. This pattern is consistent with the gender-egalitarian perspective. It provides little support for the gender-role socialization perspective, which predicts higher graduation rates for daughters of educated mothers. In fact, the female disadvantage is greater for families in which the mother has some college and the father has a high school education or less (39 percent – 26 percent = 13 percent) than it is for families in which the father has some college and the mother has a high school education or less (44 percent – 36 percent = 9 percent).

The 1966–1981 birth cohorts have a different pattern (table 12.4), one that suggests the emergence of a strong gender-role socialization effect. In cases involving parents who both had at least some college education, the completion rates for men and women look similar to those of the earlier cohorts in the top panel. But in all other cells the changes in graduation rates are quite large, and generally to the advantage of women. Where fathers had a high school education or less, daughters increased their rates of college graduation, whereas the graduation rates of sons dropped, regardless of the mothers' level of education. The graduation rates of sons who had no father present at age sixteen also dropped considerably. Only in families in which fathers had some college and mothers had a high school education or less did men maintain a considerable advantage over women. In contrast, daughters had a strong advantage in college graduation over sons in families with mothers who had some college and fathers who had a high school education or less. A shift appears to have taken place between these two periods: the mother's

level of education became more important for daughters, and the father's level of education more important for sons.

THE COMPETITION FOR COLLEGE ADMISSION

The educational system is sometimes viewed as an arena where students compete for prizes. Students with higher grades are perceived to have outcompeted students who earn low grades. Those admitted to elite colleges and universities or graduate and professional programs are the winners. Contests by their nature have a zero-sum character, and in the American educational system the zero-sum game is most visible in the annual admissions scramble at the highly selective colleges and universities. These institutions have many more applicants than spaces, and the competition for entry has been intensifying for many years.[23] Academically elite institutions, which are prominent on the U.S. educational landscape, enroll a small fraction of the students who attend four-year educational institutions. Only 14 percent of four-year colleges accept fewer than 50 percent of their applicants (Hawkins and Lautz 2007).

To what degree are constraints on the supply of admission spaces in U.S. institutions of higher education related to gender gaps in college enrollment rates today? The answer depends on the sector of American higher education. At less-selective colleges and universities (the large majority of higher education institutions in America), the overall gender imbalance in enrollment favors women. Of course, even less-selective colleges typically reject at least some applications: only about 20 percent of four-year, nonprofit colleges and universities in the United States accept more than 85 percent of their applicants (Hawkins and Lautz 2007). Nonetheless, the process of admission to less-selective colleges and universities consists mainly of meeting some baseline standards for high school grades and course curricula. In fact, selectivity has fallen for colleges outside the most selective 20 percent of institutions (measured by the mean SAT / ACT scores of matriculants). Hoxby (2009) finds that the ratio of the number of "freshman seats" (that is, the aggregate number of first-year students in four-year colleges) to the number of twelfth-grade students who score both at the relatively low "basic" level and at the higher "proficiency" level on the National Assessment of Education Progress (NAEP) mathematics and reading tests increased moderately from 1970 to the present. This ratio is greater than unity even when potential supply is measured in terms of students at "basic" levels of proficiency. The implication of the supply ratio trends and of the selectivity statistics is that the increase in the college-going population has been matched by increases in the supply of places. Thus, it is highly unlikely that males are being denied entry to the great majority of four-year colleges and universities because of competition from female applicants.[24]

In highly selective colleges and universities, the "college squeeze" (Alon and Tienda 2007) is very real. Indeed, the colleges at this most-selective 10 percent tier have become more selective than they were thirty to forty years ago (Alon and Tienda 2007; Hoxby 2009; Bound, Hershbein, and Long 2009). Aside from the early years of coeducation at formerly male institutions, when female quotas were in place (Karabel 2005), these selective institutions have sought a balanced gender mix, which they can readily achieve from their deep pool of highly qualified applicants of both genders.[25] In the 2011 Inside Higher Ed Survey of College and University Admissions Officers, 11.1 percent of four-year colleges and universities responded that they admitted men with "lower grades and test scores than other applicants" in order to achieve gender balance, compared with 2.7 percent that responded similarly for women (Green 2011). But very few selective universities are included in this survey. Other data suggest that females' acceptance rates at highly selective colleges are lower than males' acceptance rates, but any comparison of acceptance rates cannot prove either gender-based affirmative action or discrimina-

tion. Student applications are hardly submitted at random, and we do not know whether the typical male applicant to a highly selective college is "equivalent" to the typical female applicant (Heriot and Somin 2011). It is certainly plausible that qualified female applicants are at greater risk of being denied admission at highly selective institutions because admissions offices desire gender balance, but we have no definitive analysis of this question.

EDUCATIONAL GENDER GAPS: A GLOBAL PHENOMENON

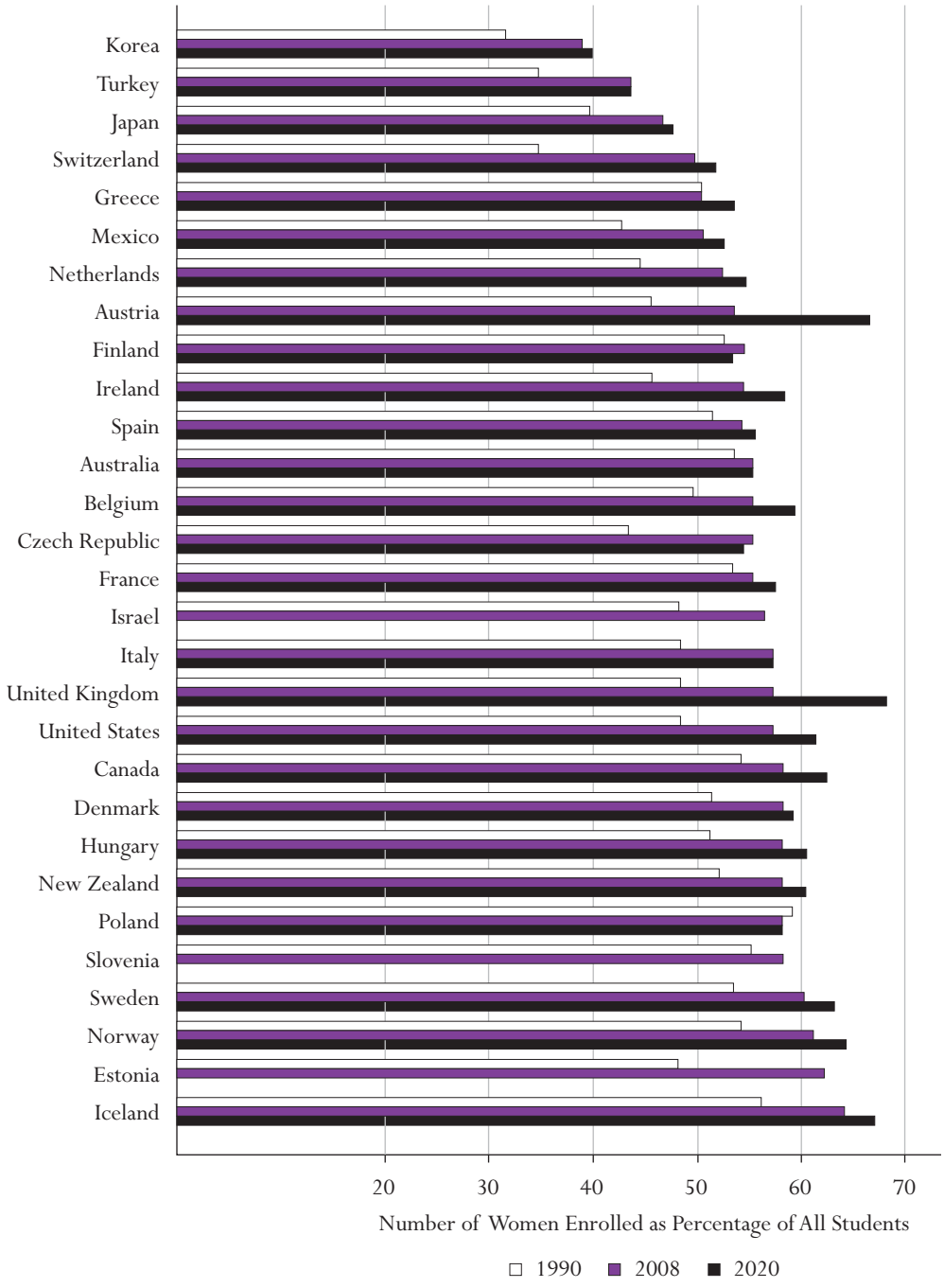
The striking reversal in the gender gap in higher education is not solely a U.S. phenomenon. Among the thirty member nations of the Organization for Economic Cooperation and Development (OECD), the once-prevalent male advantage in college completion has disappeared in all but four countries—Switzerland, Turkey, Japan, and Korea (OECD 2006). Women's progress has been striking: thirty years ago women lagged behind men in completing college degrees nearly everywhere in the world. From 1965 to 1985, women's share of higher education increased, on average, from 27 percent to 40 percent across a range of countries (Bradley and Ramirez 1996). In the 1980s, women began to reach parity with men and in many cases surpassed men in the amount of education they received. Figure 12.16 shows the rise of women's share of enrollment in higher education in OECD countries between 1990 and 2008. Countries are ordered by women's share of enrollment in 2008, from women's smallest share (Korea) to their largest (Iceland). Projections suggest that women's advantage will grow in most countries. By 2020, females are expected to make up at least 60 percent of tertiary students in Austria, Canada, Hungary, Iceland, New Zealand, Norway, Sweden, and the United Kingdom.

Note that several OECD countries have higher female shares of tertiary enrollment than the United States. This fact is related to another noteworthy comparison: after leading the world for much of the twentieth century, the United States has fallen behind other industrialized countries in terms of the percentage of the population attaining tertiary degrees. Figure 12.17 compares the fraction of the population at different age ranges who have completed a tertiary 5A degree.[26] Figure 12.18 shows the same data by gender. Figure 12.17 shows that the United States ranks first among the fraction of fifty-five- to sixty-four-year-olds with a tertiary-type A degree, but only eleventh among twenty-five- to thirty-four-year-olds with this degree.

Although the United States remains in the upper middle of the distribution, it has dropped substantially in the rankings. Figure 12.18 shows that for the 1945–1954 birth cohort, the United States had the highest rates of completion among industrialized countries for both women and men. By the 1975–1984 birth cohort, the percentage of U.S. women with a tertiary degree had risen dramatically, while the percentage of men with a tertiary degree actually declined. The progress made by U.S. men across cohorts was next to last among the thirty-four OECD countries, and American men ranked only tenth among these countries by 2009. However, while young American women had a much higher rate of tertiary degree completion than did older American women, the rise in other OECD countries was more dramatic: indeed, American women also ranked next to last among the thirty-four countries in the size of their increase in degrees across these cohorts. Women's gains in Norway, Denmark, Finland, and Poland have been particularly impressive: more than 40 percent of all young women in these countries have a tertiary degree. Overall, American women—like American men—now rank tenth among OECD countries.

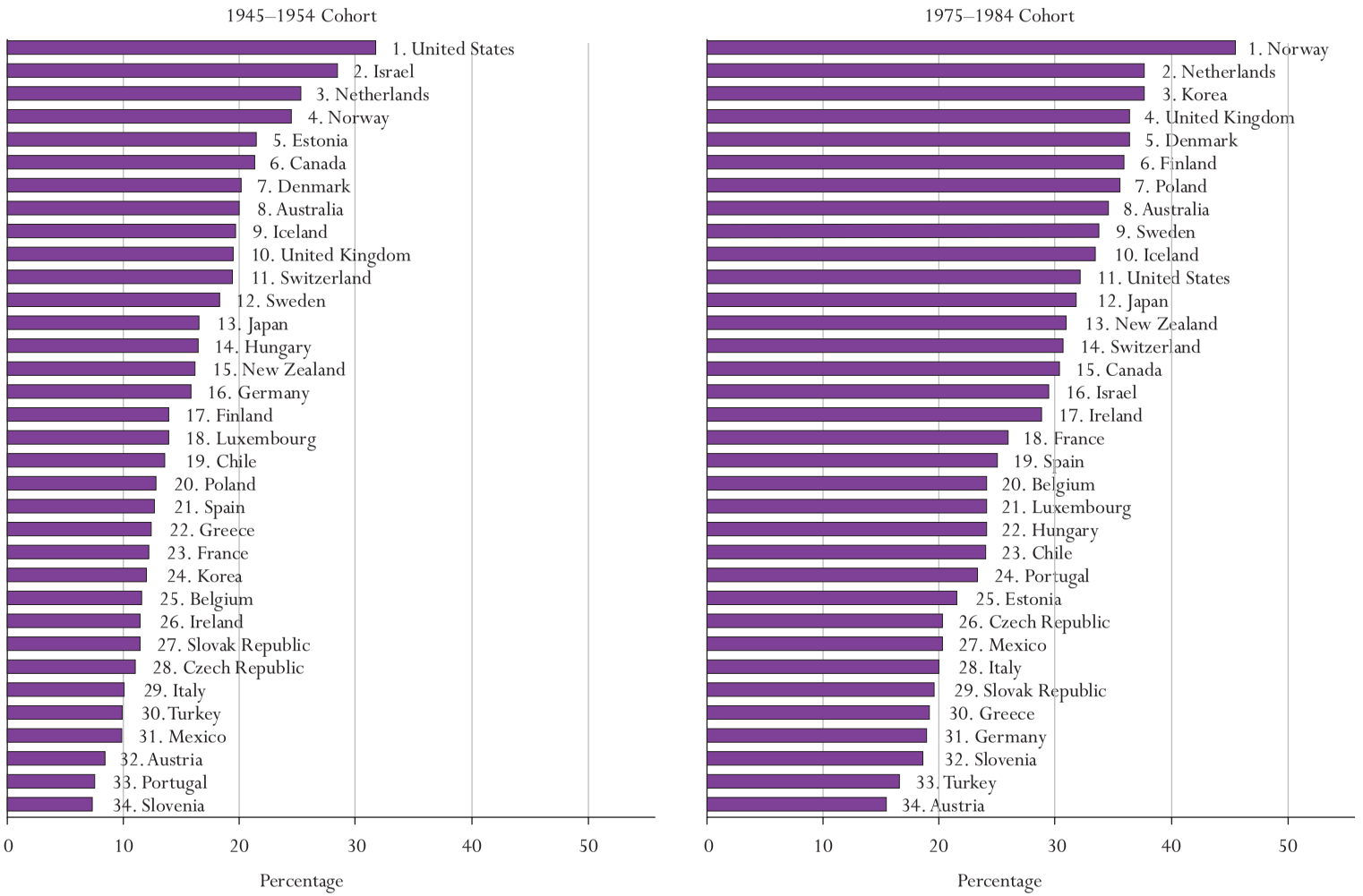
The fact that women have overtaken men in so many countries suggests a global explanation for the growing educational gender gap as well as nation-specific explanations for variation in the rate of overtaking or in the size of women's advantage. More research is needed to identify the global and local components of this trend in the United States and elsewhere.

FIGURE 12.16 *Women's Share of Tertiary Enrollment in OECD Countries, 1990 and 2008*



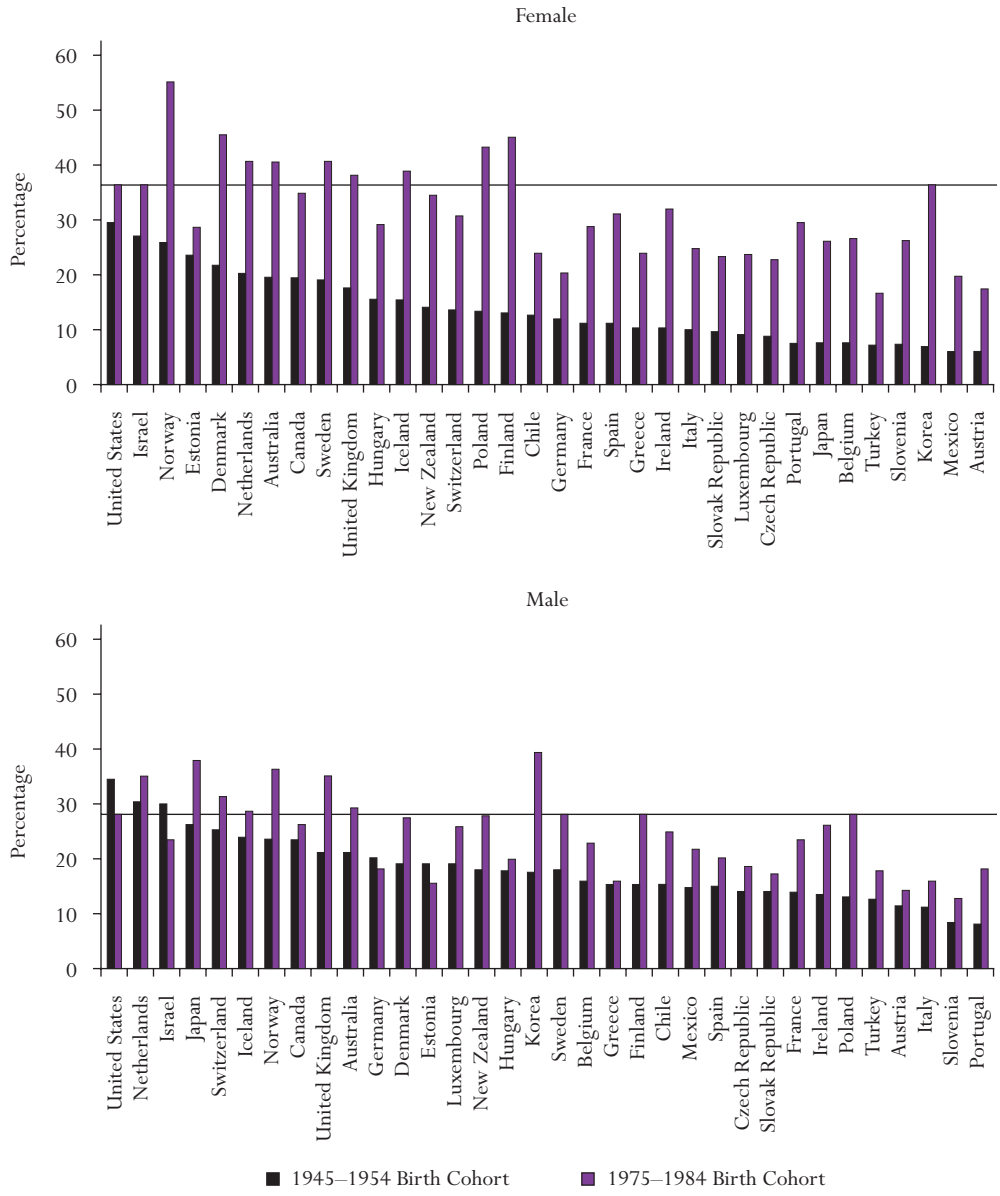
Source: 1990–2006 data, UNESCO (2009); 2020 projection, Vincent-Lancrin (2008).

FIGURE 12.17 *Ranking of OECD Countries, by Rate of Tertiary Completion, by the 1945–1954 Cohort and the 1975–1984 Cohort*



Source: Authors' compilation based on data from OECD (2011).

FIGURE 12.18 *Female and Male Members of the 1945–1954 and 1975–1984 Cohorts Who Obtained a Tertiary Type A Degree, 2009*



Source: Authors' compilation based on data from OECD (2011).

CONCLUSIONS AND IMPLICATIONS

The recent reversal of the gender gap in educational attainment is a story about females' real gains, but also about a stagnation in males' education that raises daunting challenges for American society. What are the best strategies to ameliorate gender gaps in educational achievement in the United States today? We address this question in great detail in the book *The Rise of Women: The Growing Gender Gap in Education andWhat It Means for American Schools* (DiPrete and Buchmann 2013). Here we present some of our key recommendations.

If we want more American students to progress through college, we must do more than overcome gender-related barriers. First, we must lay down strong academic foundations in elementary and middle school to undergird success in high school and beyond. Second, we must provide clear pathways from secondary and postsecondary school into skilled well-paying jobs, so that students can plan their routes and are motivated to work hard to complete the educational journey. Third, we must make higher education affordable. The high cost today discourages students, especially those who do not see clear paths from education to good jobs. The problem is not with student aspirations. Many students have high aspirations but underinvest in developing their educational skills because they do not receive immediate rewards for high academic performance, because they do not understand the training needed to develop these educational skills in middle and high school, and perhaps also because they are overconfident about their chances of economic success.

A key ingredient in this formula is the climate in schools. We do not favor proposals from critics such as Christina Hoff Sommers (2000) that would restructure schooling around what we see as outmoded gender stereotypes that are more part of the problem than part of the solution. Instead, students require classrooms that teach academic skills and reward them emotionally for academic success.

Very few students understand the extent to which college graduation depends on academic performance. They have a hazy knowledge about fields of study and their connection to the labor market. Knowledge can enhance motivation and discipline, but social support remains necessary. In the case of male educational performance, the social support goes beyond discipline; it allows for forms of masculinity that align positive educational behaviors with environmental expectations and rewards. This support can come from parents (especially fathers) and peers, and it is probably strongest when it comes from multiple sources.

For much of the twentieth century, white ethnic immigrants spurred their sons to accomplish more than their fathers, both to fulfill their parents' ambitions for them and, in the process, become successful themselves. In the 1970s, that pattern of generational progress began to falter for American boys. Conversely, girls once idealized middle-class adult femininity as a ritual of dating, courtship, and marriage, followed by suburban living, child-rearing, and civic volunteerism. Today many girls want careers and see college and advanced degrees as the route to those careers. Boys almost seem weighed down by the lingering intergenerational memory of (white male) working-class affluence, which colors their conception of masculinity as well as their strategies to transition into adulthood. The fading reality of a blue-collar route to masculine success still weighs on the current generation of adolescent boys.

Getting both boys and girls through four-year college is not the be-all and end-all educational policy. We agree with James Rosenbaum (2001) that college is not the right goal for all students. For students struggling academically in middle and high school, a more appropriate policy is to ensure that they complete high school and then follow clear pathways to good jobs. But raising college graduation rates among "the middle third" of American students, most of whom already enroll in college in large numbers, is a laudable goal. These students do not enter

the workforce with the skills that they could have achieved and that would have enabled them to obtain higher-paying jobs. It is the situation of these students that we seek to improve.

NOTES

1. The material in this chapter is largely drawn from the book *The Rise of Women: The Growing Gender Gap in Education and What It Means for American Schools* by Thomas A. DiPrete and Claudia Buchmann (New York: Russell Sage Foundation, 2013). This research was supported in part by award number R01EB010584 from the National Institute of Biomedical Imaging and Bioengineering (NIBIB). The content is solely the responsibility of the authors and does not necessarily represent the official views of NIBIB or the National Institutes of Health (NIH).
2. See, for example, "Colleges Look for Ways to Reverse a Decline in Enrollment of Men," *Chronicle of Higher Education,* November 26, 1999; "The Male Minority," *Time,* December 2, 2000; "The New Gender Gap," *Business Week,* May 26, 2003; and "Male Students' College Achievement Gap Brings Concern," *Washington Post,* August 31, 2003. See also "Diversity in Academe: The Gender Issue," *Chronicle of Higher Education,* section B, November 2, 2012.
3. For convenience, we sometimes use "BA" as a shorthand for "bachelor's degree," though colleges and universities award many types of bachelor's degrees—most notably a bachelor of science (BS), but also a bachelor of engineering (BE), a bachelor of science in engineering (BSE), a bachelor of business administration (BBA), a bachelor of nursing (BN), a bachelor of fine arts (BFA), and other variants—depending on a student's major or university attended.
4. The appearance of crossing in the early birth cohorts for blacks is an artifact of the statistical smoothing of the graphs.
5. Small sample sizes for these three groups limit the ability to document trends prior to 1980.
6. The arts and sciences consist of psychology, economics, political science and public administration, sociology, anthropology, linguistics, history of science, area and ethnic studies, other social sciences, history, English and literature, foreign languages, other humanities, religion and theology, arts and music, and architecture and environmental design. The sciences consist of aerospace engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, materials engineering, industrial engineering, other engineering, astronomy, chemistry, physics, other physical sciences, atmospheric sciences, earth sciences, oceanography, mathematics and statistics, computer science, biological sciences, and agricultural science. The "education-business-other" fields are science technologies, engineering technologies, health technologies, other science and engineering technologies, interdisciplinary or other sciences, communication and librarianship, law, social service professions, vocational studies and home economics, other nonsciences or unknown, medical sciences, other life sciences, education, science education, mathematics education, social science education, other science/technical education, nonscience education, and business and management.
7. The odds of an event is the ratio of the probability that an event will occur and the probability that the event will not occur; for example, when the odds are two-to-one in favor of the home team winning, they are twice as likely to win as to lose. If females in the 1918 birth cohort had two-thirds the odds of completing college as did white males, then the ratio of the odds for females and males (that is, the odds ratio) is 0.66.
8. Using the 1940–2000 Integrated Public Use Microdata Series (IPUMS) data, we compute the probabilities of enrolling in postsecondary education and completing college, given enrollment, for all observable birth cohorts of individuals ages twenty-two to twenty-eight. Because completed education at every age is known, we can compute the proportion of a group that has completed a specific number of years of education conditional on having completed a particular educational level. Thus, we can analyze differences in the rate of college completion between men and women, for whites and blacks, at any specific age, and for a particular birth cohort in terms of their relative probabilities of completing each of the transitions necessary to complete college. Figures 12.9 to 12.12 present the decompositions in terms of two transitions by gender and race: first, the unconditional probability of obtaining some college (college enrollment), and second, the probability of obtaining a bachelor's degree, conditional on college enrollment. The figures show actual data points for each cohort as well as fitted proportions completing each of the transitions by birth cohort from a second-degree fractional polynomial regression.
9. Census data do not distinguish between these two routes to completing high school for most of the period cov-

ered by these figures. Because adolescents following these two routes are not equivalent in terms of the probability that they will complete college, and because the composition of high school graduates over these two alternative routes has changed over time, we do not present trends in rates of high school completion.

10. Notably Title VII of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972.
11. It is hard to predict how the gender wage gap will change in the future, even as women's educational attainment continues to rise. Blau and Kahn (2007) maintain that the remaining wage gap is almost completely unaccounted for by the main predictors of wages (education and labor market experience) contained in the classic human capital earnings function.
12. Conor Dougherty, "Young Women's Pay Exceeds Male Peers," *Wall Street Journal,* September 1, 2010.
13. The arithmetic impact can be obtained simply by comparing the year-specific rates of college completion estimated only for the non-institutionalized population with the estimate of completion rates obtained for the total population. The Current Population Surveys (CPS) are administered only to the non-institutionalized population. Estimates of the number of inmates in state prisons and federal correctional facilities by race, gender, education, and age were obtained from the Surveys of Inmates in State and Federal Correctional Facilities for the years 1974, 1979, 1986, 1991, 1997, and 2004. Using these data, we interpolated the results for the intermediate years. Since information for the jail population is less complete, we assumed that the jail population matched the prison population in race, gender, education, and age composition, and we scaled up the size of the prison samples to correspond to the size of the combined prison and jail population in each year. Finally, we rescaled the combined prison and jail samples so that they were the same proportion of the population as were the CPS samples, then combined the data sets in order to estimate rates for the total population.
14. George Farkas and his colleagues (1990) reported that some studies had found evidence that girls receive higher grades than their aptitude scores would predict at various points in the school career (Brophy and Good 1974; Rehberg and Rosenthal 1978; Alexander and Eckland 1980), but that others had not found this to be true (Entwisle and Hayduk 1982; Natriello and Dornbusch 1983; Leiter and Brown 1985).
15. Goldin, Katz, and Kuziemko (2006) found that the class rank of the median girl among Wisconsin high school seniors in 1957 was twenty-one percentile points higher than the rank of the median boy, and in 1992 the median senior girl in the NELS survey was sixteen percentile points ahead of the median boy.
16. Because students tend to inflate their GPA relative to their transcript-reported GPA, we adjusted these self-reports downward by 0.4. We use 0.4 because it is the average difference between self-reported high school grades and transcript grades in HSB.
17. Our findings differ from those of Daniel Koretz and Mark Berends (2001), who found only a slight increase in average grades between HSB and NELS—mainly among high-income students—but their study differs in sample and GPA measure from what we use here. Koretz and Berends excluded anyone who transferred during their high school years or for whom data were missing on the school administrator survey, on the student survey, or in cognitive testing. We included the entire sample of original tenth-graders who were twelfth-graders in 1982 and had valid transcript data. Also, we used the overall high school GPA (not academic GPA) provided by NCES in the HSB data. It appears that Koretz and Berends calculated their own GPA measure from the course grades in the high school transcripts.
18. Goldin and her colleagues (2006) further showed that very little of the male advantage in college completion in the 1957 cohort could be accounted for by courses, test scores, or academic performance; in other words, the male advantage was statistically unrelated to the academic variables that would be expected to account for college completion rates.
19. C. J. Pascoe (2006) and Jay MacLeod (2008) offer similar evidence that some adolescent males (or males in some social situations) treat "nerds" and mental work generally as unmasculine.
20. Patricia McManus and Thomas DiPrete (2001) were the first to show that women's incomes by the early 1990s had risen to the point that the median male suffered a lower standard of living from marital breakup.
21. Buchmann and DiPrete (2006) analyzed GSS data through 2004. We update that analysis here with more recent data.
22. We operationalized "mother" to mean any female guardian and "father" to mean any male guardian.
23. Caroline Hoxby (2009) notes that the increased selectivity applies to the top 10 percent of American colleges and universities when ranked by selectivity.
24. Another form of competition that may be affecting completion rates and quality at less-selective universities is

the competition to get into courses where the number of available seats in the class is lower than the number of students trying to register for the course. Students who are closed out of required or elective courses may well have lower probabilities of graduating (or of graduating within four or five years) as a consequence. Unfortunately, the necessary data are currently not available to determine the impact of supply shortages at the level of individual courses, either on overall college completion rates or on the gender gap in completion rates.

25. Early in the twentieth century, supply constraints primarily limited the college enrollments of female students. Claudia Goldin and Lawrence Katz (2010) show that the increased number of coeducational institutions in a state increased the ratio of college-educated women to college-educated men in that state for cohorts born around the turn of the twentieth century. Janet Currie and Enrico Moretti (2003) show that the opening of new public colleges in a county in the 1940–1996 period increased women's education by an average of 0.08 years, but they did not investigate whether the increase for women was larger than that for men.
26. The OECD defines tertiary-type A programs (ISCED 5A) as "largely theory-based and . . . designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements, such as medicine, dentistry or architecture" (OECD 2011).

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