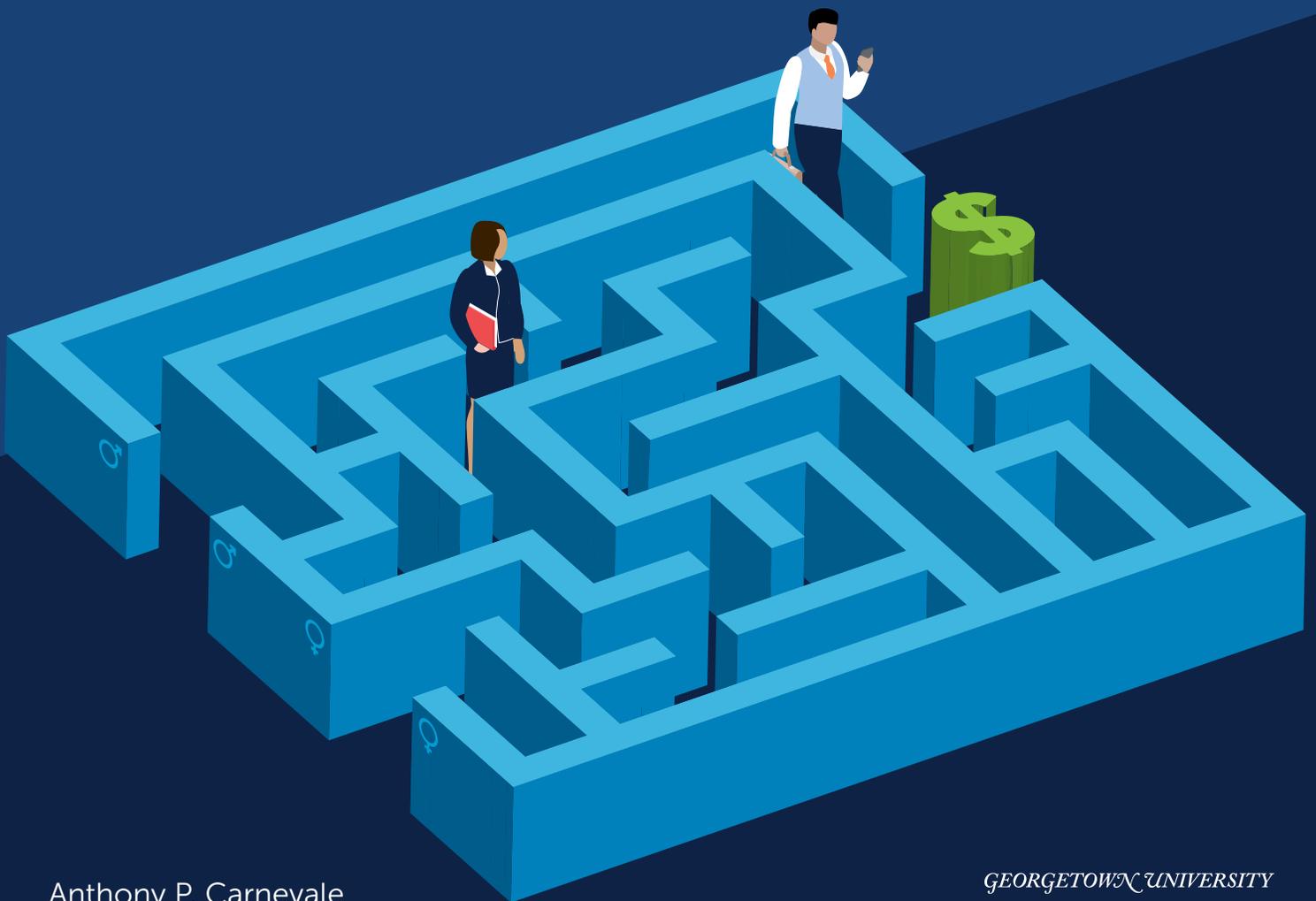


# Women Can't Win

Despite Making Educational Gains and Pursuing High-Wage Majors, Women Still Earn Less than Men



Anthony P. Carnevale  
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2018

GEORGETOWN UNIVERSITY



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# INTRODUCTION

The gender wage gap, the disparity in pay between men and women, has narrowed to 81 cents in 2016 from 57 cents on the dollar in 1975.<sup>1</sup> Nevertheless, the gap persists. Over the course of a career, the gender wage gap results in women earning \$1 million less than men do.<sup>2</sup>

To close this gap, women have relied primarily on the advantages conferred by education. Today, women are enrolling in college in greater numbers than men, breaking through barriers to pursue degrees in male-dominated majors that offer higher earnings, as well as graduating in greater numbers at all levels of education. In the 1970s, the number of associate's degrees awarded to women began outnumbering those awarded to men. In the 1980s, the number of bachelor's degrees and master's degrees awarded to women overtook the number awarded to men. By the 2000s, more women completed doctoral degrees than men.<sup>3</sup>

- 
1. The median annual earnings for men are \$51,600, about \$10,000 more than women's median annual earnings of \$41,600, according to 2016 US Census Bureau statistics; DeNavas-Walt and Proctor, "Income and Poverty in the United States," 2016.
  2. Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *American Community Survey, 2002-2016*.
  3. National Center for Education Statistics, *Digest of Education Statistics, 2014-2015*.

Even though women outperform men in educational attainment, they still earn just 81 cents for every dollar earned by men. Women with the same college majors working in the same careers as men still only earn 92 cents for every dollar earned by men.<sup>4</sup> A complex set of reasons has kept this wage disparity in place.<sup>5</sup> At its heart is discrimination in pay for people with the same sets of qualifications and experience. When it comes to career outcomes, women simply can't win. Here's why:



**Choice of field of study.** More women than ever are majoring in fields traditionally dominated by men. For example, 17 percent of workers in the field of engineering are women today, compared to 1 percent in 1970. But women are still disproportionately concentrated in the lowest-earning fields. For example, 76 percent of workers in the education field are women today, compared to 75 percent in 1970.<sup>6</sup>



**Choice of majors within fields of study.** Even when they study high-paying fields, women are still more likely to choose the least lucrative majors within those fields compared to men. For example, 32 percent of environmental engineering majors, the lowest-paying engineering major, are women, whereas among petroleum engineers, the highest-paying engineering major, only 17 percent are women.



**Choice of occupation.** Within high-paying career fields, women generally are less likely to work in the highest-paying occupations compared to men. For example, only 27 percent of chief executive officers, 44 percent of lawyers, and 43 percent of physicians and surgeons are women. In comparison, 59 percent of market research analysts and marketing specialists, 85 percent of paralegals and legal assistants, and 89 percent of registered nurses are women.<sup>7</sup>



**Discrimination.** Even when they do everything "right"—choose a high-paying field of study, pursue a high-paying major within that field, and get a job in a high-paying occupation—women still get paid less than their male peers. If a man and woman who are equally qualified get the same job, the woman still only earns 92 cents for every dollar the man is paid—more than 81 cents, to be sure, but a far cry from earnings equality.<sup>8</sup>

The traditional answer for women to overcome the gender wage gap has been and continues to be more education, a strategy that women have widely embraced. The share of bachelor's degrees earned by women has increased from 43 percent in 1970 to 57 percent in 2015.<sup>9</sup>

As women outperform men in college, some of the patriarchy of the job market is being wiped away. Nevertheless, the gender wage gap is still far from closed. In the workplace, women are forced to play by a different set of rules than men.

4. Blau and Kahn, "The Gender Pay Gap," 2007.

5. DeNavas-Walt and Proctor, "Income and Poverty in the United States," 2016.

6. Statistics referring to women's share of majors refer to prime-age workers between the ages of 25 and 54. Unless otherwise noted, in this report, the discussion of majors refers to either bachelor's degree holders or graduate degree holders' BA-level major.

7. Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *American Community Survey*, 2016.

8. The 81 cents on the dollar statistic is based on the traditional definition of the gender wage gap. However, controlling for educational attainment, choice of major, and job tenure narrows the gender wage gap to 92 cents on the dollar for equivalently educated and experienced women.

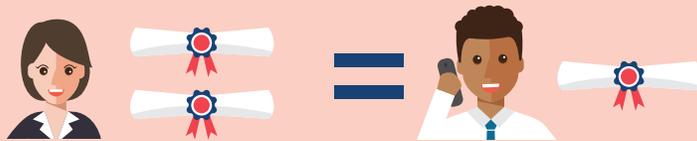
9. National Center for Education Statistics, *Digest of Education Statistics* tables, 2015.

**The share of bachelor's degrees earned by women has increased from 43 percent in 1970 to 57 percent in 2015.**



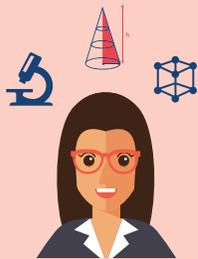
# THERE ARE **SIX RULES** OF THE GAME FOR WOMEN.

## Rule **01** Get one more degree in order to have the same earnings as a man.



A woman with a bachelor's degree earns \$61,000 per year on average, roughly equivalent to that of a man with an associate's degree. The same rule holds true for women with master's degrees compared to men with bachelor's degrees and for each successive level of educational attainment.<sup>10</sup> Over a lifetime, women with bachelor's degrees in business earn \$1.1 million less than men with bachelor's degrees in business. In fact, men earn more than women within every industry.

## Rule **02** Pick majors that pay well, as major choice largely determines earnings.



Women majoring in STEM (science, technology, engineering, and mathematics) fields earn \$840,000 more from the base year to retirement than women who major in the liberal arts, regardless of the occupations they choose.<sup>11</sup> Occupations predict wages, but major choice determines the occupations that women can access.

## Rule **03** If you major in liberal arts, get a graduate degree to attain middle class earnings.



A graduate degree in any discipline is important for earning high wages, but it is essential for female liberal arts majors. On average, women with graduate degrees in the liberal arts earn the same as men with a bachelor's degree in most other disciplines.<sup>12</sup>

10. Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *Current Population Survey*, March supplement, 2017. According to the 2015 *Digest of Education Statistics* from the NCES, on average, women with a doctoral degree earn \$80,500 per year, almost equivalent to that of men with a master's degree, \$84,800.
11. The difference is based on annual average wage of female workers with a bachelor's degree in architecture and engineering as their highest level of educational attainment relative to female workers with a bachelor's degree in humanities and liberal arts extended over a 40-year career; Georgetown University Center on Education and the Workforce analysis of data from US Census Bureau, *American Community Survey*, 2016.
12. Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2012-2016 pooled data.

# Rule ▶ 04 Negotiate your first paycheck well, as it will impact your lifetime earnings. The gender wage gap increases with age, peaking by the early 50s.



Not only do women start off at lower salaries, but the rate of increase in pay is also lower over time. By his early 50s, the average man with a bachelor's degree earns \$34,000 more annually than a similarly educated woman. A man with a bachelor's degree will see his annual earnings increase by 87 percent over his career, but a woman with a bachelor's degree will only receive a 51 percent increase in her annual earnings over her career.

# Rule ▶ 05 Be careful with postsecondary vocational certificates because they have limited labor market value for women.



Women do not get traction in the labor force until they get at least an associate's or a bachelor's degree. Certificates are not enough; there are few jobs that pay a living wage for women whose highest academic credential is a certificate.<sup>13</sup>

# Rule ▶ 06 If you don't pursue a BA, consider getting an industry-based certification.



Few jobs that pay a living wage remain for women with industry-based certifications and licenses as their highest level of education. Nevertheless, women with business certifications as their highest credential attained after high school tend to have higher wages compared to those with a high school diploma as their highest credential.

13. Glasmeier and Arete, "Living Wage Calculator," 2015. The living wage is defined as the wage needed to cover basic family expenses, plus all relevant taxes.

# EDUCATION, OCCUPATIONS, AND MAJORS

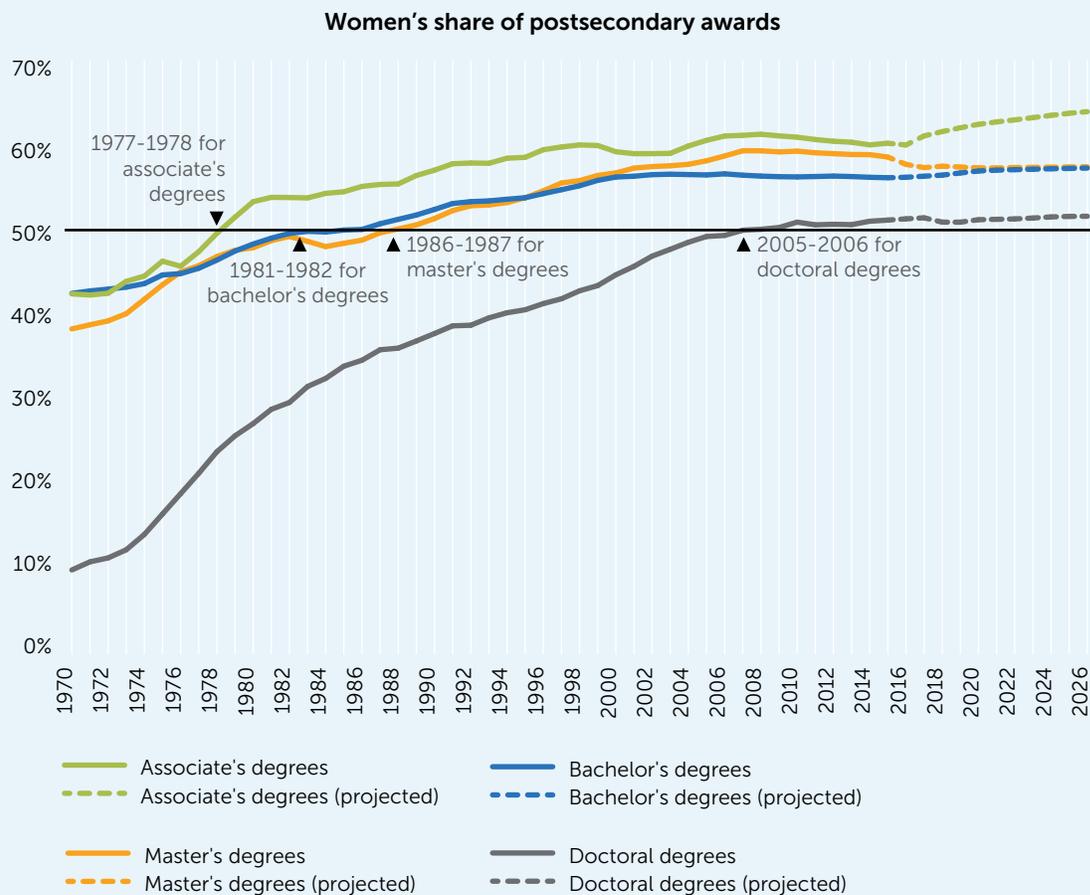


## Women have used education as their primary strategy for achieving economic progress.

The educational gains of women in the past four decades have been remarkable. Following political and economic developments such as the Civil Rights Act and the Equal Pay Act, women's participation in the labor force has soared relative to that of men. Women now outnumber men on every rung of the higher education ladder (Figure 1). In 1964, only about 39 percent of students enrolled in colleges were women.<sup>14</sup> Today, that figure stands at 57 percent.<sup>15</sup>

Roughly 3 million more women are currently enrolled in postsecondary education than men.<sup>16</sup> Among first-time students, women's enrollment is 16 percent greater than men's.<sup>17</sup> Additionally, 61 percent of associate's degrees, 60 percent of master's degrees, and 57 percent of bachelor's degrees are awarded to women.<sup>18</sup>

Figure 1. Female graduates now outnumber male graduates at every level of postsecondary education, including doctoral degrees.



14. National Center for Education Statistics, *Digest of Education Statistics* tables, 2015.

15. Ibid.

16. Ibid.

17. Georgetown University Center on Education and the Workforce analysis of data from the National Center for Education Statistics, *Digest of Education Statistics*, 2015.

18. National Center for Education Statistics, *Digest of Education Statistics* tables, 2015.

While these gains have greatly expanded job market opportunities for women, discriminatory hurdles have not budged as easily. The deep-rooted societal beliefs about differences in competencies between the sexes continue to impact labor market outcomes for many women.

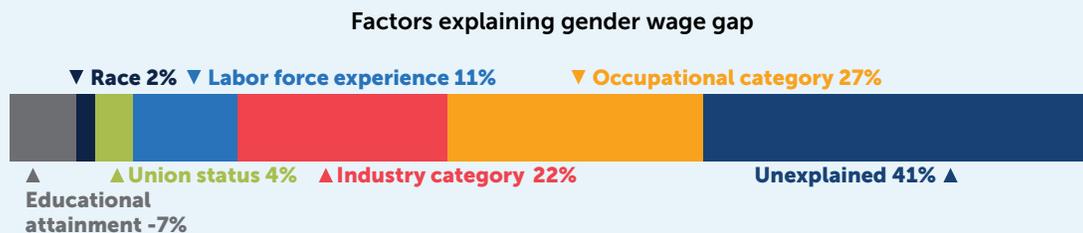
A familiar response to concerns about the 19-cent gender wage gap is that it is just a consequence of the choices women make. Women choose their majors in college, they choose occupations and industries in which to work, and they choose the number of hours they work.

When viewed through these lenses of personal preference, the gender wage gap easily can be dismissed simply as a matter of differences in choices that men and women make. However, research shows that the truth is more complicated than that.<sup>19</sup> Efforts to understand why the wage gap continues to exist have found that gains in educational attainment by women have reduced the gender wage gap by almost 7 percent (Figure 2).<sup>20</sup>

Elementary and middle school teachers, registered nurses, secretaries, and administrative assistants are among the most common occupations for women employed full-time. Software developers, truck drivers, managers, and supervisors of retail workers are among the most common occupations for men working full time. The decisions by men and women to work in specific occupations—when combined with the industries men and women work in—account for almost half of the gender wage gap. Work experience, union status, and race account for 17 percent of the gap.<sup>21</sup>

Of the current 19-cent gender wage gap, 41 percent (or about 8 cents) remains unexplained. In other words, 41 percent of the difference in pay between men and women has no obvious measurable rationale. The generally accepted interpretation is that this unexplained portion of the gender wage gap captures discrimination that women experience in the workplace, whether outright sexism or unconscious, systemic, and socially entrenched prejudice.

Figure 2. Educational gains have narrowed the wage gap between men and women by 7 percent.



Source: Blau and Kahn, "The Gender Pay Gap," 2007.

19. Carnevale and Smith. "Gender Discrimination Is at the Heart of the Wage Gap," 2014.

20. Blau and Kahn, "The Gender Pay Gap," 2007.

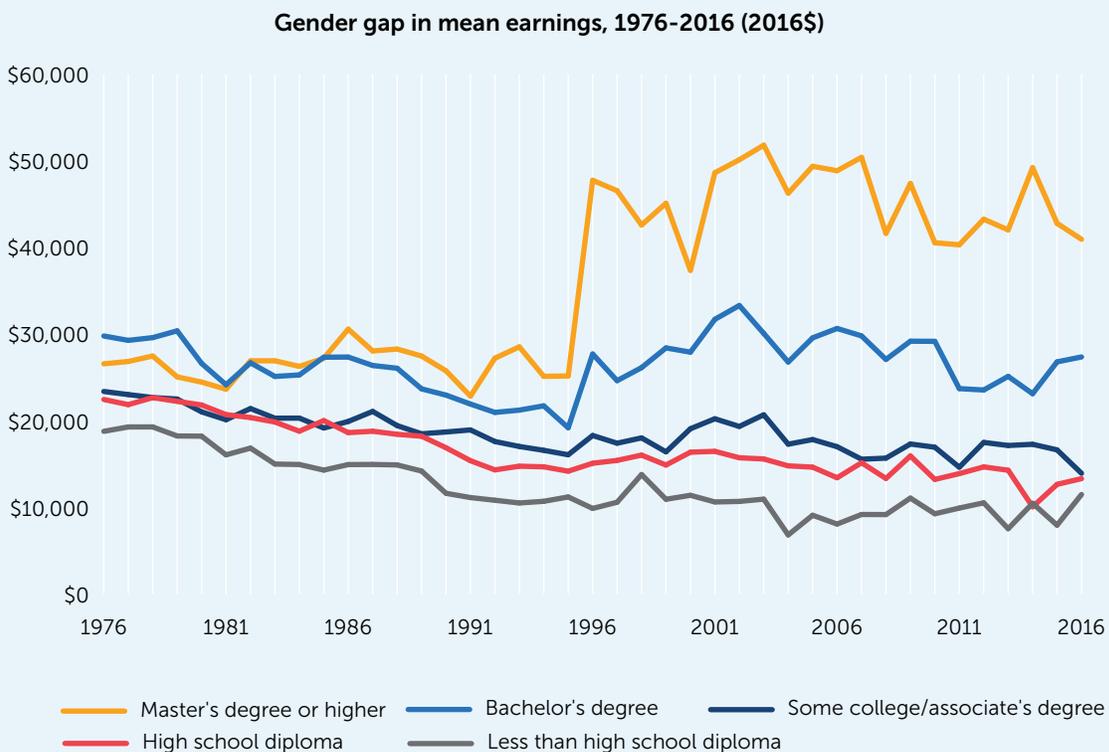
21. Ibid.

## Women's earnings lag their extraordinary educational progress.

The gender wage gap declined substantially from the late 1970s to the early 1990s, after which the convergence slowed. However, in recent years there has been some progress. For example, among bachelor's degree holders, the difference between men's and women's earnings declined by more than 30 percent between 2002 and 2014, but has started growing again since then (Figure 3).

Many standard analyses tend to highlight the achievement of women by showing the growth in women's earnings over time. If the achievements of women are examined over time in isolation, then the story is a very positive one of struggle and ever greater accomplishment. However, this type of analysis has inherent biases. Such an approach holds the implicit assumption that the labor market is inherently sex-segregated by skill, education, tenure, and other given factors. It creates an artificial division between men and women, where the earnings achievements of women count separately from the earnings achievements of men. Today, many women and men compete for the same jobs, particularly white-collar jobs. Furthermore, men and women compete for these jobs primarily based on education and experience. Yet, women's earnings still lag those of men at every education level, even within the same majors and controlling for full-time, full-year employment (Figure 4).

Figure 3. Except for graduate degree holders, the gender wage gap has declined across education levels since 1976.



Source: Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *Current Population Survey*, March supplement, 1975–2016.

Note: In 1996, the upper boundary on earnings in the CPS March supplement increased from \$199,998 to \$999,999. As a result, larger disparities in earnings are captured in 1996 and beyond. That is, earnings did not increase dramatically. Instead, higher values were reported at the top of the distribution.

Figure 4. Men’s earnings are higher than women’s at every level of educational attainment.



Source: Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *Current Population Survey*, March supplement, 2017 and *Survey of Income Program Participation*, 2009.

\* Earnings for certificate holders are median values from *Survey of Income Program Participation*, 2009, converted to 2016 dollars.

Even when women are engaged in the same high-paying careers as men, the wage gap is still evident. The fact that the gap remains demonstrates that lingering historical and cultural biases still exist. For example, more than 73 percent of CEOs are men,<sup>22</sup> and they tend to promote other men. Some of the gap can be explained by the more limited hours that women tend to work: women hold nearly two out of every three part-time jobs, and women average 37 hours of work per week compared to 40 hours per week for men.<sup>23</sup>

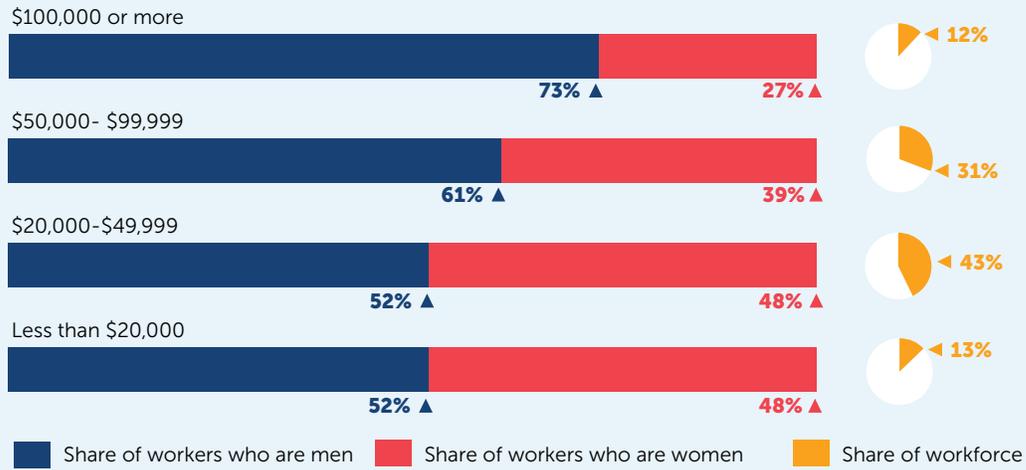
The persistent gender wage gap is a glaring example of a type of inequality in the United States that has had a disproportionately negative impact on women. Since the late 1970s, the distribution of earnings has been growing more unequal. The unadjusted mean earnings for all prime-age workers stands at about \$54,000. When controlled for full-time, full-year workers only, the mean earnings are just over \$62,000. Thirteen percent of Americans earn less than \$20,000 per year and nearly half of them are women (Figure 5). By contrast, 12 percent of Americans make more than \$100,000 per year, but only 27 percent of them are women. One concern is that women do not make up a larger proportion of high earners even after having attained an increasingly larger share of the nation’s college degrees. Even when controlling for education, the inequality deepens.

Of employed Americans with at most a high school diploma earning less than \$25,000 per year, 52 percent are women (Figure 6). Even after earning an associate’s degree, women make up 69 percent of workers with this educational attainment who earn below \$25,000 per year. Among employed Americans with a graduate degree earning more than \$100,000 per year, only 33 percent are women.

22. Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2016.

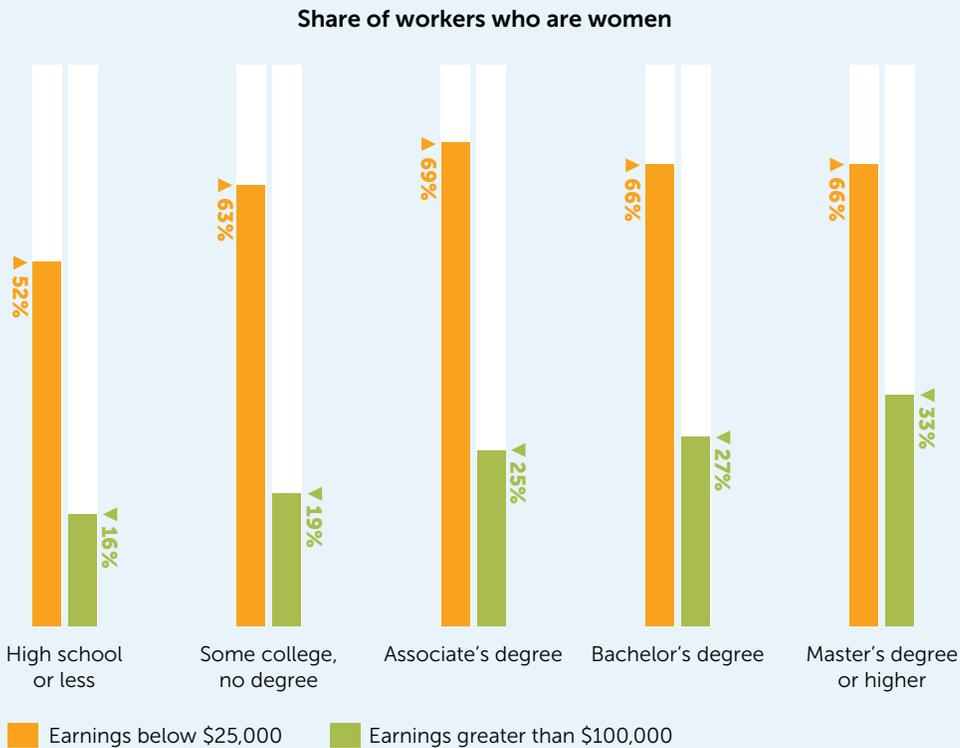
23. Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *Current Population Survey*, March supplement, 2017.

Figure 5. Women are less likely to be working in high-paying jobs and disproportionately found in low-paying jobs, even when accounting for full-time, full-year employment.



Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey* data, 2012–2016 pooled.

Figure 6. Regardless of education level, Americans earning below \$25,000 per year are more likely to be women.



Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey* data, 2012–2016 pooled.

Note: The wage categories used in this table are for all prime-age (25–54) workers (full-time and part-time).

## US female labor force participation lags many OECD countries that have more generous support for working mothers.

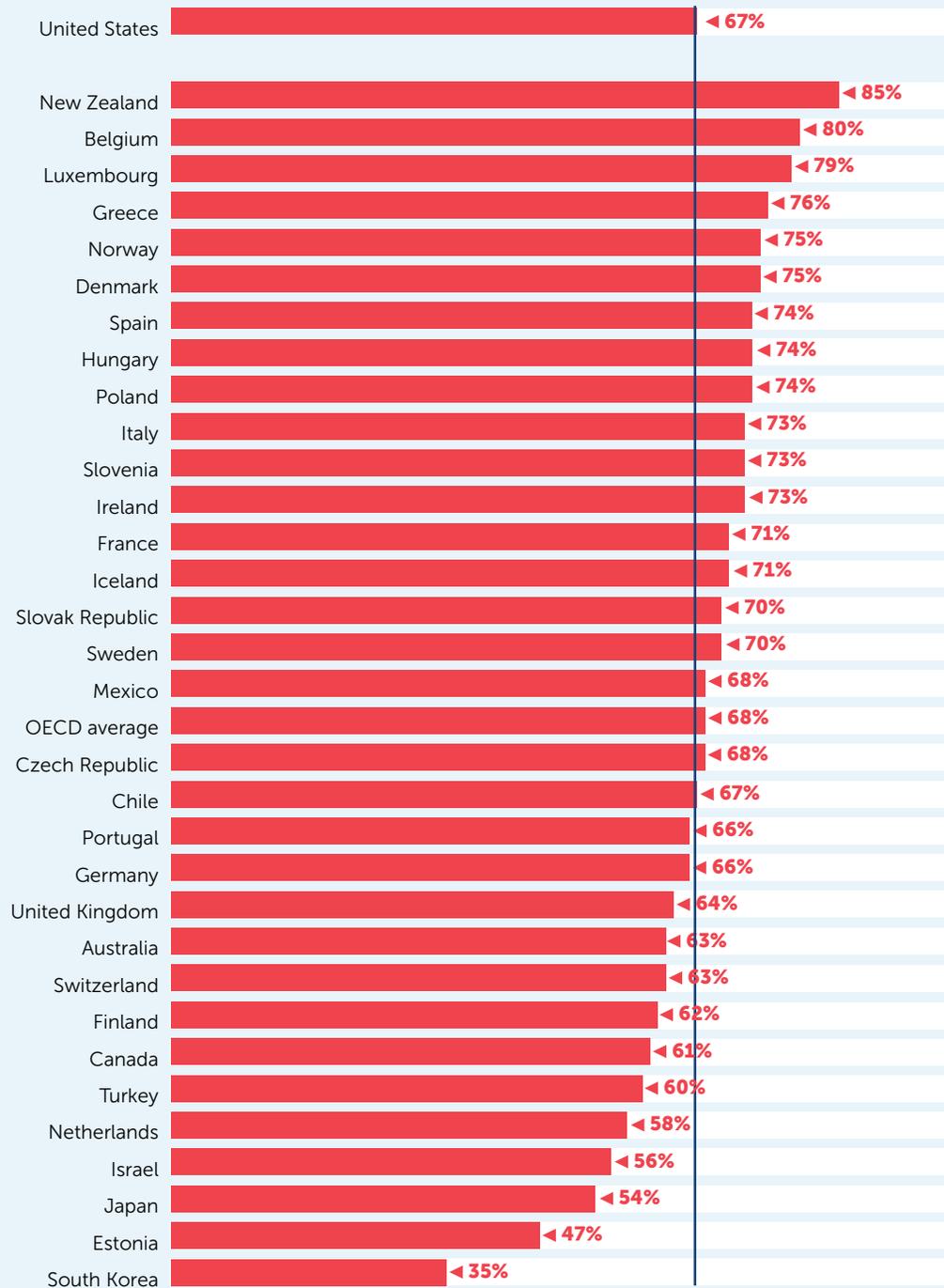
The United States trails many of its Organisation for Economic Co-operation and Development (OECD) peers in terms of women's participation in the labor force. In 2015, the US labor force participation rate was 67 percent, coming in just below the OECD average of 68 percent (Figure 7). The US ranks 18th out of the 32 nations measured on the list, which is led by New Zealand, Belgium, and Luxembourg. The female labor force participation rate in the United States has been slowly declining since 2000, when it was 71 percent.

The explanations for the disparity in labor force participation between the US and other OECD countries vary, but primarily depend on changing attitudes toward mothers at work and the greater level of support for mothers generally provided in many OECD countries. For example, French mothers get a full 16 weeks of paid leave for their first and second child, and 26 weeks of paid leave for a third child. They also have access to an income-based government subsidy that can be used toward child care or nanny services. Working mothers can take their children to very affordable income-based nationally regulated daycare centers from the time children are about six weeks old. Toddlers also get three free years of preschool and one free year of kindergarten.

By comparison, US federal law mandates a minimum of 12 weeks *unpaid* leave only to mothers tending to a newborn or a newly-adopted child. The US has one of the shortest federally mandated maternity leaves in the industrialized world and has not passed laws requiring businesses to offer paid maternity leave to their employees. These US policies have a far-reaching impact. American women must often sacrifice high-wage jobs that offer employee-based healthcare, benefits, and vacation time for time spent with children and the opportunity for more flexible work hours. Child care costs also have soared—a sick child can mean lost wages for workers with no sick days. With these types of alternatives, it is not surprising that labor force participation for US women continues to trail other OECD countries.

American women also lag their OECD peers in closing the gender wage gap. On average, full-time and self-employed women in the US made 82 percent as much as their male colleagues in 2015, a ratio which has hardly changed in the past 10 years. This 82 percent puts the United States below the OECD average of 85 percent and in 23rd place out of 32 countries (Figure 8). Again, New Zealand, Belgium, and Luxembourg lead the way, with women in those countries making 94 percent as much as their male colleagues.

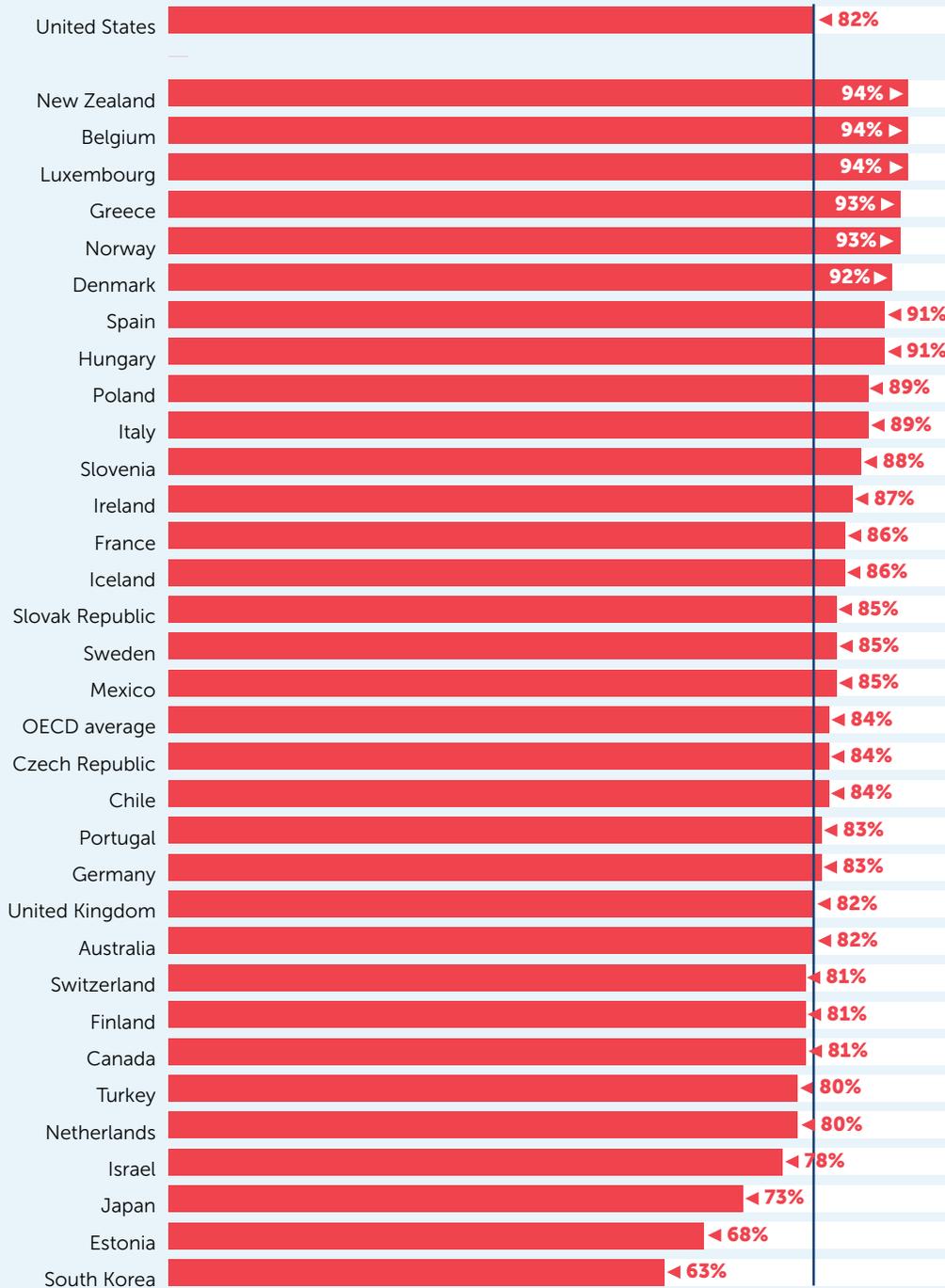
Figure 7. Female labor force participation rates (ages 15–64) are higher in many OECD countries than in the United States.



Source: Labor Force participation rate (indicator), OECD, 2015.  
 Note: The vertical line represents the rate of the United States.

Figure 8. The United States trails many of its OECD peers in closing the wage gap.

**Gender wage gap (women's earnings as percent of men's earnings)**



Source: OECD, Gender wage gap (indicator), 2015. Data refer to full-time employees and to self-employed, gross earnings, decile ratios.

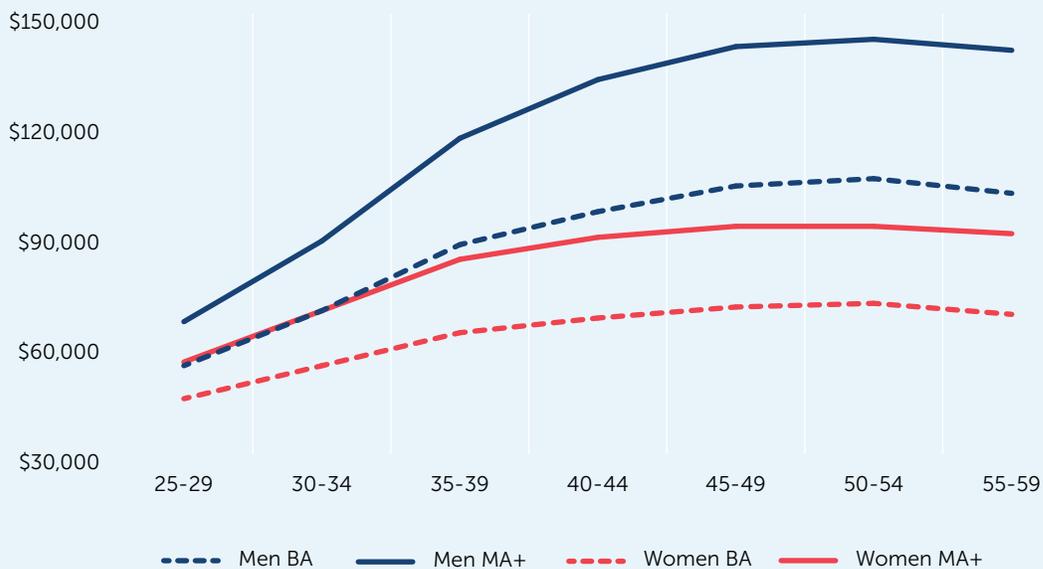
Note: The vertical line represents the gender wage gap in the United States.

## The gender wage gap for college graduates increases with age, peaking in their early 50s.

Among bachelor's degree holders in their peak earning years (50–54), women earn \$34,000 less per year than men (Figure 9). Over a career, the gender wage gap for workers with bachelor's degrees adds up to more than \$1 million.<sup>24</sup> For graduate degree holders, the lifetime earnings differential between men and women is more than \$1.6 million.<sup>25</sup>

The wage gap persists even for women who get more education than men do, even before their careers are interrupted by parenthood. When the career starting gun fires, men take a quick lead and never look back. Women tend to keep within striking distance on earnings until they are in their mid-30s, then begin to fall back.

Figure 9. The gender wage gap for college graduates peaks at age 50–54.



Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2012–2016 pooled data.

Note: The earnings for all years were inflation-adjusted to 2016 dollars for consistent comparison. The legend labels “BA” and “MA+” represent bachelor’s degrees and master’s degrees and above, respectively.

24. Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *American Community Survey*, 2012–2016.

25. Ibid.

Men continue pulling farther ahead so that by the peak earning years, in their early 50s, the wage disparity between the sexes is at its highest.<sup>26</sup> Women entering high-wage occupations still earn less than men do.

Wage equality is not simply a matter of ensuring that women go into the highest-paying professions. They have already done that. Women have increasingly taken up a diverse array of professional careers. For example, in 1985, women composed just 18 percent of people working in law, 21 percent of chemists, and 11 percent of architects.<sup>27</sup> By 2016, women's share of employment in each of these select occupations increased substantially to 56 percent, 44 percent, and 29 percent, respectively.<sup>28</sup> Similar trends occurred in other traditionally male occupations such as engineer, economist, and purchasing manager. Still, 27 percent of the differences in earnings between men and women are due to occupational choices.<sup>29</sup> And, in every major occupational group, men earn more than women (Table 1).

**Table 1. Men consistently earn more than women in every major occupational group.**

Major occupational group	Women's share of employment	Women's earnings as a percentage of men's earnings
Healthcare support	88%	79%
Healthcare professional and technical	74%	61%
Education	70%	81%
Sales and office support	57%	65%
Social science	52%	92%
Community services and arts	49%	82%
Managerial and professional office	44%	74%
Food and personal services	40%	65%
STEM	24%	80%
Blue collar	12%	70%

Source: Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *Current Population Survey* data, 2017.

Part of the answer to the persistent gender wage gap is that, even when women enter higher-paying fields, they are more likely to gravitate toward lower-paying occupations compared to men. Take law, for instance: female lawyers earn more than twice as much (\$126,000) as paralegals and legal assistants (\$52,000), but women nevertheless compose a much larger share of paralegals and legal assistants. They make up 85 percent of paralegals and legal assistants and only 44 percent of lawyers.<sup>30</sup>

Similarly, in medicine, women have much higher representation in lower-paying fields. A female physician or surgeon can expect to make \$182,000 annually, but only 43 percent of physicians and surgeons are women. A dietician or nutritionist can expect to make \$48,000 per year, and 90 percent of them are women. The theme carries over into engineering. On average, the highest-paying engineering field for women is petroleum engineering, with average earnings of \$142,000 per year. However, only about 20 percent of petroleum engineers are women. One of the lowest-paying engineering occupations is environmental engineer, in which women earn \$77,000 annually. It also has the largest share of women of any occupation in engineering; women compose 33 percent of environmental engineers.<sup>31</sup>

26. Georgetown University Center on Education and the Workforce analysis of data from US Bureau of Labor Statistics, *Current Population Survey*, 2017.

27. Georgetown University Center on Education and the Workforce analysis of data from US Bureau of Labor Statistics, *Current Population Survey*, 1985.

28. Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *American Community Survey*, 2016.

29. Blau and Kahn, "The Gender Pay Gap," 2007.

30. Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2016.

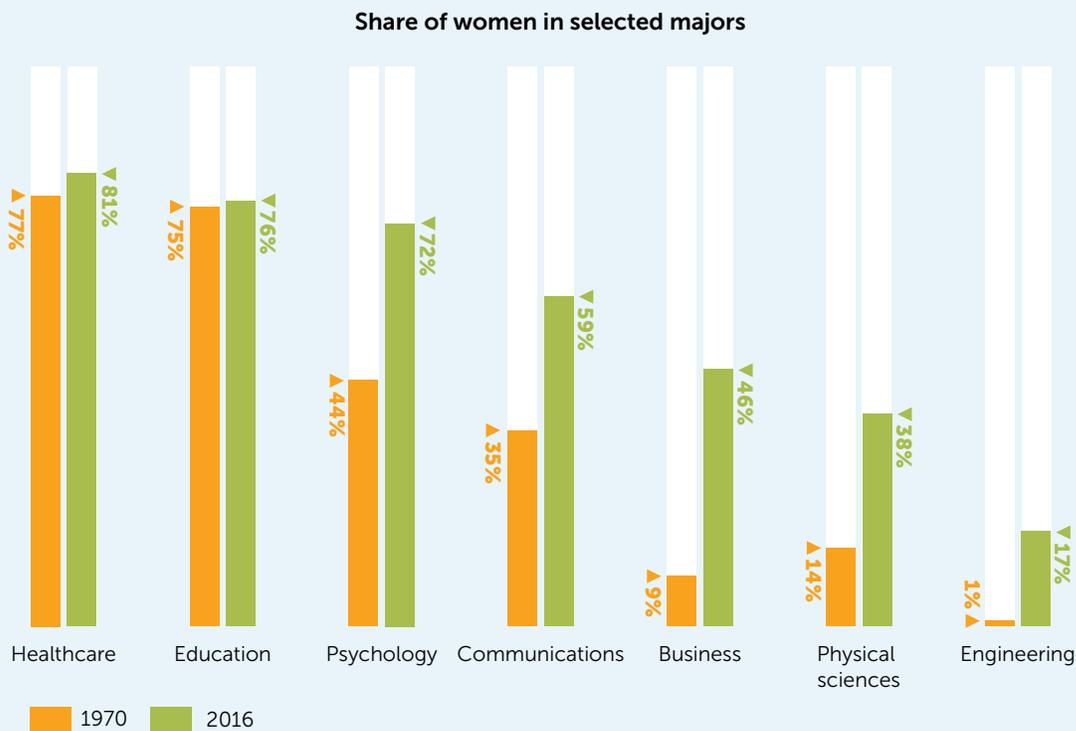
31. Ibid.

## Women disproportionately gravitate to college majors and jobs that emphasize service to others and are undervalued in labor markets.

In ever greater numbers, women are entering high-paying majors long dominated by men. Women now make up nearly half of business majors and nearly two-fifths of majors in the physical sciences (Figure 10). However, simply making inroads into those majors is not leveling the playing field. The specific majors that women choose are still largely traditional, defined by such interests and values as nurturing, caregiving, and social human interaction. Women dominate two of the lowest-paying majors, education and psychology. Among education majors, 76 percent are women today, compared to 75 percent in 1970. Also, 72 percent of psychology majors are women today, compared to 44 percent in 1970.<sup>32</sup>

Women's majors have contributed to the occupational segregation that heavily influences their low earnings relative to men. Women are increasingly majoring in areas that seem to promise higher earnings, but it will take time for them to make significant inroads in employment within high-paying and previously male-dominated occupations. Women continue to be underrepresented in engineering, one of the top paying fields, although the share of female engineers grew from 1 percent in 1970 to 17 percent in 2016.

Figure 10. While women have made significant strides in pursuing traditionally male-dominated majors, many major choices remain highly segregated.



Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey* data, 2016, and *Decennial Census* data, 1970.

32. The career pathways of today's psychology majors differ from those of psychology majors in 1970. In 1970, a bachelor's degree was sufficient to become a private practitioner, whereas currently becoming a licensed private practitioner requires at least a master's degree. Many students who major in psychology at the bachelor's degree level go into careers in other fields, such as marketing and early childhood education.

The most popular majors pursued by women who graduate with bachelor's degrees today are in healthcare, business, psychology, social sciences, history, and education.<sup>33</sup> In 1970, 77 percent of health professions graduates at the baccalaureate level were women. By 2016, that number increased to 81 percent. In communications, the proportion of women increased from 35 percent to 59 percent, and in psychology from 44 percent to 72 percent (Figure 10). These data demonstrate that, in the past as well as in the present, women tend to major in disciplines that involve nurturing, caregiving, and community service, occupations that generally are considered people-oriented.

The significant increase in participation in higher education by women over the past few decades explains some of this increase in the number of female graduates. Also, more women are studying in traditionally male-dominated areas.

In 1970, about 9 percent of workers graduating from business programs were women. By 2016, 46 percent were women. During the same period, the percentage of women who majored in physical sciences increased from 14 percent to 38 percent (Figure 10). So, there has been some movement of women into these more-lucrative careers.

Societal attitudes on gender roles have shifted, leading to changes in occupations that women select. In 1977, 74 percent of working men and 52 percent of working women agreed that men should be breadwinners and women should stay at home. By 1997, those shares had declined to 42 percent of working men and 40 percent of working women.<sup>34</sup> Factors such as easier access to birth control and early fertility have helped women to make career decisions that in turn have contributed to narrowing the gender wage gap.<sup>35</sup>

Though greater numbers of women graduate from college than men, and women have penetrated many traditionally male-dominated majors, segregation in majors is still very much a characteristic of enrollment and graduation patterns.

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33. US Department of Education, National Center for Education Statistics, *Digest of Education tables*, 2015.

34. Bradbury and Katz, "Women's Rise," 2005.

35. Bailey, et al., "The Opt-in Revolution?," 2012.

## The gender wage gap is largest in the highest-paying fields.

Male-dominated fields tend to provide higher earnings across the board. Architecture, engineering, computers, statistics, and mathematics are among the majors that lead to the highest-paying careers, but less than a quarter of college graduates in these fields are women. Education, psychology, and social work, by contrast, have some of the lowest earnings across the board, and all are fields in which more than 70 percent of workers are women.

Nevertheless, in all fields, whether they are sex-segregated or integrated, men with bachelor's degrees consistently earn more than women with bachelor's degrees (Table 2).

**Table 2. Male-dominated science and math college majors have the largest gender wage gaps.**

	Majors	Share female prime-age workers	Mean earnings (women)	Mean earnings (men)	Earnings Premium for men
Both sexes fairly equally represented	Biology and life science	54%	\$59,000	\$73,000	24%
	Humanities and liberal arts	54%	\$58,000	\$74,000	28%
	Business	47%	\$68,000	\$95,000	40%
♂ Male-dominated	Architecture and engineering	17%	\$79,000	\$97,000	23%
	Agriculture and natural resources	34%	\$54,000	\$65,000	20%
	Computers, statistics, and mathematics	24%	\$77,000	\$96,000	25%
	Industrial arts, consumer services, and recreation	44%	\$51,000	\$73,000	43%
	Law and public policy	41%	\$52,000	\$71,000	37%
	Physical sciences	41%	\$63,000	\$85,000	35%
	Social science	45%	\$66,000	\$93,000	41%
♀ Female-dominated	Arts	55%	\$53,000	\$66,000	25%
	Communications and journalism	56%	\$66,000	\$78,000	18%
	Education	76%	\$45,000	\$58,000	29%
	Health	83%	\$65,000	\$76,000	17%
	Psychology and social work	73%	\$51,000	\$70,000	37%

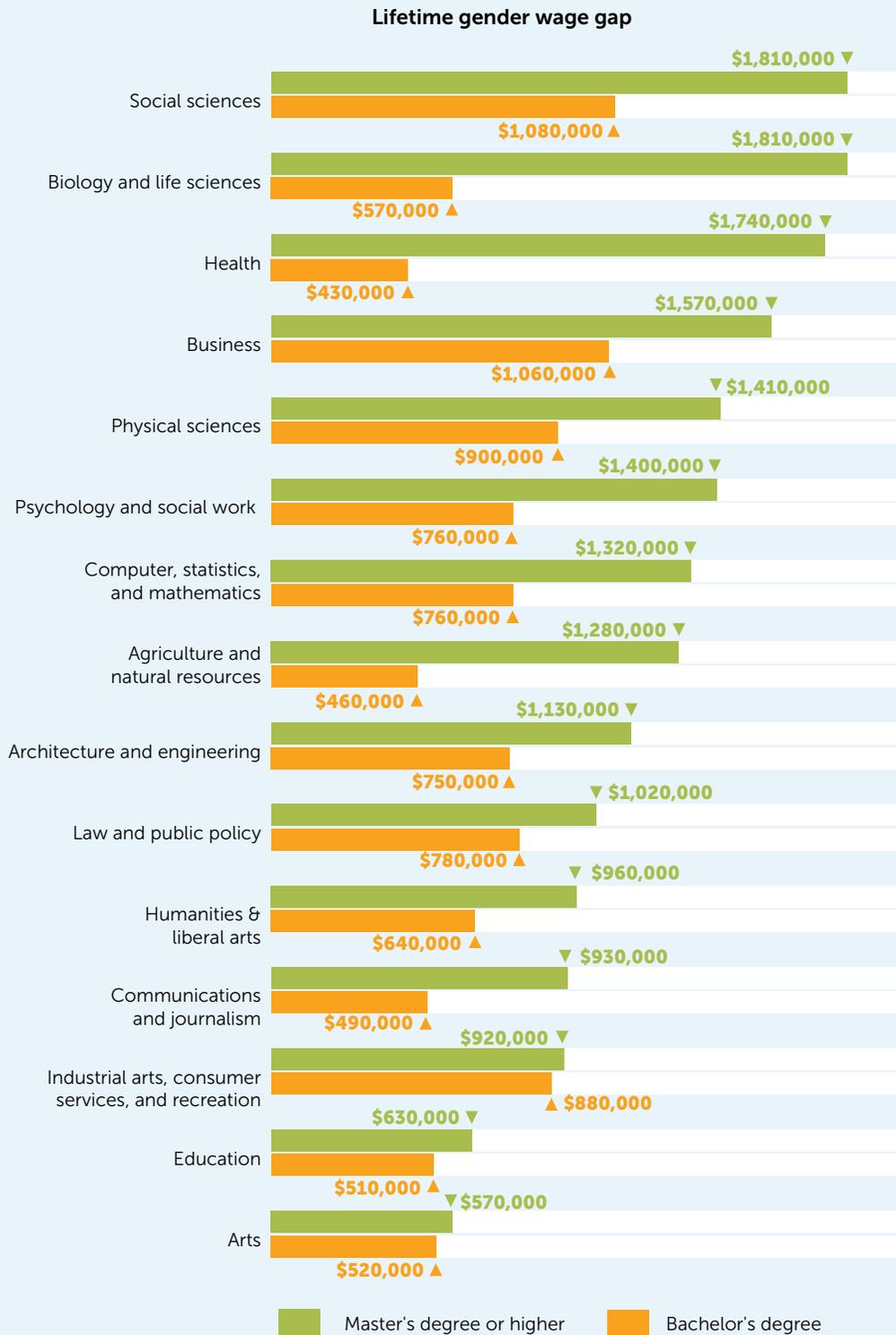
Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2016.

We see a similar gender wage gap by major for men and women with the same educational attainment level. For example, among bachelor's degree holders, the largest gender wage gaps are between men and women who majored in social science and business. Over a lifetime, women with bachelor's degrees in social science or business earn more than \$1 million less than men who major in those fields. Among business majors who go on to earn graduate degrees, women earn \$1.6 million less than men over the course of their careers. Similarly, among law and public policy majors who go on to earn graduate degrees, women earn more than \$1 million less than men (Figure 11).<sup>36</sup>

Among graduate degree holders, social science majors have the largest gender wage gap (\$1,810,000) and arts majors have the smallest (\$570,000).

36. The *American Community Survey* dataset provides detailed information on the field of study for bachelor's degrees but not the field of study for graduate degrees. As a result, we know that a person in the survey would have attained a graduate degree as their highest credential, but we do not know the field of that person's graduate degree.

Figure 11. The lifetime gender wage gap is largest for social science majors: \$1.8 million for graduate degree holders and \$1.1 million for bachelor's degree holders.



Source: Georgetown University Center on Education and the Workforce analysis of US Census Bureau, *American Community Survey* data, 2012–2016 (pooled).

## Associate's degrees in technical fields, which women tend to shy away from, pay more.

The number of associate's degrees awarded annually has more than tripled since the 1970s,<sup>37</sup> and women have accounted for three-quarters of that growth. Yet even with these degrees, earnings for women continue to lag those of their male counterparts. Also, women are less likely to pursue fields of study with the greatest potential economic rewards.

Overall, the median male associate's degree holder earns \$56,000 annually, 43 percent more than the median female associate's degree holder, who earns \$39,000 (Table 3). Furthermore, the wage premium (that is, the increase in wages resulting directly from the possession of a college degree) over a high school education is greater for men than it is for women: female associate's degree holders earn 44 percent more than women with high school diplomas, while male associate's degree holders earn 47 percent more than men with high school diplomas (Table 3).

**Table 3. The median earnings of associate's degree holders are significantly higher for men than women in both absolute and relative terms.**

Sex	Earnings (2016\$)		Wage premium over HS	
	AA	HS	Dollar increase	Percent increase
All	\$47,000	\$32,000	\$15,000	47%
Men	\$56,000	\$38,000	\$18,000	47%
Women	\$39,000	\$27,000	\$12,000	44%

Source: Georgetown University Center on Education and the Workforce analysis of data from the *Survey of Income and Program Participation* (combined 2004 and 2008 surveys).

As with bachelor's degrees, the enormous gap between men's and women's earnings for associate's degree holders results, in part, from decisions by women to study and work in different occupational fields than men. Men are four times more likely to enroll in STEM fields, while women are three times more likely to study health professions, including nursing. Men are also about twice as likely to study other career and technical education (CTE) fields.<sup>38</sup>

While health sciences is both the most common (23%) and the highest-compensated (\$51,000 annually) field of study for female associate's degree holders, women's median earnings in this major at the associate's degree level are still less than that of male associate's degree holders overall. Outside of the health sciences, women with associate's degrees tend to be in lower-earning majors including business/office management (22% of female associate's degree holders), liberal arts/humanities (8%), and education (6%). Men are more likely to attain associate's degrees in fields with greater financial rewards such as computer and information services (12% of men with associate's degrees vs. 4% of women), other vocational/technical studies (12% of men vs. 3% of women), and engineering/drafting (11% of men vs. 1% of women) (Table 4).

37. Georgetown University Center on Education and the Workforce analysis of data from the US Department of Education, *Digest of Education Statistics* tables, 2015.

38. Georgetown University Center on Education and the Workforce analysis of data from the US Department of Education, *2011–12 National Postsecondary Student Aid Study (NPSAS: 12)*, 2012.

**Table 4. Business or office management and health sciences are the most common fields of study among associate's degree holders.<sup>39</sup>**

Field of Study	Share of workers with associate's degrees		
	All	Men	Women
Business/office management	19%	15%	22%
Communications	1%	2%	1%
Computer and information services	8%	12%	4%
Education	4%	2%	6%
Engineering/drafting	5%	11%	1%
Health sciences	15%	5%	23%
Liberal art/humanities	8%	7%	8%
Nature sciences (biological and physical)	2%	2%	2%
Police/protective services	2%	4%	1%
Social sciences/history	2%	2%	2%
Visual and commercial arts	1%	1%	1%
Other vocational/technical studies	7%	12%	3%
Other	24%	24%	24%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Georgetown University Center on Education and the Workforce analysis of data from the *Survey of Income and Program Participation* (combined 2004 and 2008 surveys).

Even within the same field of study, men with associate's degrees typically make more than women with associate's degrees. For example, among associate's degree holders who studied business and office management, the median annual earnings for men (\$56,000) are substantially higher than for women (\$38,000) (Figure 12). This pattern holds true across occupational fields in a variety of areas, including social sciences and humanities, higher earning STEM majors (which men are more likely to pursue), and even women-dominated fields such as health sciences and education. At the median, male associate's degree holders consistently earn more than female associate's degree holders, whatever their field of study.

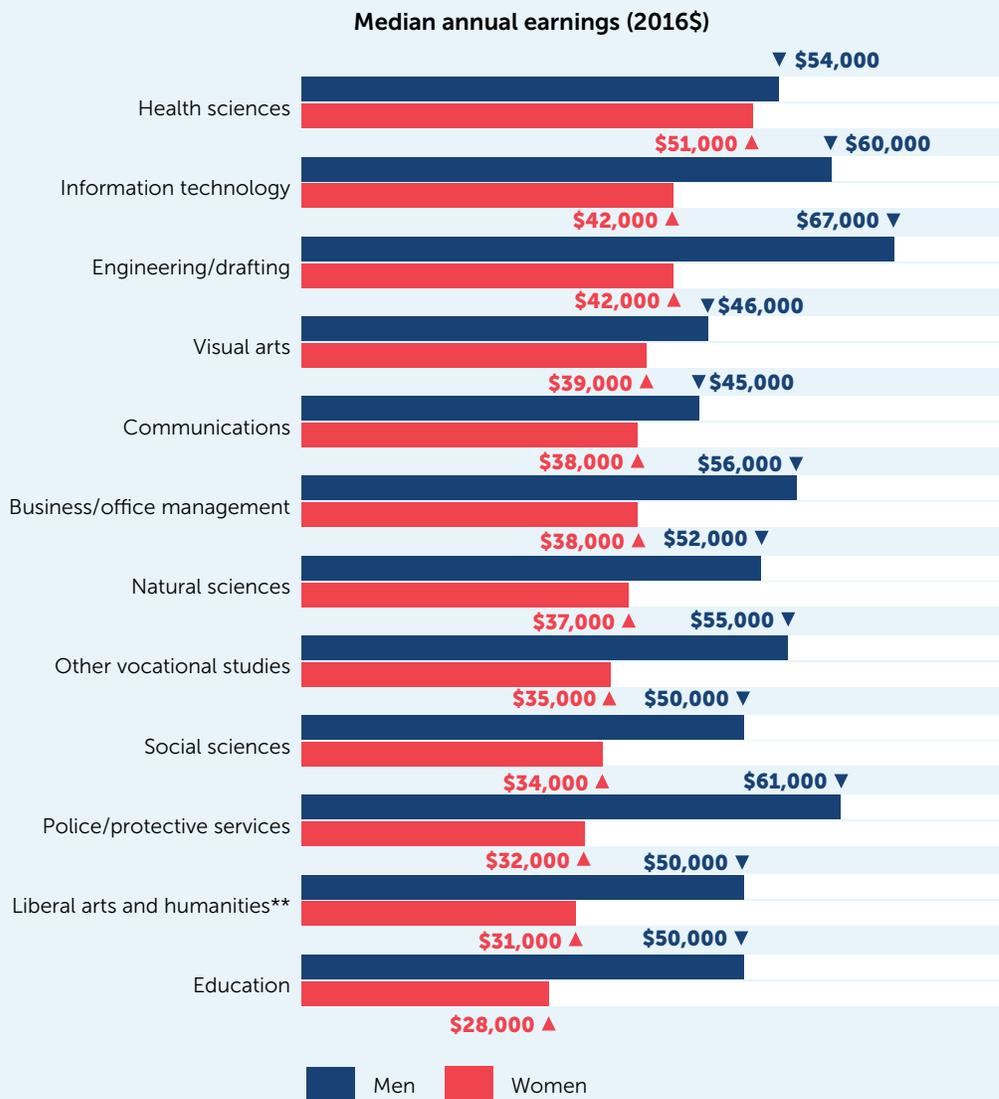
The earnings of associate's degree holders are also significantly affected by whether they work in the field they studied. Given females' lower earnings relative to males at the associate's degree level, it is especially important for women with associate's degrees to be working in their field of study.

Overall, at the associate's degree level, women are more likely to be working in their field than men. Sixty percent of women are considered to be working in their field, compared to 51 percent of men. The earnings premium for working in the field of study—the difference in earnings between associate's degree holders who work in their field and those who work outside it—is greater for women than men (65% for women compared to 47% for men).<sup>40</sup>

39. One-third of those surveyed listed their field of study as "other." These cases were omitted from these calculations.

40. Georgetown University Center on Education and the Workforce analysis of data from the *Survey of Income and Program Participation* (combined 2004 and 2008 surveys).

Figure 12. Median annual earnings for male associate's degree holders are higher than those of their female counterparts across occupational fields.



Source: Georgetown University Center on Education and the Workforce analysis of data from the *Survey of Income and Program Participation* (combined 2004 and 2008 surveys).

\*\* The earnings for liberal arts graduates are underestimated here because we do not account for students who study liberal arts and transfer to a four-year college.

However, the premium for working in field varies significantly among associate's degree fields of study. Among women with associate's degrees, those in police and protective services jobs and in the health sciences receive the greatest premium for working in their fields. A woman with an associate's degree in police and protective services earns a median of \$61,000 annually when she works in field, but only \$23,000 when she works outside her field of study. Similarly, a woman with an associate's degree in health sciences who works in field earns a median \$58,000 annually, but only \$24,000 when she works outside her field. The premium for working in field is also high for women with associate's degrees in agricultural sciences, business, information technology, engineering/drafting, and the natural sciences (Table 5).

Women with associate's degrees in education and women who pursue vocational studies do not receive a wage premium for working in field, likely because these occupations are relatively low paying. For women with associate's degrees in liberal arts or communications, the premium for working in field is relatively small at 10 percent and 21 percent respectively (Table 5).

**Table 5. Among women with associate's degrees, those in police and protective services and health sciences receive the greatest premium for working in their field of study.**

Field of study	Median annual earnings (2016 \$)		In-field premium	
	In-field	Out-of-field	Dollar increase (\$)	Percent premium (%)
Police/protective services	\$61,000	\$23,000	\$38,000	165%
Health sciences	\$58,000	\$24,000	\$34,000	142%
Agricultural sciences	\$42,000	\$21,000	\$21,000	100%
Business	\$43,000	\$22,000	\$21,000	95%
Information technology	\$62,000	\$33,000	\$29,000	88%
Engineering/drafting	\$73,000	\$39,000	\$34,000	87%
Natural sciences	\$60,000	\$32,000	\$28,000	88%
Visual arts	\$56,000	\$35,000	\$21,000	60%
Social sciences	\$47,000	\$34,000	\$13,000	38%
Communications	\$40,000	\$33,000	\$7,000	21%
Liberal arts and humanities	\$33,000	\$30,000	\$3,000	10%
Education	\$28,000	\$28,000	\$0	0%
Other vocational studies	\$36,000	\$36,000	\$0	0%

Source: Georgetown University Center on Education and the Workforce analysis of data from the *Survey of Income and Program Participation* (combined 2004 and 2008 surveys).

## Certificates have limited labor market value for women.

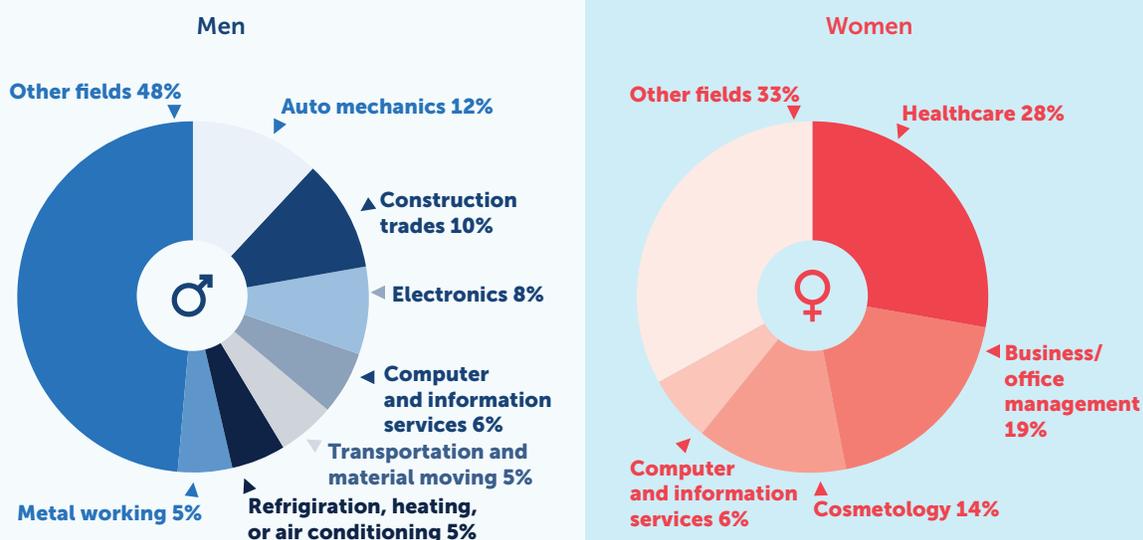
The financial consequences of attaining higher levels of education are profound, affecting a woman's ability to support herself and her family. Women who pursue certificates often pursue them after high school; in some cases, they can serve as a stepping stone on an education pathway. Many students with an associate's degree or higher who have trouble finding jobs may decide to earn a certificate in a related field—for example, in office management or healthcare—to make themselves more marketable.

The wage premium conferred by a certificate, as compared to a high school diploma, is 27 percent for men but just 16 percent for women.<sup>41</sup> This disparity is so great that it may be driving women to opt instead for at least a two-year associate's degree.

Of the 15 different certificate fields of study identified at postsecondary institutions in the United States, 13 are extremely "sex-segregated," meaning that one sex (either male or female) makes up at least 75 percent of enrollment.<sup>42</sup> This may be due in part to the types of certificates women earn—for instance, cosmetology, healthcare, or food service—compared to certificates in higher-paying fields—such as auto mechanics and air-conditioner repair—that men commonly earn (Figure 13).

Figure 13. Men are more likely to pursue certificates in auto mechanics, construction, and electronics, while women often pursue certificates in business, healthcare, and cosmetology.

Distribution of certificates by field of study



Source: Georgetown University Center on Education and the Workforce analysis of Carnevale, et al., *Certificates*, 2012.  
Note: Percentages may not add to 100% due to rounding.

41. Carnevale et al., *Certificates*, 2012.  
42. Ibid.

The cost of obtaining a postsecondary vocational certificate may not be worth it for women if they do not find a job directly related to their field of study. In fact, women with just a high school diploma out-earn women who hold certificates when the latter work in jobs not directly related to their educational credential (Table 6).

**Table 6. Not a single certificate results in a living wage for women, on average. Men earn on average 60 percent more in jobs that require postsecondary vocational certificates than do women.**

	Majors	Proportion female (%)	Median earnings—women (\$)	Median earnings—men (\$)	Earnings premium for men (%)
Both sexes fairly equally represented	Food service	46%	\$23,000	\$35,000	52%
	Computer and information services	49%	\$33,000	\$50,000	52%
♀ Female-dominated	Business/office management	81%	\$36,000	\$49,000	36%
	Healthcare	90%	\$28,000	\$46,000	64%
	Cosmetology	91%	\$25,000	\$39,000	56%
♂ Male-dominated	Transportation and materials moving	11%	\$28,000	\$48,000	71%
	Police/protective services	19%	\$31,000	\$49,000	58%
Median earnings by field regardless of field			\$30,000	\$48,000	60%

Source: Georgetown University Center on Education and the Workforce analysis of Carnevale, Rose, and Hanson, *Certificates*, 2012.

## Why do women bother to earn certificates when they offer so little apparent financial benefit?

Women are still bothering to earn certificates, despite the lack of financial benefit, for two major reasons. First, many part-time employment opportunities continue to exist for women in these fields, and women may have chosen the fields for the added convenience of being able to set their hours or to move in and out of the labor force. These workers may be getting non-monetary benefits from their certificates, such as increased job freedom, career relevance, and reduced work stress.<sup>43</sup>

Second, few middle-skilled jobs with middle-class earnings are available to women who do not have at least a two-year college degree, so there might be better opportunities for holders of the postsecondary vocational certificate—especially if it offers opportunities for self-employment.

Jobs in healthcare, transportation, cosmetology, and food service result in especially low returns for women, with pay levels below the average earnings of other jobs commonly held by workers with certificates. Jobs in business and office management and in computer and information services pay better, but they are exceptions to the rule that certificates have limited labor-market value for women.

43. Rosenbaum and Rosenbaum, *Money Isn't Everything*, 2016.

## Industry test-based certifications have some positive marginal labor market value for women.

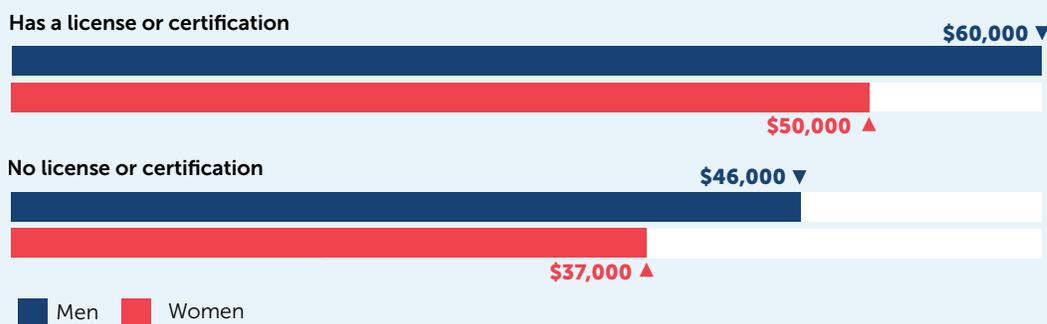
Industry test-based certifications or state licenses, such as those that apply to a specific trade or professional designation, often are earned by a person in a particular field of work to assure their qualification to perform the job or task. Many professional certifications need to be renewed regularly—usually every two to three years. The holder of the professional certification must then perform certain tasks, such as pass an exam or submit proof of continuing education credits, to extend the validity of the certification.

About 39 million Americans (22% of the labor force) hold some type of industry test-based certification or state license, more than half (52%) of whom are women.<sup>44</sup>

Industry test-based certifications or state licenses are valuable for women. On average, a woman with a professional certification or occupational license can earn \$13,000 more per year compared to a woman without one. This is only slightly less than the \$14,000 earnings boost, on average, that a certification or license can provide for a man. At \$50,000 per year, a woman with a certification earns \$8,000 more than the average woman's earnings of \$42,000 (Figure 14).

Women are generally better off with a state occupational license or industry-based certification than without one. The marginal value of a state license or industry-based certification, however, varies by other characteristics, such as the occupation selected and education level. These credentials are of highest value for women with a bachelor's degree or higher. A woman with a bachelor's degree or higher can earn an average \$8,000 more per year with a state occupational license or professional certification than without one; a man with bachelor's degree or higher and a certification or a license can earn \$3,000 more (Figure 15).

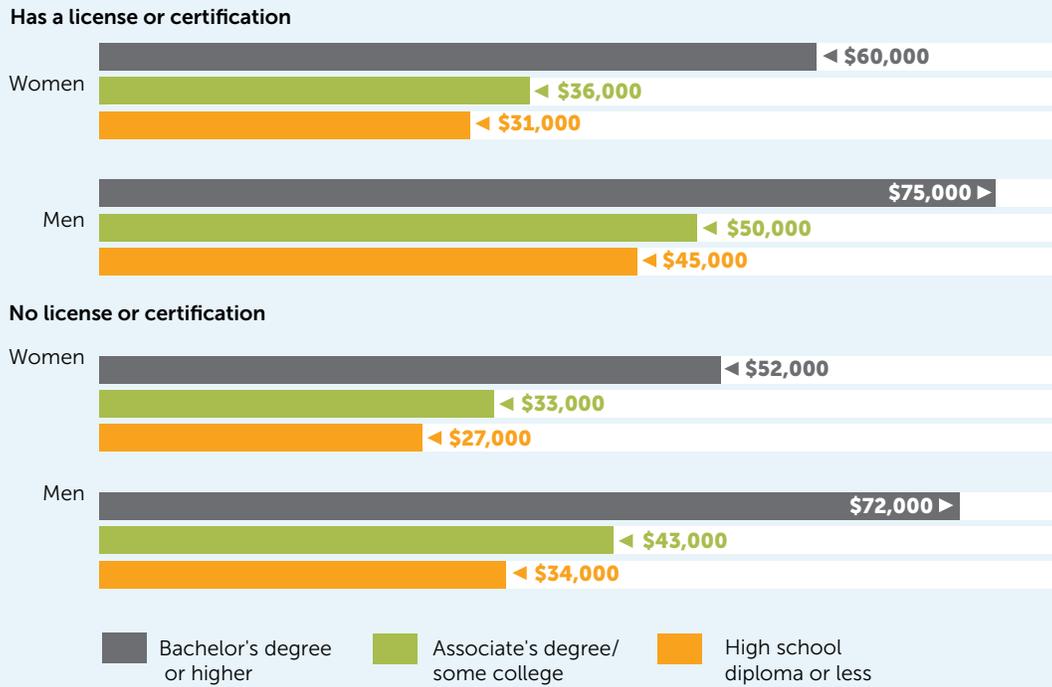
Figure 14. A license or certification leads to \$13,000 more in average annual earnings for women and \$14,000 more for men.



Source: Georgetown University Center on Education and the Workforce analysis of data from the *Current Population Survey (Basic Monthly)*, 2016.

44. Georgetown University Center on Education and Workforce Analysis of data from the *Current Population Survey*, 2016.

Figure 15. A license or certification leads to higher average earnings, especially for workers with more education.



Source: Georgetown University Center on Education and the Workforce analysis of data from the *Current Population Survey (Basic Monthly)*, 2016.

**A woman with a bachelor's degree or higher can earn an average \$8,000 more per year with a state occupational license or professional certification than without one; a man with bachelor's degree or higher and a certification or a license can earn \$3,000 more.**



# SOCIAL AND CULTURAL FACTORS



## Social and cultural barriers block access to high-wage jobs for low-income women.

For the most part, girls and boys in elementary school appear roughly to be equally prepared to pursue STEM majors in college. Data show that boys outperform girls only slightly in math and science on standardized tests in elementary school.<sup>45</sup> Upon college entry, math ability among men and women is roughly equal and occasionally even slightly in women's favor.<sup>46</sup> So why do girls not pursue college degrees or professions in STEM fields?

Implicit cultural biases and stereotypes play a significant role. For example, when teachers and parents tell girls that their intelligence is not static and can grow with experience and learning, girls do better on math tests and are more likely to say they want to continue to study math in the future.<sup>47</sup> While this was found to be true for all students, such encouragement was particularly helpful in improving girls' performance in math, an important finding considering the degree to which girls have internalized negative stereotypes about their math ability.<sup>48</sup>

Girls also tend to underestimate their math ability while, at the same time, holding themselves to higher standards than boys do, believing that they must be exceptional to succeed in what is perceived as a male field.<sup>49</sup> Even when girls have good grades and test scores, their lower self-assessment combined with their higher standard for performance means that fewer girls have aspired to STEM careers.<sup>50</sup>

Societal cues may be responsible for steering women to lower-paid professions in fields such as education and community services.<sup>51</sup> Traditional ideas about women's roles in society are visibly apparent in girls as early as middle school,<sup>52</sup> and the influence of these ideas on girls early in the career decision-making process is greater than the long-term prospect of someday earning a higher salary.<sup>53</sup> In fact, the potential earnings associated with career choices are rarely communicated to girls at an early age, particularly because society still does not tend to see women as the primary breadwinners in families.<sup>54</sup> These influences are communicated in subtle and varied ways, starting with the common expectation, for example, that little girls should play with dolls instead of with blocks.<sup>55</sup> Later influences include such factors as gender bias, classroom climate, sex stereotypes, the male-dominated culture of science and engineering departments in colleges, and the lack of female role models in male-dominated occupations.<sup>56</sup> These interests and values become key determinants in the occupational choices that women make and have major economic consequences.<sup>57</sup>

Disparities in pay are only symptoms of deep-seated biases and social pressures that affect women's decisions to gravitate to certain occupations, courses of study, and majors. These, in turn, have a powerful effect on women's economic bargaining power and lifelong earning potential.

Even when women select competitive majors, they choose occupations related to those majors that offer relatively lower pay, and they are less likely to change occupations once those choices have been made. A woman who earns a mathematics degree, for example, may go to work as a high school math teacher, while a man with the same degree might pursue a more lucrative career in fields such as aerospace engineering.

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45. National Center for Education Statistics. *National Assessment of Educational Progress, Science and Math Assessments*, 2009.

46. Goldin, "Will More of Our Daughters Grow Up to Become Economists?," 2013.

47. Hill, et al., *Why So Few*, 2010, relying on Dweck and Leggett, "A Social-Cognitive Approach to Motivation and Personality," 1988.

48. Dweck and Leggett, "A Social-Cognitive Approach to Motivation and Personality," 1988, and Good, et al., "Why Do Women Opt Out?," 2012.

49. Dweck and Leggett, "A Social-Cognitive Approach to Motivation and Personality," 1988; Good, et al., "Why Do Women Opt Out?," 2012; Correll, "Gender and the Career Choice Process," 2004; and Correll, "Constraints into Preferences," 2004.

50. Ibid.

51. Schieder and Gould, *Women's Work' and the Gender Pay Gap*, 2016.

52. Adler, et al. "Socialization to Gender Roles," 1992; Eagly, "Prejudice," 2004; Albert and Porter, "Children's Gender-Role Stereotypes," 1988.

53. LoBue and DeLoache, *Pretty in Pink*, 2011.

54. Capsi, "Life-Course Development," 2004.

55. Freeman, "Preschoolers' Perceptions of Gender Appropriate Toys and Their Parents' Beliefs about Genderized Behaviors," 2007.

56. Correll, "Gender and the Career Choice Process," 2001.

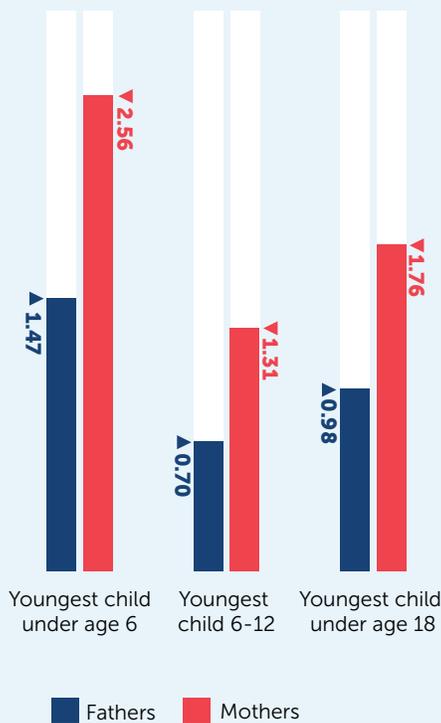
57. Vella, "Gender Roles, Occupational Choice and Gender Wage Differential," 1993.

## Much of the caretaking burden still falls on women.

In keeping with societal expectations, mothers still spend more time caring for children within the household than fathers do. According to the 2016 *American Time Use Survey*, child care includes providing physical care, reading to, playing with, educating, and other caring activities for children under 18 in the household.<sup>58</sup> For children under 18, fathers spend 0.98 hours per day in child care activities compared to mothers, who spend almost twice as much (1.76 hours per day) on child care (Figure 16). When narrowing down child care activities by age of the child, the difference between men and women in time spent caring for children becomes even starker with younger children. With children ages 6–12, fathers spend 0.70 hours per day while mothers spend 1.31 hours per day, and with children under 6, fathers spend 1.47 hours per day while mothers spend 2.56 hours per day.<sup>59</sup>

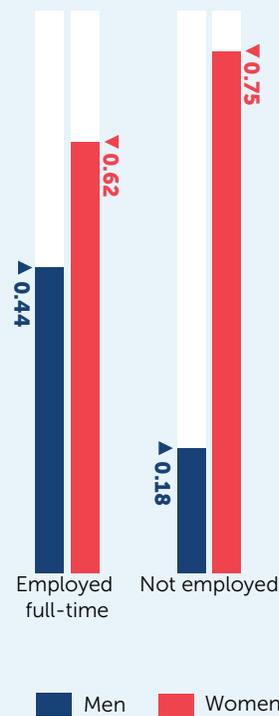
Even when narrowing the population to men and women who work outside of the home, women still spend more time, on average, caring for household members than men do. Women who are employed full-time spend 0.62 hours per day while men (also employed full-time) spend 0.44 hours per day (Figure 17). Unemployed women spend 0.75 hours per day in caring for household members, as opposed to 0.18 hours per day for unemployed men.

Figure 16. Mothers spend more hours per day than fathers in caring for household children.



Source: Bureau of Labor Statistics, *American Time Use Survey*, 2016. Data includes parents aged 15 and older.

Figure 17. Women spend more hours per day caring for household members, regardless of employment status.



Source: Bureau of Labor Statistics, *American Time Use Survey*, 2016.

58. Bureau of Labor Statistics. *American Time-Use Survey*, 2016.  
 59. Ibid.

However, when considering only adults without children under the age of 18 residing in the household, the gap between men and women narrows. Employed women spend 0.34 hours per day caring for people both inside and outside of the household, including elder care, whereas employed men spend 0.24 hours per day. Unemployed women spend more time in caretaking activities than their employed female counterparts, at 0.6 hours per day. Unemployed men, on the other hand, are similar and spend 0.55 hours per day in caretaking activities.

## Women's work interests and values often align with lower-wage jobs.

When faced with the same set of choices, women tend to select majors and occupations based on their non-cognitive and personality traits rather than on earnings or prestige. However, women's preferences in terms of work values and work interests cannot completely account for occupational segregation. Societal expectations, academic preparation, and other environmental factors also play roles in women's occupational choices. These can be classified according to the different emphases on values and interests that men and women place on their work.

- **Work values.** In male-dominated occupations, the work values linked to job satisfaction are *achievement*, *independence*, *working conditions*, and *support*; in female-dominated occupations, the most important work values for job satisfaction are *relationships*, *achievement*, and, to a lesser degree, *independence*. Achievement and independence are hallmarks of jobs that allow a worker to use the best of his or her abilities and to stand out from the crowd; not surprisingly, these are values common to both male- and female-dominated occupations. The big difference is *relationships*—this value is accorded high importance 75 percent of the time in female-dominated occupations.<sup>60</sup>
- **Work interests.** *Realistic*, *enterprising*, *conventional*, and *investigative* work interests are most highly associated with success in male-dominated occupations, which tend to involve hands-on problem solving and factual research; in female-dominated occupations, the traditional work interests linked to jobs are *social*, *enterprising*, and *conventional*. These interests usually describe jobs involving teaching and communicating with people, often in professions that provide service to others (Figure 18).

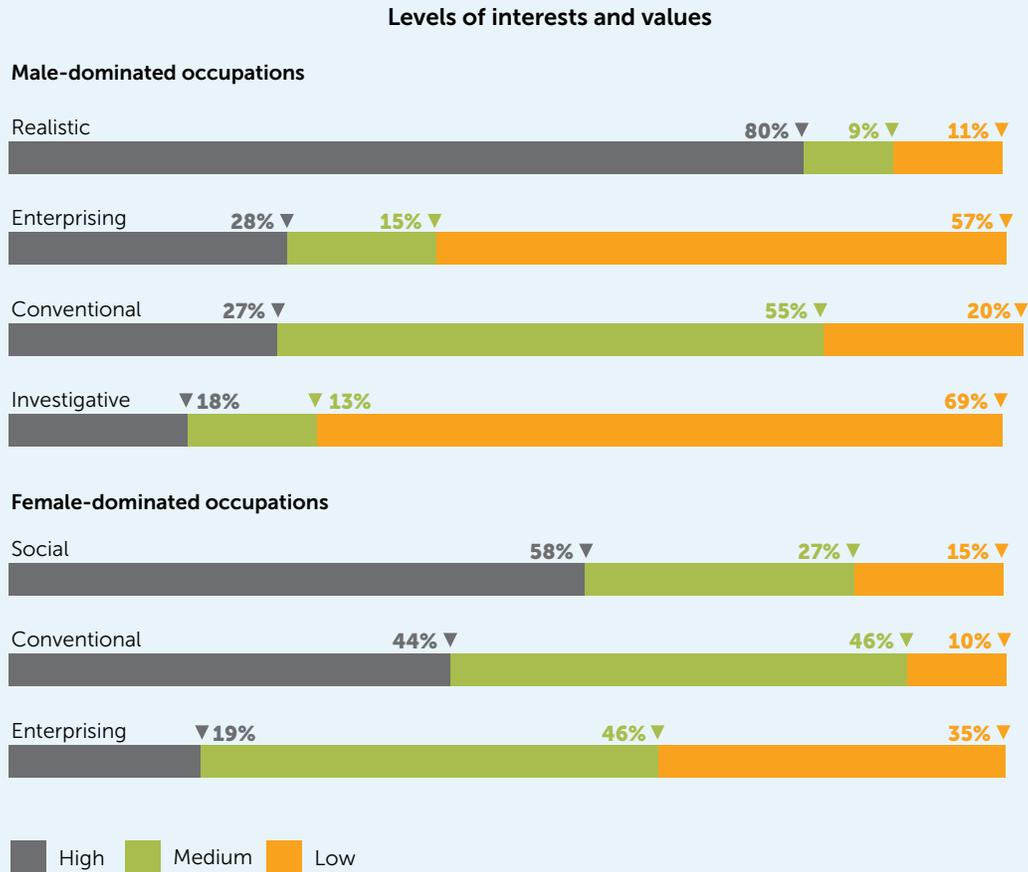
The rationale behind occupational segregation and the ultimate differences in decision-making by men and women in this regard is extremely complex and is thought to include historical, sociological, and physiological influences. Men's social behavior and psychology have been hypothesized as being distinctly different from those of women. For example, an experiment involving college students in the United Kingdom showed that in-group male behavior tended to be more competitive when an external threat was perceived, whereas women in the same circumstances did not alter their cooperative behavior.<sup>61</sup> These results can explain differences between men and women in competitive choices in social dilemmas as well as risk-reward decision making.

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60. Carnevale and Smith, *Get Smart*, 2014.

61. Vugt, et al., "Gender Differences in Cooperation and Competition," 2007.

Figure 18. Differences in interests and values between men and women can be more important than other factors in the decision to enter a particular career path.



Source: Georgetown University Center on Education and the Workforce analysis of the Bureau of Labor Statistics O\*NET 22.0 and the US Census Bureau's *American Community Survey*, 2016.

Other research has found that these stereotypes are not entirely accurate, and they certainly do not hold universally. Men do enjoy competition more than cooperation, but women enjoy cooperation just as much as competition.<sup>62</sup>

Occupational choices, in any case, have financial consequences. Male-dominated fields tend to pay higher earnings, even for those with relatively lower levels of educational attainment, such as production workers. Indeed, 30 percent of high school-educated men in production occupations earn at least \$35,000 per year; by comparison, only 5 percent of similarly qualified women earn that much.<sup>63</sup>

Why male-dominated fields pay higher earnings is less clear. It may be simply that society has historically and habitually valued production over relationships, or men's work over women's work. Whether this will evolve with the job market of the 21st century remains to be seen. What is clear is that, for now, women will be better able to achieve financial stability if they follow traditionally male paths of study and work.

62. Kivikangas, et al., "Gender Differences in Emotional Responses to Cooperative and Competitive Game Play," 2014.

63. Carnevale and Smith, *Get Smart*, 2014.

**Thirty percent of high school-educated men in production occupations earn at least \$35,000 per year; by comparison, only 5 percent of similarly qualified women earn that much.**



# RACE/ETHNICITY



## Underneath the gender wage gap, racial disparities are even deeper.

Women of all races are affected by the gender wage gap, although not all women are affected equally.<sup>64</sup> Women always earn less than White men, but those differences vary by race and ethnicity (Figure 19). On average, White and Asian women earn more than Black women who, in turn, earn more than Latina women.

Relative to White men, White women earn 75 cents on the dollar; Black women earn 62 cents on the dollar; and Latina women earn just 52 cents on the dollar (Figure 19). Since 1980, White women have consistently earned more than women from other racial/ethnic groups. The disparity between women's earnings in 1980 was relatively small, with only an 8-percentage point difference between Latina women and White women. By 2017, that disparity increased dramatically to 23 percentage points.

Across the years, in comparison to White men, women of all races and ethnicities have seen some improvements in earnings. White women earn 18 percentage points more relative to White men than they did in 1980. Black women earn 8 percentage points more relative to White men, and Latina women earn 3 percentage points more relative to White men. But relative to White men, the glass ceiling effect<sup>65</sup> limits the upward mobility of women of all races and ethnicities and prevents them from occupying all but a very small percentage of the highest paying positions.<sup>66</sup>

Educational attainment alone does not explain the gender wage gap by race. Holding education levels constant across both race and sex for prime-age workers, some clear patterns emerge. For women, a higher level of education alone is necessary but not sufficient to close the gender wage gap. Wage earners with the least amount of education have the smallest pay gap—the lack of education affects everyone about equally, resulting in poverty. But the highest levels of education hold the most benefit for men, especially White men.

Figure 19. Despite recent progress in narrowing the wage gap, women of all races and ethnicities trail far behind White men in earning power.

### Gender wage gap relative to White men



Source: Georgetown University Center on Education and the Workforce analysis of data from the US Census Bureau, *Current Population Survey*, March supplement, 1980, 2017.

Note: As the largest group of income earners, White men are used in this figure as the comparison point. For both years, we use the average earnings of women by race/ethnicity as the numerator and the average earnings of White men as the denominator to determine the extent to which racial differences matter in the gender wage gap.

64. Note that the point of comparison is to White men and not all men, so the gap will be larger than the overall 81 cents on the dollar.

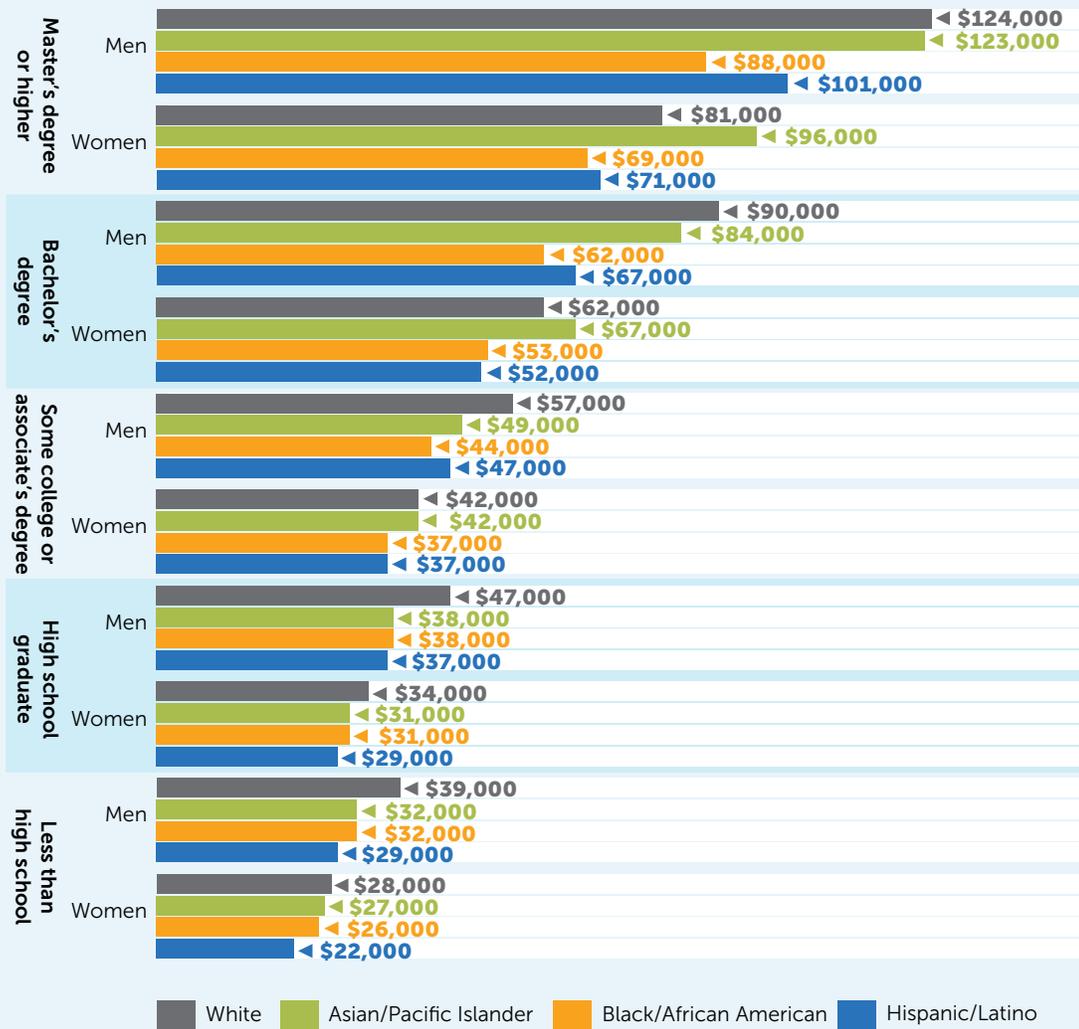
65. The "glass ceiling effect" refers to a barrier that keeps a given demographic (typically applied to women and minorities) from rising beyond a certain level in a hierarchy.

66. We choose to compare all earnings to that of White men to facilitate comparisons of women's earnings by ethnicity to one standard.

Workers with at least a bachelor's degree have the widest gender wage gap. Among bachelor's degree holders, the difference in pay between White men and White women is \$28,000 per year, and even more for Black and Latina women (Figure 20). Black and Latino men with bachelor's and graduate degrees fare better than Black or Latina women, but the wage gap between them and White men with the same educational attainment is significant. Furthermore, major choice varies little among races.<sup>67</sup>

Whereas, on average, a woman needs the next-higher degree to attain the same earnings as a man, a Black or Latina woman with a graduate degree still earns less than a White man with a bachelor's degree.

Figure 20. White workers usually earn more than workers from any other race or ethnicity, by attainment level and sex. The gender wage gap by race, however, is most pronounced for bachelor's and graduate degree holders.



Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey* data, 2012–2016 pooled.

67. Variation in occupational choices by race accounts for much of the variation in earnings by race.



Among bachelor's degree holders, the difference in pay between White men and White women is \$28,000 per year, and even more for Black and Latina women.



**CONCLUSION:**  
Discrimination Is  
Responsible for Some of  
the Gender Wage Gap.



Women earn 81 cents for every dollar paid to a man. Even after accounting for the fact that women often work in different occupations and industries than men, as well as differences in work experience, union status, education, and race, 41 percent of the wage gap is unexplained.

When social scientists control for every measurable employment factor that could help explain the disparity, women still earn only 92 percent of what men earn for doing the same job.<sup>68</sup> Of course some aspects to this debate are difficult to measure. These include the extent to which women ask for a pay raise compared to men, or even negotiate for a higher salary when they first get hired compared to men. The first salary is a very important leverage point for upward mobility and can result in a slower trajectory if women aim lower to begin with. However, discrimination also explains the residual difference in pay between men and women.

Female-dominated occupations tend to pay less, often much less, than male-dominated occupations. Beginning in the 1970s and 1980s, women made great progress moving into careers traditionally dominated by men.<sup>69</sup> Today, however, women still account for the majority of waitresses, retail workers, administrative assistants, and nurses, but account for very few engineers, scientists, managers, and technicians. Women also tend to work in service jobs and not-for-profit and public-sector organizations, none of which are highly valued financially in a market economy. Moreover, though women lost fewer jobs overall during the recession than did men, they regained fewer during the recovery. And many of the gains were in sectors facing serious budget cuts, like education and social services.

Furthermore, education has not effectively reduced the gender wage gap, even though women are now substantially more educated than men. Women surpassed men in college enrollment in the mid-1990s, and the gap has been growing ever since. Today 45 percent of young women<sup>70</sup> are enrolled in college, compared with 38 percent of young men; 36 percent of young women have a bachelor's or a graduate degree, compared with 28 percent of young men. Yet women with graduate degrees earn the same as men with bachelor's degrees, and women with bachelor's degrees earn the same as men with associate's degrees.<sup>71</sup>

What is behind these differences? Part of the problem lies in what women study, which plays a large role in where they work later in their careers. Women are not likely to choose high-paying majors like engineering; instead, they often gravitate to low-paying majors like education, psychology, and social work. Women represent 97 percent of early childhood education majors but only 6 percent of mechanical engineering majors.<sup>72</sup>

Critics of initiatives to close the gender wage gap, or those who deny that it is a legitimate problem, say these wage inequalities are due to individual choice,<sup>73</sup> job tenure, and hours worked. However, Harvard economist Claudia Goldin demonstrates that men and women with identical degrees and experience still are paid unequally.<sup>74</sup> The answer to the conundrum is far more complex than personal choice. Though a large part of the wage gap is explained by occupation and industry choices, these choices are further influenced by choices of high school courses and college majors, which in turn have significant cultural and social origins. These social and cultural dimensions to the gender wage gap are not unique to the women that make these decisions. Women's work has traditionally been undervalued. A preponderance of women in an occupation, for example, is a good indication that women will make less in this occupation compared to others.

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68. Blau and Kahn, "The Gender Pay Gap," 2007.

69. Carnevale and Smith. "Gender Discrimination Is at the Heart of the Wage Gap," 2014.

70. "Young" is defined here as 18–24 years of age.

71. Carnevale and Smith. "Gender Discrimination Is at the Heart of the Wage Gap," 2014.

72. Ibid.

73. Blau and Kahn, "The Gender Wage Gap," 2016. The paper shows that almost half of the gender wage gap is explained by occupation and industry choices.

74. Goldin, "A Grand Gender Convergence," 2014.

Extensive family obligations and a lack of exposure to college are factors that keep some women from completing their degrees. Though the family structure has changed over the past 50 years<sup>75</sup> (51 percent of young women over the age of 15 today are married compared to 75 percent in 1963), the burden of single parenting today still rests heavily on women.<sup>76</sup> More than 40 percent of births today are to unmarried women, compared to 5 percent of births in 1960.<sup>77</sup>

Expanded access to child care would offer enormous support for student mothers trying to achieve a college degree. But the need for child care goes beyond the hours in the classroom. Student parents often work full-time during the school year and need child care in the evenings and on weekends as well. However, only 13 percent of the on-campus child care centers provide evening care and only 3 percent provide weekend care.<sup>78</sup> On-campus care centers that offer flexible accessible hours would help mothers who are trying to balance school and caregiving responsibilities. Furthermore, studies show that on-campus child care centers improve economic outcomes for low-income families by allowing parents to focus on their studies, greatly improving their chances of completing a postsecondary degree. At the same time, on-campus child care centers expose children to learning environments at a young age, allowing them to reap the enormous benefits of early childhood education.<sup>79</sup>

Some child care centers on college campuses offer a range of comprehensive services to parents, including academic, financial, parenting, and personal counseling. For example, in 2005, the University of Michigan launched an initiative to increase child care capacity, expand the number of infants and toddlers it serves, and improve its care facilities. The university met all three of these goals by 2011 by combining its care centers under a single administrative umbrella and establishing a coordinated system that offered an array of shared services, including child care referral specialists, summer camps, child care subsidies, and loans to cover child-care expenses.<sup>80</sup>

Women's participation in the labor force increased most rapidly from 1970 to 1990. At the time, women's earnings often were viewed as a second salary in a male-headed household. Married women often were paid less because their salary was viewed as an additional income to what was generated by the primary breadwinner. In the 1960s, three in four adult women were married. Today just about half of adult women are married, and with the increase in single parent households and the burden of childrearing still falling on the mother, this reason for pay discrimination is anachronistic.<sup>81</sup>

To place all the blame of pay differences on women's career choices fails to recognize the social structure that determines value. Young girls and young women do not make choices in a vacuum about what to study and where to work. They make them under the influence of peers, family members, and adults who tell them, through words and actions, the subjects, majors, and careers that are acceptable for them to choose. These influences inevitably inform their later decisions on careers. Stereotypes also underlie the decisions that are made to assign a certain dollar value to some kinds of work and different values to others: a female first-grade teacher, for example, usually makes less than a male video-game software developer. Sometimes people place no dollar value on work at all: for centuries, women have borne the brunt of everyday housework and caring for children and the elderly for no pay.

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75. US Department of Labor, *American Women*, 1963.

76. Taylor, *The Decline of Marriage and the Rise of New Families*, 2010.

77. *Ibid.*

78. Miller, et al., *Improving Child Care Access to Promote Postsecondary Success among Low-Income Parents*, 2011.

79. *Ibid.*

80. University of Michigan, "Childcare & Dependent Care," 2015.

81. Taylor, *The Decline of Marriage and the Rise of New Families*, 2010.

The gender wage gap can be closed. In the 1960s, the gap hovered around 60 percent. After initiatives such as the Equal Pay Act and Title VII of the Civil Rights Act made gender-based discrimination in the labor market illegal, the gap closed substantially between the 1970s and mid-1990s. Some states have a much lower gender wage gap than others: women earn 90 percent of men's salaries in Washington, DC, for instance, compared with 64 percent in Wyoming. Similarly, some European countries, such as Belgium and Luxembourg, have nearly closed their gender wage gaps.<sup>82</sup>

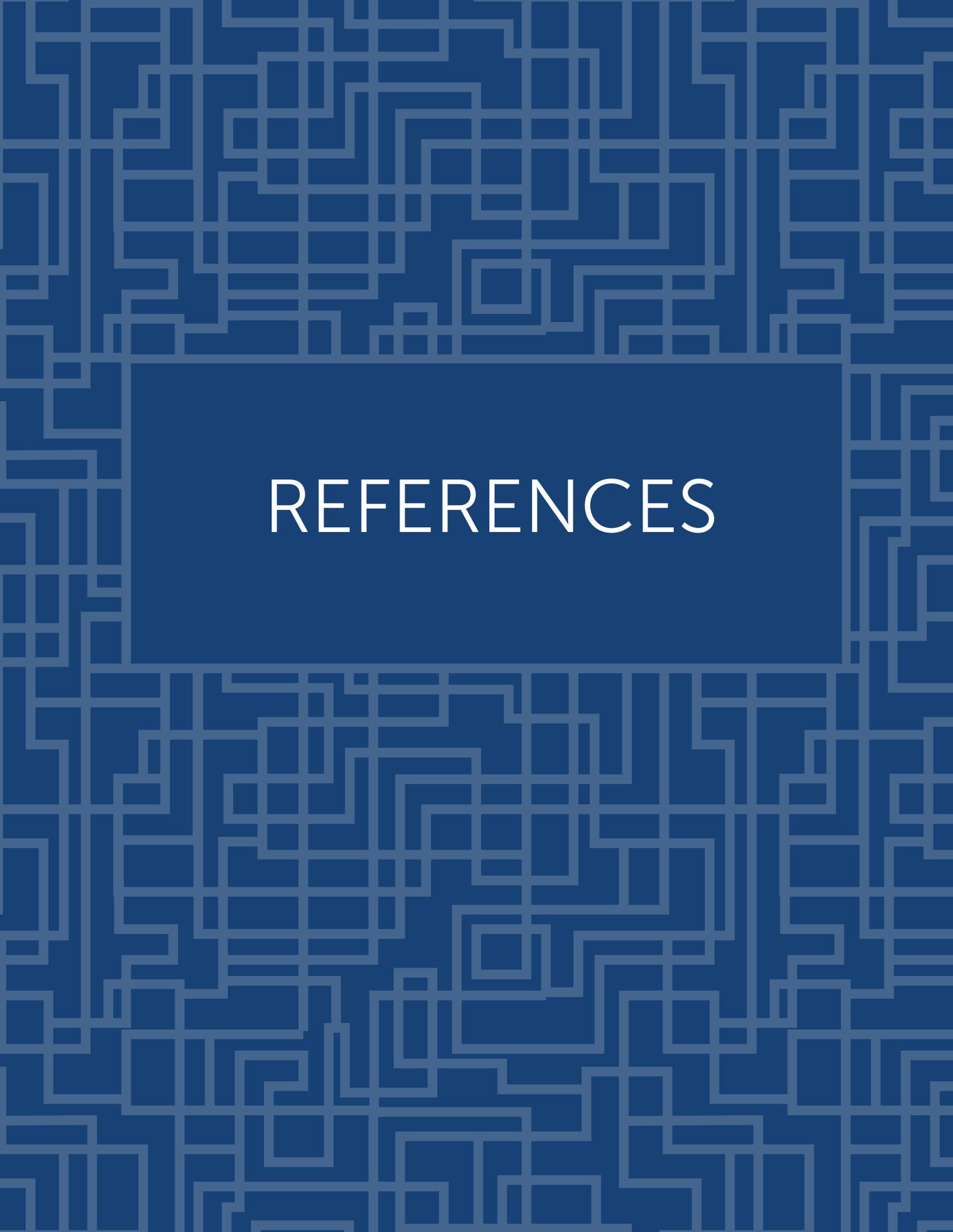
Closing the gender wage gap in the US will require initiatives aimed at combatting workplace discrimination. One of these is the proposed Paycheck Fairness Act,<sup>83</sup> which would increase wage transparency and provide legal protections for workers who raise concerns about gender-based wage discrimination.

Solving the gender wage gap will require more than just new laws. It will require a new cultural approach. Women need more flexible work options that build upon women's rights established under the Family and Medical Leave Act. Women should not have to surrender their careers (and high earnings) when they decide to start a family. Solving the earnings disparity will also require people to alter the cultural norms and stereotypes that they communicate to young girls. The stories we tell and the people we admire should not limit young girls' horizons; rather, they should fill young girls with hope for what is possible.

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82. Carnevale and Smith, "Gender Discrimination Is at the Heart of the Wage Gap," 2014.

83. The Paycheck Fairness Act is a proposed law introduced in the 115th Congress as bills S. 819 and H.R.1869.



# REFERENCES

- Adler, Patricia A., Steven J. Kless, and Peter Adler. "Socialization to Gender Roles: Popularity Among Elementary School Boys and Girls." *Sociology of Education* (1992): 169–187.
- Albanesi, Stefania, Victoria Gregory, Christina Patterson, and Aysegül Sahin. "Is Job Polarization Holding Back the Labor Market?" *Liberty Street Economics* (2013).
- Albert, Alexa A., and Judith R. Porter. "Children's Gender-Role Stereotypes: A Sociological Investigation of Psychological Models." *Sociological Forum*, vol. 3, no. 2 (1988): 184–210.
- Andrews, Dan, and Andrew Leigh. "More Inequality, Less Social Mobility." *Applied Economics Letters* 16, no. 15 (2009): 1489–1492.
- Bailey, Martha J., Brad Hershbein, and Amalia R. Miller. "The Opt-In Revolution? Contraception and The Gender Gap in Wages." *American Economic Journal: Applied Economics* 4, no. 3 (2012): 225–254.
- Baker, Bruce D., and Sean P. Corcoran. *The Stealth Inequities of School Funding: How State and Local School Finance Systems Perpetuate Inequitable Student Spending*. Washington, DC: Center for American Progress, 2012.
- Bernanke, Ben S. Speech at the Children's Defense Fund National Conference, Cincinnati, Ohio. Board of Governors of the Federal Reserve System, July 24, 2012.
- Blanden, Joe, Paul Gregg, and Stephen Machin. *Intergenerational Mobility in Europe and North America*. Report supported by the Sutton Trust, Centre for Economic Performance, London School of Economics, 2005.
- Blau, Francine D., and Jed DeVaro. "New Evidence on Gender Difference in Promotion Rates: An Empirical Analysis of a Sample of New Hires." *NBER Working Papers*, no.12321, 2006.
- Blau, Francine D., and Lawrence M. Kahn. "The Gender Pay Gap: Have Women Gone as Far as They Can?" *The Academy of Management Perspectives* 21, no. 1 (2007): 7–23.
- Blau, Francine D., and Lawrence M. Kahn. "The Gender Wage Gap: Extent, Trends, and Explanations." *NBER Working Papers*, no. 21913, 2016.
- Blumberg, Alex. "Preschool: The Best Job-Training Program." *National Public Radio (NPR), Planet Money*, August 12, 2011. <http://www.npr.org/blogs/money/2011/08/12/139583385/preschool-the-best-job-training-program>.
- Bradbury, Katharine, and Jane Katz. "Women's Rise: A Work In Progress." *Regional Review*, Q 1 (2005): 58–67.
- Brown, Cynthia G. "Toward a Coherent and Fair Funding System." In *Education Governance for the Twenty-First Century: Overcoming the Structural Barriers to School Reform*, edited by Paul Manna, and Patrick McGuinn. Washington, DC: Brookings Institution Press, 2013.
- Brown, Meta, Andrew Haughwout, Danghon Lee, Maricar Mabutas, and Wilbert van der Klaauw. *Grading Student Loans*. New York: Federal Reserve Bank of New York, March 5, 2012, <http://libertystreeteconomics.newyorkfed.org/2012/03/grading-student-loans.html>.
- Carnevale, Anthony P., Tamara Jayasundera, and Ban Cheah. *The College Advantage: Weathering the Economic Storm*. Washington, DC: Georgetown University Center on Education and the Workforce, 2012.
- Carnevale, Anthony P., Tamara Jayasundera, and Andrew R. Hanson. *Career and Technical Education: Five Ways That Pay Along the Way to the BA*. Washington, DC: Georgetown University Center on Education and the Workforce, 2012.

- Carnevale, Anthony P., and Stephen J. Rose. *The Economy Goes to College: The Hidden Promise of Higher Education in the Post-Industrial Service Economy*. Washington, DC: Georgetown University Center on Education and the Workforce, 2015.
- Carnevale, Anthony P., Stephen J. Rose, and Ban Cheah. *The College Payoff: Education, Occupations, and Lifetime Earnings*. Washington, DC: Georgetown University Center on Education and the Workforce, 2011.
- Carnevale, Anthony P., Stephen J. Rose, and Andrew R. Hanson. *Certificates: Gateway to Gainful Employment and College Degrees*. Washington, DC: Georgetown University Center on Education and the Workforce, 2012.
- Carnevale, Anthony P., and Nicole Smith. "Gender Discrimination Is at the Heart of the Wage Gap." *Time Magazine*. May 19, 2014.
- Carnevale, Anthony P., and Nicole Smith. *Get Smart: A 21st-Century Education for All Women*. Washington, DC: Georgetown University Center on Education and the Workforce, 2014.
- Carnevale, Anthony P., Nicole Smith, and Jeff Strohl. *Recovery: Job Growth and Education Requirements through 2020*. Washington, DC: Georgetown University Center on Education and the Workforce, 2013.
- Carnevale, Anthony P., Nicole Smith, James R. Stone III, Pradeep Kotamraju, Bruce Steuernagel, and Kimberly A. Green. *Career Clusters: Forecasting Demand for High School through College Jobs*. Washington, DC: Georgetown University Center on Education and the Workforce, 2011.
- Carnevale, Anthony P., and Jeff Strohl. *Separate & Unequal: How Higher Education Reinforces the Intergenerational Reproduction of White Racial Privilege*. Washington, DC: Georgetown University Center on Education and the Workforce, 2013.
- Carnevale, Anthony P., Jeff Strohl, and Michele Melton. *What's It Worth?: The Economic Value of College Majors*. Washington, DC: Georgetown University Center on Education and the Workforce, 2011.
- Caspi, Avshalom. "Life-Course Development: The Interplay of Social Selection and Social Causation within and across Generations." In *The Jacobs Foundation Series on Adolescence. Human Development Across Lives and Generations: The Potential for Change*, edited by P. Lindsay Chase-Lansdale, Kathleen Kiernan, and Ruth J. Friedman. New York: Cambridge University Press, 2004.
- Catalyst. "Catalyst 2013 Census of Fortune 500: Still No Progress After Years of No Progress," Catalyst, 2013.
- Centers for Disease Control and Prevention. "About Teen Pregnancy." Atlanta: Centers for Disease Control and Prevention, 2012.
- Cha, Youngjoo, and Kim A. Weeden. "Overwork and the Slow Convergence in the Gender Gap in Wages." *American Sociological Review* 79, no. 3 (2014): 457–484.
- Chetty, Raj, John N. Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan. "\$320,000 Kindergarten Teachers." *Phi Delta Kappan* 92, no. 3 (2010): 22–25.
- Cicarelli, James, and Julianne Cicarelli. *Distinguished Women Economists*. Westport, CT: Greenwood Publishing Group, 2003.
- The College Board. *Trends in College Pricing 2012*. Washington, DC: The College Board, 2012.
- Corak, Miles. "Do Poor Children Become Poor Adults? Lessons From a Cross-Country Comparison of Generational Earnings Mobility." In *Dynamics Of Inequality and Poverty*, edited by John Creedy and Guyonne Kalb. Emerald Group Publishing Limited, 2006.

- Corbett, Christianne, and Catherine Hill. *Graduating to a Pay Gap: The Earnings of Women and Men One Year after College Graduation*. Washington, DC: American Association of University Women, 2012.
- Correll, Shelley J. "Constraints into Preferences: Gender, Status, and Emerging Career Aspirations." *American Sociological Review* 69, no. 1 (2004): 93–113.
- Correll, Shelley J. "Gender and the Career Choice Process: The Role of Biased Self-Assessments." *American Journal of Sociology* 106, no. 6 (2001): 1691–1730.
- d'Addio, Anna C. "Intergenerational Transmission of Disadvantage: Mobility or Immobility Across Generations?" *OECD Social, Employment, and Migration Working Papers* 52 (2007): 0\_1.
- Deming, David, and Susan Dynarski. "Into College, Out of Poverty? Policies to Increase the Postsecondary Attainment of the Poor." *NBER Working Papers*, no. 15387, 2009.
- DeNavas-Walt, Carmen, and Bernadette D. Proctor. "Income and Poverty in the United States: 2016." *Current Population Reports*. Washington, DC: US Census Bureau, Department of Commerce, 2017.
- Dougherty, Conor. "Young Women's Pay Exceeds Male Peers." *Wall Street Journal*. September 1, 2010.
- DuBois, David L., Bruce E. Holloway, Jeffrey C. Valentine, and Harris Cooper. "Effectiveness of Mentoring Programs for Youth: A Meta-Analytic Review." *American Journal of Community Psychology* 30, no. 2 (2002): 157-197.
- Duncan, Greg J. "Introduction: The American Dream, Then and Now." In *Whither Opportunity?: Rising Inequality, Schools, and Children's Life Chances*, edited by Greg J. Duncan, and Richard J. Murnane. New York: Russell Sage Foundation, 2011.
- Dweck, Carol S., and Ellen L. Leggett. "A Social-Cognitive Approach to Motivation and Personality." *Psychological Review* 95, no. 2 (1988): 256–273.
- Eagly, Alice H. "Prejudice: Toward a More Inclusive Understanding." In *APA Decade of Behavior Vols. The Social Psychology of Group Identity and Social Conflict: Theory, Application, and Practice*, edited by Alice H. Eagly, Reuben M. Baron, & V. Lee Hamilton. Washington, DC: American Psychological Association, 2004.
- Ewert, Stephanie. "GED Recipients Have Lower Earnings, Are Less Likely to Enter College," Washington, DC: United States Census Bureau, 2012.
- Fain, Paul. "New Front in For-Profit Battle," *Inside Higher Ed*. April 19, 2012.
- Freeman, Nancy K. "Preschoolers' Perceptions of Gender Appropriate Toys and their Parents' Beliefs About Genderized Behaviors: Miscommunication, Mixed Messages, or Hidden Truths?" *Early Childhood Education Journal* (2007).
- Glasmeier, Amy K., and West Arete. "Living Wage Calculator." Cambridge: Massachusetts Institute of Technology, 2015. <http://livingwage.mit.edu>.
- Glynn, Sarah Jane. *Explaining the Gender Wage Gap*. Washington, DC: Center for American Progress, 2014.
- Goldin, Claudia. "Claudia Goldin: Will More of Our Daughters Grow Up to Be Economists?" *Akron Beacon Journal*, October 17, 2013.
- Goldin, Claudia. "A Grand Gender Convergence: Its Last Chapter." *American Economic Review* (2014): 1091–1119.
- Goldin, Claudia, and Lawrence Katz. *The Race between Education and Technology*. Cambridge: Becknap Press, 2008.

- Good, Catherine, Aneeta Rattan, and Carol S. Dweck. "Why Do Women Opt Out? Sense of Belonging and Women's Representation in Mathematics." *Journal of Personality and Social Psychology* 102, no. 4 (2012): 700.
- Heckman, James J. "The Case for Investing in Disadvantaged Young Children," in *Big Ideas for Children: Investing in Our Nation's Future*. Washington, DC: First Focus, 2008.
- Heckman, James J., John Eric Humphries, and Nicholas S. Mader. "The GED." *NBER Working Paper*, no. 16064, 2010.
- Hegewisch, Ariane, Hannah Liepmann, Jeffrey Hayes, and Heidi Hartmann. "Separate and Not Equal? Gender Segregation in The Labor Market and the Gender Wage Gap." *IWPR Briefing Paper* 377 (2010).
- Hill, Catherine, Christianne Corbett, and Andresse St Rose. *Why So Few? Women in Science, Technology, Engineering, and Mathematics*. Washington, DC: American Association of University Women, 2010.
- Jackson, Hannah-Beth. "Governor Signs Jackson Bill to Provide Job-Protected Leave for New Parents." *Hannah-Beth Jackson*, California State Senate, 2017.
- Jacobi, Maryann. "Mentoring and Undergraduate Academic Success: A Literature Review." *Review of Educational Research* 61, no. 4 (1991): 505-532.
- James, Sarah, and Torbjörn Lahti. "Life-cycle Variation in the Association between Current and Lifetime Earnings." *The American Economic Review* 96, no. 4 (2006): 1308–1320.
- Kirkham, Chris, and Kevin Short. "How For-Profit Colleges Stay in Business Despite Terrible Track Record," *Huffington Post*, September 19, 2013.
- Kivikangas, J. Matias, Jari Kätsyri, Simo Järvelä, and Niklas Ravaja. "Gender Differences in Emotional Responses to Cooperative and Competitive Game Play." *PloS one* 9, no. 7 (2014).
- LoBue, Vanessa, and Judy S. DeLoache. "Pretty in Pink: The Early Development of Gender Stereotyped Colour Preferences." *British Journal of Developmental Psychology* 29, no. 3 (2011): 656–667.
- Mettler, Suzanne. *Degrees of Inequality: How the Politics of Higher Education Sabotaged the American Dream*. New York: Basic Books, 2014.
- Miller, Claire Cain. "Paid Leave Encourages Female Employees to Stay," *The New York Times*, July 28, 2014.
- Miller, Kevin, Barbara Gault, and Abby Thorman. *Improving Child Care Access to Promote Postsecondary Success among Low-Income Parents. Report# C378*. Washington, DC: Institute for Women's Policy Research, 2011.
- Munasinghe, Lalith, Tania Reif, and Alice Henriques. "Gender Gap in Wage Returns to Job Tenure and Experience." *Labour Economics* 15, no. 6 (2008): 1296–1316.
- Murnane, Richard J., John B. Willett, and John H. Tyler. "Who Benefits from Obtaining a GED? Evidence from High School and Beyond." *NBER Working Papers*, no.7172, 1999.
- Ochsenfeld, Fabian. "Why Do Women's Fields of Study Pay Less? A Test of Devaluation, Human Capital, and Gender Role Theory." *European Sociological Review* 30, no. 4 (2014): 536–548.
- Organisation for Economic Co-operation and Development. "A Family Affair: Intergenerational Social Mobility Across OECD Countries." In *Economy Policy Reforms: Going for Growth*, 181–197. Paris: OECD, 2010.
- Organisation for Economic Co-operation and Development. *OECD Data, 2015*. <https://data.oecd.org/>

- Parker, Kim, and Wendy Wang. *Modern Parenthood: Roles of Moms and Dads Converge as They Balance Work and Family*. Washington, DC: Pew Research Center, 2013.
- Peske, Heather G., and Kati Haycock. *Teaching Inequality: How Poor and Minority Students Are Shortchanged on Teacher Quality: A Report and Recommendations by the Education Trust*. Education Trust, 2006. Washington, DC:
- Rosenbaum, Janet, and James Rosenbaum. "Money Isn't Everything: Job Satisfaction, Non-Monetary Job Rewards, and Sub-Baccalaureate Credentials." *Research in Higher Education Journal*, volume 30, September 2016.
- Rundle, Michael. "Forty-Seven Percent of All Jobs Will Be Automated by 2034, And 'No Government is Prepared' Says Economist," *Huffington Post*, January 17, 2014.
- Sahin, Aysegul, Joseph Song, and Bart Hobijn. "The Unemployment Gender Gap During the 2007 Recession." *Current Issues in Economics and Finance*, February 2010.
- Schieder, Jessica, and Elise Gould. *'Women's Work' and the Gender Pay Gap: How Discrimination, Societal Norms, and Other Forces Affect Women's Occupational Choices—and Their Pay*. Washington, DC: Economic Policy Institute, 2016.
- Schmitt, John, and Heather Boushey. *The College Conundrum: Why the Benefits of a College Education May not Be So Clear, Especially to Men*. Washington, DC: Center for American Progress, 2010.
- Shaefer, H. Luke. "Part-Time Workers: Some Key Differences Between Primary and Secondary Earners." *Monthly Labor Market Review* 132 (2009): 3.
- Shuger, Lisa. *Teen Pregnancy and High School Dropout: What Communities Can Do to Address These Issues*. Washington, DC: National Campaign to Prevent Teen and Unplanned Pregnancy, n.d.
- Snyder, Thomas D., and Sally A. Dillow. *Digest of Education Statistics 2011*. Washington, DC: National Center for Education Statistics, 2012.
- Sorhagen, Nicole S. "Early Teacher Expectations Disproportionately Affect Poor Children's High School Performance." *Journal of Educational Psychology*, 105, no. 2 (2013): 465.
- State Higher Education Executive Officers. *State Higher Education Finance FY 2012*. Boulder, CO: State Higher Education Executive Officers Association, 2013.
- Stoeger, Heidrun, Xiaoju Duan, Sigrun Schirner, Teresa Greindl, and Albert Ziegler. "The Effectiveness of a One-Year Online Mentoring Program for Girls in STEM." *Computers & Education* 69 (2013): 408-418.
- Strauss, Rebecca. "Schooling Ourselves in an Unequal America," *The New York Times*, June 16, 2013.
- Taylor, Paul. *The Decline of Marriage and Rise of New Families*. Washington, DC: Pew Research Center, 2010.
- Tennessee Department of Education. "Tennessee's Most Effective Teachers: Are They Assigned to the Schools That Need Them Most?" *Tennessee Department of Education Research Brief*, March, 2007.
- The Project on Student Debt. *Student Debt and the Class of 2011*. Washington, DC: The Institute for College Access and Success, 2012.
- US Census Bureau, *American Community Survey (ACS): 2012–2016: one-year person level micro data files*; Ruggles, Steven, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. *Integrated Public Use Microdata Series: Version 6.0 [Machine-readable database]*. Minneapolis: University of Minnesota, 2015.

- US Census Bureau and Bureau of Labor Statistics. *American Time Use Survey*, 2016. <https://www.bls.gov/tus/>.
- US Census Bureau and Bureau of Labor Statistics. *Current Population Survey (Basic Monthly)*, 2016. [http://thedataweb.rm.census.gov/ftp/cps\\_ftp.html#cpsbasic](http://thedataweb.rm.census.gov/ftp/cps_ftp.html#cpsbasic).
- US Census Bureau and Bureau of Labor Statistics, *Current Population Survey March Supplement (Annual Economic and Social Supplement)* microdata files, 1976–2017. [https://thedataweb.rm.census.gov/ftp/cps\\_ftp.html](https://thedataweb.rm.census.gov/ftp/cps_ftp.html).
- US Census Bureau. *Survey of Income and Program Participation (SIPP)*, 2009. <http://www2.census.gov/>.
- US Department of Education. *Proposed Rule Links Federal Student Aid to Loan Repayment Rates and Debt-to-Earnings Levels for Career College Graduates*, July 23, 2010.
- US Department of Education, Institute of Education Sciences, National Center for Education Statistics. *National Assessment of Educational Progress, Science and Math Assessments*, 2009.
- US Department of Education, Institute of Education Sciences, National Center for Education Statistics. *National Postsecondary Student Aid Survey*, 2012.
- US Department of Education, Institute of Education Sciences, National Center for Education Statistics. "Women As a Percentage of Total Employed in Selected Occupations, 1985–2012 Annual Averages," 2013.
- US Department of Education, Institute of Education Sciences, National Center for Education Statistics. *Tuition Costs of Colleges and Universities*, 2013.
- US Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics. *Monitoring Quality: An Indicators Report*, 2000.
- US Department of Education. Institute of Education Sciences, National Center for Education Statistics. *Integrated Postsecondary Education Data System, 1955–2010*.
- US Department of Education. Institute of Education Sciences, National Center for Education Statistics. *Beginning Postsecondary Students Longitudinal Study*, 2009. (BPS: 04/09).
- US Department of Education. Institute of Education Sciences, National Center for Education Statistics. *Digest of Education Statistics* tables, 2015.
- US Department of Labor. *Highlight of Women's Earnings in 2008*, 2009.
- US Department of Labor. *Women's Employment During the Recovery*, 2011.
- US Department of Labor, Bureau of Labor Statistics. "Women's-to-Men's Earnings Ratio by Age, 2009," *The Economics Daily*, 2010.
- US Department of Labor, Bureau of Labor Statistics. *Employment Projections*, 2013.
- US Department of Labor, Bureau of Labor Statistics. "College Enrollment and Work Activity of 2013 High School Graduates," 2014.
- US Department of Labor, Bureau of Labor Statistics. "Table 22: Persons at Work in Nonagricultural Industries by Age, Sex, Race, Hispanic or Latino Ethnicity, Marital Status, and Usual Full- or Part-Time Status," 2014.
- US Department of Labor, Employment and Training Administration. *Occupational Information Network*, 2012.
- US Department of Labor. *American Women: Report of the President's Commission on the Status of Women*, 1963.

University of Michigan. "Childcare & Dependent Care: Policies and Resources," <http://www.provost.umich.edu/faculty/family/children/>

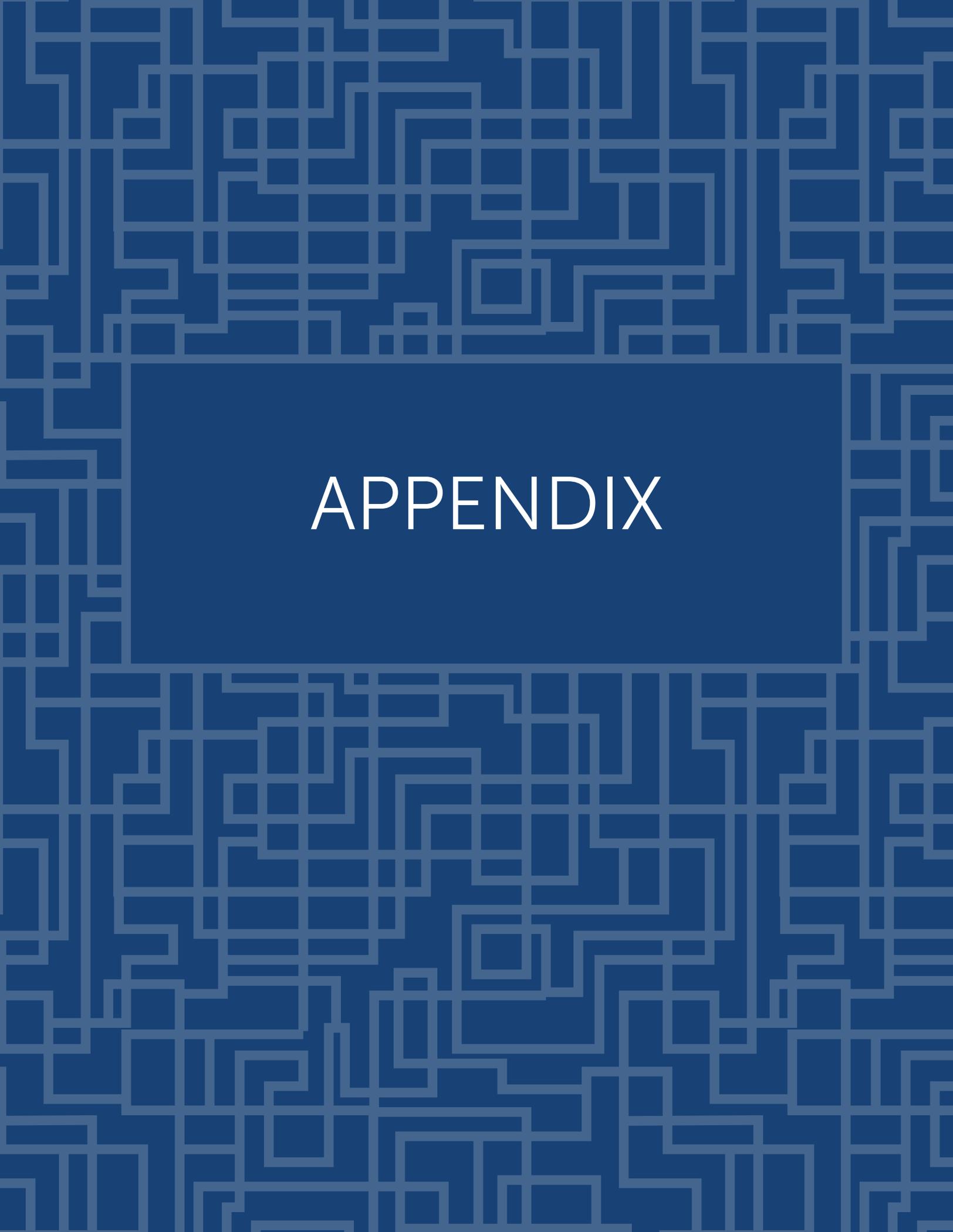
Valletta, Rob, and Leila Bengali. "What's Behind the Increase in Part-Time Work?" *Federal Reserve Bank of San Francisco Economic Letter*, August 26, 2013.

Van Vugt, Mark, David De Cremer, and Dirk P. Janssen. "Gender Differences in Cooperation and Competition: The Male-Warrior Hypothesis." *Psychological Science* 18, no. 1 (2007): 19–23.

Vella, Francis. "Gender Roles, Occupational Choice and Gender Wage Differential." *Economic Record* 69, no. 4 (1993): 382–392.

Warner, Judith. *The Women's Leadership Gap: Women's Leadership by the Numbers*. Washington, DC: Center for American Progress, 2014.

Webley, Kayla. "Rethinking Pre-K: 5 Ways to Fix Preschool." *Time*, September 26, 2011.



# APPENDIX

# Appendix A. Mean Earnings and Sex of Bachelor's Degree Holders by Detailed Major

Major group	Detailed major	Share women	Mean earnings (women) 2016\$	Mean earnings (men) 2016\$	Earnings premium for men
Agriculture and natural resources	Agricultural economics	22%	\$64,000	\$84,000	31%
	Agriculture production and management	23%	\$56,000	\$69,000	23%
	Animal sciences	57%	\$49,000	\$65,000	33%
	Food science	59%	\$72,000	\$89,000	24%
	Forestry	16%	\$55,000	\$66,000	20%
	General agriculture	25%	\$47,000	\$60,000	28%
	Miscellaneous agriculture	58%	\$45,000	\$60,000	33%
	Natural resources management	32%	\$51,000	\$66,000	29%
	Plant science and agronomy	28%	\$43,000	\$64,000	49%
	Soil science	20%	\$57,000	\$69,000	21%
Architecture and engineering	Aerospace engineering	11%	\$90,000	\$99,000	10%
	Architectural engineering	22%	\$68,000	\$95,000	40%
	Architecture	32%	\$60,000	\$77,000	28%
	Biological engineering	25%	\$66,000	\$83,000	26%
	Biomedical engineering	35%	\$81,000	\$95,000	17%
	Chemical engineering	32%	\$96,000	\$110,000	15%
	Civil engineering	17%	\$76,000	\$95,000	25%
	Electrical engineering	12%	\$88,000	\$104,000	18%
	Electrical engineering technology	12%	\$71,000	\$83,000	17%
	Engineering and industrial management	20%	\$82,000	\$90,000	10%
	Engineering mechanics, physics, and science	13%	\$77,000	\$84,000	9%
	Engineering technologies	17%	\$59,000	\$80,000	36%

Major group	Detailed major	Share women	Mean earnings (women) 2016\$	Mean earnings (men) 2016\$	Earnings premium for men
Architecture and engineering <i>continued</i>	Environmental engineering	32%	\$62,000	\$93,000	50%
	General engineering	14%	\$78,000	\$89,000	14%
	Geological and geophysical engineering	26%	\$72,000	\$108,000	50%
	Industrial and manufacturing engineering	25%	\$83,000	\$100,000	20%
	Industrial production technologies	9%	\$66,000	\$87,000	32%
	Materials engineering and materials science	24%	\$79,000	\$91,000	15%
	Mechanical engineering	9%	\$91,000	\$99,000	9%
	Mechanical engineering related technology	7%	\$89,000	\$77,000	-13%
	Metallurgical engineering	16%	\$81,000	\$125,000	54%
	Mining and mineral engineering	15%	\$90,000	\$105,000	17%
	Miscellaneous engineering	16%	\$75,000	\$88,000	17%
	Miscellaneous engineering technologies	18%	\$65,000	\$80,000	23%
	Naval architecture and marine engineering	4%	\$98,000	\$99,000	1%
	Nuclear engineering	12%	\$81,000	\$109,000	35%
	Petroleum engineering	17%	\$167,000	\$189,000	13%
Arts	Commercial art and graphic design	62%	\$54,000	\$67,000	24%
	Drama and theater arts	58%	\$49,000	\$65,000	33%
	Film, video, and photographic arts	37%	\$50,000	\$68,000	36%
	Fine arts	57%	\$50,000	\$63,000	26%
	Miscellaneous fine arts	40%	\$48,000	\$52,000	8%
	Music	42%	\$48,000	\$59,000	23%
	Studio arts	64%	\$46,000	\$58,000	26%
	Visual and performing arts	73%	\$48,000	\$76,000	58%
Biology and life sciences	Biochemical sciences	44%	\$61,000	\$75,000	23%
	Biology	57%	\$58,000	\$74,000	28%
	Botany	49%	\$58,000	\$67,000	16%
	Ecology	53%	\$50,000	\$67,000	34%
	Environmental science	44%	\$57,000	\$69,000	21%
	Genetics	56%	\$58,000	\$66,000	14%
	Microbiology	59%	\$64,000	\$82,000	28%
	Miscellaneous biology	43%	\$55,000	\$63,000	15%
	Molecular biology	52%	\$62,000	\$82,000	32%
	Neuroscience	52%	\$51,000	\$69,000	35%
Zoology	58%	\$53,000	\$69,000	30%	

Major group	Detailed major	Share women	Mean earnings (women) 2016\$	Mean earnings (men) 2016\$	Earnings premium for men
Business	Accounting	56%	\$72,000	\$99,000	38%
	Actuarial science	37%	\$97,000	\$122,000	26%
	Business economics	35%	\$81,000	\$109,000	35%
	Business management and administration	46%	\$62,000	\$86,000	39%
	Finance	33%	\$78,000	\$108,000	38%
	General business	41%	\$65,000	\$92,000	42%
	Hospitality management	58%	\$53,000	\$72,000	36%
	Human resources and personnel management	69%	\$62,000	\$80,000	29%
	International business	53%	\$66,000	\$86,000	30%
	Management information systems and statistics	31%	\$78,000	\$95,000	22%
	Marketing and marketing research	54%	\$67,000	\$94,000	40%
	Miscellaneous business and medical administration	42%	\$60,000	\$84,000	40%
	Operations logistics and e-commerce	29%	\$74,000	\$80,000	8%
	Communications and journalism	Advertising and public relations	65%	\$63,000	\$84,000
Communications		57%	\$63,000	\$81,000	29%
Journalism		59%	\$66,000	\$77,000	17%
Mass media		45%	\$58,000	\$65,000	12%
Computers, statistics, and mathematics	Applied mathematics	39%	\$83,000	\$102,000	23%
	Computer and information systems	27%	\$69,000	\$81,000	17%
	Computer engineering	16%	\$85,000	\$102,000	20%
	Computer information management and security	20%	\$61,000	\$74,000	21%
	Computer networking and telecommunications	27%	\$66,000	\$73,000	11%
	Computer programming and data processing	29%	\$64,000	\$77,000	20%
	Computer science	21%	\$81,000	\$98,000	21%
	Information sciences	27%	\$73,000	\$86,000	18%
	Mathematics	42%	\$75,000	\$98,000	31%
	Mathematics and computer science	32%	\$77,000	\$106,000	38%
Statistics and decision science	41%	\$81,000	\$102,000	26%	

Major group	Detailed major	Share women	Mean earnings (women) 2016\$	Mean earnings (men) 2016\$	Earnings premium for men
Education	Art and music education	64%	\$43,000	\$52,000	21%
	Early childhood education	96%	\$40,000	\$56,000	40%
	Educational administration and supervision	58%	\$38,000	\$93,000	145%
	Elementary education	89%	\$43,000	\$53,000	23%
	General education	75%	\$46,000	\$58,000	26%
	Language and drama education	80%	\$46,000	\$54,000	17%
	Mathematics teacher education	63%	\$50,000	\$59,000	18%
	Miscellaneous education	51%	\$50,000	\$69,000	38%
	Physical and health education teaching	42%	\$50,000	\$61,000	22%
	Science and computer teacher education	57%	\$46,000	\$63,000	37%
	Secondary teacher education	53%	\$47,000	\$58,000	23%
	Social science or history teacher education	45%	\$46,000	\$54,000	17%
	Special needs education	87%	\$45,000	\$54,000	20%
	Teacher education: multiple levels	79%	\$41,000	\$51,000	24%
Health	Communication disorders sciences and services	91%	\$48,000	\$70,000	46%
	Community and public health	70%	\$51,000	\$67,000	31%
	Health and medical administrative services	77%	\$55,000	\$82,000	49%
	Health and medical preparatory programs	58%	\$61,000	\$79,000	30%
	Medical assisting services	90%	\$58,000	\$89,000	53%
	Medical technologies technicians	73%	\$63,000	\$77,000	22%
	Miscellaneous health medical professions	85%	\$52,000	\$64,000	23%
	Nursing	89%	\$68,000	\$78,000	15%
	Nutrition sciences	86%	\$56,000	\$62,000	11%
	Pharmacology	63%	\$82,000	\$91,000	11%
	Pharmacy and pharmaceutical sciences and administration	60%	\$96,000	\$118,000	23%
Treatment therapy professions	73%	\$64,000	\$74,000	16%	

Major group	Detailed major	Share women	Mean earnings (women) 2016\$	Mean earnings (men) 2016\$	Earnings premium for men
Humanities and liberal arts	Area ethnic and civilization studies	63%	\$59,000	\$76,000	29%
	Art history and criticism	81%	\$65,000	\$76,000	17%
	Composition and speech	57%	\$50,000	\$65,000	30%
	English language and literature	63%	\$59,000	\$77,000	31%
	French, German, Latin, and other common foreign language studies	71%	\$59,000	\$74,000	25%
	History	35%	\$57,000	\$77,000	35%
	Humanities	62%	\$53,000	\$65,000	23%
	Intercultural and international studies	64%	\$57,000	\$78,000	37%
	Liberal arts	57%	\$56,000	\$75,000	34%
	Library science	89%	\$40,000	\$47,000	18%
	Linguistics and comparative language and literature	68%	\$56,000	\$70,000	25%
	Multi/interdisciplinary studies	68%	\$46,000	\$61,000	33%
	Other foreign languages	57%	\$57,000	\$77,000	35%
	Philosophy and religious studies	32%	\$57,000	\$71,000	25%
	Theology and religious vocations	27%	\$42,000	\$53,000	26%
United States history	34%	\$65,000	\$85,000	31%	
Industrial arts, consumer services, and recreation	Construction services	8%	\$60,000	\$84,000	40%
	Cosmetology services and culinary arts	39%	\$42,000	\$54,000	29%
	Electrical and mechanic repairs and technology	9%	\$49,000	\$59,000	20%
	Family and consumer sciences	89%	\$49,000	\$70,000	43%
	Military technologies	28%	\$65,000	\$105,000	62%
	Physical fitness, parks, recreation, and leisure	42%	\$49,000	\$60,000	22%
	Transportation sciences and technologies	10%	\$73,000	\$87,000	19%
Law and public policy	Criminal justice and fire protection	39%	\$51,000	\$69,000	35%
	Court reporting	36%	\$47,000	\$65,000	38%
	Pre-law and legal studies	70%	\$57,000	\$80,000	40%
	Public administration	47%	\$63,000	\$82,000	30%
	Public policy	49%	\$86,000	\$100,000	16%

Major group	Detailed major	Share women	Mean earnings (women) 2016\$	Mean earnings (men) 2016\$	Earnings premium for men
Physical sciences	Atmospheric sciences and meteorology	23%	\$72,000	\$76,000	6%
	Astronomy and astrophysics	30%	\$57,000	\$90,000	58%
	Chemistry	44%	\$64,000	\$80,000	25%
	Geology and earth science	30%	\$62,000	\$80,000	29%
	Geosciences	26%	\$61,000	\$79,000	30%
	Materials science	28%	\$65,000	\$95,000	46%
	Multidisciplinary or general science	49%	\$60,000	\$82,000	37%
	Nuclear, industrial radiology, and biological technologies	63%	\$55,000	\$79,000	44%
	Oceanography	44%	\$50,000	\$76,000	52%
	Physical sciences	20%	\$61,000	\$88,000	44%
	Physics	17%	\$72,000	\$100,000	39%
	Physiology	54%	\$57,000	\$73,000	28%
Psychology and social work	Human services and community organization	82%	\$44,000	\$66,000	50%
	Clinical psychology	75%	\$40,000	\$44,000	10%
	Cognitive science and biopsychology	40%	\$68,000	\$94,000	38%
	Counseling psychology	66%	\$44,000	\$58,000	32%
	Educational psychology	79%	\$42,000	\$56,000	33%
	Industrial and organizational psychology	59%	\$74,000	\$92,000	24%
	Miscellaneous psychology	77%	\$52,000	\$68,000	31%
	Psychology	70%	\$53,000	\$71,000	34%
	School student counseling	63%	\$54,000	\$77,000	43%
	Social psychology	71%	\$53,000	\$67,000	26%
Social work	87%	\$46,000	\$55,000	20%	
Social sciences	Anthropology and archeology	62%	\$53,000	\$67,000	26%
	Criminology	43%	\$50,000	\$67,000	34%
	Economics	30%	\$80,000	\$112,000	40%
	General social sciences	58%	\$54,000	\$70,000	30%
	Geography	31%	\$61,000	\$71,000	16%
	Interdisciplinary social sciences	71%	\$51,000	\$75,000	47%
	International relations	55%	\$70,000	\$96,000	37%
	Miscellaneous social sciences	48%	\$60,000	\$88,000	47%
	Political science and government	39%	\$69,000	\$91,000	32%
Sociology	64%	\$55,000	\$73,000	33%	

Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2012–2016 (pooled).

# Appendix B. Top Occupations by Major for Prime-Age Workers with Bachelor's Degree or Higher by Sex

<b>Agriculture and natural resources</b>	
♂ Men	Managerial and professional office (35%), Sales and office support (16%)
♀ Women	Managerial and professional office (24%), Sales and office support (21%)
<b>Architecture and engineering</b>	
♂ Men	STEM (44%), Managerial and professional office (29%), Blue collar (9%)
♀ Women	STEM (39%), Managerial and professional office (27%), Sales and office support (12%)
<b>Arts</b>	
♂ Men	Community services and arts (25%), Managerial and professional office (20%), Sales and office support (15%)
♀ Women	Community services and arts (23%), Sales and office support (22%), Managerial and professional office (20%)
<b>Biology and life sciences</b>	
♂ Men	Healthcare professional and technical (34%), Managerial and professional office (19%), STEM (17%)
♀ Women	Healthcare professional and technical (36%), Managerial and professional office (17%), STEM (15%)
<b>Business</b>	
♂ Men	Managerial and professional office (49%), Sales and office support (25%)
♀ Women	Managerial and professional office (50%), Sales and office support (29%)
<b>Communications and journalism</b>	
♂ Men	Managerial and professional office (32%), Sales and office support (24%), Community services and arts (16%)
♀ Women	Managerial and professional office (36%), Sales and office support (27%), Community services and arts (13%)
<b>Computers, statistics, and mathematics</b>	
♂ Men	STEM (52%), Managerial and professional office (23%), Sales and office support (9%)
♀ Women	STEM (35%), Managerial and professional office (27%), Sales and office support (14%)
<b>Education</b>	
♂ Men	Education (51%), Managerial and professional office (19%), Sales and office support (10%)
♀ Women	Education (68%), Managerial and professional office (11%), Sales and office support (9%)

<b>Health</b>	
♂ <i>Men</i>	Healthcare professional and technical (58%), Managerial and professional office (18%)
♀ <i>Women</i>	Healthcare professional and technical (70%), Managerial and professional office (10%)
<b>Humanities and liberal arts</b>	
♂ <i>Men</i>	Managerial and professional office (34%), Sales and office support (18%), Education (16%)
♀ <i>Women</i>	Managerial and professional office (29%), Education (26%), Sales and office support (20%)
<b>Industrial arts, consumer services, and recreation</b>	
♂ <i>Men</i>	Managerial and professional office (29%), Blue collar (21%), Sales and office support (15%)
♀ <i>Women</i>	Managerial and professional office (22%), Education (22%), Sales and office support (20%)
<b>Law and public policy</b>	
♂ <i>Men</i>	Food and personal service (38%), Managerial and professional office (24%), Sales and office support (15%)
♀ <i>Women</i>	Managerial and professional office (29%), Sales and office support (28%), Food and personal service (19%)
<b>Physical sciences</b>	
♂ <i>Men</i>	STEM (30%), Managerial and professional office (24%), Healthcare professional and technical (13%)
♀ <i>Women</i>	Healthcare professional and technical (22%), Managerial and professional office (20%), STEM (19%)
<b>Psychology and social work</b>	
♂ <i>Men</i>	Managerial and professional office (29%), Sales and office support (17%)
♀ <i>Women</i>	Managerial and professional office (26%), Sales and office support (19%), Education (15%)
<b>Social sciences</b>	
♂ <i>Men</i>	Managerial and professional office (45%), Sales and office support (20%)
♀ <i>Women</i>	Managerial and professional office (41%), Sales and office support (21%), Education (13%)

Source: Georgetown University Center on Education and the Workforce analysis of *American Community Survey*, 2012–2016 (pooled).



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