

# **An Evaluation of the Gender Wage Gap Using Linked Survey and Administrative Data**

by

**Thomas B. Foster**  
**U.S. Census Bureau**

**Marta Murray-Close**  
**U.S. Census Bureau**

**Liana Christin Landivar**  
**Women's Bureau, U.S. Department of Labor**

**Mark deWolf**  
**Women's Bureau, U.S. Department of Labor**

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## Abstract

The narrowing of the gender wage gap has slowed in recent decades. However, current estimates show that, among full-time year-round workers, women earn approximately 18 to 20 percent less than men at the median. Women's human capital and labor force characteristics that drive wages increasingly resemble men's, so remaining differences in these characteristics explain less of the gender wage gap now than in the past. As these factors wane in importance, studies show that others like occupational and industrial segregation explain larger portions of the gender wage gap. However, a major limitation of these studies is that the large datasets required to analyze occupation and industry effectively lack measures of labor force experience. This study combines survey and administrative data to analyze and improve estimates of the gender wage gap within detailed occupations, while also accounting for gender differences in work experience. We find a gender wage gap of 18 percent among full-time, year-round workers across 316 detailed occupation categories. We show the wage gap varies significantly by occupation: while wages are at parity in some occupations, gaps are as large as 45 percent in others. More competitive and hazardous occupations, occupations that reward longer hours of work, and those that have a larger proportion of women workers have larger gender wage gaps. The models explain less of the wage gap in occupations with these attributes. Occupational characteristics shape the conditions under which men and women work and we show these characteristics can make for environments that are more or less conducive to gender parity in earnings.

**Keyword:** gender; earnings gap; wage gap; women's employment; occupations; administrative records

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## Introduction

The gender wage gap, commonly defined as the percentage difference between the median wages of men and women working full-time year-round, narrowed significantly between 1960 and 2000, as women's wages increased both absolutely and relatively compared with men's wages (Fontenot, Semega, and Kollar 2018). Research shows that a key driver of the narrowing gender wage gap over this period is a concomitant narrowing of the gender gap in human capital and labor force characteristics driving workers' earnings. Women made significant progress in educational attainment, surpassing men in college graduation rates (Bauman and Ryan 2015). Prime-age women increased their employment rate from 60 percent in 1980 to 73 percent in 2018 (Bureau of Labor Statistics 2018). Women's representation increased in higher-earning occupations as women became more likely to be employed as doctors, lawyers, and managers than in the past (Landivar 2017).

Since 2000, however, the narrowing of the gap has stalled at approximately 20 percent. While approaching parity with men on some measures, women's progress on some measures of education and employment has been uneven and on other measures stalled in recent decades (England 2010). Women remain more likely to work part time than men, with about one in four employed women working part time, and women's share of the part-time workforce has not changed much over the last five decades (Bureau of Labor Statistics 2017). Furthermore, despite substantial gender integration in professional occupations, women's earnings lag behind men's even when they work in the same occupations (Women's Bureau 2019), and convergence in men's and women's earnings has slowed (Blau and Kahn 2017).

To understand the sources of persistent gender wage inequality, we take advantage of new data sources that combine large-scale, nationally representative sample survey data and administrative records. These combined data sources offer two key advantages over survey data alone. First, survey data sources rarely combine extensive work histories with sample sizes sufficient to evaluate the gender wage gap within subgroups adequately. We combine survey and administrative records to create detailed work experience histories for a large sample of workers in the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) and the American Community Survey (ACS). Second, earnings nonresponse in survey data sources is extensive, and nonresponse differs across the wage distribution and by gender (Bollinger et al. 2019). We use administrative records of earnings to obtain a more complete picture of men's and women's pay than would be possible with survey-reported earnings.

The CPS is a monthly survey of about 60,000 households conducted by the U.S. Census Bureau for the Bureau of Labor Statistics and is the primary source of labor force statistics for the population of the United States. The CPS ASEC is a supplemental survey of about 95,000 households offering additional data on work experience, income, and noncash benefits. We link survey responses from the 2004-2013 CPS ASEC to administrative earnings records from the Social Security Administration (SSA), allowing the construction of individuals' work histories back to 1978. These work histories classify CPS

ASEC respondents as either working or not working, based on their earnings, in each of the 25 years leading up to their CPS ASEC earnings observation.

We use the linked CPS-SSA data to conduct a detailed examination of the effects of actual, rather than estimated, work experience on the gender wage gap. Specifically, we use Oaxaca-Blinder models to decompose the gender gap in mean wages into an “explained” component resulting from differences in observable characteristics and an “unexplained,” or residual, component resulting from differences in unobservable characteristics or discrimination (Fortin, Lemieux, and Firpo 2010). To estimate the contribution of gender differences in work experience to the gap, and to compare the contribution of experience to the contributions of other observable characteristics, including education, occupation, industry, and work hours, we further decompose the explained component of the gap into subcomponents attributable to gender differences in the mean level of each characteristic. Finally, to assess the contribution of recent versus earlier work experience to the gender wage gap, we repeat this analysis using work histories of 5, 10, 15, and 25 years.

Results show that the wage gap between men and women working full-time, year round in 2004-2013 was 20 percent at the median of the wage distribution (women earned 80 percent of what men earned) and 21 percent at the mean.<sup>1</sup> In the decomposition model with the 5-year work history, gender differences in observable characteristics explain 32.8 percent of the mean gap. In the model with the 25-year work history, they explain 41.3 percent. This increase in the total percentage of the gender wage gap explained by the observable characteristics is due almost entirely to an increase in the percentage explained by work experience; gender differences in the 5-year work history explain less than one percent of the mean gap, but gender differences in the 25-year work history explain 9 percent. At the same time, gender differences in work experience explain much less of the gender wage gap than differences in occupation and industry, regardless of the length of the work history. Across all four models, gender differences in occupation explain between 14 and 15 percent of the gap, and gender differences in industry explain between 21 and 22 percent.

Although the CPS ASEC combined with SSA administrative records offers extensive work histories, the sample is inadequate for detailed occupational analyses. The ACS is the largest household survey in the United States, surveying 3.5 million addresses each year. We link survey responses from the 2015-2016 ACS to Internal Revenue Service (IRS) Form W-2 data from 2005 to 2016, allowing the construction of individuals’ work histories in the 10 years preceding their ACS response. Because the ACS is the only household sample survey large enough to evaluate the effects of detailed occupation and occupational characteristics on the gender wage gap, we use linked ACS-IRS data to estimate the effects of occupation and occupational characteristics while controlling for more recent work experience. Results from our analysis of the CPS-SSA linked data suggest that using recent rather than complete work histories has little impact of the estimated contribution of occupation to the gender wage gap.

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<sup>1</sup> Consistent with the wage gap literature, we use differences in median annual earnings of full-time, year round workers when possible. For wage gap decomposition analyses, we use means as required by Oaxaca-Blinder methods.

We first examine the gender wage gap across 316 detailed occupation categories and find a gender wage gap of 18 percent among full-time, year-round workers, with women earning 82 percent of men's earnings. Gender differences in occupational distribution accounted for about 18 percent of the gender wage gap, but we also find substantial variation in the size of the gender wage gap within occupations. Out of 316 occupations examined, 270 (85 percent) had an average or below average wage gap. Among the 15 percent of occupations that had an above average wage gap, several were financial occupations. Personal care and service occupations had smaller than average wage gaps. To gain insight into these occupation-specific variations in wage gaps, we evaluated the effect of seven occupational characteristics: time pressure, level of competition, occupational hazards, worker autonomy, level of communication or teamwork required, proportion female, and returns to overtime. We show that more competitive and hazardous occupations, occupations that reward longer hours of work, and those with a larger proportion of women workers were associated with a larger wage gap and together accounted for about 30 percent of the gender wage gap. Occupations that offer more worker autonomy and require more communication and teamwork were associated with a smaller gender wage gap.

Across the 316 occupations in this study, some occupations retained larger unexplained residual gender wage gaps than others, indicating that traditional demographic and economic variables explain more of the gender wage gap in some occupations than in others. Following Goldin (2014), who argues that researchers need to isolate occupations with large unexplained residuals to understand what is contributing to unequal pay, we estimate 316 occupation-specific Oaxaca-Blinder decompositions to identify which occupations retained larger unexplained residuals after controlling for conventional demographic and human capital characteristics. We show that occupations requiring more communication and teamwork tend to have smaller unexplained residual gaps, while more hazardous occupations and occupations with larger, nonlinear returns to hours worked have the largest unexplained residuals. Larger occupation-specific residual wage gaps could be consistent with higher levels of discrimination in occupations that are hazardous and reward long working hours, but could also be associated with particular characteristics that are not accounted for using conventional control variables, including a larger variation in job titles within the occupation that are compensated differently.

The rest of the paper is organized as follows: we begin by discussing the gender wage gap over time, followed by recent research on compensating differentials and nonlinear returns to hours worked. We discuss limitations of prior studies on the gender wage gap, in particular, the constraints of using longitudinal surveys with small samples or larger, cross-sectional studies lacking actual work history measures. Next, we present our data sources and methods. We conclude with our findings and discuss how these findings contribute to our understanding of the gender wage gap.

## Key Findings

- The gender wage gap is between 18 and 20 percent at the median of the wage distribution and between 21 and 24 percent at the mean using administrative earnings records and survey-reported hours and weeks of work.

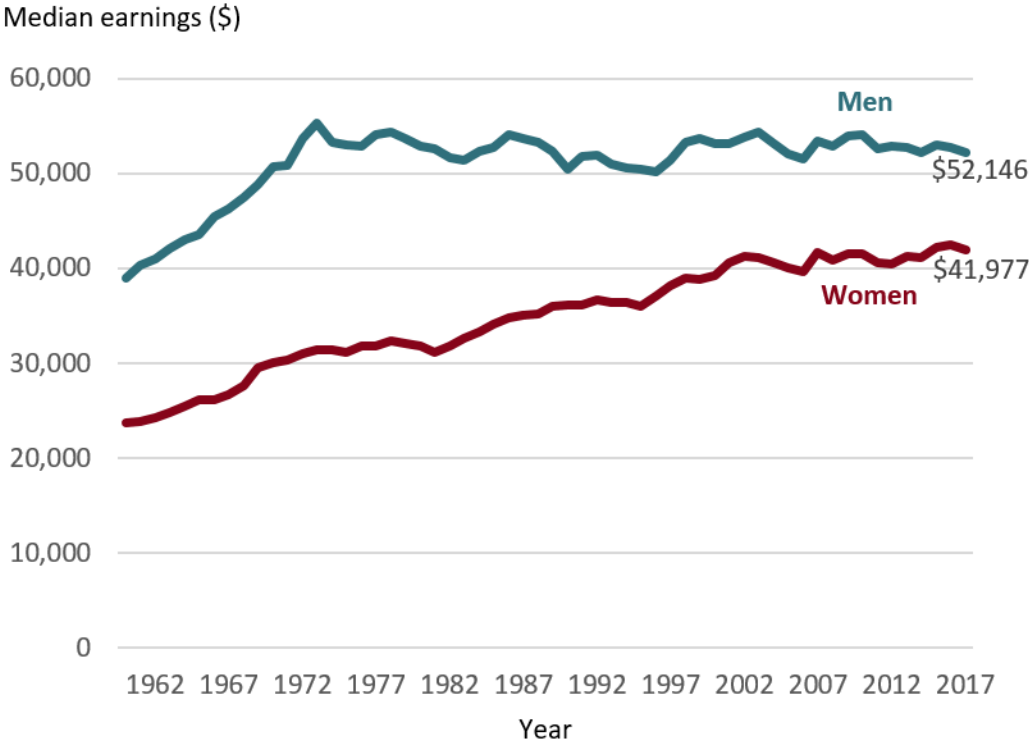
- A decomposition model that controls for standard demographic and economic characteristics, including a detailed 25-year work history, industry, and occupation explains 41 percent of the gender wage gap at the mean of the wage distribution, leaving most of the gap unexplained.
- Gender differences in 5-year work history explain almost none of the gender wage gap, but gender differences in 25-year work history explain just under 10 percent.
- Gender differences in occupation and industry explain much more of the gender wage gap than gender differences in work history, accounting for approximately one third of the gap net of other observable characteristics.
- The gender wage gap varies significantly by occupation: while wages are at parity in some occupations, gaps are as large as 45 percent in others.
- Compared with the average wage gap of 18 percent, the gender wage gap is larger than average in 15 percent of occupations and lower than average in 43 percent of occupations, indicating the wage gap within occupations was usually smaller than the average wage gap.
- Occupations in finance had among the largest gender wage gaps.
- Women's underrepresentation in occupations with high levels of competition increases the gender wage gap and accounts for 18 percent of the total gap. Women's overrepresentation in occupations with a higher proportion of women workers explains 10 percent of the gender wage gap. Occupations with a larger share of women workers are paid less even after accounting for characteristics of the workers and of the occupation.
- Women's overrepresentation in more autonomous occupations and in occupations that require more communication and teamwork reduces the gender wage gap.
- Gender differences in long hours of work explained little of the gender wage gap among full-time, year-round workers (less than 2 percent). Working long hours also provides diminishing returns. Men and women who worked between 41 and 49 hours per week received the largest wage premium, and a larger wage premium than those working 50 or more hours.
- Not all occupations reward longer hours of work. Some even penalize long hours. Several finance and retail occupations reward working in excess of 49 hours per week, while several healthcare and education occupations penalize working longer hours.
- Decomposition models by 316 occupations were able to explain all, or nearly all, of the observed gap in wages in some occupations, while some occupations retained logged hourly wage gaps as large as 0.63, equivalent to a wage difference of \$1.88 per hour in favor of men. Unexplained residual gaps tended to be smaller in occupations requiring more communication and teamwork, while more hazardous occupations and occupations with longer and nonlinear returns to hours worked had a larger unexplained residual wage gap.
- Methodologically, our results suggest that in studies of the gender wage gap, datasets with large samples to analyze detailed industry and occupation categories are preferable to datasets containing measures of actual labor-market experience when there is a tradeoff between these variables.

## Background

### The Gender Wage Gap Over Time

Women's earnings increased substantially between 1960 and 2000, but women have seen smaller gains since the early 2000s when earnings growth stalled for both men and women (Figure 1). Women's earnings relative to men's increased more during the 1960s through the 1980s compared with later years, from 60.7 percent in 1960 to 80.5 percent in 2017 (Figure 2). Researchers attribute the narrowing of the gender wage gap prior to 2000 to several changes in women's labor force participation and the economy over this period. Women's labor force participation rate increased by 20 percentage points between 1970 and 1990, driven by growing employment among mothers (Landivar 2017). As women became increasingly likely to remain employed continuously during prime employment and childrearing ages, women invested more in higher education and training and became more likely to enter occupations that value labor force attachment (Goldin 1990). In turn, greater investment in training and higher earnings potential increased the opportunity costs for taking time out of the labor force, making exits costlier. Returns to educational attainment and training increased, favoring women's increasing educational attainment, and the returns to cognitive skills increased between the 1960s and 1990s, especially among women, while the returns to motor skills declined, explaining about 20 percent of the reduction in the gender wage gap (Bacolod and Blum 2010; Kilbourne et al. 1994). Recent research shows that women's growing presence in high-skilled jobs with larger returns to education and analytical skills narrowed the gender wage gap by 4 cents to the dollar, raising the gender wage ratio by 4 percent (Kochhar 2020). During this period women also became less segregated in traditionally female occupations. Occupational segregation by gender declined 6.1 percent in the 1970s, 4.3 percent in the 1980s, 2.1 percent in the 1990s, and 1.1 percent in the 2000s (Blau, Brummund, and Liu 2012).

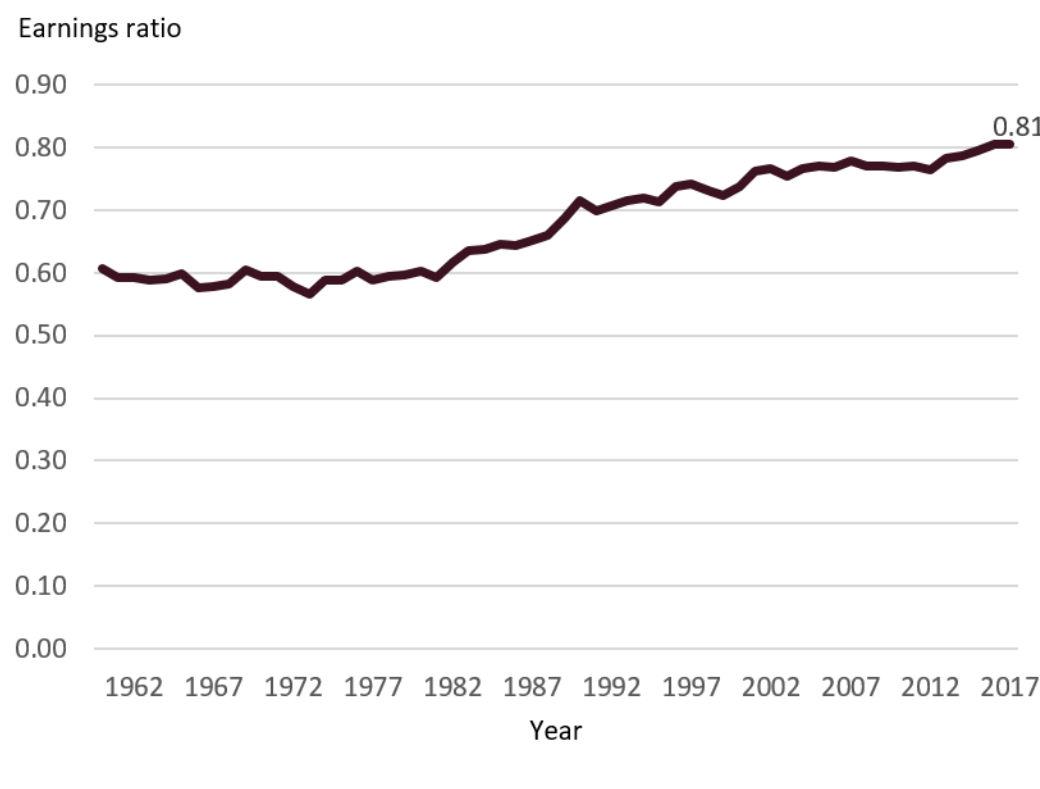
**Figure 1. Median Earnings of Full-Time, Year-Round Workers 15 Years and Older by Sex: 1960 to 2017**



Source: Fontenot, Kayla, Jessica Semega, and Melissa Kollar. 2018. "Income and Poverty in the United States: 2017." U.S. Census Bureau. Issued September.



**Figure 2. Ratio of Median Female Earnings to Median Male Earnings Among Full-Time, Year-Round Workers 15 Years and Older by Sex: 1960 to 2017**



Source: Fontenot, Kayla, Jessica Semega, and Melissa Kollar. 2018. "Income and Poverty in the United States: 2017." U.S. Census Bureau. Issued September.

Note: New estimates were released in September 2019, but due to changes in methodology, the time series loses consistency with preceding years.

## Occupational Characteristics and the Gender Wage Gap

Although women now have more continuous labor force attachment and some professional occupations have integrated, women and men remain substantially segregated. Prior research shows this segregation across industries and occupations contributes to about half of the explained variance in earnings between women and men (Chamberlain 2016; Blau and Kahn 2017). Characteristics of these occupations, including gender composition, job amenities and disamenities, and work-hour requirements and compensation contribute to the gender wage gap.

### *Occupational Devaluation*

Occupations that have a larger share of female incumbents pay less. Even after controlling for relevant differences, wages are lower in female-dominated occupations and the devaluation of women's work remains an important contributor to the gender wage gap (Tomaskovic-Devey 1993; Bayard, Hellerstein, Neumark, and Troske 1999; England, Hermsen, and Cotter 2000; Levanon, England, and Allison 2009; Cohen, Huffman, and Knauer 2009). Kilbourne and colleagues (1994) offer two explanations for why wages may be lower in female-dominated occupations net of other characteristics: 1) employers make cognitive errors in estimating women's contributions to organizational profits; and 2) skills associated with women's work are devalued and erroneously believed to require less effort. Occupations that require more female-typed skills, such as nurturing, are devalued and paid less (Weeden 2002; England et al. 1994). Jobs with more male-typed characteristics, such as authority and physical demands, pay more, and the wage returns to authority are lower for women (Kilbourne et al. 1994). Tomaskovic-Devey (1993) finds lower wages for occupations with a larger share of women workers even after accounting for human capital characteristics, firm characteristics, and job skills. Using experimental data, Alksnis and colleagues (2008) show that participants assigned lower wages to jobs that were placed under a female-domain label compared with identical job tasks under a male-domain label.

The lower pay in female-dominated occupations makes additional occupational integration difficult, as there is less incentive for men to enter lower-paying occupations (Blau, Brummund, and Liu 2012; Reskin and Bielby 2005). Even after accounting for differences in entry to male- and female-dominated occupations, men and women have different rates of permanence in these occupations. Men are more likely to leave female-dominated occupations and a move to a male-dominated occupation is associated with an increase in wages (Torre 2018). Women continue to be disproportionately responsible for balancing work and family, which is associated with gendered outcomes in occupational distribution, with mothers less likely to remain in male-dominated occupations requiring long working hours (Cha 2013). Gender segregation across occupations and differential compensation of predominately male and female occupations contributes to observed individual-level wage gaps.

### *Job Attributes and Compensating Differentials*

In addition to human capital explanations of the gender wage gap drawing on Becker's (1981) household specialization theory, recent research has evaluated how employers' compensation of

particular occupational attributes impacts the gender wage gap. Using a compensating differentials framework, Goldin (2014) argues that employers will penalize workers who desire amenities that are costly for them to provide. A compensating differentials hypothesis predicts that workers will trade wages for job amenities and risks that meet their preferences. Jobs that carry higher risks or offer poorer amenities need to be more highly compensated by employers to attract workers (Smith 1979). Some hazardous jobs that are dangerous to perform or cause physical discomfort or distress are rewarded through higher base wages or hazard pay (U.S. Department of Labor 2019; Kilbourne et al. 1994). Amenities, like flexibility in the number of hours or specific hours worked, may be more costly for some employers than others. Some employers may also experience higher transaction costs to transmit information about the job or clients, making shorter hours less desirable and workers less substitutable. In each of these cases, workers will accept lower wages in exchange for desirable work hours (Goldin 2014). Workers that are not easily substitutable will earn disproportionately higher wages when they work long hours, whereas workers that work shorter hours or desire particular hours of work in a context where these are costly to provide will earn disproportionately lower wages.

Goldin (2014) combines American Community Survey data with data on occupational attributes from O\*NET Online, a database of occupational characteristics developed and maintained by the U.S. Department of Labor, to model the effect of work context and activities on gender wage gaps. She shows that occupations scoring higher on characteristics like time pressure, the degree and importance of contact with others, and the freedom to make decisions on the job tend to have larger gender wage gaps. Business and law occupations had incumbents who were less substitutable compared with technology and science workers who had more flexible working environments. Similarly, in examining which work conditions contributed to higher earnings for mothers, Yu and Kuo (2017) find that occupations requiring less teamwork and less competition had smaller motherhood wage penalties. However, these occupations tended to pay less, indicating that mothers were trading off higher wages for these occupational amenities. Highly competitive occupations may lead to more job strain, and teamwork can require more coordination and presenteeism, thereby reducing flexibility and hindering women's employment. Jobs with competitive demands often entail establishing and maintaining client relationships. Under these conditions, women who take time off from work when they have children may lose clients or career networks, affecting their earnings over the long term. Prior findings on the effects of autonomy are in less agreement. Yu and Kuo (2017) find that greater autonomy is associated with a lower motherhood wage penalty, whereas Goldin (2014) finds that occupations offering workers greater freedom to make decisions have larger gender wage gaps. Greater autonomy can allow people more flexibility in their schedules and priorities, but greater autonomy may also come with the "stress of higher status" and more extensive job demands, leading to more work-to-family spillover (Schieman, Milkie, and Glavin 2009). We evaluate the effect of autonomy here to reconcile these differences in findings and determine whether greater autonomy is associated with a larger or smaller wage gap.

#### *Nonlinear Returns to Hours Worked*

Over the past two decades, the wage premium for working long hours has increased. Compared with full-time (35-49 hours) and part-time (less than 35 hours) workers, those working 50 or more hours

per week experienced faster wage growth (Weeden, Cha, and Bucca 2016). In 2014, the hourly wages for long-hour workers, net of controls, were 4 to 7 percent higher at the mean than the hourly wages for full-time workers (Weeden, Cha, and Bucca 2016). Whereas long hours were penalized in the 1980s, the penalty for working long hours turned into a premium starting around the year 2000 and continued to grow until around 2010.

The wage premium for working long hours is gender neutral in principle, but not in practice. Men typically have more flexibility to work overtime and long hours because they perform a smaller share of household and caretaking responsibilities (Sayer 2016). Therefore, occupations with wage premiums for long working hours and less individual worker substitution have larger gender wage gaps (Goldin 2014), as men are more likely to reap the financial rewards of long work hours. While many economic trends have contributed to a narrowing of the gender wage gap over the past several decades, increasing rewards to long working hours may slow or reverse progress.

Examining the returns to long work hours among college graduates, Goldin (2014) argues that earnings elasticity in hours of work explains a significant portion of the gender wage gap. Occupations in law and business disproportionately reward long hours of work and have a larger gender wage gap than occupations in science, technology, and health. Part-time workers in business and legal occupations earn disproportionately less per hour, as working shorter hours is more highly penalized and they are provided with less lucrative work assignments (Epstein et. al 1999). In contrast, health occupations offer more schedule flexibility without penalizing shorter schedules (Clawson and Gerstel 2014). For example, Goldin (2014) notes that pharmacists have more flexible schedules and small penalties for working fewer hours – that is, pharmacists’ work hours are rewarded more linearly. Among non-college graduates, workers in manufacturing and production occupations may more often work schedules that reward hours nonlinearly through premium pay for overtime hours. However, women are less likely to work these hours because they are disproportionately likely to be caregivers, limiting their ability to take on longer hours or unpredictable shifts. These conditions can contribute to larger intra-occupational wage disparities.

### Limitations of Prior Studies

As women’s human capital characteristics approach parity with those of men, three analytical issues have emerged. First, and not surprisingly, human capital explanations of the gender wage gap have declined in importance over time, although they still contribute to the gender wage gap (Goldin 2014; Blau and Kahn 2017). Human capital variables, in general, and labor force experience measures, in particular, are more readily available in small sample, longitudinal data sources than in large scale cross-sectional sources. Studies that use large scale survey data typically use potential work experience as a substitute for actual work histories (Weeden, Cha, and Bucca 2016; Goldin 2014; Oaxaca 1973). For example, lacking a direct measure of individual work experience, Oaxaca (1973) controlled for the presence of children in the household. CONSAD (2009) based work experience on occupational group averages, and Goldin (2014) used potential work experience. Simulated measures of labor-market experience, such as age-years of education-6 years (Mincer 1974), tend to overestimate the experience of workers who take time out of the labor force after finishing their education (Regan and Oaxaca 2009)

and underestimate the returns to work experience (Light and Ureta 1995). Since women are more likely than men to take time off due to caregiving responsibilities, empirical models that include simulated rather than actual experience will tend to overestimate the gender differential in returns to experience and, therefore, the unexplained component of the gender wage gap. Potential experience has been shown to overstate actual experience by more than five years for women, overstate the effects of schooling on wages relative to work experience, and increase unexplained residuals (Regan and Oaxaca 2009). In addition, labor force disruptions due to the Great Recession have exacerbated the issues associated with simulated and potential measure of experience, making measurements of actual work experience increasingly important among men (Blau and Kahn 2017).

Second, occupational and industrial segregation by gender have increased in importance over time and now explain a larger proportion of the remaining gender wage gap. Recent evidence from the Panel Study of Income Dynamics (PSID) suggests that the contribution of industry and occupation to the gender wage gap has grown considerably over time, while the contribution of work experience has declined as women have increasingly entered and remained attached to the labor force throughout their prime working years (Blau and Kahn 2017). Yet the small, longitudinal surveys on which most of the gender wage gap literature relies limits researchers' estimates of the contributions of detailed, precise occupation and industry categories to the remaining gap (Budig and England 2001; Wilde, Batchelder, and Ellwood 2010; England et al. 2016; Yu and Kuo 2017; Blau and Kahn 2017). Even large-scale surveys like the CPS ASEC do not have a large enough samples to evaluate detailed occupations. Researchers using longitudinal or CPS ASEC data must aggregate occupations or pool data over several years to avoid small cell sizes and unstable estimates. CONSAD (2009) used the Outgoing Rotation Group of the CPS and was only able to analyze 23 major occupation groups. Blau and Kahn (2017) similarly aggregated occupations into 21 categories, a tradeoff they made to be able to use actual work experience measures available only in the PSID. As much of the research on the gender wage gap uses the same longitudinal data sources with the same cohorts (Weeden, Cha, Bucca 2016), there is a growing need to validate these results with large samples to fully account for and evaluate industry and occupation effects.

Third, with the declining predictive power of human capital variables, the explained portion of the gender wage gap has declined over time (Goldin 2014). In traditional Oaxaca-Blinder decomposition models, the residual is the variance in earnings that is unexplained after accounting for compositional effects (Oaxaca 1973; Blinder 1973). Studies that control for human capital, occupation, industry, and work experience are able to explain part of the wage gap. Yet, even after controlling for a substantial number of characteristics, most studies are unable to explain between 38 and 71 percent of the gender wage gap (CONSAD 2009; Chamberlain 2016; Blau and Kahn 2017). Although the gender wage gap has narrowed over the years, a growing share of the remaining gap is unexplained (Blau and Kahn 2017). The remaining unexplained residual has been attributed to many factors, including unobservable characteristics, differential returns to negotiation for wages and promotions, differential returns to hours worked, and discrimination. Nevertheless, it is difficult to disentangle choice from discrimination. The residual may only partly stem from discrimination, and the effects of discrimination may not be confined to the residual. Labor force patterns and occupational choice can themselves be a function of discrimination experienced and accumulated over time (Black et al. 2008; Fortin, Lemieux, and Firpo

2010). By controlling for occupation, models do not account for discrimination in occupational selection and underestimate the extent of discrimination as women may adapt to biases in the labor market (Oaxaca 1973).

We expand upon existing studies in several ways. First, we use the CPS ASEC to evaluate the effect of actual work history using administrative records. We use 10 years of CPS ASEC data linked with 25 years of SSA administrative earnings records to conduct a decomposition of the gender wage gap while controlling for demographic and economic characteristics and multiple specifications of work history. Second, we combine the ACS with 10 years of IRS administrative earnings records to evaluate the effect of occupation and occupational characteristics on the gender wage gap using a large sample with actual work experience data. Using the ACS, we have adequate sample to analyze 316 detailed occupation categories with precision using actual work experience measures derived from the IRS administrative records. We conduct a decomposition showing the contribution of detailed occupation to the gender wage gap. We also incorporate data on gender composition, nonlinearities in returns to hours worked by occupation, and occupational characteristics from O\*NET Online to show what types of occupational characteristics ameliorate or exacerbate the gender wage gap. Finally, we conduct a decomposition within each of 316 occupations to show which occupations have larger unexplained residuals. Using these occupation-specific decompositions, we show the extent of occupational diversity in the size of the gender wage gap residual which may be a partial indicator of the occupations in which women experience more extensive discrimination in earnings.

## Data and Methods

### Data

We first use the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) from 2004 to 2013 to establish the association between work history and the gender wage gap. We link these CPS ASEC records to the Social Security Administration (SSA) Detailed Earnings Record using Protected Identification Keys (PIKs) assigned via the U.S. Census Bureau's Person Validation System (Wagner and Layne 2014).<sup>2</sup> As is common in studies of the gender wage gap, we restrict our analyses to

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<sup>2</sup> The Person Validation System assigns individuals in survey and administrative data sources unique, anonymous Person Identification Keys (PIKs) using Social Security Numbers (SSN), when available, as well as names, dates of birth, and other basic demographic information in the absence of an SSN. After PIK assignment is completed and before researchers are granted access to the data, all personally identifiable information, like SSNs and names, is removed. It is important to note that, in the absence of an SSN, not all individuals can be assigned a PIK and, therefore cannot be linked to other data sources. Rates of PIK assignment in SSA and IRS administrative records are very high (>99%), but are lower in survey data (over 80 percent in the CPS ASEC and over 90 percent in the ACS). Prior research has shown that the likelihood of PIK assignment in the absence of an SSN is not random, and varies predictably with ACS respondents' demographic and socioeconomic characteristics (Bond et al. 2014). Therefore, to account for this non-random variation in PIK assignment, we adjust CPS ASEC sample weights, ACS

civilian workers employed full-time (usually working at least 35 hours per week), year-round (working at least 50 weeks of the year) for greater comparability in earnings (Blau and Kahn 2017; Fontenot, Semega, and Kollar 2018). We further limit to workers between the ages of 25 and 54 to focus on prime working years after most workers have likely completed schooling. We exclude self-employed workers, as these individuals do not have current earnings in administrative records. After sample restrictions, our analytical CPS-SSA universe contains approximately 381,000 individuals – 169,000 women and 212,000 men.<sup>3</sup>

We use recent responses to American Community Survey (ACS) from 2015 and 2016 to evaluate the effects of detailed occupation and occupational characteristics on the gender wage gap. As the largest household survey in the United States, the ACS is the best source of detailed occupational data. Smaller surveys, such as the CPS ASEC, only allow for analyses with larger aggregations of occupation, and these aggregations mask the combination of predominately male and female detailed occupations within larger occupational groups (Blau, Brummund, and Liu 2012). Earnings also differ significantly by the detailed occupations nested within major occupational groups. As with the CPS ASEC, we restrict our analytical universe to civilian workers employed full-time, year-round between the ages of 25 and 54. We drop self-employed workers because Internal Revenue Service (IRS) Forms W-2 only contain wages reported by employers for tax purposes. We pool 2015 and 2016 1-year ACS responses and link them to IRS Forms W-2 from 2005 through 2016 using PIKs. After applying restrictions, our analytical ACS-IRS universe contains approximately 1,914,000 individuals – 864,000 women and 1,050,000 men.

## Variables

### *Wages*

Prior research suggests that earnings data contain significant nonresponse in survey data sources (Bollinger et al. 2019), so we use earnings reported by employers and obtained from SSA and IRS administrative records. We then use these earnings to calculate workers' hourly wages using respondents' CPS ASEC and ACS answers to questions regarding the usual hours worked per week and the number of weeks worked last year. Specifically, for the full-time, year-round workers in our analytical sample, we compute wages as follows:  $\text{wage} = \text{administrative earnings per year in 2017 dollars} / (52 \text{ weeks per year} * \text{survey-reported usual hours worked per week})$ . Administrative earnings are wage and salary earnings plus deferred compensation from all jobs held during the year, as reported on the worker's W-2 forms. Because very high values of usual hours worked per week may be a sign that hours are over-reported or coded incorrectly, we topcode usual hours worked per week to 80. This topcoding

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person weights, and ACS replicate weights by the inverse predicted probability of PIK assignment obtained from probit models not reported. We then normalize each individual's adjusted survey weights by the average of all weights to ensure that weighted and unweighted Ns are equal, thereby avoiding artificially small error estimates in the analyses that follow.

<sup>3</sup> Per U.S. Census Bureau Disclosure Avoidance Guidelines, we round Ns throughout to protect anonymity of CPS ASEC and ACS respondents.

affects very few observations (for reference, about 0.37 percent of the ACS sample reported working in excess of 80 hours, the most common response being 99 hours per week). In addition, we drop observations with hourly wages less than 3 dollars or greater than 500 dollars and observations with usual hours worked per week allocated by the Census Bureau.

### *Economic and Demographic Characteristics*

A number of individual human capital and labor-force experience characteristics have been shown to influence wages, and aggregate compositional differences between women and men with respect to these characteristics account for some of the overall gap in wages. We consider a broad array of these characteristics in the analyses that follow, including age, race/ethnicity, marital status, presence/age of children in the household, educational attainment, industry, occupation, geographic region, usual hours worked per week, and work history. Our measurement of these characteristics is explained in detail below, and these characteristics are summarized in Table 1. (Summary statistics for occupation and occupational aggregations are provided in Appendix Tables A1 through A3.)



**Table 1: Proportion of Men and Women Ages 25-54 Working Full-Time, Year-Round**

Subgroup	American Community Survey				Current Population Survey Annual Social and Economic Supplement			
	Women		Men		Women		Men	
	Pro-portion	SE	Pro-portion	SE	Pro-portion	SE	Pro-portion	SE
Total	0.45	< 0.01	0.55	< 0.01	0.44	<0.01	0.56	<0.01
Age								
25 to 34	0.34	< 0.01	0.34	< 0.01	0.32	< 0.01	0.32	< 0.01
35 to 44	0.32	< 0.01	0.33	< 0.01	0.35	< 0.01	0.36	< 0.01
45 to 54	0.34	< 0.01	0.33	< 0.01	0.34	< 0.01	0.32	< 0.01
Race and Ethnicity								
Non-Hispanic Asian Alone	0.06	< 0.01	0.06	< 0.01	0.05	< 0.01	0.05	< 0.01
Non-Hispanic Black Alone	0.14	< 0.01	0.10	< 0.01	0.14	< 0.01	0.09	< 0.01
Non-Hispanic White Alone	0.62	< 0.01	0.65	< 0.01	0.66	< 0.01	0.70	< 0.01
Hispanic	0.16	< 0.01	0.17	< 0.01	0.13	< 0.01	0.14	< 0.01
Other	0.03	< 0.01	0.02	< 0.01	0.02	< 0.01	0.02	< 0.01
Marital Status								
Unmarried	0.45	< 0.01	0.36	< 0.01	0.41	< 0.01	0.31	< 0.01
Married	0.55	< 0.01	0.64	< 0.01	0.59	< 0.01	0.69	< 0.01
Presence and Age of Children								
None	0.52	< 0.01	0.50	< 0.01	0.48	< 0.01	0.46	< 0.01
Children under 6 only	0.09	< 0.01	0.12	< 0.01	0.10	< 0.01	0.14	< 0.01
Children 6 to 17 only	0.30	< 0.01	0.28	< 0.01	0.33	< 0.01	0.28	< 0.01
Children under 6 and 6 to 17	0.09	< 0.01	0.11	< 0.01	0.10	< 0.01	0.12	< 0.01
Education								
High school diploma or less	0.24	< 0.01	0.33	< 0.01	0.30	< 0.01	0.37	< 0.01
Some college, including associate/vocational degrees	0.32	< 0.01	0.30	< 0.01	0.30	< 0.01	0.27	< 0.01
Bachelor's degree	0.26	< 0.01	0.24	< 0.01	0.26	< 0.01	0.24	< 0.01
Master's degree	0.13	< 0.01	0.10	< 0.01	0.11	< 0.01	0.09	< 0.01
Professional or doctorate degree	0.04	< 0.01	0.04	< 0.01	0.03	< 0.01	0.04	< 0.01
Industry								

Subgroup	American Community Survey				Current Population Survey Annual Social and Economic Supplement			
	Women		Men		Women		Men	
	Pro-portion	SE	Pro-portion	SE	Pro-portion	SE	Pro-portion	SE
Agriculture, forestry and fishing, and mining	0.01	< 0.01	0.02	< 0.01	0.00	< 0.01	0.02	< 0.01
Construction	0.01	< 0.01	0.09	< 0.01	0.01	< 0.01	0.09	< 0.01
Manufacturing	0.09	< 0.01	0.18	< 0.01	0.09	< 0.01	0.19	< 0.01
Wholesale trade	0.02	< 0.01	0.04	< 0.01	0.02	< 0.01	0.05	< 0.01
Retail trade	0.09	< 0.01	0.09	< 0.01	0.09	< 0.01	0.10	< 0.01
Transportation, warehousing, and utilities	0.03	< 0.01	0.08	< 0.01	0.03	< 0.01	0.08	< 0.01
Information	0.02	< 0.01	0.03	< 0.01	0.03	< 0.01	0.03	< 0.01
Finance, real estate, rental, and leasing	0.10	< 0.01	0.07	< 0.01	0.10	< 0.01	0.07	< 0.01
Professional, scientific, and management services	0.10	< 0.01	0.12	< 0.01	0.10	< 0.01	0.11	< 0.01
Educational services, health care, and social assistance	0.38	< 0.01	0.12	< 0.01	0.37	< 0.01	0.11	< 0.01
Arts, entertainment, accommodation, and food services	0.06	< 0.01	0.06	< 0.01	0.05	< 0.01	0.05	< 0.01
Other services	0.03	< 0.01	0.03	< 0.01	0.03	< 0.01	0.03	< 0.01
Public administration	0.07	< 0.01	0.07	< 0.01	0.07	< 0.01	0.07	< 0.01
Usual Hours Worked per Week								
35 to 39 hours	0.11	< 0.01	0.04	< 0.01	0.11	< 0.01	0.03	< 0.01
40 hours	0.62	< 0.01	0.54	< 0.01	0.68	< 0.01	0.60	< 0.01
41 to 49 hours	0.12	< 0.01	0.12	< 0.01	0.08	< 0.01	0.11	< 0.01
50+ hours	0.15	< 0.01	0.28	< 0.01	0.13	< 0.01	0.26	< 0.01
Work History								
Worked 1 year ago	0.98	< 0.01	0.98	< 0.01	0.92	< 0.01	0.92	< 0.01
Did not work 1 year ago	0.02	< 0.01	0.02	< 0.01	0.08	< 0.01	0.08	< 0.01
Worked 5 years ago	0.89	< 0.01	0.89	< 0.01	0.95	< 0.01	0.96	< 0.01
Did not work 5 years ago	0.11	< 0.01	0.11	< 0.01	0.05	< 0.01	0.04	< 0.01
Worked 10 years ago	0.82	< 0.01	0.83	< 0.01	0.87	< 0.01	0.89	< 0.01
Did not work 10 years ago	0.13	< 0.01	0.12	< 0.01	0.11	< 0.01	0.09	< 0.01
Under 18 years of age 10 years ago	0.05	< 0.01	0.05	< 0.01	0.02	< 0.01	0.02	< 0.01
Worked 15 years ago	-	-	-	-	0.71	< 0.01	0.76	< 0.01

Subgroup	American Community Survey				Current Population Survey Annual Social and Economic Supplement			
	Women		Men		Women		Men	
	Pro-portion	SE	Pro-portion	SE	Pro-portion	SE	Pro-portion	SE
Did not work 15 years ago	-	-	-	-	0.16	< 0.01	0.12	< 0.01
Under 18 years old 15 years ago	-	-	-	-	0.13	< 0.01	0.12	< 0.01
Worked 20 years ago	-	-	-	-	0.53	< 0.01	0.59	< 0.01
Did not work 20 years ago	-	-	-	-	0.20	< 0.01	0.14	< 0.01
Under 18 years old 20 years ago	-	-	-	-	0.28	< 0.01	0.27	< 0.01
Worked 25 years ago	-	-	-	-	0.39	< 0.01	0.43	< 0.01
Did not work 25 years ago	-	-	-	-	0.18	< 0.01	0.12	< 0.01
Under 18 years old 25 years ago	-	-	-	-	0.44	< 0.01	0.45	< 0.01
Metropolitan Status								
Non-Metro	0.05	< 0.01	0.05	< 0.01	0.15	< 0.01	0.14	< 0.01
Metro	0.95	< 0.01	0.95	< 0.01	0.85	< 0.01	0.86	< 0.01
Region								
Northeast	0.19	< 0.01	0.18	< 0.01	0.18	< 0.01	0.18	< 0.01
Midwest	0.22	< 0.01	0.22	< 0.01	0.23	< 0.01	0.23	< 0.01
South	0.38	< 0.01	0.36	< 0.01	0.38	< 0.01	0.36	< 0.01
West	0.21	< 0.01	0.23	< 0.01	0.21	< 0.01	0.23	< 0.01
N	864,000		1,050,000		169,000		212,000	

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016) and Current Population Survey Annual Social and Economic Supplement (CPS ASEC) responses (2004-2013) linked to Social Security Detailed Earnings Record (DER) administrative records (1978-2012).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: - indicates data not available. SE = standard error.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002 and #CBDRB-FY2019-CES005-014.

## *Age*

Our empirical models include labor-market histories constructed from administrative earnings records, so unlike most studies using CPS ASEC or ACS data, we do not use age to proxy for experience (for example, by computing potential experience as a function of age and education). Instead, we include age directly as a demographic control variable. We allow for a non-linear relationship between age and wages, as well as differences in the age distribution of men and women, using age and age squared terms in all decompositions. Table 1 details the distribution of men and women of prime working age in three 10-year age categories in the CPS-SSA and ACS-IRS analytical samples. Broadly speaking, the men and women in each sample are distributed fairly equally across these bins.

## *Race/Ethnicity*

ACS and CPS ASEC respondents' racial and ethnic self-identification is coded using five categories: non-Hispanic Asian alone; non-Hispanic Black alone; non-Hispanic White alone; Hispanic (of any race); and other (including American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, multiple races, and any other non-Hispanic self-identification). Standard Census Bureau race and ethnicity tabulations typically disaggregate the "other" category to distinguish, for example, between those self-identifying as multiple races and American Indian/Alaskan Native, producing seven race/ethnicity categories.<sup>4</sup> However, changes in race and ethnicity items on the CPS ASEC over time, as well as small samples in some gender- and race/ethnicity-specific categories necessitate the aggregation of smaller populations into a broader "other" race/ethnicity category. We collapse these categories in the ACS responses, as well, for consistency.

## *Marital Status and the Presence/Age of Children in the Household*

The gender wage gap differs by marital and parental status. On average, married men and women earn more than their unmarried counterparts (Vandenbroucke 2018; Landivar 2017). At the same time, fathers earn more than men without children (Glauber 2008, Lundberg and Rose 2000), whereas mothers earn less than women without children (Budig and England 2001; Jee, Misra, and Murray-Close 2019). To provide a current picture of variation in the gender wage gap by family composition, we use CPS ASEC and ACS self-reports to categorize workers as either married or

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<sup>4</sup> Race and Hispanic origin data are presented following the guidance of the U.S. Office of Management and Budget's (OMB) 1997 Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. These federal standards mandate that race and Hispanic origin (ethnicity) are separate and distinct concepts and that when collecting these data via self-identification, two different questions must be used. Therefore, two basic ways of defining a race group are possible. A group such as Asian may be defined as those who reported Asian and no other race (the race-alone or single-race concept) or as those who reported Asian regardless of whether they also reported another race (the race-alone-or-in-combination concept). This working paper shows data using the first approach (race alone). Use of the single-race population does not imply that it is the preferred method of presenting or analyzing data. Census Bureau products use a variety of approaches.

unmarried (including never married, cohabiting, widowed, and divorced individuals). We also place workers into one of four categories capturing the presence and age of children in the household at the time of CPS ASEC or ACS response: no children; children under age 6 only; children between the ages of 6 and 17 only; and children under 6 and between 6 and 17. We report summary statistics detailing the distribution of men and women workers by marital status and the presence/age of children in the household (Table 1).

We do not include marital or parental status in the empirical models we use to decompose the gender wage gap because we are interested primarily in the contributions of education, labor-market experience, and occupational and industrial segregation to the gap. Family composition is correlated with these variables (Jee, Murray-Close, and Misra 2019; Women’s Bureau 2019), so including marital and parental status when decomposing the gender wage gap risks understating the contribution of human capital to the gap. To the extent that mothers work fewer hours, are concentrated in different occupations and industries, or invest less in human capital development, it is captured by our inclusion of these variables in the models. Our decomposition results should be interpreted as quantifying the contribution of observed human capital variables to the gender wage gap in an accounting rather than a causal sense, with associations between human capital and wages that may be driven by family composition attributed to human capital.

#### *Educational attainment*

Educational attainment of workers in our analytical samples is gauged using self-responses on highest degree earned CPS ASEC and ACS items. To maintain consistency between CPS ASEC and ACS categories, we aggregate detailed categories into the following five: high school diploma or less; some college (including associate and vocational degrees); bachelor’s degree; master’s degree; and professional or doctorate degree.

#### *Occupation*

The Census Bureau publishes data on 535 civilian occupations coded based on the 2010 Standard Occupational Classification (SOC). However, many of these occupations are too small for robust multivariate analyses. Using the Current Population Survey Annual Social and Economic Supplement, we conduct analyses using 22 major occupation groups (see Appendix Table A1 for groupings and descriptive statistics). Analyses with more detailed occupational categories in the CPS ASEC provide unreliable estimates due to small cell counts in some occupations. In analyses with ACS data, we are able to use a more detailed occupational specification with 316 occupations. We combined similar occupations following the SOC nesting hierarchy when the average unweighted sample size in an occupation fell below 100 observations.<sup>5</sup> Aggregations were most extensive in agriculture, construction,

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<sup>5</sup> Occupation cells with fewer than 100 observations can provide unreliable estimates, especially median earnings estimates. The Census Bureau recommends suppressing derived estimates, such as the gender earnings

installation, and maintenance occupations where many detailed occupations had few incumbents. We combined an additional three occupations for which O\*NET did not collect occupational characteristic data. O\*NET does not collect data for some residual, non-specific occupation categories identified by the description “all other” in their titles (e.g., therapists, all other; personal care and service workers, all other). A list of our 316 occupations and a mapping to the original 535 Census occupation codes and 2010 SOC codes is available in Appendix Table A2.

#### *Weeks Worked Last Year and Usual Hours Worked per Week*

We use CPS ASEC and ACS respondents’ reports of usual hours worked each week and weeks worked last year to both restrict our primary analytical samples to full-time, year-round workers and create hourly wage measures. We also include measures of usual hours worked each week when decomposing differences in men’s and women’s average hourly wage. Specifically, we place full-time, year-round workers into one of three hours-worked-per-week bins – 35-40 hours, 41-49 hours, and 50+ hours – to understand the contribution of differences in men’s and women’s likelihood of working 40+ hours to the overall gender wage gap. Grouping usual hours worked each week into bins has two advantages over a using continuous measure: the bins allow for non-linear effects of hours worked on wages, and they minimize concerns that measurement error in hours worked will bias our estimates of the relationship between hours worked and wages. In additional analyses of the nonlinear returns to long work hours, we compare the median log wages of full-time workers in three hours-worked-per-week bins 35-40 hours, 41-49 hours, and 50+ hours – to identify occupations with particularly positive or negative returns to overtime work.

#### *Work History*

Work history variables are constructed using earnings from administrative records: the Social Security Administration’s (SSA) Detailed Earnings Record, which includes compensation reported on W-2 forms going back to 1978 for individuals in the CPS-SSA linked data, and IRS Forms W-2 going back to 2005 for individuals in the ACS-IRS linked data. Respondents over the age of 18 in year  $Y$  are coded as having worked in year  $Y$  if their aggregate wage and salary earnings (not including self-employment income) are greater than or equal to the amount that would be earned if one worked 520 hours at the prevailing federal minimum wage in year  $Y$  (Goldin and Mitchell 2017). Respondents over the age of 18 in year  $Y$  whose wage and salary earnings do not meet this threshold are coded as not working, while individuals who were under 18 years of age in year  $Y$  are coded as such.

Because access to IRS Form W-2 data are limited to the post-2004 period, earnings histories in the ACS-IRS data extend only as far back as 2005, providing 10 full years of actual work experience for all workers responding to the ACS in 2015 and 2016. While this is a limitation of the ACS-IRS data, we show in analyses using the CPS-SSA data that including 10 years of experience accounts for 3 percent of the

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ratio, for occupations with fewer than 100 observations. See, for example:

<https://www.census.gov/data/tables/time-series/demo/industry-occupation/median-earnings.html>.

gender earnings gap. Additional experience up to 25 years add 6 percent, a relatively small share of the gender wage gap compared with industry and occupation variables that are best measured in ACS. Light and Ureta (1995) show that earnings losses due to work experience gaps are recovered within 4 years among women. Given our sample is limited to those who are employed and we have at least 10 years of work history, a substantial share of the effect of work history is accounted for in these models.

### *Industry*

To capture variation in wages and shares of the gender wage gap due to industry segregation, we measure industry using 13 major industry categories commonly used by the U.S. Census Bureau. These industries are presented according to the 2012 North American Industry Classification System (NAICS).

### *Occupational Characteristics*

We obtained data on occupational characteristics from O\*NET Online. O\*NET occupation categories are based on the 2010 Standard Occupational Classification (SOC). However, O\*NET expands the SOC by adding emerging occupations or more detailed occupational breakouts. O\*NET identifies these occupations using the standard 6-digit SOC code, but appends a decimal and two digits to the breakout occupations. For example, SOC code 11-1011 is chief executives but O\*NET includes a breakout occupation, chief sustainability officers, using code 11-1011.03. Because O\*NET does not provide a count of the number of people employed in these breakout occupations (the count provided on their website is actually the count of the parent 6-digit occupation), we cannot use them. We retain O\*NET data only for the main occupations that are consistent with the 6-digit SOC classification. O\*NET uses the Occupational Employment Statistics (OES) estimates at the 6-digit SOC level to provide the occupation size. We use the OES estimates to create weights for O\*NET data to be able to aggregate O\*NET occupational characteristic data into the 316 Census occupation categories (see Table 2 for an example). We use these weights so that small occupations do not exert as much influence as large occupations over the final occupational characteristics estimates for the aggregated occupation categories.

**Table 2: Example Census Occupation Mapping to the 2010 Standard Occupational Classification (SOC) and Occupational Employment Statistics (OES) to Derive O\*NET Occupational Characteristic Data Weighted by Occupational Employment Counts**

Occupation Title	Aggregated 2010 Census Code	2010 SOC Code	OES count	Occupation weight
Human resources managers			186,330	
Compensation and benefits managers	0135	11-3111	15,520	0.08
Human resources managers	0136	11-3121	136,310	0.73
Training and development managers	0137	11-3131	34,500	0.19



To evaluate the association between occupational characteristics and the gender wage gap, we use nine occupational characteristics from O\*NET. We grouped these nine characteristics to create five variables that measure time pressure, level of competition, occupational hazards, autonomy, and communication and teamwork. Variables were grouped to reduce multicollinearity and when two or more characteristics together were good indicators of the underlying variable we wanted to measure (i.e., autonomy or communication). A full description of the O\*NET questions and value ranges we use are included in Table 3. Occupational characteristics for all 316 occupations are available in Appendix Table A3. New research has evaluated alternative ways of grouping occupations using O\*NET, classifying occupations by routine or non-routine manual or cognitive work (Manzella, Totty, and Benedetto 2019). We show in our results section that our grouping of O\*NET occupations is more appropriate for the evaluation of the gender wage gap and for analyses using more detailed occupations. In addition to our use of O\*NET occupation characteristic variables, we include proportion female in the occupation derived from the American Community Survey. We also derive the returns to overtime hours by comparing the hourly wages of those working 40 hours a week to those working between 41 and 49 hours a week and 50 or more hours a week. These can be interpreted as the economic returns per hour of work when working in each of these work-hour distributions (35 to 40, 41-49, and 50 or more hours per week).

**Table 3: Occupational Characteristics From O\*NET Online**

Variable	Measure	Question text	Description	Illustrative examples ranking highly on these metrics	Response Range
Time pressure	Percentage of workers in an occupation that have to meet strict deadlines ranging from “never” to “every day.”	<i>How often does this job require the worker to meet strict deadlines?</i>	Lower values indicate infrequent strict deadlines and higher values indicate frequent strict deadlines.	News analysts, chefs, couriers and messengers	19%-99%
Competition	Percentage of workers in an occupation indicating the worker has to compete or be aware of competitive pressures ranging from “not at all competitive” to “highly competitive.”	<i>To what extent does this job require the worker to compete or be aware of competitive pressures?</i>	Lower values indicate the occupation is not competitive and higher values indicate the occupation is highly competitive.	Photographers, real estate brokers, advertising sales agents	7%-91%
Occupational hazards	Percentage of workers in an occupation indicating the job requires exposure to hazardous conditions ranging from “never” to “every day.”	<i>How often does this job require exposure to hazardous conditions?</i>	Lower values indicate workers are never exposed to hazardous conditions and higher values indicate workers are exposed to hazardous conditions daily.	Plant and system operators, painting workers, chemical processing machine setters	0%-87%
Autonomy	Index variable combining 2 variables that measure decision-making freedom and ability to structure work priorities and goals ranging from “no freedom” to “a lot of freedom.”	<i>1. How much decision making freedom, without supervision, does this job offer? 2. To what extent is this job structured for the worker, rather than allowing the worker to determine tasks, priorities, and goals?</i>	Lower values indicate no freedom to make decisions or structure the job and higher values indicate a lot of decision-making freedom and ability to determine tasks, priorities, and goals. Cronbach’s alpha = .82.	Chief executives, chiropractors, real estate brokers	46%-99%
Communication and teamwork	Index variable combining 4 variables that measure contact with others (“no contact” to “constant contact”), dealing with external customers (“not important at all” to “extremely important”), teamwork (“not important at all” to “extremely important”), and establishing and maintaining interpersonal	<i>1. How much does this job require the worker to be in contact with others (face-to-face, by telephone, or otherwise) in order to perform it? 2. How important is it to work with external customers or the public in this job?</i>	Lower values indicate less contact with others and maintenance of interpersonal relationships and higher values indicate more contact with others and maintenance of interpersonal relationships. Cronbach’s alpha = .85.	Public relations and fundraising managers, meeting and event planners, police officers	45%-93%

relationships (“not important at all” to “extremely important”).

*3. How important is it to work with others in a group or team in this job?*

*4. Developing constructive and cooperative working relationships with others, and maintaining them over time?*

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Source: O\*NET Online 2019. Data and detailed descriptions available at: [https://www.onetonline.org/find/descriptor/browse/Work\\_Context/](https://www.onetonline.org/find/descriptor/browse/Work_Context/) and [https://www.onetonline.org/find/descriptor/browse/Work\\_Activities/](https://www.onetonline.org/find/descriptor/browse/Work_Activities/).

## Region and Year

Finally, we consider for summary and control purposes the broad regional labor markets in which workers earn, as well as the years in which they respond to the CPS ASEC or ACS. Regional variation in wages is captured using the U.S. Census Bureau's four-category designations (Northeast, Midwest, South, and West), while year dummy variables indicate the timing of survey responses.

## Methods

### *Oaxaca-Blinder Decompositions*

We decompose the contemporary gender gap in hourly wages among CPS ASEC and ACS respondents using well-established Oaxaca-Blinder decomposition methods (Oaxaca 1973; Blinder 1973; Jann 2008). Specifically, we decompose gender differences in the natural log of hourly wages in the previous year (adjusted for inflation) into components attributable to (1) differences in the human capital and labor market characteristics of men and women earners and to (2) differences in the effects of characteristics on earnings, which may be indicative of gender discrimination and/or unobserved characteristics.

The Oaxaca-Blinder decomposition occurs in two stages. First, to estimate the effects of human capital and other observed characteristics on earnings, we use linear regression to model log hourly wages for men and women separately:

$$\begin{aligned} Y_i &= X_i\beta_m + \varepsilon_i \\ Y_j &= X_j\beta_w + \varepsilon_j \end{aligned}$$

where  $Y_i$  and  $Y_j$  are the log hourly wages for man  $i$  and woman  $j$ , respectively,  $X_i$  and  $X_j$  are vectors of observed characteristics,  $\beta_m$  and  $\beta_w$  are vectors of estimated coefficients representing the effects of observed characteristics on log wages, and  $\varepsilon_i$  and  $\varepsilon_j$  are error terms.

Second, by rearranging the linear regression equations above, we can decompose differences in the average log wages of men and women into two component parts:

$$\bar{Y}_m - \bar{Y}_w = E + (C + EC).$$

The first component,  $E$ , is the "explained" portion of the wage gap, or the portion attributable to observed differences in the characteristics of men and women.  $E$  is equal to  $(\bar{X}_m - \bar{X}_w)\beta_m$ . The second component,  $C + EC$ , folds together the "unexplained" portion of the wage gap, or the portion attributable to gender differences in the returns to particular characteristics, and an interaction term that accounts for unobserved characteristics of men and women. As such,  $C + EC$  is equal to  $(\beta_m - \beta_w)\bar{X}_m + (\bar{X}_m - \bar{X}_w)(\beta_m - \beta_w)$ .

This twofold decomposition assumes implicitly that one group's characteristics are compensated fairly, while the other group's characteristics are not. For example, it is possible that women's characteristics are compensated fairly, and that men's higher average wages are attributable to

particularly generous compensation from employers. Alternatively, it could be that men's characteristics are compensated fairly, while women experience discrimination and, therefore, wages that are less than commensurate with their endowments. Throughout the main text we report decomposition results consistent with the latter scenario, but we also present decomposition results assuming the former scenario in Appendix Tables A5 and A8.

Making the assumption that men are compensated fairly is advantageous for two reasons. First, this facilitates an intuitive and straightforward interpretation of decomposition results from the viewpoint of women. For example, the  $E$  component details the expected change in women's mean log earnings under a counterfactual scenario in which women had the same observed characteristics as men. Similarly, the  $C + EC$  component captures the expected change in women's mean log earnings under the counterfactual scenario in which women's observed characteristics had the same effects on earnings as men's. Second, this approach is consistent with other research on the gender wage gap operating under typical data quality restrictions. As Blau and Kahn (2017) note, men's characteristics and coefficients are typically used as referents for women because most studies lack measures of actual work experience. Though this study is not hampered in this way, we nonetheless adopt the implicit assumptions of prior studies for consistency and comparison.

Using this general Oaxaca-Blinder framework, we first use CPS-SSA data to understand the effects of actual work experience over the past 25 years on the gender wage gap. We then conduct a series of decompositions using ACS-IRS data to gauge: (1) the effects of occupational segregation across 316 detailed occupations on the overall gender wage gap; (2) the effects of occupational characteristics on the overall gender wage gap; and (3) the size of the occupation-specific residual gender wage gaps remaining after accounting for observed differences in men's and women's characteristics in each of 316 occupation categories.

Though fundamentally similar in structure, our CPS-SSA and ACS-IRS decompositions differ slightly in the details. First, because our access to IRS administrative records is limited to the post-2004 period, we can only include actual work history measures for the 10 years prior to ACS response. Second, due to the larger sample sizes in the ACS-IRS data, we are able to maintain cell sizes in each of 316 detailed occupation categories large enough for the precise estimation of not only occupation effects in a pooled decomposition, but also 316 disaggregated occupation-specific decompositions. Finally, by constructing occupation characteristics for each of 316 detailed occupation categories we are able to swap out occupation categories for characteristics to understand the effects of differences in men's and women's typical work context on the gender wage gap. Throughout the text we report the results of all decompositions in terms of their percentage contribution to the gender wage gap, but full decomposition results, including men's and women's mean characteristics and returns to characteristics can be found in Table 1 and Appendix Tables A1, A4, A6, and A7.

#### *Occupation-Specific Residual Gaps, Work Characteristics, and Returns to Hours Worked*

We expand on Goldin's (2014) evaluation of occupation-specific residual wage gaps using work context and work activities variables from O\*NET Online, proportion of women in an occupation, and occupation-specific returns to hours worked. First, we summarize for each occupation category a

number of O\*NET characteristics identified in prior research as important in understanding differential compensation for men and women (Goldin 2014). Second, we summarize the effect of having a larger proportion of women and the returns to hours worked in each occupation derived from the ACS-IRS. Finally, using residuals obtained from 316 occupation-specific Oaxaca-Blinder decomposition models described above, we use linear regression to predict residuals as a function of occupation characteristics and the returns to hours worked. These models help distinguish the occupations in which traditional demographic and economic characteristics more fully account for the gender wage gap from those occupations in which they account for only a small portion of the gender wage gap.

#### *A Note on the Presentation of Results*

Because of its larger sample size yielding more precise estimates, we primarily focus on results from the American Community Survey when describing subgroup estimates, in particular, estimates for demographic groups and occupations. As the CPS-SSA linked data have more extensive work history data, we primarily rely on these data for our description and analyses of work experience and its impact on the gender wage gap. When available, results are presented for both surveys. All ACS analyses presented use Census Bureau-provided replicate weights. All CPS ASEC analyses use Census Bureau-provided sample weights.<sup>6</sup> The weights for both surveys are adjusted for the probability that a record was assigned a PIK.<sup>7</sup> Because individuals in the CPS ASEC may be observed for up to two years, standard errors are clustered at the person level. Unless otherwise noted, all claims regarding significant differences have undergone statistical testing and are statistically significant at the 10 percent level.

## Results

### Gender Wage Gap by Demographic and Economic Characteristics

The gender wage gap for full-time, year-round workers is 18 percent in estimates derived from the 2015-2016 American Community Survey sample linked to IRS W-2 administrative records. That is, on average, women earned 82 percent of men's earnings (Table 4). The gender wage ratio is 1 percent lower than what would have been obtained using the same sample and methods but based solely ACS earnings estimates rather than linked data sources (Figure 3). Linked survey and administrative records show a gender wage ratio of 0.82, whereas survey estimates show a gender wage ratio of 0.83, though the estimates are not statistically different.

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<sup>6</sup> The CPS replicate weights are not available for the whole 2004-2013 study period.

<sup>7</sup> The adjustment factor is the inverse of the predicted probability that the record was assigned a PIK, based on a probit model with standard demographic predictors.

**Figure 3. Gender Wage Ratio: Administrative Records and Survey Data**



Administrative records wage sources: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records.

Survey data wage source: 1-Year American Community Survey (2015-2016).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round. All estimates presented are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY19-CES005-012 and #CBDRB-FY20-CES010-004.

The gender wage gap increases with age and is larger among married than unmarried people (Figure 4). When comparing men and women of the same race and ethnicity, Black, non-Hispanic women had the highest earnings ratio (92 percent) and Asian, non-Hispanic women had the lowest earnings ratio (77 percent). These ratios may reflect the lower wages of Black, non-Hispanic men and the higher wages of Asian, non-Hispanic men and women. When compared with White, non-Hispanic men, Black women had the lowest earnings ratio (67 percent) and Asian women had the highest earnings ratio (102 percent).

Women's earnings ratio relative to men's was higher among women without children (90 percent) followed by women with children under age 6 (81 percent). Women with older children or children in multiple age groups had the lowest earnings ratio, perhaps reflecting larger wage penalties among those with multiple children (Chung et al. 2017) or more years of accumulated disadvantage relative to men of a similar age (e.g., more time out of the labor force, fewer promotions at work).



**Table 4: Median Hourly Wages and Gender Wage Ratio of Full-Time, Year-Round Workers by Selected Characteristics: American Community Survey and Current Population Survey Annual Social and Economic Supplement**

	American Community Survey						Current Population Survey Annual Social and Economic Supplement					
	Women		Men		Ratio (W:M)		Women		Men		Ratio (W:M)	
	Median	SE	Median	SE	Median	SE	Median	SE	Median	SE	Median	SE
Total	20.31	0.04	24.82	0.04	0.82	0.04	19.75	0.05	24.84	0.06	0.80	0.00
Age												
25 to 34	18.86	0.03	21.52	0.04	0.88	< 0.01	18.22	0.08	21.02	0.08	0.87	< 0.01
35 to 44	21.09	0.04	26.37	0.05	0.80	< 0.01	20.27	0.09	26.34	0.10	0.77	< 0.01
45 to 54	21.18	0.04	27.35	0.04	0.77	< 0.01	20.94	0.08	27.96	0.11	0.75	< 0.01
Race and Ethnicity												
Non-Hispanic Asian Alone	27.23	0.13	35.37	0.19	0.77	0.01	25.18	0.34	31.43	0.45	0.80	0.02
Non-Hispanic Black Alone	17.78	0.05	19.41	0.07	0.92	< 0.01	17.60	0.11	20.02	0.14	0.88	0.01
Non-Hispanic White Alone	21.48	0.03	26.60	0.04	0.81	< 0.01	20.79	0.06	26.57	0.07	0.78	< 0.01
Hispanic	16.94	0.05	20.62	0.05	0.82	< 0.01	16.03	0.10	19.83	0.11	0.81	0.01
Other	19.73	0.13	22.88	0.13	0.86	0.01	18.49	0.25	22.20	0.36	0.83	0.02
Marital Status												
Unmarried	18.83	0.03	20.42	0.03	0.92	< 0.01	18.67	0.08	20.51	0.08	0.91	< 0.01
Married	21.63	0.03	27.79	0.03	0.78	< 0.01	20.53	0.08	27.19	0.07	0.75	< 0.01
Presence and age of children												
None	20.86	0.03	23.29	0.03	0.90	< 0.01	20.89	0.07	23.30	0.08	0.90	< 0.01
Children under 6 only	21.12	0.07	26.05	0.07	0.81	< 0.01	20.10	0.12	25.41	0.14	0.79	0.01
Children 6 to 17 only	19.70	0.04	27.56	0.05	0.72	< 0.01	18.83	0.07	27.26	0.09	0.69	< 0.01
Children under 6 and 6 to 17	18.11	0.06	24.68	0.07	0.73	< 0.01	17.20	0.10	24.85	0.15	0.69	0.01
Education												
High school diploma or less	14.61	0.03	19.11	0.02	0.76	< 0.01	14.71	0.05	19.59	0.06	0.75	< 0.01
Some college	18.10	0.03	23.09	0.03	0.78	< 0.01	18.50	0.07	23.77	0.10	0.78	< 0.01
Bachelor's degree	25.02	0.04	32.79	0.06	0.76	< 0.01	24.79	0.11	32.27	0.16	0.77	0.01
Master's degree	29.03	0.07	40.81	0.11	0.71	< 0.01	29.29	0.20	40.90	0.28	0.72	0.01
Professional or doctorate Degree	38.22	0.21	48.04	0.25	0.80	0.01	38.53	0.61	48.91	0.68	0.79	0.02

	American Community Survey						Current Population Survey Annual Social and Economic Supplement					
	Women		Men		Ratio (W:M)		Women		Men		Ratio (W:M)	
	Median	SE	Median	SE	Median	SE	Median	SE	Median	SE	Median	SE
<b>Industry</b>												
Agriculture and mining	19.55	0.32	22.16	0.13	0.88	0.02	18.59	0.66	21.86	0.36	0.85	0.03
Construction	21.53	0.21	23.77	0.08	0.91	0.01	21.09	0.32	23.21	0.14	0.91	0.01
Manufacturing	19.76	0.08	24.86	0.05	0.79	< 0.01	19.55	0.15	26.03	0.12	0.75	0.01
Wholesale trade	21.18	0.14	23.58	0.11	0.90	0.01	20.26	0.30	24.06	0.19	0.84	0.01
Retail trade	15.67	0.05	19.39	0.06	0.81	< 0.01	14.97	0.08	19.43	0.12	0.77	0.01
Transportation and utilities	21.90	0.14	25.48	0.07	0.86	0.01	22.24	0.32	26.37	0.17	0.84	0.01
Information	26.88	0.20	33.13	0.22	0.81	0.01	24.94	0.45	32.22	0.49	0.77	0.02
Finance, rental, and leasing	23.44	0.07	33.46	0.14	0.70	< 0.01	22.11	0.12	31.33	0.33	0.71	0.01
Professional, management services	24.29	0.10	31.84	0.12	0.76	< 0.01	23.25	0.19	30.84	0.24	0.75	0.01
Education, health care, and social	20.29	0.04	24.88	0.07	0.82	< 0.01	20.05	0.08	24.55	0.17	0.82	0.01
Arts, accommodation, and food	13.77	0.07	16.14	0.07	0.85	0.01	13.00	0.13	15.81	0.16	0.82	0.01
Other services	17.35	0.10	19.70	0.10	0.88	0.01	15.59	0.17	19.34	0.18	0.81	0.01
Public administration	23.70	0.08	29.02	0.09	0.82	< 0.01	22.78	0.17	29.89	0.22	0.76	0.01
<b>Usual Hours Worked per Week</b>												
35 to 39 hours	18.00	0.07	18.55	0.14	0.97	0.01	17.29	0.13	19.30	0.28	0.90	0.01
40 hours	19.75	0.03	24.23	0.03	0.81	< 0.01	19.43	0.05	24.28	0.06	0.80	< 0.01
41 to 49 hours	23.09	0.06	26.68	0.07	0.87	< 0.01	23.37	0.16	27.47	0.15	0.85	0.01
50+ hours	22.18	0.06	25.91	0.04	0.86	< 0.01	21.32	0.15	25.75	0.12	0.83	0.01
<b>Work History</b>												
Worked 1 year ago	20.50	0.02	25.10	0.02	0.82	< 0.01	20.15	0.05	25.45	0.06	0.79	< 0.01
Did not work 1 year ago	9.00	0.09	11.24	0.10	0.80	0.01	14.89	0.17	17.98	0.16	0.83	0.01
Worked 5 years ago	21.23	0.02	25.96	0.03	0.82	< 0.01	20.09	0.05	25.25	0.06	0.80	< 0.01
Did not work 5 years ago	13.57	0.05	16.41	0.05	0.83	< 0.01	12.67	0.15	15.56	0.18	0.81	0.01
Worked 10 years ago	21.39	0.03	26.05	0.03	0.82	< 0.01	20.56	0.05	25.77	0.07	0.80	< 0.01
Did not work 10 years ago	15.22	0.04	19.20	0.06	0.79	< 0.01	14.32	0.11	17.78	0.14	0.81	0.01

	American Community Survey						Current Population Survey Annual Social and Economic Supplement					
	Women		Men		Ratio (W:M)		Women		Men		Ratio (W:M)	
	Median	SE	Median	SE	Median	SE	Median	SE	Median	SE	Median	SE
Worked 15 years ago	-	-	-	-	-	-	21.34	0.07	26.60	0.07	0.80	< 0.01
Did not work 15 years ago	-	-	-	-	-	-	15.25	0.11	20.27	0.15	0.75	0.01
Worked 20 years ago	-	-	-	-	-	-	22.40	0.07	27.74	0.08	0.81	< 0.01
Did not work 20 years ago	-	-	-	-	-	-	15.80	0.09	22.15	0.14	0.71	0.01
Worked 25 years ago	-	-	-	-	-	-	22.73	0.08	28.51	0.09	0.80	< 0.01
Did not work 25 years ago	-	-	-	-	-	-	16.40	0.11	22.74	0.16	0.72	0.01

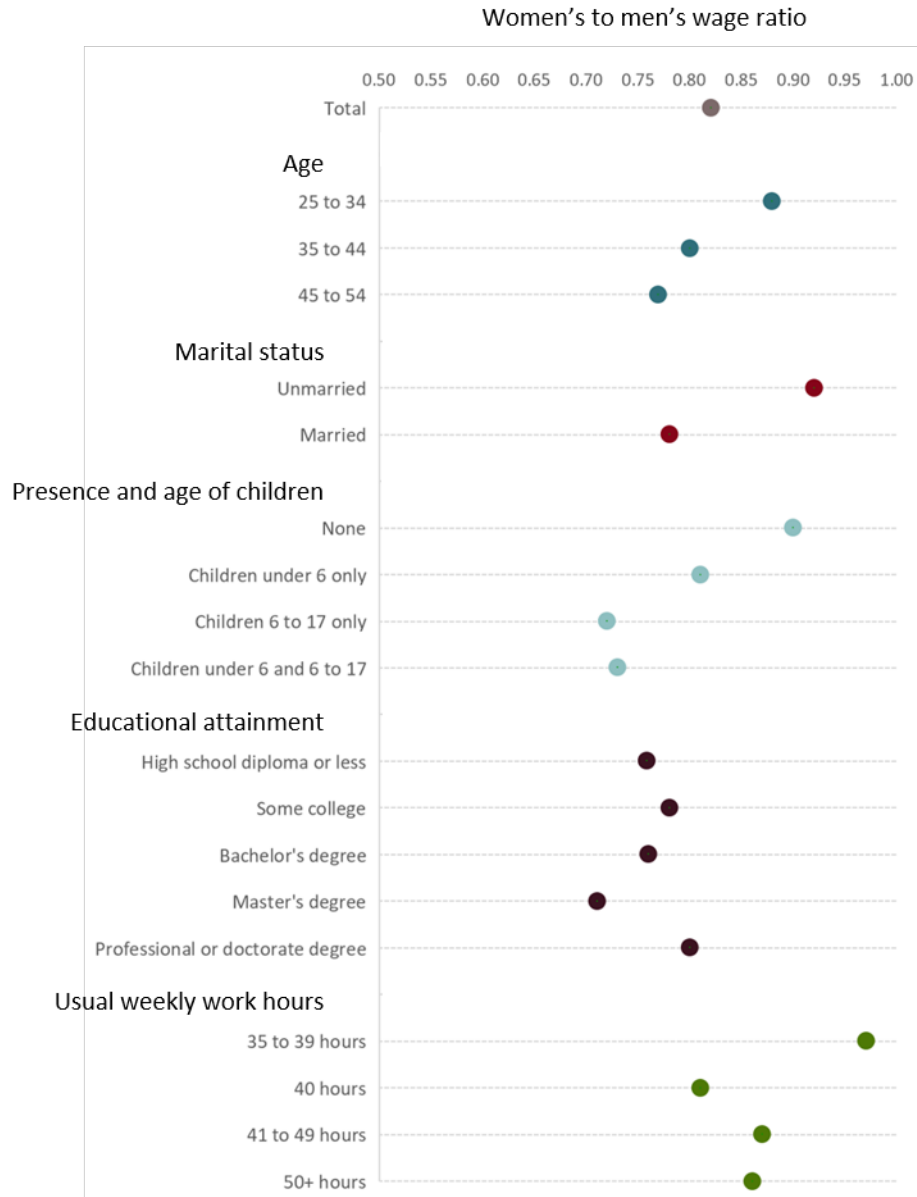
Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005- 2016) and Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security Detailed Earnings Record administrative records (1978-2012).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: - indicates data not available. SE = standard error.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002 and #CBDRB-FY2019-CES005-014.

**Figure 4. Ratio of Women’s to Men’s Wages by Selected Characteristics: American Community Survey**



Source: American Community Survey (2015-2016) linked to IRS Form W-2 administrative records (2005- 2016).  
 Note: Sample is restricted to adults 25 to 54 working full-time, year-round. All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002.

The relationship between educational attainment and the gender wage ratio is not linear. Rather, women's earnings were lowest relative to men's among workers with master's degrees (71 percent), followed by those with a high school diploma or less (76 percent), and a bachelor's degree (76 percent). Wage ratios were largest among workers with some college education (78 percent) or a professional or doctorate degree (80 percent). When looking at men's and women's wages, we see that not only did women earn less than men in every educational attainment group, but women with one level of educational attainment higher than men earned less with the exception of women with bachelor's degrees compared to men with some college. For example, women with a professional or doctorate degree earned less than men with a master's degree (Table 4). Therefore, even as women have become more likely to graduate from college or obtain higher levels of educational attainment compared with men, they still earn less than men with lower levels of education.

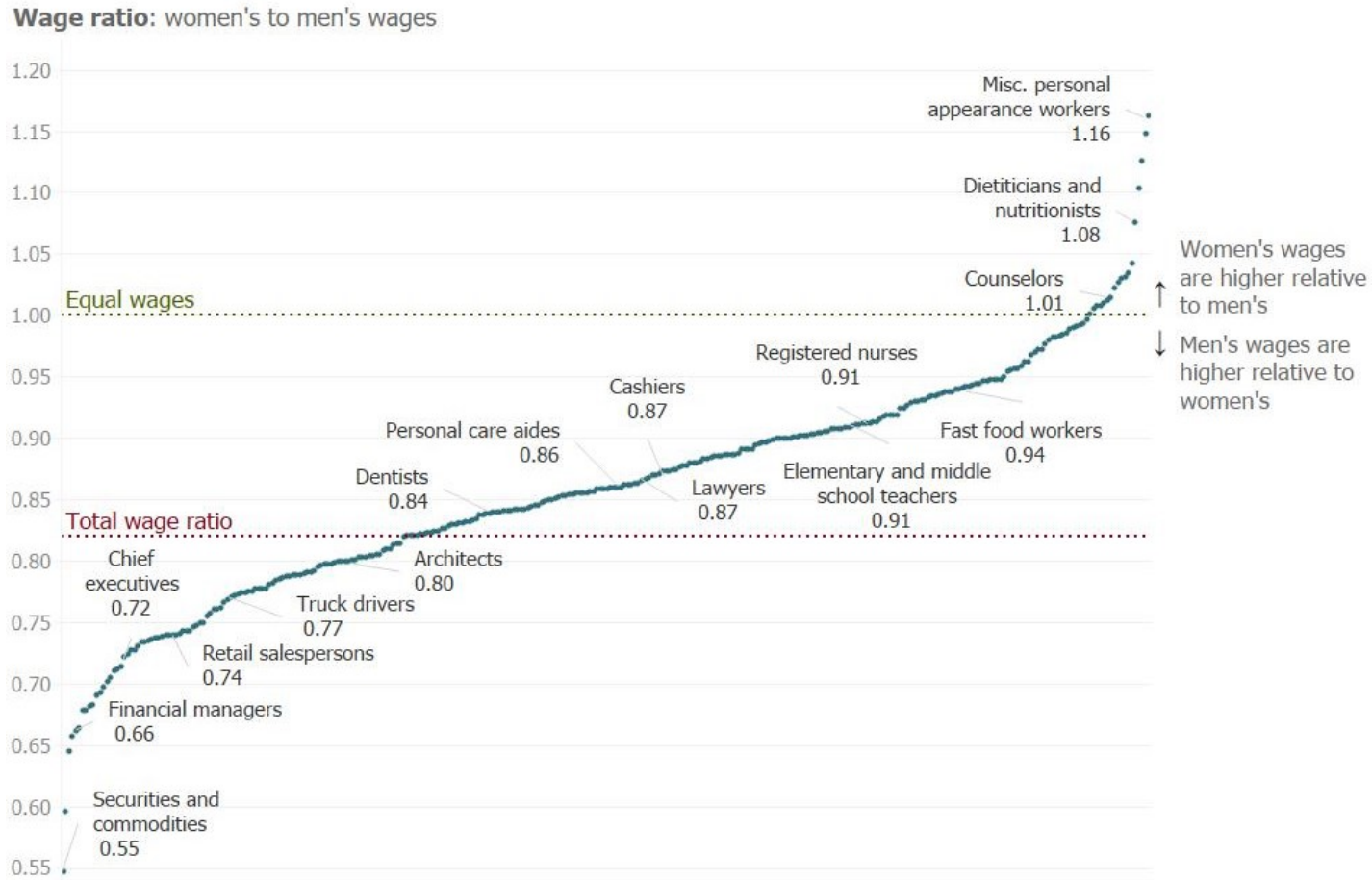
Across industries, wage ratios were highest in construction (91 percent) and wholesale trade. The industry with the largest gender wage gap was finance, insurance, and rental and leasing where women earned 70 percent of men's earnings, a 30 percent wage gap. The finance industry and finance occupations are often noted for having the largest gender wage gaps across all industries and occupations, and, out of the 316 occupations in this study, finance occupations were among those with the smallest gender wage ratios (Figure 5). For example, securities, commodities, and financial services sales agents (0.55), financial managers (0.66), and personal financial advisors (0.68). Other occupations with lower wage ratios include bus drivers (0.71), aircraft pilots (0.71), and chief executives (0.72). Occupations with higher gender wage ratios include crossing guards (1.13), dietitians (1.08), counselors (1.01), and nurse practitioners (0.99).<sup>8</sup> The gender wage ratio for all occupations is available in Appendix Table A3.

Overall, 137 occupations, or 43 percent, had wage ratios that were statistically above average and 46 occupations, or 15 percent, had wage ratios that were below average. The wage ratio was not statistically different than the average, 0.82, in 133 occupations, or 42 percent of all occupations. Recent research argues that the wage gap within occupations is larger than the gap across occupations (Goldin 2014; Moore 2018). Moore (2018) finds using CPS data that the wage gap is larger within most occupations than the average wage gap. Using a much larger survey (ACS) with robust cell counts and more detailed occupational categories, we show here that the wage gap within occupations was usually smaller than the average wage gap.

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<sup>8</sup> None of the estimates shown in Figure 5 where women's earnings appear larger than men's are significantly different from 1 (or equal earnings).

**Figure 5. Gender Wage Ratio by Occupation: American Community Survey**

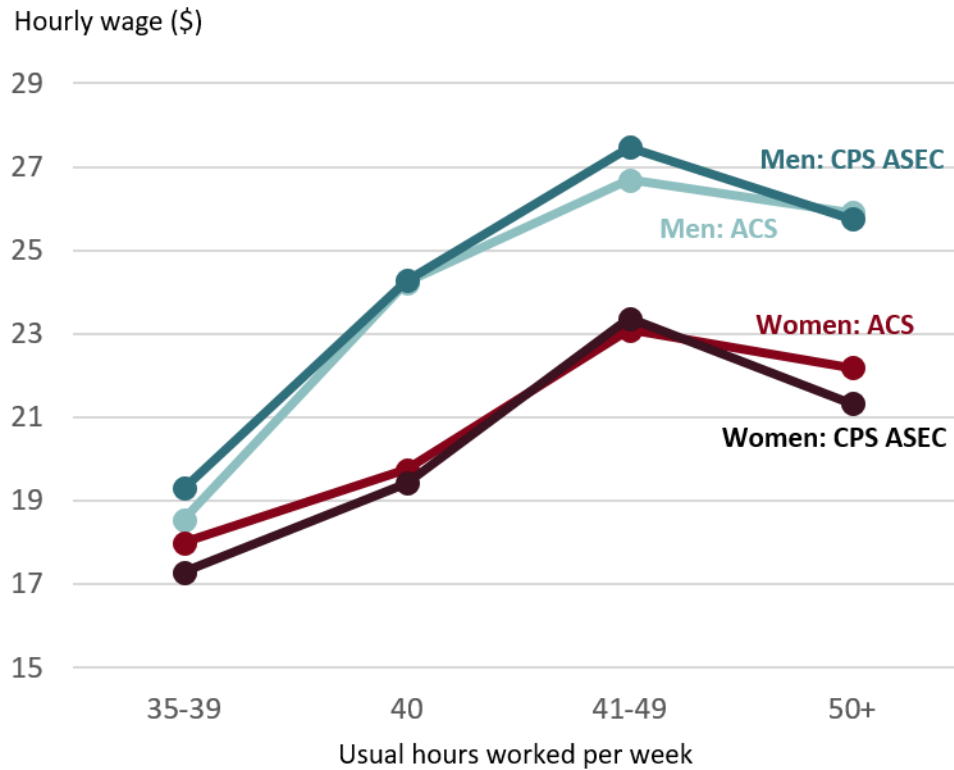


Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round. All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-012.

Among full-time workers, the gender wage ratio was highest among men and women who worked 35 to 39 hours a week and lowest among those working 40 hours per week. Those working between 35 and 39 hours per week (11 percent of women and 4 percent of men) had a gender wage ratio of 97 percent. The majority of full-time workers work 40 hours per week - 64 percent of women and 54 percent of men in this full-time worker sample (Table 1). The wage gap was largest among this group (19 percent) with a gender wage ratio of 81 percent. Although recent research shows increasing financial returns to long hours of work, especially among those working 50 or more hours a week (Weeden, Cha, and Bucca 2016), we find nonlinear returns to long hours with smaller wage premiums among those working 50 or more hours. Those working between 41 and 49 hours per week (12 percent of men and women) had the largest wage premium, whereas those working 50 or more hours per week (15 percent of women and 28 percent of men) earned less per hour than those working 41 to 49 hours (Table 4). Men who worked 41 to 49 hours per week earned 26.68 per hour compared with 23.09 among women for a wage ratio of 87 percent. Men who worked 50 or more hours per week earned 25.91 per hour compared with 22.18 among women for a wage ratio of 86 percent. Data from the Current Population Survey Annual Social and Economic Supplement shows similar patterns: those working 41 to 49 hours per week experienced a larger wage premium compared with those working 50 or more hours per week (Figure 6). Perhaps because many workers with long work-hour schedules are salaried, they may not receive higher hourly wages when they put in long hours, rather longer hours per week decrease their per-hour wage. Additionally, workers who receive compensation based on clients served and are able to set daily hours of work (e.g., taxi drivers, barbers and hairstylists) may earn more in fewer hours on busy days and stop working when they reach their target threshold (Camerer et al. 1997). In contrast, on slow work days, it may take more hours to attain a daily income target, thus reducing their hourly wage.

**Figure 6. Returns to Hours of Work: American Community Survey (ACS) and Current Population Survey Annual Social and Economic Supplement (CPS ASEC)**



Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005- 2016) and Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security

Detailed Earnings Record administrative records (1978-2012).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002 and #CBDRB-FY2019-CES005-014.



## Gender Wage Gap Decomposition and the Importance of Work Experience

To evaluate the effects of work history over a period of 25 years, we use data from the 2003-2014 Current Population Survey Annual Social and Economic Supplement (CPS ASEC) linked with administrative earnings data from the 1978-2012 Detailed Earnings Record from the Social Security Administration (SSA). The gender wage gap estimated from this CPS-SSA data is comparable to the gap estimated from the ACS-IRS data: among full-time, year-round workers, women earn 80 percent of what men earn at the median (Table 4), and 79 percent of what men earn at the mean (Table 5;  $e^{-0.2355} = 0.79$ ).

Not surprisingly, given that they have strong labor-force participation in the year they are observed, the recent work histories of men and women working full-time, year-round are similar. Men are no more likely than women to have been working one year ago, and they are only 2 percentage points more likely to have been working ten years ago (Table 1). The more-distant work histories show somewhat larger differences by sex. Men are 4 percentage points more likely than women to have been working 25 years ago. This last difference reflects a gender gap in the labor-market participation of the older cohorts in our analytic sample (men and women between the ages of 43 and 54 when we observe them) in their late teens and early twenties. The younger cohorts in the sample may have more-similar early work histories, but given that we are interested in period- rather than cohort-specific estimates of the gender wage gap, we do not explore these cross-cohort differences.

Table 5 shows the results of four Oaxaca-Blinder decompositions of the gender wage gap using the CPS-SSA linked data and including work histories of varying lengths. The first decomposition includes a 5-year work history and all of the other explanatory variables described earlier (age, race and ethnicity, region of residence, year of CPS ASEC interview, educational attainment, usual hours worked per week, industry, and occupation). The second, third, and fourth decompositions expand the work history to 10, 15, and 25 years. Consistent with the finding in Table 1 that women are more likely than men to have entered college and to have earned a bachelor's or master's degree, the results in Table 5 show that gender differences in educational attainment do not explain why women earn less than men. Across all four decomposition models, women's greater average educational attainment reduces the gender wage gap by between 5 and 6 percent.

Nor do differences in weekly work hours explain the gap among full-time workers. Although women work slightly fewer hours per week than men, on average, this difference does not appear to contribute to the gender wage gap. On the contrary, the modest gender difference in work hours reduces the gender wage gap by between 1 and 2 percent. This result may seem inconsistent with evidence that wages increase with long work hours (Weeden, Cha, and Bucca 2016, Goldin 2014). However, among salaried workers and others not paid strictly by the hour, long work hours may reduce rather than increase hourly earnings (Denning et al. 2019; Camerer et al. 1997). As we show here, the largest returns to hours worked is among those working 41 to 49 hours per week, with a declining premium for those working 50 or more hours who are also more likely to be men.

Consistent with the finding in Table 1 that men and women working full-time year-round have comparable recent work histories, gender differences in 5-year work history do not contribute meaningfully to the gender wage gap (column 2 of Table 5). As we move back in time, however, gender

differences in work experience grow, and the measured contribution of work experience to the gender wage gap grows accordingly. Expanding the work history in the decomposition model to 10 years increases the contribution of work experience to 2.7 percent (column 4). Expanding it to 15 years increases the contribution of work experience to 5.1 percent (column 6), and expanding it to 25 years increase the contribution of work experience to 9.3 percent (column 8). These results indicate that gender differences in work experience reduced women's wages relative to men's through the mid-2010s but that differences in work experience are not the main reason that women continue to earn less than men.

Compared with estimates of work experience in earlier studies, we show a declining contribution of work history in explanations of the gender wage gap. Blau and Kahn (2017) show that the gap in work experience between men and women narrowed from nearly 7 years to 1.4 years between 1981 and 2011, and a commensurate drop in the relative importance of work history in explaining the gender wage gap from 21 percent to 14 percent. We show the estimated contribution of work experience in explaining the gender wage gap may have fallen further in more recent cohorts, now explaining about 9 percent of the gender wage gap (Figure 7).

The variables that contribute the most, by far, to explaining the gender wage gap are industry and occupation. Differences in the allocation of male and female workers across occupations explain between 14 and 15 percent of the gap, and differences in their allocation across industries explain between 21 and 22 percent. Taken together, industry and occupation explain more than one third of the gender wage gap and account for most of the portion explained by measured characteristics, regardless of the length of the work history included in the decomposition model. Substantively, these results suggest that persistent gender segregation by occupation and industry contributes more to contemporary gender wage inequality than gender differences in either educational attainment or work experience. Methodologically, they suggest that datasets containing good measures of industry and occupation are preferable to datasets containing measures of actual labor-market experience when there is a tradeoff between these variables.

Before turning to decompositions using the ACS-IRS data, we note one additional feature of the results from the CPS-SSA data. We have seen that substituting the 10-year work history for the 25-year work history in the decomposition model leads us to underestimate the percentage of the gender wage gap explained by gender differences in work experience by about 7 percentage points. This downward bias in the percentage of the gap explained by work experience translates, almost percentage point for percentage point, into downward bias in the total percentage explained by the measured characteristics. Substituting the 10-year work history for the 25-year work history does not appear to cause meaningful bias in the contributions of other measured characteristics, which remain stable as we increase the length of the work history. This result is reassuring with respect to our ACS-IRS analysis, which focuses on the contribution of occupation to the gender wage gap and where work histories beyond 10 years are not available.

**Table 5: Results of Oaxaca-Blinder Decompositions of Gap Between Full-Time, Year-Round Men’s and Women’s Wages: Current Population Survey Annual Social and Economic Supplement**

Explanatory variables	5-year work history		10-year work history		15-year work history		25-year work history	
	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained
Age	-0.0014	-0.59%	-0.0013	-0.55%	-0.0012	-0.51%	-0.0010	-0.42%
Race/ethnicity	0.0061	2.59%	0.0058	2.46%	0.0058	2.46%	0.0057	2.42%
Education	-0.0134	-5.69%	-0.0134	-5.69%	-0.0134	-5.69%	-0.0133	-5.65%
Usual weekly hours	-0.0025	-1.06%	-0.0033	-1.40%	-0.0036	-1.53%	-0.0041	-1.74%
Industry	0.0510	21.66%	0.0513	21.78%	0.0517	21.95%	0.0518	22.00%
Occupation	0.0336	14.27%	0.0333	14.14%	0.0332	14.10%	0.0332	14.10%
Work history	0.0003	0.13%	0.0063	2.68%	0.0120	5.10%	0.0220	9.34%
Metropolitan status	0.0005	0.21%	0.0005	0.21%	0.0005	0.21%	0.0006	0.25%
Region	0.0024	1.02%	0.0023	0.98%	0.0023	0.98%	0.0023	0.98%
Wage gap	0.2355	100.00%	0.2355	100.00%	0.2355	100.00%	0.2355	100.00%
Explained	0.0773	32.82%	0.0818	34.73%	0.0874	37.11%	0.0972	41.27%
Unexplained	0.1582	67.18%	0.1536	65.22%	0.1481	62.89%	0.1383	58.73%
N	381,000		381,000		381,000		381,000	

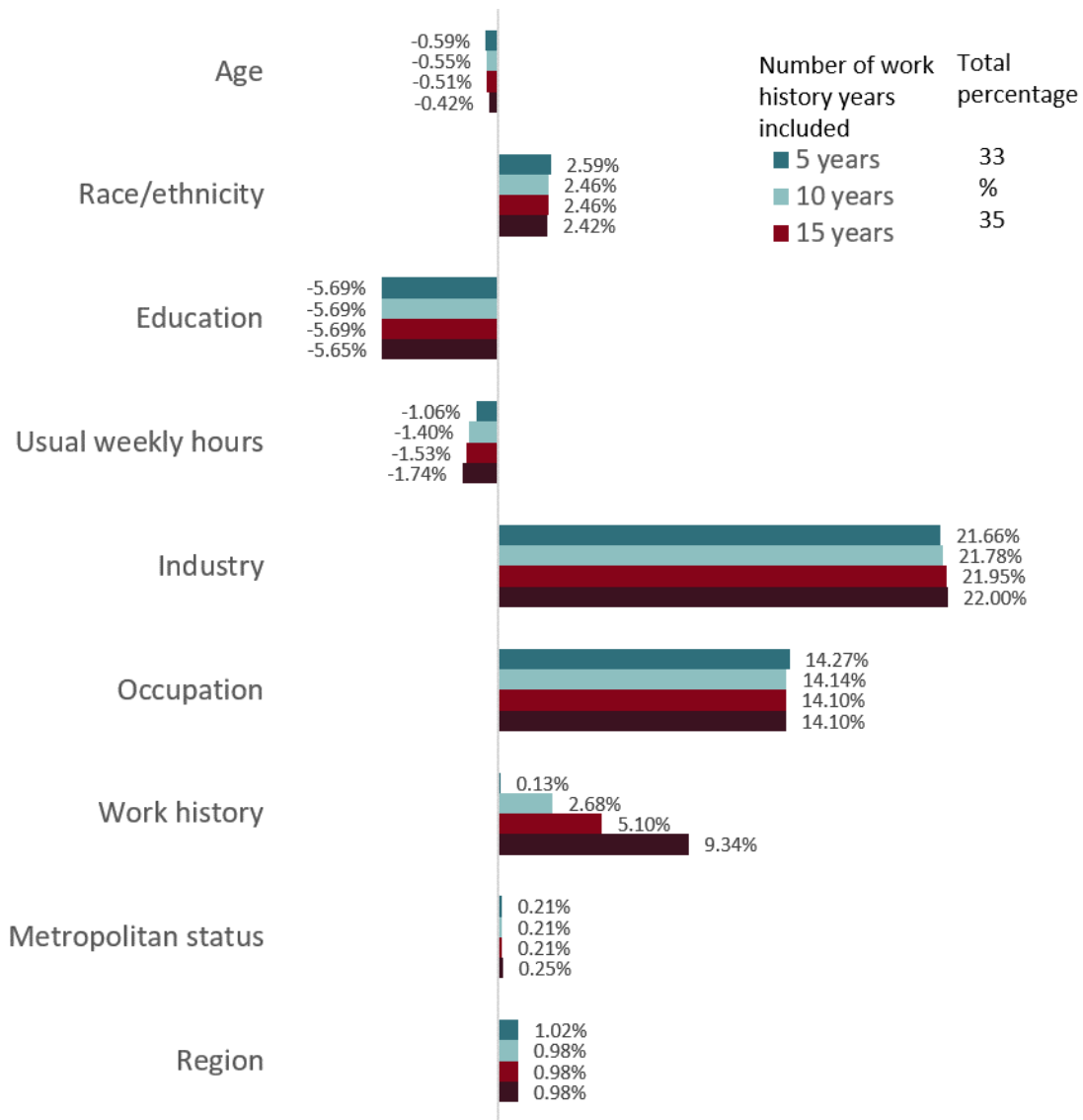
Source: Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security Administration Detailed Earnings Record administrative data (1978-2012).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-014.

Note: Men’s coefficients are used as the reference point. Decompositions using women’s coefficients as the reference point are available in Appendix Table A5.

**Figure 7. Percentage of the Gender Wage Gap Explained by Each Variable in the Oaxaca-Blinder Decomposition Models by Length of Work History: Current Population Survey Annual Social and Economic Supplement**



Source: Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security Detailed Earnings Record administrative records (1978-2012).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-014.

## The Gender Wage Gap and the Importance of Detailed Occupation and Occupational Characteristics

To adequately measure the effect of occupation and occupational characteristics, a large survey sample is required. We use the American Community Survey to evaluate the gender wage gap across and within 316 occupations. Our first model shows results from a traditional Oaxaca-Blinder decomposition that pools 316 detailed occupations (detailed occupation model). We include age, race and ethnicity, educational attainment, usual weekly work hours, industry, work history, metropolitan status, and region. Our second model includes seven occupational characteristics instead of 316 occupations (occupational characteristics model).

Our detailed occupation model shows a gender wage gap of .21 log points of which 0.06 is explained and 0.15 is unexplained, or 30 percent explained and 70 percent unexplained (Table 6). Gender differences in industry and occupation distribution contribute the most to explaining the gender wage gap. Gender differences in industry distribution explain 24 percent of the variance in earnings, whereas differences in occupational distribution explain 18 percent (Table 6). Women's higher levels of educational attainment reduce the gender wage gap. If women's educational attainment levels resembled men's, the wage gap would be larger. Similarly, among full-time workers, if women worked hours that were more similar to men's the wage gap would be larger. As we showed in Table 4, those working 50 or more hours per week experienced declining returns per hour worked and earned less than those working 41-49 hours per week, and men are more likely than women to work 50 or more hours per week.

**Table 6: Results of Oaxaca-Blinder Decompositions of Full-Time, Year-Round Men’s and Women’s Wages: American Community Survey**

Explanatory variables	Occupation: 316 categories		Occupational characteristics		Excluding occupation and industry	
	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained
Age	-0.0009	-0.44%	-0.0010	-0.45%	-0.0010	-0.47%
Race/ethnicity	0.0052	2.45%	0.0061	2.87%	0.0082	3.88%
Education	-0.0289	-13.64%	-0.0353	-16.64%	-0.0443	-20.87%
Usual weekly hours	-0.0036	-1.71%	-0.0021	-0.98%	0.0122	5.76%
Industry	0.0518	24.41%	0.0496	23.37%		
Occupation: 316 categories	0.0374	17.61%	-	-		
Occupation characteristics	-	-				
O*NET characteristics						
Time pressure	-	-	-0.0008	-0.38%		
Competition	-	-	0.0315	14.87%		
Occupational hazards	-	-	0.0046	2.15%		
Autonomy	-	-	-0.0019	-0.91%		
Communication	-	-	-0.0108	-5.09%		
Proportion female	-	-	0.0205	9.65%		
Returns to overtime	-	-				
41-49:40 log wage ratio	-	-	0.0058	2.73%		
50+:40 log wage ratio	-	-	-0.0012	-0.56%		
Work history	0.0010	0.47%	0.0010	0.49%	0.0012	0.55%
Metropolitan status	0.0001	0.03%	0.0001	0.04%	0.0001	0.04%
Region	0.0018	0.87%	0.0018	0.87%	0.0018	0.83%
Wage gap	0.2122	100.00%	0.2122	100.00%	0.2122	100%
Explained	0.0638	30.05%	0.0679	31.98%	-0.0218	-10.28%
Unexplained	0.1484	69.95%	0.1443	68.02%	0.2340	110.3%
N	1,914,000		1,914,000		1,914,000	

Linear model R<sup>2</sup>

0.41

0.37

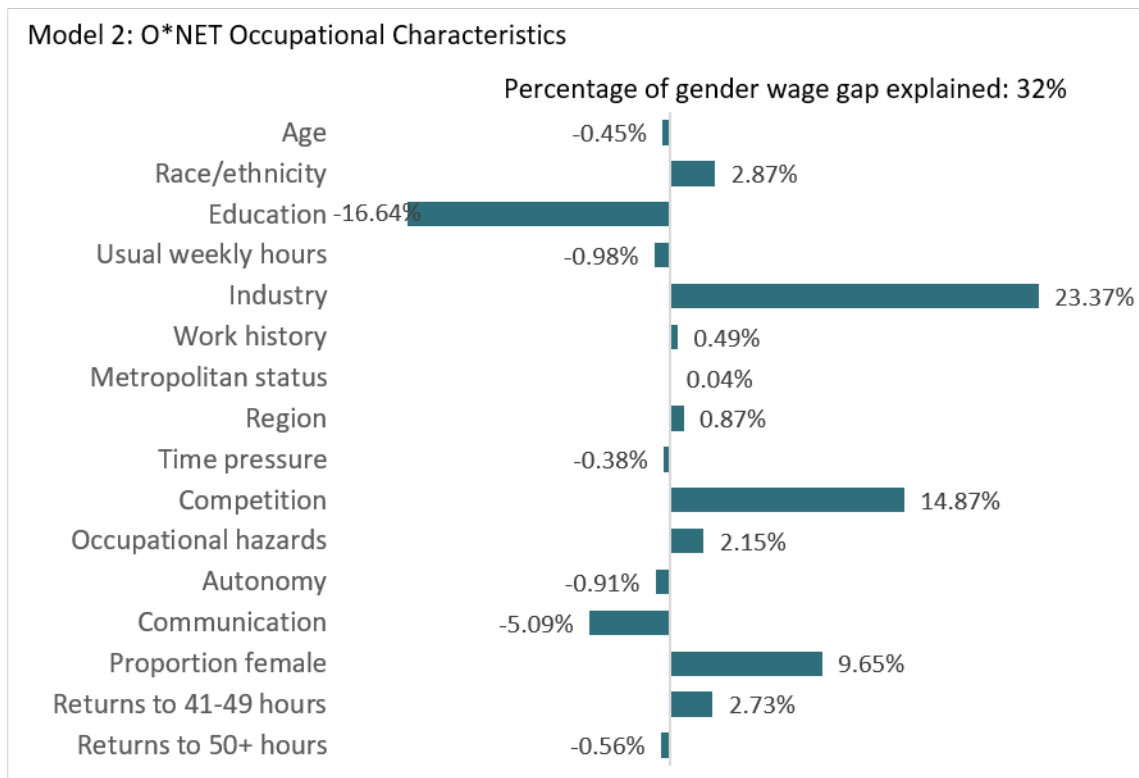
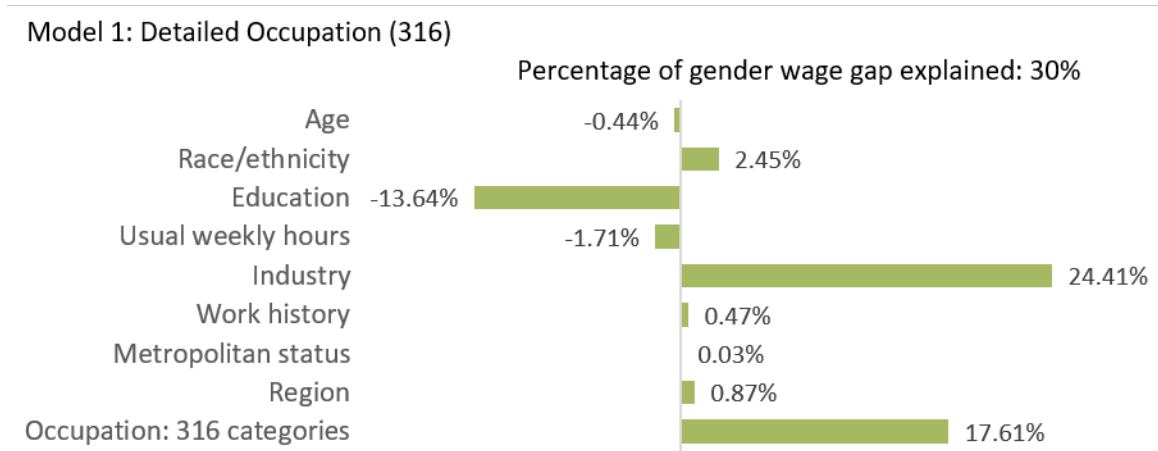
0.32

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, items #CBDRB-FY2019-CES005-002 and #CBDRB-FY2020-CES010-004.

Note: O\*NET characteristics are standardized such that the mean = 0 and the SD = 1. Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their ACS response. Explanatory variable coefficients (as well as percentages of the overall wage gap explained) are aggregated.

**Figure 8. Percentage of the Gender Wage Gap Explained by Each Variable in the Oaxaca-Blinder Decomposition Models: American Community Survey and O\*NET Online**



Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005- 2016) and O\*NET Online 2019.

Note: Sample is restricted to adults 25 to 54 working full-time, year-round. All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002.



To understand what types of occupational characteristics contribute to the gender wage gap, we ran a second model incorporating occupational characteristics from O\*NET, proportion female in the occupation, and returns to hours worked in 316 detailed occupations. The occupational characteristics model explains 0.07 of the gender wage gap of 0.21, leaving 0.14 unexplained, or 32 percent explained and 68 percent unexplained (Figure 8).

This model shows that gender differences in several occupational characteristics contribute to the gender wage gap. Women's underrepresentation in occupations with high levels of competition, which pay higher average wages than less competitive occupations, increases the gender wage gap and accounts for 15 percent of the total gap (see Appendix Tables A6 and A7 for the mean values of men's and women's occupational characteristics and the wage return to each characteristic). The most competitive occupations were concentrated in sales and finance, for example real estate brokers, advertising sales agents, and personal financial advisors - occupations that require competing with other businesses or coworkers to get clients or make sales. Prior research indicates that competitiveness is associated with working in higher-paying industries, particularly finance and consulting, and may explain 10 percent of the gender wage gap (Reuben, Sapienza, and Zingales 2015). From our results in Table 4, we also show that the gender wage gap within finance is larger than other industries. Therefore, not only are women less likely to be in higher-paying competitive industries, such as finance, they are also paid less within those industries.

Another significant contributor to the gender wage gap was the proportion of women workers in the occupation. Women's overrepresentation in occupations with a larger share of women workers, which pay lower average wages, increases the gender wage gap and accounts for 10 percent of the total gap. Results from this model are consistent with the devaluation perspective, which indicates that jobs with a larger representation of women are paid less even after accounting for worker and job characteristics and indicate a similar wage penalty to other studies (England, Hermsen, and Cotter 2000; Kilbourne et al. 1994). As noted in prior work, many of these occupations are caregiving or nurturing occupations such as teachers, childcare workers, and nurses, and are paid less than workers with comparable skills and characteristics (England et al. 1994).

A smaller contributor to the gender wage gap is occupational hazards. Women's underrepresentation in hazardous occupations, which pay higher average wages, explains 2 percent of the gender wage gap. This result, together with the findings regarding competitiveness, offers partial support to a compensating differentials perspective, where workers in more competitive and hazardous occupations garner higher compensation. However, the returns to working in hazardous occupations are relatively small, also comparable to prior findings (Kilbourne et al. 1994).

On the other hand, gender differences in several occupational characteristics favor women over men and counteract rather than amplify the gender wage gap. Women's overrepresentation in more autonomous occupations and in occupations that require more communication and teamwork, both of which pay higher average wages, reduces the gender wage gap by about 6 percentage points. The gender wage gap would be about 1 percentage point higher if women had a more similar distribution to men's in occupational autonomy, and about 5 percentage points higher if they worked in occupations with communication and teamwork requirements that more closely resembled men's. While we cannot

be sure why women sort into occupations with these characteristics, we can think of several possibilities. Employment in more autonomous jobs may allow women greater flexibility to maintain full-time employment and, as a result, higher wages (Landivar 2017). Occupations with more teamwork may allow for more job interchangeability, allowing for more flexibility in schedules. For example, Briscoe (2009) shows that doctors who worked in a more bureaucratic, team setting were more likely to be able to work shorter hours, as their work was more substitutable and could be taken on by others. Goldin (2014) shows that pharmacists, who follow standardized procedures and make extensive use of computer tracking systems, can substitute for each other, making reduced hours possible with little to no wage penalty for working shorter hours. Autonomy and communication/teamwork may reduce the gender wage gap to the extent that women are more likely to maintain employment in these occupations and wages are less penalized on an hourly basis.

To explore the sensitivity of our results to the inclusion of occupation and industry in our models, we estimate an additional model excluding these variables. The results from this model underscore the overriding importance of industry and occupation to the gender wage gap in recent years. Given that women are now better educated than men and have similar work histories, standard human capital variables alone no longer explain any of the gender wage gap.

To put our results in context, we compare our estimates to estimates based on a recently developed alternative occupational classification method. Using Survey of Income and Program Participation (SIPP) data and a task-based approach to categorizing occupations using 144 O\*NET occupation characteristics, Manzella and her colleagues (2019) show that their O\*NET aggregations explain about 10 percent of the gender wage gap. This is lower than our estimate using 316 occupations (18 percent) and individual O\*NET work characteristic measures such as competitiveness (15 percent). Using O\*NET characteristics that measure a variety of job skills, including social, basic, analytical, managerial, and technical skills, as well as industry, part-time work status, education, and union membership, Kochhar (2020) is able to explain 3 cents out of a 15-cent wage gap, or 20 percent of the gap. Our models explain 30 to 32 of the gender wage gap after accounting for detailed occupation, occupational characteristics, and individual characteristics. We show detailed occupation retains more explanatory power for evaluating the gender wage gap than task-based or skill-based approaches or summary work characteristic measures.

## Nonlinear Returns to Hours Worked

Occupations differ in the extent to which they reward long hours of work. Some occupations offer higher wages to those that work long hours. This may come in many forms, including higher compensation offered as a reward for perceived commitment to the job, more lucrative assignments, or premium pay for overtime hours. On the other hand, some occupations may be salaried and offer no higher compensation to workers that put in more hours. In fact, some salaried workers may be penalized on an hourly basis if they work longer hours because their salaries do not increase commensurate with their longer hours. Furthermore, some workers are paid directly by clients, thus, are not rewarded on an hourly basis (Camerer et al. 1997). Longer hours in these occupations can reflect having a “slow day” in which it takes longer to earn a desired income. For example, taxicab drivers seek

to meet a daily minimum income to cover operational costs and on slow days they need to drive longer hours to make the minimum threshold. As they gain experience, they become more adept at locating clients and recognizing slow days and adjust their labor supply accordingly. Longer hours worked in these jobs may be associated with less experience in finding clients and lower hourly compensation. Workers in some occupations may also put in longer hours at the outset of their career when they are earning less per hour in hopes of reaping rewards at a later career stage.

Evaluating 316 occupations, we show that it is not the case that all occupations derive a wage premium for longer hours. In Table 4, we show that workers who usually work 41 to 49 hours per week receive a wage premium, but those working 50 or more hours per week receive a lower premium relative to those working 41 to 49 hours per week when looking at median wages. Prior research that shows larger returns to working 50 or more hours per week uses mean wages (Weeden, Cha, and Bucca 2016; Goldin 2014). As a point of comparison, using mean wages, we show workers experience a premium when working 41 to 49 hours per week of about 5.3 percent and 5.6 percent among those working 50 or more hours, similar to prior research. However, mean wages are more strongly influenced by outlier values and the larger premium for long-hour workers may be driven by a small number of workers with large earnings. Median earnings will more accurately convey how a typical worker is compensated when working in excess of 40 hours per week and this measure shows diminishing returns to working longer hours.

Increasing returns to working long hours is one of the reasons the gender wage gap has not narrowed over the past several decades according to recent studies (Weeden, Cha, and Bucca 2016). However, we show here that not all occupations reward long hours, and some occupations actually penalize long hours on an hourly basis.<sup>9</sup> Several finance and retail occupations reward working in excess of 49 hours per week, while several healthcare and education occupations penalize working longer hours. In Table 7 we show which occupations are among those with the largest returns to working 50 or more hours per week and which occupations are among those with the largest wage penalties for working 50 or more hours per week. The wage premium and penalty for each occupation is provided in Appendix Table A9. Credit authorizers, checkers, and clerks had a return of about 25 percent for working 50 or more hours per week relative to those in the same occupation working full-time hours (35-40 hours per week). Similarly, securities, commodities, and financial services sales agents received about 24 percent higher compensation for working long hours. In contrast, dentists received 11 percent less compensation per hour when working in excess of 49 hours per week and secondary school teachers received 9 percent less per hour compared with those working a 35 to 40-hour week. Figure 9 displays returns to hours worked for selected occupations with large returns to hours worked (premium) and those that penalize working longer hours on an hourly basis.

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<sup>9</sup> These analyses use wages which divide total earnings by weeks and hours worked. Some workers may earn more if they work additional hours and are compensated by the hour or for the additional work incurred and they do not have a fixed salary. However, their hourly rate is still lower than those working fewer hours.

**Table 7: Occupations with Larger and Smaller Returns to Hours Worked**

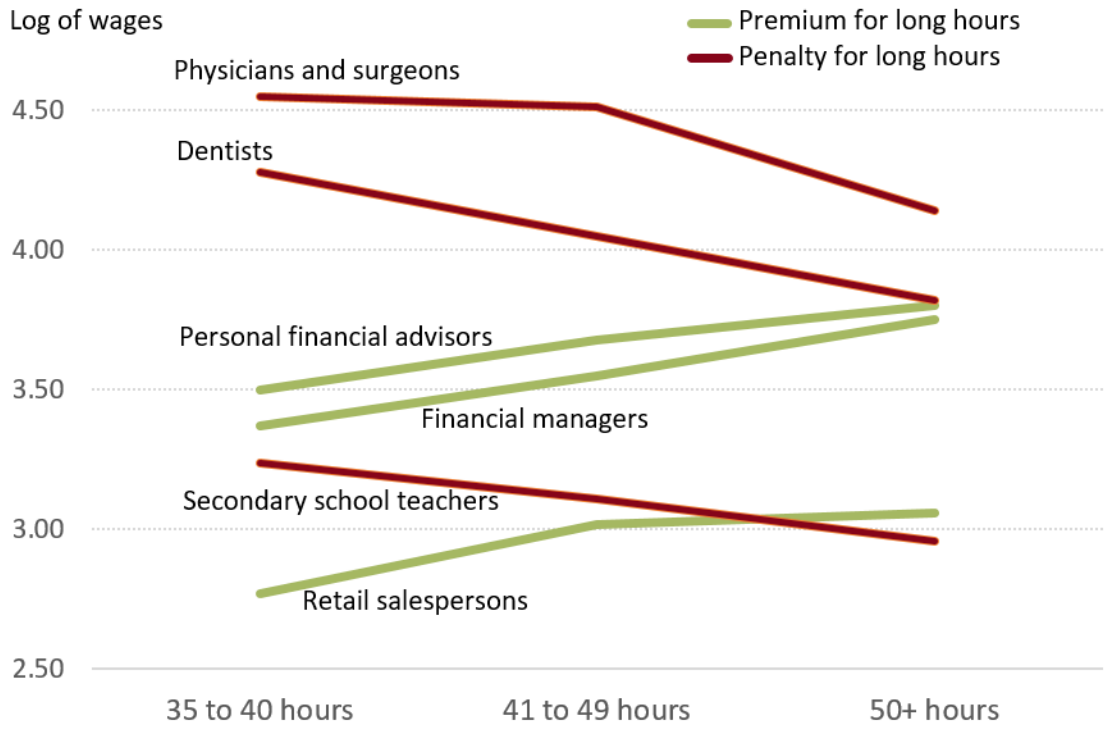
Panel A: Occupations with larger returns to 50+ hours	Hourly premium (in %)	SE (in %)
Credit authorizers, checkers, and clerks	24.90%	3.77%
Securities, commodities, and financial services sales agents	23.94%	1.42%
Financial clerks, all other	21.55%	1.88%
Financial specialists, all other	19.73%	2.93%
Tax preparers	16.75%	3.88%
Statistical assistants	11.99%	10.61%
Credit counselors and loan officers	11.30%	1.29%
Financial managers	11.01%	0.43%
Retail salespersons	10.68%	0.52%
Advertising and promotions managers	10.65%	3.11%
Sales and related workers, all other	9.52%	1.38%
Financial analysts	9.51%	1.11%
Agents and business managers of artists, performers, and athletes	9.46%	3.85%
Appraisers and assessors of real estate	8.95%	2.30%
Insurance sales agents	8.78%	1.36%
Personal financial advisors	8.70%	1.04%
Public relations specialists	8.35%	1.38%
First-line supervisors of retail sales workers	8.19%	0.33%
Customer service representatives	8.01%	0.70%
Market research analysts and marketing specialists	7.97%	1.01%

Panel B: Occupations with the smallest returns to 50+ hours	Hourly penalty (in %)	SE (in %)
Barbers	-21.17%	7.49%
Miscellaneous personal appearance workers	-18.30%	4.92%
Air traffic controllers and airfield operations specialists	-15.66%	2.44%
Counter attendants, cafeteria, food concession, and coffee shop	-14.23%	10.36%
Dentists	-10.81%	2.79%
Library assistants, clerical	-10.71%	5.69%
Bartenders	-10.63%	1.61%
First-line supervisors of gaming workers	-10.31%	14.19%
Miscellaneous social scientists	-10.19%	3.88%
Baggage porters, bellhops, and concierges	-10.11%	5.41%
Petroleum, mining and geological engineers	-9.93%	2.42%
Massage therapists	-9.74%	7.76%
Flight attendants	-9.39%	2.37%
Physicians and surgeons	-9.03%	0.67%
Secondary school teachers	-8.63%	0.40%
Aircraft pilots and flight engineers	-8.61%	1.35%
Veterinarians	-8.53%	1.08%
Elementary and middle school teachers	-8.44%	0.16%
Food preparation workers	-8.41%	2.21%
Firefighters and fire inspectors	-8.40%	0.52%

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-012.

**Figure 9. Returns to Hours Worked in Selected Occupations: American Community Survey**



Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-012.

Note: Sample is restricted to adults 25 to 54 working year-round (full- or part-time) in the year referenced in their ACS response.

Recent research has focused on the role of nonlinear returns to work hours in explaining the gender wage gap. Goldin (2014) argues that earnings elasticity in hours of work explains a significant portion of the gender wage gap, with occupations in law and business disproportionately rewarding long hours of work and retaining a larger gender wage gap than occupations in science, technology, and health with more linear returns to hours worked. As an example, Goldin (2014) offers pharmacy as an occupation with relatively linear returns to hours worked, thus women are not penalized in hourly wages if they work shorter hours and men who do work long hours do not earn disproportionately more. Using median hourly wages, we show pharmacists working 41 to 49 hours per week earn about the same hourly wage as those working 35 to 40 hours per week. Pharmacists who work 50 hours or more per week are actually penalized per hour (-5.9 percent) relative to those working fewer hours. Chief executives have modest returns to hours worked: 1.7 percent for those working 41 to 49 hours per week and 3.6 percent for those working 50 or more hours. Software developers incur a small hourly penalty for working longer hours – about 1.3 percent less among those working 41 to 49 or 50 or more hours. Finance occupations, which have among the largest gender wage gaps, tend to remunerate workers nonlinearly for working longer hours. That is, those working the longest hours receive a large wage premium per hour. However, in some occupations that have a larger than average gender wage gap, physicians and surgeons, for example, a more linear return to hours worked could potentially increase the gender wage gap because long hours are currently penalized, perhaps because they are salaried.

As in Camerer and colleagues' (1997) study, we find an hourly wage penalty for taxi drivers of -3.9 percent among those working for 50 or more hours a week relative to those working 35 to 40 hours a week. As their study suggests, we find a larger hourly wage penalty in jobs with variable hours where workers receive a fee for services (e.g., barbers, personal appearance workers, massage therapists). Longer hours in these jobs often reflect having slow days in which it takes more time to earn the same amount they would earn during busy days. It can also reflect accumulated experience in locating clients and scheduling work hours. Together, these findings underscore the importance of evaluating the returns to hours worked within occupations and understanding the significant differences in reward mechanisms that may reward or penalize longer hours of work on an hourly basis. To the extent that long hours are more highly compensated within an occupation on a per hour basis, the gender wage gap may be larger as women are less likely to work over 50 hours per week compared with men.

### Occupation-Specific Decompositions and Unexplained Residuals

Because most of the gender wage gap remains unexplained even after controlling for conventional demographic and economic characteristics, including work history, industry, and occupation, we turn our focus to occupation-specific residuals. Goldin (2014) argues that evaluating occupations that have larger residuals will provide an "important clue" to the factors that contribute to inequality in wages: "If one can isolate the features of occupations that have high and low residual differences by gender one can figure out what factors make for more equal pay" (p. 1102). Isolating these features will shed light on why there are large gender wage gaps in some occupations and may also help identify the occupations that may experience more discrimination which is one potential

reason the residuals are large. We evaluate residual differences here in three parts. First, we show the range of occupational residuals across 316 occupations to highlight which occupations have larger or smaller residuals. Second, we show which occupational characteristics contribute to larger or smaller residuals. Third, we analyze how nonlinear returns to hours worked contribute to the gender wage gap and occupational residuals.

We conduct an Oaxaca-Blinder decomposition including age, race and ethnicity, educational attainment, usual weekly work hours, industry, work history, metropolitan status, and region within each of 316 occupations. For each occupation, we show the portion of the wage gap that is explained and unexplained with these variables. These estimates are available in Appendix Table A3. Occupations with large unexplained residuals include models and product promoters, print binding and finishing workers, and air traffic controllers (Table 8). Several occupations in finance also retain large unexplained residuals (e.g., credit counselors and loan officers, financial specialists, personal financial advisors). Some occupations that combine multiple job titles, identified as “all other” or “not elsewhere classified” in occupational classifications, also have larger residuals and this may stem from the diversity in job titles within the aggregated occupation. Occupations with smaller residuals include crossing guards, urban and regional planners, and announcers. Several occupations in health fields also have small residuals (e.g., optometrists, nurse anesthetists). For example, among personal financial advisors, gender differences in work history, work hours, and demographic characteristics explain about a quarter of the gender wage gap but do not account for the remainder. On the other hand, work history, work hours, and other demographic and economic characteristics account for all of the gender wage gap among nurse anesthetists.



**Table 8: Occupations with Larger and Smaller Unexplained Residuals: American Community Survey**

Panel A: Occupations with larger residuals	Residual
Models, demonstrators, and product promoters	0.63
Print binding and finishing workers	0.43
Air traffic controllers and airfield operations specialists	0.35
Jewelers and precious stone and metal workers	0.32
Farmers, ranchers, and other agricultural managers	0.32
First-line supervisors of farming, fishing, and forestry workers	0.31
Welding, soldering, and brazing workers	0.31
Health diagnosing and treating practitioners, all other	0.31
Tailors, and shoe and leather workers	0.30
Statistical assistants	0.29
Machinists	0.29
Credit counselors and loan officers	0.28
Machine feeders and offbearers	0.28
Miscellaneous material moving workers	0.28
Financial specialists, all other	0.27
Personal financial advisors	0.27
Miscellaneous metal workers and plastic workers	0.27
First-line supervisors of housekeeping and janitorial workers	0.27
Production, planning, and expediting clerks	0.26
Rail and water transportation workers	0.26

Panel B: Occupations with smaller residuals	Residual
Crossing guards	-0.05
Optometrists	-0.04
Nurse anesthetists	-0.01
Urban and regional planners	-0.01
Announcers	0.00
First-line supervisors of landscaping, lawn service, and groundskeeping	0.00
Library technicians	0.02
News analysts, reporters and correspondents	0.03
Industrial truck and tractor operators	0.03
Clergy and religious workers	0.03
Human resources assistants	0.03
Biomedical, agricultural, and chemical engineers	0.03
Massage therapists	0.03
Chemical processing machine setters, operators, and tenders	0.03
Surveying and mapping technicians	0.03
Social workers	0.04
Entertainers and performers	0.04
Travel agents	0.04
Barbers	0.04
Public relations and fundraising managers	0.04

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002.

Turning to the features of occupations that are associated with larger or smaller residuals, we conduct bivariate and multivariate regression models using the unexplained residuals summarized in Table 8 as the dependent variable. Bivariate results show the raw relationships between a given occupational characteristic and the residual wage gap without controlling statistically for other factors which may or may not influence the relationship between the characteristic of interest and the residual gap. Multivariate results show the relationships between occupational characteristics and the residual wage gaps net of all other characteristics in the model; in other words, the multivariate coefficients below show the independent effect of a characteristic while statistically holding all other variables constant. In our bivariate models, we show that occupations with larger shares of women workers, more autonomy, and greater communication and teamwork have lower unexplained residuals than other occupations (Table 9). In contrast, hazardous occupations with larger returns to working overtime have larger unexplained residuals. In multivariate models, occupations that require more communication and teamwork have lower unexplained residuals, whereas occupations that are more hazardous and have greater financial returns to working 50 or more hours per week are associated with larger unexplained residuals.

**Table 9: Linear Regression Models Predicting Occupation-Specific Unexplained Residual Wage Gaps**

Occupational characteristic	Bivariate regression	Multivariate regression
Proportion female	-0.046**	-0.027
O*NET characteristics		
Time pressure	0.004	-0.002
Competition	-0.003	-0.006
Occupational hazards	0.011**	0.012**
Autonomy	-0.012**	-0.006
Communication	-0.021***	-0.013*
Returns to overtime		
41-49 hours	0.387**	0.227
50+ hours	0.281***	0.355***
N	316	316
R <sup>2</sup>	--	0.137

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-008 and CBDRB-FY2019-CES005-012.

To account for the possibility that occupational characteristics have a different association with the gender wage gap and unexplained residuals among high- or low-wage workers, we estimated the residuals by occupational earnings quartiles and deciles. We find that the relationship between occupational characteristics and gender wage gap residuals is largely similar for high- and low-wage workers, with a few exceptions. Having more autonomy and more communication and teamwork reduces the unexplained residual in low-earning occupations, whereas larger returns to working 41-49 hours per week increases the unexplained portion of the gender wage gap (Appendix Figure A1). Although these patterns are more pronounced when evaluating occupational earnings deciles and higher levels of competition increase the residuals in high-earning occupations, the number of occupations shrinks and estimates are not statistically significant.

## Discussion and Conclusion

This study linked Census Bureau sample survey and administrative earnings records to generate estimates of the contemporary gender gap in wages. We find that, despite significant gains in women's human capital and labor force participation, a gender wage gap of approximately 18 to 20 percent remains. Consistent with other recent studies, we show that only a relatively small portion of this gap – around 30 to 40 percent – can be explained by the observed characteristics of men and women and the occupations in which they work. The residual gap left over after accounting for these characteristics – roughly 60 to 70 percent of the overall gap – is typically attributed to some combination of characteristics that are unobserved and discrimination (Oaxaca 1973; Fortin, Lemieux, and Firpo 2010). Understanding this residual gap is difficult because it is not possible to observe every possible worker characteristic that might contribute to legitimate gender differentials in wages, and because discrimination need not be (and most likely is not) limited strictly to employers at the point of deciding workers' wages.

Leveraging the rich detail and large sample sizes afforded by our linked survey and administrative data, we examined several potential contributors to the wage gap that are difficult to address using conventional, publicly-available data sources. First, using 25 years of administrative earnings history data linked to CPS ASEC responses, we examined the contribution of actual work experience to the contemporary wage gap. Results show that the portion of the overall gap explained increases as years of work history are added to the decompositions. Using 5-year work histories, our decomposition models explain 33 percent of the overall gap; this explained portion grows to 37 percent after accounting for 15 years of work history and to 41 percent with 25 years of work history. These findings suggest that gender differences in the likelihood of taking extended periods of time off work – for example, to take care of young children or aging parents – compound over time and contribute to overall wage gaps. However, with more continuous labor force participation among younger cohorts of women, differences in years of work history explain less of the wage gap now than in the past. In fact, our estimates of the effect of work history on the current gender wage gap are lower than those found in studies using older cohorts (Blau and Kahn 2017; Kilbourne et al. 1994). As women's labor force participation patterns more resemble men's, differences in industry and occupation have become more

significant explanatory variables. Methodologically, our study contributes an assessment of the tradeoffs in using actual work history measures with detailed occupation categories. Our results suggest that in studies attempting to explain the current gender wage gap, datasets with large samples to analyze detailed industry and occupation categories are preferable to datasets containing measures of actual labor-market experience when there is a tradeoff between these variables.

Second, using 316 detailed occupation categories from the ACS, we gauge whether and how occupational sorting and segregation by gender influence overall wage gaps. The ratio of women's to men's wages varies widely across occupations, from a low of 0.45 to a high of 1.16, but our analysis of recent ACS workers suggests that there are only 17 occupations in which the average wage ratio favors women and none are statistically different from equal wages (1.00). Although recent research posits that most of the gender wage gap is occurring within occupations (Goldin 2014; Moore 2018), here we show that the wage gap within occupations was typically smaller than the wage gap across occupations. Overall, 43 percent of occupations had wage ratios that were above average, whereas 15 percent of occupations had wage ratios below the average. Results of Oaxaca-Blinder decompositions show that the tendency for women and men to sort into particular occupations accounts for approximately 17.6 percent of the overall gender wage gap. Furthermore, we find that the gender wage gap was larger in occupations that had a larger share of women workers and accounted for 9.7 percent of the gender wage gap, similar to results in other studies finding a wage penalty of 5 to 8 percent (England, Hermsen, and Cotter 2000; Kilbourne et al. 1994). Taken together, these findings suggest that promoting both women's pursuit of careers in traditionally higher-paying, male-dominated occupations, as well as higher compensation in traditionally lower-paying, female-dominated occupations, may help shrink the aggregate gap in wages.

Third, we evaluated how gender differences in hours worked and nonlinear remuneration of hours worked contributes to the gender wage gap. We show that among full-time workers, men and women are equally likely to work 41 to 49 hours per week and these hours carry the largest wage premium relative to working 35 to 40 hours per week. Men are more likely to report working 50 or more hours per week, yet the wage premium for these hours is not as large as workers earn less per hour than their counterparts working 41 to 49 hours per week. Unlike research showing a larger premium to overwork (50+ hours) at the mean (Weeden, Cha, and Bucca 2016), we show that measured at the median, there are diminishing returns for long hours of work. Furthermore, not all occupations reward long hours of work, with several healthcare and education occupations penalizing longer hours of work unlike finance occupations in which longer hours of work are rewarded. These results caution against the assumption that long hours are similarly rewarded within occupations and that increasing women's hours to men's hours will necessarily reduce the gender wage gap. To the extent that some occupations are salaried and offer no higher hourly returns for the longer time investment, women's longer hours would not reduce the gender wage gap absent additional long-term rewards tied to longer hours of work (e.g., promotions).

Fourth, we assessed the extent to which sorting into occupations with particular characteristics, rather than gendered sorting into occupations themselves, might help explain overall wage gaps. We created a linked dataset combining ACS and O\*NET Online data on occupational characteristics for 316

occupations and included proportion female in the occupation and nonlinear returns to hours worked by occupation. Results of Oaxaca-Blinder decompositions using these data showed that 22.5 percent of the overall gap can be attributed to gender differences in the characteristics of occupations into which men and women sort. In particular, the level of competition appears important in determining gender wage gaps, accounting on its own for 14.9 percent of the overall gap. Prior research shows that competitiveness increases the motherhood wage gap (Yu and Kuo 2017) and we show similar results for the gender wage gap. This finding can help reconcile some of the mixed findings on the association between autonomy and the wage gap. We find that occupations with greater autonomy have a lower gender wage gap, as Yu and Kuo (2017) find with the motherhood wage gap. However, Goldin (2014) finds that increased autonomy increases the gender wage gap. Because having autonomy is correlated with being in a competitive occupation, the competitiveness of the occupation may itself restrict individuals' decisions and priorities to avoid penalties. We show that autonomy is more strongly associated with lower wage gaps in lower-income occupations that are less competitive with lower-wage women deriving more benefit. Autonomy may offer less benefit in higher-wage jobs where competitiveness effectively limits the benefits of autonomy. As Schieman, Milkie, and Glavin (2009) argue, higher-wage workers may have autonomy but these positions carry the "stress of higher status" with more extensive job demands. Other characteristics we evaluated, such as a need for communication amongst workers, reduced the gap in wages, whereas working in hazardous occupations, occupations that nonlinearly reward working overtime, and had a higher proportion of women increased the gap.

Finally, we used results from 316 occupation-specific decomposition models to assess whether and how occupational characteristics drive unexplained, residual gender wage gaps. Recent research has called for looking at occupations with larger residual gender wage gaps to get a better understanding of what might contribute to the gender wage gap (Goldin 2014). While the residual gap in a handful of occupations was essentially zero – that is, our decomposition models explained all, or nearly all, of the observed gap in wages for men and women – other occupations had residual logged hourly wage gaps as large as 0.63, equivalent to a wage difference of \$1.88 per hour in favor of men. At the detailed occupation level, results did not offer as much insight as hoped. Occupations with large residual gaps were varied, though several finance occupations ranked near the top. Looking at the characteristics of these occupations was more revealing. Using multivariate regression models, we find that occupations that require more communication and teamwork tended to have lower unexplained residuals, whereas more hazardous occupations and occupations with larger returns to working 50 or more hours per week were associated with larger unexplained residuals.

This study offers an in-depth evaluation of the effects of work history, occupation, and occupational characteristics to understand the largest contributors to the contemporary gender wage gap. Our use of linked survey and administrative data sources offers us the ability to validate results on the gender wage gap compared with using survey sources alone. While preferable to be able to use full occupational detail and extensive work histories, administrative data sources that currently make this possible are highly restricted. To researchers without access to these combined sources, we offer some reassuring findings. Our estimates of the overall gender wage gap using administrative earnings records

are in line with survey estimates of the gender wage gap showing an overall gap of 18 to 20 percent. We further establish that the use of cross-sectional data sources can provide reliable estimates of the gender wage gap even in absence of more complete work histories as it does not bias other predictors and the gains to more extensive work history data are small. More extensive work history information does improve the estimation of the wage gap but more detailed assessments of industry and occupation are critical. As the estimated effect of industry was larger than the estimated effect of detailed occupation, future research could examine the effects of industry in greater depth. For example, as job benefits and amenities have diverged by industry, additional analyses may assess the role of work benefits in maintaining the gender wage gap. Future research could also examine more detailed occupational data at the level of job titles to the extent that some portion of the wage gap resides within occupation. Finally, as the American Community Survey garners a longer history, future similar studies will be able to include more extensive work history measures to aid in our understanding of the gender wage gap.



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## Appendix

**Table A1: Occupation Groupings and Descriptive Statistics: Current Population Survey Annual Social and Economic Supplement**

	Occupational distribution				Median wage ratios	
	Women	SE	Men	SE	Ratio	SE
Total	0.44	< 0.01	0.56	< 0.01	0.80	< 0.01
Management	0.11	< 0.01	0.14	< 0.01	0.77	0.01
Business and financial operations	0.07	< 0.01	0.04	< 0.01	0.79	0.01
Computer and mathematical science	0.02	< 0.01	0.05	< 0.01	0.87	0.01
Architecture and engineering	0.01	< 0.01	0.04	< 0.01	0.84	0.02
Life, physical, and social science	0.01	< 0.01	0.01	< 0.01	0.85	0.02
Community and social service	0.03	< 0.01	0.01	< 0.01	1.10	0.02
Legal	0.02	< 0.01	0.01	< 0.01	0.57	0.02
Education, training, and library	0.09	< 0.01	0.03	< 0.01	0.85	0.01
Arts, design, entertainment, sports, and media	0.01	< 0.01	0.02	< 0.01	0.90	0.02
Healthcare practitioner and technical	0.10	< 0.01	0.03	< 0.01	0.80	0.01
Healthcare support occupations	0.04	< 0.01	0.00	< 0.01	0.88	0.02
Protective service	0.01	< 0.01	0.04	< 0.01	0.78	0.02
Food preparation and serving related	0.03	< 0.01	0.02	< 0.01	0.82	0.01
Building and grounds cleaning and maintenance	0.02	< 0.01	0.03	< 0.01	0.72	0.01
Personal care and service	0.02	< 0.01	0.01	< 0.01	0.72	0.02
Sales and related	0.09	< 0.01	0.10	< 0.01	0.70	0.01
Office and administrative support	0.23	< 0.01	0.07	< 0.01	0.85	0.01
Farming, fishing, and forestry	0.00	< 0.01	0.01	< 0.01	0.90	0.04
Construction and extraction	0.00	< 0.01	0.08	< 0.01	0.85	0.05
Installation, maintenance, and repair	0.00	< 0.01	0.07	< 0.01	0.90	0.03

Production	0.05	< 0.01	0.10	< 0.01	0.69	0.01
Transportation and material moving	0.02	< 0.01	0.09	< 0.01	0.75	0.01

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Source: Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security Detailed Earnings Record administrative records (1978-2012).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: SE = standard error.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-014.

**Table A2: Aggregated Census Occupation Codes Mapped to 2010 Census Occupation Codes and 2010 Standard Occupational Classification Codes**

*Note: Boxes indicate where two or more Census codes were aggregated. The 2010 Census occupation classification list has 535 codes. The aggregated Census occupation classification for these analyses has 316 codes.*

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Management, Business, Science, and Arts Occupations:	0010-3540	11-0000 - 29-0000	
	<i>Management, Business, and Financial Occupations:</i>	0010-0950	11-0000 - 13-0000	
	Management Occupations:	0010-0430	11-0000	
1	Chief executives and legislators			
	Chief executives	0010	11-1011	11-1011
	Legislators	0030	11-1031	11-1031
2	General and operations managers	0020	11-1021	11-1021
3	Advertising and promotions managers	0040	11-2011	11-2011
4	Marketing and sales managers	0050	11-2020	
	Marketing managers			11-2021
	Sales managers			11-2022
5	Public relations and fundraising managers	0060	11-2031	11-2031
6	Administrative services managers	0100	11-3011	11-3011
7	Computer and information systems managers	0110	11-3021	11-3021
8	Financial managers	0120	11-3031	11-3031
9	Human resources managers			
	Compensation and benefits managers	0135	11-3111	11-3111
	Human resources managers	0136	11-3121	11-3121
	Training and development managers	0137	11-3131	11-3131
10	Industrial production managers	0140	11-3051	11-3051
11	Purchasing managers	0150	11-3061	11-3061
12	Transportation, storage, and distribution managers	0160	11-3071	11-3071
13	Farmers, ranchers, and other agricultural managers	0205	11-9013	11-9013

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
14	Construction managers	0220	11-9021	11-9021
15	Education administrators	0230	11-9030	
	Education administrators, preschool and childcare center/program			11-9031
	Education administrators, elementary and secondary school			11-9032
	Education administrators, postsecondary			11-9033
	Education administrators, all other			11-9039
16	Architectural and engineering managers	0300	11-9041	11-9041
17	Food service managers	0310	11-9051	11-9051
18	Gaming managers	0330	11-9071	11-9071
19	Lodging managers	0340	11-9081	11-9081
20	Medical and health services managers	0350	11-9111	11-9111
21	Natural sciences managers	0360	11-9121	11-9121
22	Property, real estate, and community association managers	0410	11-9141	11-9141
23	Social and community service managers	0420	11-9151	11-9151
24	Miscellaneous managers			
	Managers, all other	0430	11-9199	11-9199
	Funeral service managers	0325	11-9061	11-9061
	Postmasters and mail superintendents	0400	11-9131	11-9131
	Emergency management directors	0425	11-9161	11-9161
	Business and Financial Operations Occupations:	0500-0950	13-0000	
25	Agents and business managers of artists, performers, and athletes	0500	13-1011	13-1011
26	Buyers and purchasing agents			
	Buyers and purchasing agents, farm products	0510	13-1021	13-1021
	Wholesale and retail buyers, except farm products	0520	13-1022	13-1022
	Purchasing agents, except wholesale, retail, and farm products	0530	13-1023	13-1023
27	Claims adjusters, appraisers, examiners, and investigators	0540	13-1030	
	Claims adjusters, examiners, and investigators			13-1031



Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Insurance appraisers, auto damage			13-1032
28	Compliance officers	0565	13-1041	13-1041
29	Cost estimators	0600	13-1051	13-1051
30	Human resources workers	0630	13-1070	
	Human resources specialists			13-1071
	Farm labor contractors			13-1074
	Labor relations specialists			13-1075
31	Compensation, benefits, and job analysis specialists	0640	13-1141	13-1141
32	Training and development specialists	0650	13-1151	13-1151
33	Logisticians	0700	13-1081	13-1081
34	Management analysts	0710	13-1111	13-1111
35	Meeting, convention, and event planners	0725	13-1121	13-1121
36	Fundraisers	0726	13-1131	13-1131
37	Market research analysts and marketing specialists	0735	13-1161	13-1161
38	Business operations specialists, all other	0740	13-1199	13-1199
39	Accountants and auditors	0800	13-2011	13-2011
40	Appraisers and assessors of real estate	0810	13-2021	13-2021
41	Budget analysts	0820	13-2031	13-2031
42	Credit analysts	0830	13-2041	13-2041
43	Financial analysts	0840	13-2051	13-2051
44	Personal financial advisors	0850	13-2052	13-2052
45	Insurance underwriters	0860	13-2053	13-2053
46	Financial examiners	0900	13-2061	13-2061
47	Credit counselors and loan officers	0910	13-2070	
	Credit counselors			13-2071
	Loan officers			13-2072
48	Tax examiners and collectors, and revenue agents	0930	13-2081	13-2081
49	Tax preparers	0940	13-2082	13-2082

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
50	Financial specialists, all other	0950	13-2099	13-2099
	<i>Computer, Engineering, and Science Occupations:</i>	1000-1965	15-0000 - 19-0000	
	Computer and mathematical occupations:	1000-1240	15-0000	
51	Computer and information scientists and analysts			
	Computer and information research scientists	1005	15-1111	15-1111
	Computer systems analysts	1006	15-1121	15-1121
	Information security analysts	1007	15-1122	15-1122
52	Computer programmers	1010	15-1131	15-1131
53	Software developers, applications and systems software	1020	15-113X	
	Software developers, applications			15-1132
	Software developers, systems software			15-1133
54	Web developers	1030	15-1134	15-1134
55	Computer support specialists	1050	15-1150	
	Computer user support specialists			15-1151
	Computer network support specialists			15-1152
56	Database administrators	1060	15-1141	15-1141
57	Network and computer systems administrators	1105	15-1142	15-1142
58	Computer network architects	1106	15-1143	15-1143
59	Computer occupations, all other	1107	15-1199	15-1199
60	Actuaries	1200	15-2011	15-2011
61	Operations research analysts	1220	15-2031	15-2031
62	Miscellaneous mathematical science occupations			
	Miscellaneous mathematical science occupations	1240	15-2090	
	Mathematical technicians			15-2091
	Mathematical science occupations, all other			15-2099
	Mathematicians	1210	15-2021	15-2021
	Statisticians	1230	15-2041	15-2041
	Architecture and Engineering Occupations:	1300-1560	17-0000	

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
63	Architects, except naval	1300	17-1010	
	Architects, except landscape and naval			17-1011
	Landscape architects			17-1012
64	Surveyors, cartographers, and photogrammetrists	1310	17-1020	
	Cartographers and photogrammetrists			17-1021
	Surveyors			17-1022
65	Aerospace engineers	1320	17-2011	17-2011
66	Biomedical, agricultural, and chemical engineers			
	Agricultural engineers	1330	17-2021	17-2021
	Biomedical engineers	1340	17-2031	17-2031
	Chemical engineers	1350	17-2041	17-2041
67	Civil engineers	1360	17-2051	17-2051
68	Computer hardware engineers	1400	17-2061	17-2061
69	Electrical and electronics engineers	1410	17-2070	
	Electrical engineers			17-2071
	Electronics engineers, except computer			17-2072
70	Environmental engineers	1420	17-2081	17-2081
71	Industrial engineers, including health and safety	1430	17-2110	
	Health and safety engineers, except mining safety engineers and inspectors			17-2111
	Industrial engineers			17-2112
72	Mechanical engineers	1460	17-2141	17-2141
73	Mining and petroleum engineers			
	Mining and geological engineers, including mining safety engineers	1500	17-2151	17-2151
	Petroleum engineers	1520	17-2171	17-2171
74	Miscellaneous engineers			
	Engineers, all other	1530	17-2199	17-2199

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Marine engineers and naval architects	1440	17-2121	17-2121
	Materials engineers	1450	17-2131	17-2131
	Nuclear engineers	1510	17-2161	17-2161
75	Drafters	1540	17-3010	
	Architectural and civil drafters			17-3011
	Electrical and electronics drafters			17-3012
	Mechanical drafters			17-3013
	Drafters, all other			17-3019
76	Engineering technicians, except drafters	1550	17-3020	
	Aerospace engineering and operations technicians			17-3021
	Civil engineering technicians			17-3022
	Electrical and electronics engineering technicians			17-3023
	Electro-mechanical technicians			17-3024
	Environmental engineering technicians			17-3025
	Industrial engineering technicians			17-3026
	Mechanical engineering technicians			17-3027
	Engineering technicians, except drafters, all other			17-3029
77	Surveying and mapping technicians	1560	17-3031	17-3031
	Life, Physical, and Social Science Occupations:	1600-1965	19-0000	
78	Agricultural and food scientists	1600	19-1010	
	Animal scientists			19-1011
	Food scientists and technologists			19-1012
	Soil and plant scientists			19-1013
79	Biological scientists	1610	19-1020	
	Biochemists and biophysicists			19-1021
	Microbiologists			19-1022
	Zoologists and wildlife biologists			19-1023
	Biological scientists, all other			19-1029

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
80	Conservation scientists and foresters	1640	19-1030	
	Conservation scientists			19-1031
	Foresters			19-1032
81	Medical and life scientists, all other			
	Medical scientists	1650	19-1040	
	Epidemiologists			19-1041
	Medical scientists, except epidemiologists			19-1042
	Life scientists, all other	1660	19-1099	19-1099
82	Physical scientists			
	Astronomers and physicists	1700	19-2010	
	Astronomers			19-2011
	Physicists			19-2012
	Atmospheric and space scientists	1710	19-2021	19-2021
	Chemists and materials scientists	1720	19-2030	
	Chemists			19-2031
	Materials scientists			19-2032
	Environmental scientists and geoscientists	1740	19-2040	
	Environmental scientists and specialists			19-2041
	Geoscientists, except hydrologists and geographers			19-2042
	Hydrologists			19-2043
	Physical scientists, all other	1760	19-2099	19-2099
83	Economists	1800	19-3011	19-3011
84	Psychologists	1820	19-3030	
	Clinical, counseling, and school psychologists			19-3031
	Industrial-organizational psychologists			19-3032
	Psychologists, all other			19-3039
85	Urban and regional planners	1840	19-3051	19-3051
86	Miscellaneous social scientists			

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Survey researchers	1815	19-3022	19-3022
	Sociologists	1830	19-3041	19-3041
	Miscellaneous social scientists and related workers	1860	19-3090	
	Anthropologists and archeologists			19-3091
	Geographers			19-3092
	Historians			19-3093
	Political scientists			19-3094
	Social scientists and related workers, all other			19-3099
87	Science technicians and research assistants			
	Agricultural and food science technicians	1900	19-4011	19-4011
	Biological technicians	1910	19-4021	19-4021
	Chemical technicians	1920	19-4031	19-4031
	Geological and petroleum technicians	1930	19-4041	19-4041
	Nuclear technicians	1940	19-4051	19-4051
	Social science research assistants	1950	19-4061	19-4061
	Miscellaneous life, physical, and social science technicians	1965	19-4090	
	Environmental science and protection technicians			19-4091
	Forensic science technicians			19-4092
	Forest and conservation technicians			19-4093
	Life, physical, and social science technicians, all other			19-4099
	<i>Education, Legal, Community Service, Arts, and Media Occupations:</i>	<i>2000-2960</i>	<i>21-0000 - 27-0000</i>	
	Community and Social Service Occupations:	2000-2060	21-0000	
88	Counselors	2000	21-1010	
	Substance abuse and behavioral disorder counselors			21-1011
	Educational, guidance, school, and vocational counselors			21-1012
	Marriage and family therapists			21-1013
	Mental health counselors			21-1014
	Rehabilitation counselors			21-1015

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Counselors, all other			21-1019
89	Social workers	2010	21-1020	
	Child, family, and school social workers			21-1021
	Healthcare social workers			21-1022
	Mental health and substance abuse social workers			21-1023
	Social workers, all other			21-1029
90	Probation officers and correctional treatment specialists	2015	21-1092	21-1092
91	Social and human service assistants	2016	21-1093	21-1093
92	Miscellaneous community and social service specialists, including health educators and community health workers	2025	21-109X	
	Health educators			21-1091
	Community health workers			21-1094
	Community and social service specialists, all other			21-1099
93	Clergy and religious workers			
	Clergy	2040	21-2011	21-2011
	Directors, religious activities and education	2050	21-2021	21-2021
	Religious workers, all other	2060	21-2099	21-2099
	Legal Occupations:	2100-2160	23-0000	
94	Judicial law clerks	2105	23-1012	23-1012
95	Lawyers and judges			
	Lawyers	2100	23-1011	23-1011
	Judges, magistrates, and other judicial workers	2110	23-1020	
	Administrative law judges, adjudicators, and hearing officers			23-1021
	Arbitrators, mediators, and conciliators			23-1022
	Judges, magistrate judges, and magistrates			23-1023
96	Paralegals and legal assistants	2145	23-2011	23-2011
97	Miscellaneous legal support workers	2160	23-2090	
	Court reporters			23-2091

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Title examiners, abstractors, and searchers			23-2093
	Legal support workers, all other			23-2099
98	Education, Training, and Library Occupations: Postsecondary teachers	2200-2550 2200	25-0000 25-1000	
	Business teachers, postsecondary			25-1011
	Computer science teachers, postsecondary			25-1021
	Mathematical science teachers, postsecondary			25-1022
	Architecture teachers, postsecondary			25-1031
	Engineering teachers, postsecondary			25-1032
	Agricultural sciences teachers, postsecondary			25-1041
	Biological science teachers, postsecondary			25-1042
	Forestry and conservation science teachers, postsecondary			25-1043
	Atmospheric, earth, marine, and space sciences teachers, postsecondary			25-1051
	Chemistry teachers, postsecondary			25-1052
	Environmental science teachers, postsecondary			25-1053
	Physics teachers, postsecondary			25-1054
	Anthropology and archeology teachers, postsecondary			25-1061
	Area, ethnic, and cultural studies teachers, postsecondary			25-1062
	Economics teachers, postsecondary			25-1063
	Geography teachers, postsecondary			25-1064
	Political science teachers, postsecondary			25-1065
	Psychology teachers, postsecondary			25-1066
	Sociology teachers, postsecondary			25-1067
	Social sciences teachers, postsecondary, all other			25-1069
	Health specialties teachers, postsecondary			25-1071
	Nursing instructors and teachers, postsecondary			25-1072
	Education teachers, postsecondary			25-1081



Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Library science teachers, postsecondary			25-1082
	Criminal justice and law enforcement teachers, postsecondary			25-1111
	Law teachers, postsecondary			25-1112
	Social work teachers, postsecondary			25-1113
	Art, drama, and music teachers, postsecondary			25-1121
	Communications teachers, postsecondary			25-1122
	English language and literature teachers, postsecondary			25-1123
	Foreign language and literature teachers, postsecondary			25-1124
	History teachers, postsecondary			25-1125
	Philosophy and religion teachers, postsecondary			25-1126
	Graduate teaching assistants			25-1191
	Home economics teachers, postsecondary			25-1192
	Recreation and fitness studies teachers, postsecondary			25-1193
	Vocational education teachers, postsecondary			25-1194
	Postsecondary teachers, all other			25-1199
99	Preschool and kindergarten teachers	2300	25-2010	
	Preschool teachers			25-2011
	Kindergarten teachers			25-2012
100	Elementary and middle school teachers	2310	25-2020	
	Elementary school teachers			25-2021
	Middle school teachers			25-2022
	Career/technical education teachers, middle school			25-2023
101	Secondary school teachers	2320	25-2030	
	Secondary school teachers			25-2031
	Career/technical education teachers, secondary school			25-2032
102	Special education teachers	2330	25-2050	
	Special education teachers, preschool			25-2051
	Special education teachers, kindergarten and elementary school			25-2052

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Special education teachers, middle school			25-2053
	Special education teachers, secondary school			25-2054
	Special education teachers, all other			25-2059
103	Other teachers and instructors	2340	25-3000	
	Adult basic and secondary education and literacy teachers and instructors			25-3011
	Self-enrichment education teachers			25-3021
	Teachers and instructors, all other			25-3099
104	Archivists, curators, and museum technicians	2400	25-4010	
	Archivists			25-4011
	Curators			25-4012
	Museum technicians and conservators			25-4013
105	Librarians	2430	25-4021	25-4021
106	Library technicians	2440	25-4031	25-4031
107	Teacher assistants	2540	25-9041	25-9041
108	Other education, training, and library workers	2550	25-90XX	
	Audio-visual and multimedia collections specialists			25-9011
	Farm and home management advisors			25-9021
	Instructional coordinators			25-9031
	Education, training, and library workers, all other			25-9099
	Arts, Design, Entertainment, Sports, and Media Occupations:	2600-2960	27-0000	
109	Artists and related workers	2600	27-1010	
	Art directors			27-1011
	Craft artists			27-1012
	Fine artists, including painters, sculptors, and illustrators			27-1013
	Multimedia artists and animators			27-1014
	Artists and related workers, all other			27-1019
110	Designers	2630	27-1020	

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Commercial and industrial designers			27-1021
	Fashion designers			27-1022
	Floral designers			27-1023
	Graphic designers			27-1024
	Interior designers			27-1025
	Merchandise displayers and window trimmers			27-1026
	Set and exhibit designers			27-1027
	Designers, all other			27-1029
111	Entertainers and performers			
	Actors	2700	27-2011	27-2011
	Producers and directors	2710	27-2012	27-2012
	Athletes, coaches, umpires, and related workers	2720	27-2020	
	Athletes and sports competitors			27-2021
	Coaches and scouts			27-2022
	Umpires, referees, and other sports officials			27-2023
	Dancers and choreographers	2740	27-2030	
	Dancers			27-2031
	Choreographers			27-2032
	Musicians, singers, and related workers	2750	27-2040	
	Music directors and composers			27-2041
	Musicians and singers			27-2042
	Entertainers and performers, sports and related workers, all other	2760	27-2099	27-2099
112	Announcers	2800	27-3010	
	Radio and television announcers			27-3011
	Public address system and other announcers			27-3012
113	News analysts, reporters and correspondents	2810	27-3020	
	Broadcast news analysts			27-3021
	Reporters and correspondents			27-3022

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
114	Public relations specialists	2825	27-3031	27-3031
115	Editors	2830	27-3041	27-3041
116	Technical writers	2840	27-3042	27-3042
117	Writers and authors	2850	27-3043	27-3043
118	Miscellaneous media and communication workers	2860	27-3090	
	Interpreters and translators			27-3091
	Media and communication workers, all other			27-3099
119	Photographers	2910	27-4021	27-4021
120	Television, video, and motion picture camera operators and editors	2920	27-4030	
	Camera operators, television, video, and motion picture			27-4031
	Film and video editors			27-4032
121	Media and communication equipment workers			
	Media and communication equipment workers, all other	2960	27-4099	27-4099
	Broadcast and sound engineering technicians and radio operators	2900	27-4010	
	Audio and video equipment technicians			27-4011
	Broadcast technicians			27-4012
	Radio operators			27-4013
	Sound engineering technicians			27-4014
	<i>Healthcare Practitioners and Technical Occupations:</i>	<i>3000-3540</i>	<i>29-0000</i>	
122	Chiropractors	3000	29-1011	29-1011
123	Dentists	3010	29-1020	
	Dentists, general			29-1021
	Oral and maxillofacial surgeons			29-1022
	Orthodontists			29-1023
	Prosthodontists			29-1024
	Dentists, all other			29-1029
124	Dietitians and nutritionists	3030	29-1031	29-1031
125	Optometrists	3040	29-1041	29-1041

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
126	Pharmacists	3050	29-1051	29-1051
127	Physicians and surgeons	3060	29-1060	
	Anesthesiologists			29-1061
	Family and general practitioners			29-1062
	Internists, general			29-1063
	Obstetricians and gynecologists			29-1064
	Pediatricians, general			29-1065
	Psychiatrists			29-1066
	Surgeons			29-1067
	Physicians and surgeons, all other			29-1069
128	Physician assistants	3110	29-1071	29-1071
129	Therapists			
	Occupational therapists	3150	29-1122	29-1122
	Physical therapists	3160	29-1123	29-1123
	Radiation therapists	3200	29-1124	29-1124
	Recreational therapists	3210	29-1125	29-1125
	Respiratory therapists	3220	29-1126	29-1126
	Speech-language pathologists	3230	29-1127	29-1127
	Exercise physiologists	3235	29-1128	29-1128
	Therapists, all other	3245	29-1129	29-1129
130	Veterinarians	3250	29-1131	29-1131
131	Registered nurses	3255	29-1141	29-1141
132	Nurse anesthetists	3256	29-1151	29-1151
133	Nurse practitioners and nurse midwives			
	Nurse midwives	3257	29-1161	29-1161
	Nurse practitioners	3258	29-1171	29-1171
134	Health diagnosing and treating practitioners, all other			
	Podiatrists	3120	29-1081	29-1081

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Audiologists	3140	29-1181	29-1181
	Health diagnosing and treating practitioners, all other	3260	29-1199	29-1199
135	Clinical laboratory technologists and technicians	3300	29-2010	
	Medical and clinical laboratory technologists			29-2011
	Medical and clinical laboratory technicians			29-2012
136	Dental hygienists	3310	29-2021	29-2021
137	Diagnostic related technologists and technicians	3320	29-2030	
	Cardiovascular technologists and technicians			29-2031
	Diagnostic medical sonographers			29-2032
	Nuclear medicine technologists			29-2033
	Radiologic technologists			29-2034
	Magnetic resonance imaging technologists			29-2035
138	Emergency medical technicians and paramedics	3400	29-2041	29-2041
139	Health practitioner support technologists and technicians	3420	29-2050	
	Dietetic technicians			29-2051
	Pharmacy technicians			29-2052
	Psychiatric technicians			29-2053
	Respiratory therapy technicians			29-2054
	Surgical technologists			29-2055
	Veterinary technologists and technicians			29-2056
	Ophthalmic medical technicians			29-2057
140	Licensed practical and licensed vocational nurses	3500	29-2061	29-2061
141	Medical records and health information technicians	3510	29-2071	29-2071
142	Opticians, dispensing	3520	29-2081	29-2081
143	Miscellaneous health technologists and technicians	3535	29-2090	
	Orthotists and prosthetists			29-2091
	Hearing aid specialists			29-2092
	Health technologists and technicians, all other			29-2099

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
144	Other healthcare practitioners and technical occupations	3540	29-9000	
	Occupational health and safety specialists			29-9011
	Occupational health and safety technicians			29-9012
	Athletic trainers			29-9091
	Genetic counselors			29-9092
	Healthcare practitioners and technical workers, all other			29-9099
	Service Occupations:	3600-4650	31-0000 - 39-0000	
	Healthcare Support Occupations:	3600-3655	31-0000	
145	Nursing, psychiatric, and home health aides	3600	31-1010	
	Home health aides			31-1011
	Psychiatric aides			31-1013
	Nursing assistants			31-1014
	Orderlies			31-1015
146	Occupational and physical therapy assistants and aides			
	Occupational therapy assistants and aides	3610	31-2010	
	Occupational therapy assistants			31-2011
	Occupational therapy aides			31-2012
	Physical therapist assistants and aides	3620	31-2020	
	Physical therapist assistants			31-2021
	Physical therapist aides			31-2022
147	Massage therapists	3630	31-9011	31-9011
148	Dental assistants	3640	31-9091	31-9091
149	Medical assistants	3645	31-9092	31-9092
150	Pharmacy aides	3647	31-9095	31-9095
151	Veterinary assistants and laboratory animal caretakers	3648	31-9096	31-9096
152	Phlebotomists	3649	31-9097	31-9097
153	Healthcare support workers, all other			

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Healthcare support workers, all other, including medical equipment preparers	3655	31-909X	
	Medical equipment preparers			31-9093
	Healthcare support workers, all other			31-9099
	Medical transcriptionists	3646	31-9094	31-9094
	Protective Service Occupations:	3700-3955	33-0000	
154	First-line supervisors of protective service workers			
	First-line supervisors of correctional officers	3700	33-1011	33-1011
	First-line supervisors of police and detectives	3710	33-1012	33-1012
	First-line supervisors of fire fighting and prevention workers	3720	33-1021	33-1021
	First-line supervisors of protective service workers, all other	3730	33-1099	33-1099
155	Firefighters and fire inspectors			
	Firefighters	3740	33-2011	33-2011
	Fire inspectors	3750	33-2020	
	Fire inspectors and investigators			33-2021
	Forest fire inspectors and prevention specialists			33-2022
156	Bailiffs, correctional officers, and jailers	3800	33-3010	
	Bailiffs			33-3011
	Correctional officers and jailers			33-3012
157	Detectives and criminal investigators	3820	33-3021	33-3021
158	Police officers			
	Police and sheriff's patrol officers	3850	33-3051	33-3051
	Transit and railroad police	3860	33-3052	33-3052
159	Private detectives and investigators	3910	33-9021	33-9021
160	Security guards and gaming surveillance officers	3930	33-9030	
	Gaming Surveillance Officers and Gaming Investigators			33-9031
	Security Guards			33-9032
161	Crossing guards	3940	33-9091	33-9091



Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
162	Transportation security screeners	3945	33-9093	33-9093
163	Miscellaneous protective service workers			
	Fish and game wardens	3830	33-3031	33-3031
	Parking enforcement workers	3840	33-3041	33-3041
	Animal control workers	3900	33-9011	33-9011
	Lifeguards and other recreational, and all other protective service workers	3955	33-909X	
	Lifeguards, ski patrol, and other recreational protective service workers			33-9092
	Protective service workers, all other			33-9099
	Food Preparation and Serving Related Occupations:	4000-4160	35-0000	
164	Chefs and head cooks	4000	35-1011	35-1011
165	First-line supervisors of food preparation and serving workers	4010	35-1012	35-1012
166	Cooks	4020	35-2010	
	Cooks, fast food			35-2011
	Cooks, institution and cafeteria			35-2012
	Cooks, private household			35-2013
	Cooks, restaurant			35-2014
	Cooks, short order			35-2015
	Cooks, all other			35-2019
167	Food preparation workers	4030	35-2021	35-2021
168	Bartenders	4040	35-3011	35-3011
169	Combined food preparation and serving workers, including fast food	4050	35-3021	35-3021
170	Counter attendants, cafeteria, food concession, and coffee shop	4060	35-3022	35-3022
171	Waiters and waitresses	4110	35-3031	35-3031
172	Food servers, nonrestaurant	4120	35-3041	35-3041
173	Dishwashers	4140	35-9021	35-9021
174	Hosts and hostesses, restaurant, lounge, and coffee shop	4150	35-9031	35-9031

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
175	Miscellaneous food preparation and serving workers			
	Dining room and cafeteria attendants and bartender helpers	4130	35-9011	35-9011
	Food preparation and serving related workers, all other	4160	35-9099	35-9099
	Building and Grounds Cleaning and Maintenance Occupations:	4200-4250	37-0000	
176	First-line supervisors of housekeeping and janitorial workers	4200	37-1011	37-1011
	First-line supervisors of landscaping, lawn service, and groundskeeping workers	4210	37-1012	37-1012
177				
178	Janitors and building cleaners and pest control workers			
	Janitors and building cleaners	4220	37-201X	
	Janitors and cleaners			37-2011
	Building cleaning workers, all other			37-2019
	Pest control workers	4240	37-2021	37-2021
179	Maids and housekeeping cleaners	4230	37-2012	37-2012
180	Grounds maintenance workers	4250	37-3010	
	Landscaping and groundskeeping Workers			37-3011
	Pesticide handlers, sprayers, and applicators, vegetation			37-3012
	Tree trimmers and pruners			37-3013
	Grounds maintenance workers, all other			37-3019
	Personal Care and Service Occupations:	4300-4650	39-0000	
181	First-line supervisors of gaming workers	4300	39-1010	
	Gaming supervisors			39-1011
	Slot supervisors			39-1012
182	First-line supervisors of personal service workers	4320	39-1021	39-1021
183	Animal trainers	4340	39-2011	39-2011
184	Nonfarm animal caretakers	4350	39-2021	39-2021
185	Entertainment attendants			
	Gaming services workers	4400	39-3010	
	Gaming dealers			39-3011

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Gaming and sports book writers and runners			39-3012
	Gaming service workers, all other			39-3019
	Motion picture projectionists	4410	39-3021	39-3021
	Ushers, lobby attendants, and ticket takers	4420	39-3031	39-3031
	Miscellaneous entertainment attendants and related workers	4430	39-3090	
	Amusement and recreation attendants			39-3091
	Costume attendants			39-3092
	Locker room, coatroom, and dressing room attendants			39-3093
	Entertainment attendants and related workers, all other			39-3099
186	Morticians, embalmers and funeral attendants			
	Embalmers and funeral attendants	4460	39-40XX	
	Embalmers			39-4011
	Funeral attendants			39-4021
	Morticians, undertakers, and funeral directors	4465	39-4031	39-4031
187	Barbers	4500	39-5011	39-5011
188	Hairdressers, hairstylists, and cosmetologists	4510	39-5012	39-5012
189	Miscellaneous personal appearance workers	4520	39-5090	
	Makeup artists, theatrical and performance			39-5091
	Manicurists and pedicurists			39-5092
	Shampooers			39-5093
	Skincare specialists			39-5094
190	Baggage porters, bellhops, and concierges	4530	39-6010	
	Baggage porters and bellhops			39-6011
	Concierges			39-6012
191	Childcare workers	4600	39-9011	39-9011
192	Personal care aides	4610	39-9021	39-9021
193	Recreation and fitness workers	4620	39-9030	
	Fitness trainers and aerobics instructors			39-9031

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Recreation workers			39-9032
194	Residential advisors	4640	39-9041	39-9041
195	Tour guides and personal care and service workers, all other			
	Personal care and service workers, all other	4650	39-9099	39-9099
	Tour and travel guides	4540	39-7010	
	Tour guides and escorts			39-7011
	Travel guides			39-7012
	Sales and Office Occupations:	4700-5940	41-0000 - 43-0000	
	<i>Sales and Related Occupations:</i>	<i>4700-4965</i>	<i>41-0000</i>	
196	First-line supervisors of retail sales workers	4700	41-1011	41-1011
197	First-line supervisors of non-retail sales workers	4710	41-1012	41-1012
198	Cashiers	4720	41-2010	
	Cashiers			41-2011
	Gaming change persons and booth cashiers			41-2012
199	Counter and rental clerks	4740	41-2021	41-2021
200	Parts salespersons	4750	41-2022	41-2022
201	Retail salespersons	4760	41-2031	41-2031
202	Advertising sales agents	4800	41-3011	41-3011
203	Insurance sales agents	4810	41-3021	41-3021
204	Securities, commodities, and financial services sales agents	4820	41-3031	41-3031
205	Travel agents	4830	41-3041	41-3041
206	Sales representatives, services, all other	4840	41-3099	41-3099
207	Sales representatives, wholesale and manufacturing	4850	41-4010	
	Sales representatives, wholesale and manufacturing, technical and scientific products			41-4011
	Sales representatives, wholesale and manufacturing, except technical and scientific products			41-4012
208	Models, demonstrators, and product promoters	4900	41-9010	

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Demonstrators and product promoters			41-9011
	Models			41-9012
209	Real estate brokers and sales agents	4920	41-9020	
	Real estate brokers			41-9021
	Real estate sales agents			41-9022
210	Telemarketers	4940	41-9041	41-9041
	Door-to-door sales workers, news and street vendors, and related workers	4950	41-9091	41-9091
211				
212	Sales and related workers, all other			
	Sales engineers	4930	41-9031	41-9031
	Sales and related workers, all other	4965	41-9099	41-9099
	<i>Office and Administrative Support Occupations:</i>	<i>5000-5940</i>	<i>43-0000</i>	
213	First-line supervisors of office and administrative support workers	5000	43-1011	43-1011
214	Communications equipment operators			
	Switchboard operators, including answering service	5010	43-2011	43-2011
	Telephone operators	5020	43-2021	43-2021
	Communications equipment operators, all other	5030	43-2099	43-2099
215	Bill and account collectors	5100	43-3011	43-3011
216	Billing and posting clerks	5110	43-3021	43-3021
217	Bookkeeping, accounting, and auditing clerks	5120	43-3031	43-3031
218	Payroll and timekeeping clerks	5140	43-3051	43-3051
219	Procurement clerks	5150	43-3061	43-3061
220	Tellers	5160	43-3071	43-3071
221	Financial clerks, all other			
	Gaming cage workers	5130	43-3041	43-3041
	Financial clerks, all other	5165	43-3099	43-3099
222	Correspondence clerks and order clerks			
	Correspondence clerks	5210	43-4021	43-4021

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Order clerks	5350	43-4151	43-4151
223	Court, municipal, and license clerks	5220	43-4031	43-4031
224	Credit authorizers, checkers, and clerks	5230	43-4041	43-4041
225	Customer service representatives	5240	43-4051	43-4051
226	Eligibility interviewers, government programs	5250	43-4061	43-4061
227	File clerks	5260	43-4071	43-4071
228	Hotel, motel, and resort desk clerks	5300	43-4081	43-4081
229	Interviewers, except eligibility and loan	5310	43-4111	43-4111
230	Library assistants, clerical	5320	43-4121	43-4121
231	Loan interviewers and clerks	5330	43-4131	43-4131
232	Human resources assistants, except payroll and timekeeping	5360	43-4161	43-4161
233	Receptionists and information clerks	5400	43-4171	43-4171
234	Reservation and transportation ticket agents and travel clerks	5410	43-4181	43-4181
235	Information and record clerks, all other			
	Brokerage clerks	5200	43-4011	43-4011
	New accounts clerks	5340	43-4141	43-4141
	Information and record clerks, all other	5420	43-4199	43-4199
236	Cargo and freight agents	5500	43-5011	43-5011
237	Couriers and messengers	5510	43-5021	43-5021
238	Dispatchers	5520	43-5030	
	Police, fire, and ambulance dispatchers			43-5031
	Dispatchers, except police, fire, and ambulance			43-5032
239	Postal service clerks	5540	43-5051	43-5051
240	Postal service mail carriers	5550	43-5052	43-5052
	Postal service mail sorters, processors, and processing machine operators	5560	43-5053	43-5053
241				
242	Production, planning, and expediting clerks	5600	43-5061	43-5061
243	Shipping, receiving, and traffic clerks	5610	43-5071	43-5071

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
244	Stock clerks and order fillers	5620	43-5081	43-5081
245	Weighers, measurers, checkers, and samplers, recordkeeping	5630	43-5111	43-5111
246	Secretaries and administrative assistants	5700	43-6010	
	Executive secretaries and executive administrative assistants			43-6011
	Legal secretaries			43-6012
	Medical secretaries			43-6013
	Secretaries and administrative assistants, except legal, medical, and executive			43-6014
247	Computer operators	5800	43-9011	43-9011
248	Data entry keyers	5810	43-9021	43-9021
249	Word processors and typists	5820	43-9022	43-9022
250	Insurance claims and policy processing clerks	5840	43-9041	43-9041
251	Mail clerks and mail machine operators, except postal service	5850	43-9051	43-9051
252	Office clerks, general	5860	43-9061	43-9061
253	Office machine operators, except computer	5900	43-9071	43-9071
254	Statistical assistants	5920	43-9111	43-9111
255	Miscellaneous office and administrative support workers			
	Meter readers, utilities	5530	43-5041	43-5041
	Desktop publishers	5830	43-9031	43-9031
	Proofreaders and copy markers	5910	43-9081	43-9081
	Office and administrative support workers, all other	5940	43-9199	43-9199
	Natural Resources, Construction, and Maintenance Occupations:	6005-7630	45-0000 - 49-0000	
	<i>Farming, Fishing, and Forestry Occupations:</i>	6005-6130	45-0000	
256	First-line supervisors of farming, fishing, and forestry workers	6005	45-1011	45-1011
257	Farming, fishing, and forestry workers			
	Agricultural inspectors	6010	45-2011	45-2011
	Animal breeders	6020	45-2021	45-2021
	Graders and sorters, agricultural products	6040	45-2041	45-2041

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Miscellaneous agricultural workers	6050	45-2090	
	Agricultural equipment operators			45-2091
	Farmworkers and laborers, crop, nursery, and greenhouse			45-2092
	Farmworkers, farm, ranch, and aquacultural animals			45-2093
	Agricultural workers, all other			45-2099
	Fishers and related fishing workers	6100	45-3011	45-3011
	Hunters and trappers	6110	45-3021	45-3021
	Forest and conservation workers	6120	45-4011	45-4011
	Logging workers	6130	45-4020	
	Fallers			45-4021
	Logging equipment operators			45-4022
	Log graders and scalers			45-4023
	Logging workers, all other			45-4029
	<i>Construction and Extraction Occupations:</i>	<i>6200-6940</i>	<i>47-0000</i>	
258	First-line supervisors of construction trades and extraction workers	6200	47-1011	47-1011
259	Construction and extraction workers			
	Boilermakers	6210	47-2011	47-2011
	Brickmasons, blockmasons, and stonemasons	6220	47-2020	
	Brickmasons and blockmasons			47-2021
	Stonemasons			47-2022
	Carpenters	6230	47-2031	47-2031
	Carpet, floor, and tile installers and finishers	6240	47-2040	
	Carpet installers			47-2041
	Floor layers			47-2042
	Floor sanders and finishers			47-2043
	Tile and marble setters			47-2044
	Cement masons, concrete finishers, and terrazzo workers	6250	47-2050	
	Cement masons and concrete finishers			47-2051



Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Terrazzo workers and finishers			47-2053
	Construction laborers	6260	47-2061	47-2061
	Paving, surfacing, and tamping equipment operators	6300	47-2071	47-2071
	Pile-driver operators	6310	47-2072	47-2072
	Operating engineers and other construction equipment operators	6320	47-2073	47-2073
	Drywall installers, ceiling tile installers, and tapers	6330	47-2080	
	Drywall and ceiling tile installers			47-2081
	Tapers			47-2082
	Electricians	6355	47-2111	47-2111
	Glaziers	6360	47-2121	47-2121
	Insulation workers	6400	47-2130	
	Insulation workers, floor, ceiling, and wall			47-2131
	Insulation workers, mechanical			47-2132
	Painters, construction and maintenance	6420	47-2141	47-2141
	Paperhangers	6430	47-2142	47-2142
	Pipelayers, plumbers, pipefitters, and steamfitters	6440	47-2150	
	Pipelayers			47-2151
	Plumbers, pipefitters, and steamfitters			47-2152
	Plasterers and stucco masons	6460	47-2161	47-2161
	Reinforcing iron and rebar workers	6500	47-2171	47-2171
	Roofers	6515	47-2181	47-2181
	Sheet metal workers	6520	47-2211	47-2211
	Structural iron and steel workers	6530	47-2221	47-2221
	Solar photovoltaic installers	6540	47-2231	47-2231
	Helpers, construction trades	6600	47-3010	
	Helpers--brickmasons, blockmasons, stonemasons, and tile and marble Setters			47-3011
	Helpers--carpenters			47-3012

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Helpers--electricians			47-3013
	Helpers--painters, paperhangers, plasterers, and stucco masons			47-3014
	Helpers--pipelayers, plumbers, pipefitters, and steamfitters			47-3015
	Helpers--roofers			47-3016
	Helpers, construction trades, all other			47-3019
	Construction and building inspectors	6660	47-4011	47-4011
	Elevator installers and repairers	6700	47-4021	47-4021
	Fence erectors	6710	47-4031	47-4031
	Hazardous materials removal workers	6720	47-4041	47-4041
	Highway maintenance workers	6730	47-4051	47-4051
	Rail-track laying and maintenance equipment operators	6740	47-4061	47-4061
	Septic tank servicers and sewer pipe cleaners	6750	47-4071	47-4071
	Miscellaneous construction and related workers	6765	47-4090	
	Segmental pavers			47-4091
	Construction and related workers, all other			47-4099
	Derrick, rotary drill, and service unit operators, oil, gas, and mining	6800	47-5010	
	Derrick operators, oil and gas			47-5011
	Rotary drill operators, oil and gas			47-5012
	Service unit operators, oil, gas, and mining			47-5013
	Earth drillers, except oil and gas	6820	47-5021	47-5021
	Explosives workers, ordnance handling experts, and blasters	6830	47-5031	47-5031
	Mining machine operators	6840	47-5040	
	Continuous mining machine operators			47-5041
	Mine cutting and channeling machine operators			47-5042
	Mining machine operators, all other			47-5049
	Roof bolters, mining	6910	47-5061	47-5061
	Roustabouts, oil and gas	6920	47-5071	47-5071

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Helpers--extraction workers	6930	47-5081	47-5081
	Other extraction workers	6940	47-50XX	
	Rock splitters, quarry			47-5051
	Extraction workers, all other			47-5099
	<i>Installation, Maintenance, and Repair Occupations:</i>	<i>7000-7630</i>	<i>49-0000</i>	
260	First-line supervisors of mechanics, installers, and repairers	7000	49-1011	49-1011
261	Electrical and electronic equipment mechanics, installers, and repairers			
	Computer, automated teller, and office machine repairers	7010	49-2011	49-2011
	Radio and telecommunications equipment installers and repairers	7020	49-2020	
	Radio, cellular, and tower equipment installers and repairs			49-2021
	Telecommunications equipment installers and repairers			49-2022
	Avionics technicians	7030	49-2091	49-2091
	Electric motor, power tool, and related repairers	7040	49-2092	49-2092
	Electrical and electronics installers and repairers, transportation equipment	7050	49-2093	49-2093
	Electrical and electronics repairers, industrial and utility equipment	7100	49-209X	
	Electrical and electronics repairers, commercial and industrial equipment			49-2094
	Electrical and electronics repairers, powerhouse, substation, and relay			49-2095
	Electronic equipment installers and repairers, motor vehicles	7110	49-2096	49-2096
	Electronic home entertainment equipment installers and repairers	7120	49-2097	49-2097
	Security and fire alarm systems installers	7130	49-2098	49-2098
262	Vehicle and mobile equipment mechanics, installers, and repairers			
	Aircraft mechanics and service technicians	7140	49-3011	49-3011
	Automotive body and related repairers	7150	49-3021	49-3021
	Automotive glass installers and repairers	7160	49-3022	49-3022

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
263	Automotive service technicians and mechanics	7200	49-3023	49-3023
	Bus and truck mechanics and diesel engine specialists	7210	49-3031	49-3031
	Heavy vehicle and mobile equipment service technicians and mechanics	7220	49-3040	
	Farm equipment mechanics and service technicians			49-3041
	Mobile heavy equipment mechanics, except engines			49-3042
	Rail car repairers			49-3043
	Small engine mechanics	7240	49-3050	
	Motorboat mechanics and service technicians			49-3051
	Motorcycle mechanics			49-3052
	Outdoor power equipment and other small engine mechanics			49-3053
	Miscellaneous vehicle and mobile equipment mechanics, installers, and repairers	7260	49-3090	
	Bicycle repairers			49-3091
	Recreational vehicle service technicians			49-3092
	Tire repairers and changers			49-3093
	Other installation, maintenance, and repair workers			
	Control and valve installers and repairers	7300	49-9010	
	Mechanical door repairers			49-9011
	Control and valve installers and repairers			49-9012
	Heating, air conditioning, and refrigeration mechanics and installers	7315	49-9021	49-9021
	Home appliance repairers	7320	49-9031	49-9031
Industrial and refractory machinery mechanics	7330	49-904X		
Industrial machinery mechanics			49-9041	
Refractory materials repairers			49-9045	
Maintenance and repair workers, general	7340	49-9071	49-9071	
Maintenance workers, machinery	7350	49-9043	49-9043	
Millwrights	7360	49-9044	49-9044	

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Electrical power-line installers and repairers	7410	49-9051	49-9051
	Telecommunications line installers and repairers	7420	49-9052	49-9052
	Precision instrument and equipment repairers	7430	49-9060	
	Camera and photographic equipment repairers			49-9061
	Medical equipment repairers			49-9062
	Musical instrument repairers and tuners			49-9063
	Watch repairers			49-9064
	Precision instrument and equipment repairers, all other			49-9069
	Wind turbine service technicians	7440	49-9081	49-9081
	Coin, vending, and amusement machine servicers and repairers	7510	49-9091	49-9091
	Commercial divers	7520	49-9092	49-9092
	Locksmiths and safe repairers	7540	49-9094	49-9094
	Manufactured building and mobile home installers	7550	49-9095	49-9095
	Riggers	7560	49-9096	49-9096
	Signal and track switch repairers	7600	49-9097	49-9097
	Helpers--installation, maintenance, and repair workers	7610	49-9098	49-9098
	Other installation, maintenance, and repair workers	7630	49-909X	
	Fabric menders, except garment			49-9093
	Installation, maintenance, and repair workers, all other			49-9099
	Production, Transportation, and Material Moving Occupations:	7700-9750	51-0000 - 53-0000	
	<i>Production Occupations:</i>	7700-8965	51-0000	
264	First-line supervisors of production and operating workers	7700	51-1011	51-1011
265	Assemblers and fabricators, except electrical			
	Aircraft structure, surfaces, rigging, and systems assemblers	7710	51-2011	51-2011
	Engine and other machine assemblers	7730	51-2031	51-2031
	Structural metal fabricators and fitters	7740	51-2041	51-2041
	Miscellaneous assemblers and fabricators	7750	51-2090	
	Fiberglass laminators and fabricators			51-2091

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Team assemblers			51-2092
	Timing device assemblers and adjusters			51-2093
	Assemblers and fabricators, all other			51-2099
266	Electrical, electronics, and electromechanical assemblers	7720	51-2020	
	Coil winders, tapers, and finishers			51-2021
	Electrical and electronic equipment assemblers			51-2022
	Electromechanical equipment assemblers			51-2023
267	Bakers	7800	51-3011	51-3011
268	Butchers and other meat, poultry, and fish processing workers	7810	51-3020	
	Butchers and meat cutters			51-3021
	Meat, poultry, and fish cutters and trimmers			51-3022
	Slaughterers and meat packers			51-3023
269	Food batchmakers	7840	51-3092	51-3092
270	Food processing workers, all other			
	Food and tobacco roasting, baking, and drying machine operators and tenders	7830	51-3091	51-3091
	Food cooking machine operators and tenders	7850	51-3093	51-3093
	Food processing workers, all other	7855	51-3099	51-3099
271	Computer control programmers and operators	7900	51-4010	
	Computer-controlled machine tool operators, metal and plastic			51-4011
	Computer numerically controlled machine tool programmers, metal and plastic			51-4012
272	Forging machine and machine tool cutting setters, operators, and tenders, metal and plastic			
	Extruding and drawing machine setters, operators, and tenders, metal and plastic	7920	51-4021	51-4021
	Forging machine setters, operators, and tenders, metal and plastic	7930	51-4022	51-4022
	Rolling machine setters, operators, and tenders, metal and plastic	7940	51-4023	51-4023

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	7950	51-4031	51-4031
	Drilling and boring machine tool setters, operators, and tenders, metal and plastic	7960	51-4032	51-4032
	Grinding, lapping, polishing, and buffing machine tool setters, operators, and tenders, metal and plastic	8000	51-4033	51-4033
	Lathe and turning machine tool setters, operators, and tenders, metal and plastic	8010	51-4034	51-4034
	Milling and planing machine setters, operators, and tenders, metal and plastic	8020	51-4035	51-4035
273	Machinists	8030	51-4041	51-4041
274	Model makers, patternmakers, and molding machine setters, metal and plastic			
	Model makers and patternmakers, metal and plastic	8060	51-4060	
	Model makers, metal and plastic			51-4061
	Patternmakers, metal and plastic			51-4062
	Molders and molding machine setters, operators, and tenders, metal and plastic	8100	51-4070	
	Foundry mold and coremakers			51-4071
	Molding, coremaking, and casting machine setters, operators, and tenders, metal and plastic			51-4072
275	Miscellaneous metal workers and plastic workers			
	Multiple machine tool setters, operators, and tenders, metal and plastic	8120	51-4081	51-4081
	Metal furnace operators, tenders, pourers, and casters	8040	51-4050	
	Metal-refining furnace operators and tenders			51-4051
	Pourers and casters, metal			51-4052
	Tool and die makers	8130	51-4111	51-4111
	Heat treating equipment setters, operators, and tenders, metal and plastic	8150	51-4191	51-4191

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Layout workers, metal and plastic	8160	51-4192	51-4192
	Plating and coating machine setters, operators, and tenders, metal and plastic	8200	51-4193	51-4193
	Tool grinders, filers, and sharpeners	8210	51-4194	51-4194
	Metal workers and plastic workers, all other	8220	51-4199	51-4199
276	Welding, soldering, and brazing workers	8140	51-4120	
	Welders, cutters, solderers, and brazers			51-4121
	Welding, soldering, and brazing machine setters, operators, and tenders			51-4122
277	Prepress technicians and workers	8250	51-5111	51-5111
278	Printing press operators	8255	51-5112	51-5112
279	Print binding and finishing workers	8256	51-5113	51-5113
280	Laundry and dry-cleaning workers	8300	51-6011	51-6011
281	Pressers, textile, garment, and related materials	8310	51-6021	51-6021
282	Sewing machine operators	8320	51-6031	51-6031
283	Tailors, and shoe and leather workers			
	Shoe and leather workers and repairers	8330	51-6041	51-6041
	Shoe machine operators and tenders	8340	51-6042	51-6042
	Tailors, dressmakers, and sewers	8350	51-6050	
	Sewers, hand			51-6051
	Tailors, dressmakers, and custom sewers			51-6052
284	Textile machine setters, operators, and tenders			
	Textile bleaching and dyeing machine operators and tenders	8360	51-6061	51-6061
	Textile cutting machine setters, operators, and tenders	8400	51-6062	51-6062
	Textile knitting and weaving machine setters, operators, and tenders	8410	51-6063	51-6063
	Textile winding, twisting, and drawing out machine setters, operators, and tenders	8420	51-6064	51-6064
285	Miscellaneous textile, apparel, and furnishings workers			



Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Extruding and forming machine setters, operators, and tenders, synthetic and glass fibers	8430	51-6091	51-6091
	Fabric and apparel patternmakers	8440	51-6092	51-6092
	Textile, apparel, and furnishings workers, all other	8460	51-6099	51-6099
286	Upholsterers	8450	51-6093	51-6093
287	Woodworkers			
	Cabinetmakers and bench carpenters	8500	51-7011	51-7011
	Furniture finishers	8510	51-7021	51-7021
	Model makers and patternmakers, wood	8520	51-7030	
	Model makers, wood			51-7031
	Patternmakers, wood			51-7032
	Sawing machine setters, operators, and tenders, wood	8530	51-7041	51-7041
	Woodworking machine setters, operators, and tenders, except sawing	8540	51-7042	51-7042
	Woodworkers, all other	8550	51-7099	51-7099
288	Plant and system operators			
	Power plant operators, distributors, and dispatchers	8600	51-8010	
	Nuclear power reactor operators			51-8011
	Power distributors and dispatchers			51-8012
	Power plant operators			51-8013
	Stationary engineers and boiler operators	8610	51-8021	51-8021
	Water and wastewater treatment plant and system operators	8620	51-8031	51-8031
	Miscellaneous plant and system operators	8630	51-8090	
	Chemical plant and system operators			51-8091
	Gas plant operators			51-8092
	Petroleum pump system operators, refinery operators, and gaugers			51-8093
	Plant and system operators, all other			51-8099

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
289	Chemical processing machine setters, operators, and tenders	8640	51-9010	
	Chemical equipment operators and tenders			51-9011
	Separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders			51-9012
290	Crushing, grinding, polishing, mixing, and blending workers	8650	51-9020	
	Crushing, grinding, and polishing machine setters, operators, and tenders			51-9021
	Grinding and polishing workers, hand			51-9022
	Mixing and blending machine setters, operators, and tenders			51-9023
291	Cutting workers	8710	51-9030	
	Cutters and trimmers, hand			51-9031
	Cutting and slicing machine setters, operators, and tenders			51-9032
	Extruding, forming, pressing, and compacting machine setters, operators, and tenders	8720	51-9041	51-9041
292				
293	Inspectors, testers, sorters, samplers, and weighers	8740	51-9061	51-9061
294	Jewelers and precious stone and metal workers	8750	51-9071	51-9071
295	Medical, dental, and ophthalmic laboratory technicians	8760	51-9080	
	Dental laboratory technicians			51-9081
	Medical appliance technicians			51-9082
	Ophthalmic laboratory technicians			51-9083
296	Packaging and filling machine operators and tenders	8800	51-9111	51-9111
297	Painting workers	8810	51-9120	
	Coating, painting, and spraying machine setters, operators, and tenders			51-9121
	Painters, transportation equipment			51-9122
	Painting, coating, and decorating workers			51-9123
298	Photographic process workers and processing machine operators	8830	51-9151	51-9151
299	Miscellaneous production workers			
	Furnace, kiln, oven, drier, and kettle operators and tenders	8730	51-9051	51-9051

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Semiconductor processors	8840	51-9141	51-9141
	Adhesive bonding machine operators and tenders	8850	51-9191	51-9191
	Cleaning, washing, and metal pickling equipment operators and tenders	8860	51-9192	51-9192
	Cooling and freezing equipment operators and tenders	8900	51-9193	51-9193
	Etchers and engravers	8910	51-9194	51-9194
	Molders, shapers, and casters, except metal and plastic	8920	51-9195	51-9195
	Paper goods machine setters, operators, and tenders	8930	51-9196	51-9196
	Tire builders	8940	51-9197	51-9197
	Helpers--production workers	8950	51-9198	51-9198
	Production workers, all other	8965	51-9199	51-9199
	<i>Transportation and Material Moving Occupations:</i>	<i>9000-9750</i>	<i>53-0000</i>	
	Transportation Occupations:	9000-9420	53-1000 - 53-6000	
300	Supervisors of transportation and material moving workers	9000	53-1000	
	Aircraft cargo handling supervisors			53-1011
	First-line supervisors of helpers, laborers, and material movers, hand			53-1021
	First-line supervisors of transportation and material-moving machine and vehicle operators			53-1031
301	Aircraft pilots and flight engineers	9030	53-2010	
	Airline pilots, copilots, and flight engineers			53-2011
	Commercial pilots			53-2012
302	Air traffic controllers and airfield operations specialists	9040	53-2020	
	Air traffic controllers			53-2021
	Airfield operations specialists			53-2022
303	Flight attendants	9050	53-2031	53-2031
304	Motor vehicle operators, all other			
	Ambulance drivers and attendants, except emergency medical technicians	9110	53-3011	53-3011

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Motor vehicle operators, all other	9150	53-3099	53-3099
305	Bus drivers	9120	53-3020	
	Bus drivers, transit and intercity			53-3021
	Bus drivers, school or special client			53-3022
306	Driver/sales workers and truck drivers	9130	53-3030	
	Driver/sales workers			53-3031
	Heavy and tractor-trailer truck drivers			53-3032
	Light truck or delivery services drivers			53-3033
307	Taxi drivers and chauffeurs	9140	53-3041	53-3041
308	Rail and water transportation workers			
	Locomotive engineers and operators	9200	53-4010	
	Locomotive engineers			53-4011
	Locomotive firers			53-4012
	Rail yard engineers, dinkey operators, and hostlers			53-4013
	Railroad brake, signal, and switch operators	9230	53-4021	53-4021
	Railroad conductors and yardmasters	9240	53-4031	53-4031
	Subway, streetcar, and other rail transportation workers	9260	53-40XX	
	Subway and streetcar operators			53-4041
	Rail transportation workers, all other			53-4099
	Sailors and marine oilers	9300	53-5011	53-5011
	Ship and boat captains and operators	9310	53-5020	
	Captains, mates, and pilots of water vessels			53-5021
	Motorboat operators			53-5022
	Ship engineers	9330	53-5031	53-5031
309	Miscellaneous transportation workers			
	Bridge and lock tenders	9340	53-6011	53-6011
	Parking lot attendants	9350	53-6021	53-6021
	Automotive and watercraft service attendants	9360	53-6031	53-6031

Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
	Transportation inspectors	9410	53-6051	53-6051
	Transportation attendants, except flight attendants	9415	53-6061	53-6061
	Other transportation workers	9420	53-60XX	
	Traffic technicians			53-6041
	Transportation workers, all other			53-6099
	Material Moving Occupations:	9500-9750	53-7000	
310	Industrial truck and tractor operators	9600	53-7051	53-7051
311	Cleaners of vehicles and equipment	9610	53-7061	53-7061
312	Laborers and freight, stock, and material movers, hand	9620	53-7062	53-7062
313	Machine feeders and offbearers	9630	53-7063	53-7063
314	Packers and packagers, hand	9640	53-7064	53-7064
315	Refuse and recyclable material collectors	9720	53-7081	53-7081
316	Miscellaneous material moving workers			
	Crane and tower operators	9510	53-7021	53-7021
	Dredge, excavating, and loading machine operators	9520	53-7030	
	Dredge operators			53-7031
	Excavating and loading machine and dragline operators			53-7032
	Loading machine operators, underground mining			53-7033
	Hoist and winch operators	9560	53-7041	53-7041
	Conveyor operators and tenders	9500	53-7011	53-7011
	Pumping station operators	9650	53-7070	
	Gas compressor and gas pumping station operators			53-7071
	Pump operators			53-7072
	Wellhead pumpers			53-7073
	Mine shuttle car operators	9730	53-7111	53-7111
	Tank car, truck, and ship loaders	9740	53-7121	53-7121
	Material moving workers, all other	9750	53-7199	53-7199

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Occupation	Occupation 2010 Description	2010 Census Code	2010 SOC Code	2010 SOC Detailed Occupation
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Notes: Occupations were aggregated if they did not have a minimum of 100 unweighted sample cases. Occupations were aggregated if O\*NET Online did not collect data for the occupation.

**Table A3: Census Occupation Codes by Proportion Female, O\*NET Online Occupational Characteristics, and Explained and Unexplained Gender Wage Gap Residuals**

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Chief executives and legislators	1	0.72	0.02	0.27	80	80	16	99	90	0.0103	0.2470	0.0291	0.2783
General and operations managers	2	0.83	0.01	0.31	81	61	16	95	86	0.0060	0.2099	0.0035	0.2139
Advertising and promotions managers	3	0.81	0.07	0.56	85	59	2	79	84	0.0724	0.1961	0.1090	0.1623
Marketing and sales managers	4	0.76	0.01	0.45	72	77	5	82	87	0.0494	0.2160	0.0431	0.2266
Public relations and fundraising managers	5	0.96	0.04	0.66	86	60	0	85	95	0.0486	0.0406	0.0387	0.0492
Administrative services managers	6	0.89	0.04	0.42	68	37	11	77	84	-0.0230	0.1622	-0.0196	0.1566
Computer and information systems managers	7	0.89	0.01	0.26	59	66	9	90	77	-0.0007	0.1568	0.0010	0.1601
Financial managers	8	0.66	0.01	0.53	78	69	3	83	78	0.1808	0.2518	0.1488	0.2907
Human resources managers	9	0.87	0.02	0.62	71	55	1	91	78	-0.0326	0.1682	-0.0171	0.1647
Industrial production managers	10	0.92	0.03	0.20	89	62	37	88	82	-0.0489	0.1413	-0.0776	0.1699
Purchasing managers	11	0.86	0.02	0.50	81	58	7	73	83	0.0128	0.1570	0.0227	0.1475
Transportation, storage, and distribution managers	12	0.99	0.03	0.19	85	60	19	78	79	-0.0413	0.0848	-0.0557	0.0987
Farmers, ranchers, and other agricultural managers	13	0.78	0.04	0.14	62	53	43	89	74	-0.0982	0.3181	-0.0060	0.2433
Construction managers	14	0.91	0.02	0.09	75	67	30	73	80	-0.0573	0.1649	-0.0239	0.1517
Education administrators	15	0.86	0.01	0.63	73	55	1	88	87	0.0369	0.1374	0.0434	0.1300
Architectural and engineering managers	16	1.01	0.04	0.09	81	57	17	87	76	-0.0426	0.0519	-0.0041	0.0168

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Food service managers	17	0.85	0.01	0.47	74	61	19	80	83	0.0421	0.1360	0.0481	0.1256
Gaming managers	18	0.94	0.08	0.39	79	68	2	89	86	-0.0033	0.1051	0.0730	0.0211
Lodging managers	19	0.85	0.03	0.52	84	63	3	90	90	0.0342	0.1401	0.0364	0.1345
Medical and health services managers	20	0.81	0.01	0.72	88	60	3	77	80	0.0700	0.1519	0.0592	0.1658
Natural sciences managers	21	0.80	0.07	0.55	77	57	33	93	77	0.0483	0.2397	0.0697	0.2144
Property, real estate, and community association managers	22	0.80	0.02	0.58	74	53	10	80	77	0.0921	0.1396	0.0565	0.2064
Social and community service managers	23	0.82	0.02	0.71	73	30	4	84	85	0.0254	0.1689	0.0266	0.1681
Miscellaneous managers	24	0.82	0.01	0.38	74	62	19	83	81	-0.0040	0.1815	0.0077	0.1986
Agents and business managers of artists, performers, and athletes	25	0.82	0.09	0.51	79	85	0	97	85	-0.0348	0.0941	-0.0016	0.1097
Buyers and purchasing agents	26	0.97	0.02	0.53	70	66	11	91	87	-0.0038	0.0491	-0.0018	0.0483
Claims adjusters, appraisers, examiners, and investigators	27	0.86	0.02	0.62	84	62	12	76	78	0.0380	0.1199	0.0313	0.1295
Compliance officers	28	0.85	0.02	0.54	67	42	21	75	78	0.0300	0.1079	0.0299	0.1085
Cost estimators	29	0.80	0.03	0.14	80	75	14	78	75	-0.0019	0.2005	-0.0300	0.2243
Human resources workers	30	0.90	0.02	0.74	74	44	2	85	79	0.0186	0.1121	0.0225	0.1089
Compensation, benefits, and job analysis specialists	31	0.79	0.05	0.80	66	49	0	86	70	0.0531	0.2303	0.0678	0.2159
Training and development specialists	32	0.84	0.03	0.56	68	50	2	78	80	-0.0145	0.1616	-0.0027	0.1568
Logisticians	33	0.91	0.03	0.34	86	60	19	74	83	-0.0224	0.0895	0.0006	0.0713
Management analysts	34	0.85	0.01	0.44	71	73	1	81	75	0.0369	0.1254	0.0234	0.1516



Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Meeting, convention, and event planners	35	1.02	0.04	0.78	89	73	2	91	91	-0.0701	0.0882	-0.0706	0.0799
Fundraisers	36	0.91	0.04	0.74	68	61	0	87	88	0.0218	0.1106	0.0153	0.1182
Market research analysts and marketing specialists	37	0.78	0.02	0.57	76	58	1	85	75	0.0445	0.1820	0.0408	0.2041
Business operations specialists, all other	38	0.79	0.02	0.54	72	57	9	78	77	0.0483	0.2158	0.0590	0.2086
Accountants and auditors	39	0.77	0.01	0.63	80	61	3	78	79	0.0978	0.1738	0.0901	0.1858
Appraisers and assessors of real estate	40	0.74	0.03	0.43	71	56	6	85	65	0.0746	0.1996	0.0598	0.2355
Budget analysts	41	0.91	0.03	0.61	78	57	3	77	73	0.0042	0.1012	0.0155	0.0935
Credit analysts	42	0.96	0.05	0.56	74	44	3	68	70	0.0759	0.0862	0.1150	0.0479
Financial analysts	43	0.80	0.03	0.42	77	76	0	77	74	0.1512	0.1701	0.0847	0.2357
Personal financial advisors	44	0.68	0.02	0.34	73	78	0	72	79	0.1137	0.2688	0.1372	0.2826
Insurance underwriters	45	0.82	0.04	0.63	89	58	1	80	76	0.0944	0.1500	0.0554	0.1880
Financial examiners	46	0.80	0.08	0.46	72	51	0	85	74	0.1171	0.2400	0.2528	0.1043
Credit counselors and loan officers	47	0.66	0.02	0.55	74	71	0	86	84	0.1129	0.2773	0.1151	0.2774
Tax examiners and collectors, and revenue agents	48	0.78	0.06	0.66	67	45	4	75	85	0.1057	0.1107	0.0718	0.1446
Tax preparers	49	0.77	0.06	0.62	64	61	0	79	68	0.0942	0.1354	0.1985	0.0906
Financial specialists, all other	50	0.66	0.07	0.57	64	67	5	81	71	0.2052	0.2719	0.1721	0.2947
Computer and information scientists and analysts	51	0.82	0.01	0.36	73	55	22	74	72	0.0126	0.1862	-0.0013	0.2043
Computer programmers	52	0.90	0.02	0.21	76	64	0	61	63	-0.0255	0.1536	-0.0470	0.1838

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Software developers, applications and systems software	53	0.84	0.01	0.18	72	70	2	75	65	-0.0009	0.1995	-0.0050	0.2081
Web developers	54	0.87	0.03	0.33	75	71	0	82	62	-0.0131	0.1590	-0.0312	0.1668
Computer support specialists	55	0.90	0.01	0.24	68	44	6	84	76	-0.0079	0.1292	-0.0119	0.1331
Database administrators	56	0.74	0.02	0.35	60	58	4	63	69	0.0277	0.2456	0.0383	0.2351
Network and computer systems administrators	57	0.91	0.02	0.18	70	53	4	78	59	-0.0357	0.1539	-0.0369	0.1569
Computer network architects	58	0.97	0.02	0.08	59	67	4	77	61	-0.0699	0.0977	-0.0957	0.1223
Computer occupations, all other	59	0.94	0.02	0.22	68	62	2	78	69	-0.0353	0.1284	-0.0432	0.1373
Actuaries	60	0.79	0.06	0.31	66	65	0	70	62	0.0414	0.1749	0.0083	0.2089
Operations research analysts	61	0.84	0.03	0.50	58	56	0	92	64	0.0364	0.1347	0.0208	0.1508
Miscellaneous mathematical science occupations	62	0.93	0.05	0.45	54	55	0	81	54	0.0294	0.0484	-0.0050	0.0837
Architects, except naval	63	0.80	0.02	0.26	76	81	9	69	77	0.0692	0.1336	0.0859	0.1360
Surveyors, cartographers, and photogrammetrists	64	0.91	0.09	0.19	72	52	19	73	73	-0.0490	0.1502	0.1277	-0.0184
Aerospace engineers	65	0.94	0.03	0.12	64	46	21	81	74	0.0222	0.0974	0.0565	0.0631
Biomedical, agricultural, and chemical engineers	66	1.00	0.05	0.16	62	62	45	78	68	-0.0149	0.0307	-0.0735	0.0889
Civil engineers	67	0.91	0.03	0.13	66	63	20	74	69	0.0064	0.0969	-0.0298	0.1295
Computer hardware engineers	68	0.99	0.08	0.13	55	68	17	72	59	-0.0340	0.1308	0.0081	0.0924
Electrical and electronics engineers	69	0.91	0.02	0.09	64	54	33	80	72	0.0042	0.1289	0.0195	0.1136
Environmental engineers	70	0.87	0.04	0.28	69	66	41	80	81	-0.0212	0.1137	-0.0616	0.1535

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Industrial engineers, including health and safety	71	0.98	0.02	0.21	64	40	37	82	75	-0.0279	0.0951	-0.0164	0.0837
Mechanical engineers	72	0.99	0.03	0.08	71	64	29	89	71	-0.0597	0.0862	-0.0686	0.0979
Mining and petroleum engineers	73	1.00	0.22	0.13	69	59	23	89	69	-0.1763	0.1847	-0.0916	0.0633
Miscellaneous engineers	74	0.95	0.02	0.13	65	56	34	77	69	-0.0301	0.0945	-0.0306	0.1004
Drafters	75	0.92	0.02	0.17	73	51	12	74	64	-0.0246	0.1115	-0.0290	0.1155
Engineering technicians, except drafters	76	0.82	0.02	0.17	68	46	41	77	71	0.0122	0.1932	0.0068	0.2001
Surveying and mapping technicians	77	0.93	0.07	0.07	68	50	11	78	61	0.0306	0.0338	-0.0386	0.0726
Agricultural and food scientists	78	0.90	0.08	0.36	70	62	33	79	73	-0.0252	0.0872	0.0500	0.0117
Biological scientists	79	0.98	0.03	0.47	60	71	20	95	72	0.0264	0.0582	0.0137	0.0700
Conservation scientists and foresters	80	0.94	0.04	0.22	59	48	17	81	81	-0.0533	0.1546	-0.0675	0.1787
Medical and life scientists, all other	81	0.88	0.03	0.51	72	67	25	85	75	0.0300	0.0866	0.0283	0.0879
Physical scientists	82	0.86	0.02	0.38	65	51	43	82	70	0.0336	0.1191	0.0245	0.1266
Economists	83	0.85	0.04	0.32	70	74	0	89	55	0.0506	0.1465	0.1193	0.0779
Psychologists	84	0.86	0.04	0.73	73	48	2	90	82	0.0681	0.0610	0.0586	0.0622
Urban and regional planners	85	0.94	0.05	0.41	71	58	2	74	87	0.0431	-0.0063	0.0493	-0.0074
Miscellaneous social scientists	86	0.86	0.08	0.49	64	62	2	79	76	-0.0625	0.1406	-0.0207	0.0890
Science technicians and research assistants	87	0.91	0.02	0.40	68	46	45	72	67	-0.0048	0.1195	-0.0351	0.1508
Counselors	88	1.01	0.02	0.72	74	42	2	81	85	-0.0473	0.0523	-0.0501	0.0559
Social workers	89	1.01	0.02	0.82	83	39	3	84	90	-0.0107	0.0364	-0.0122	0.0393

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Probation officers and correctional treatment specialists	90	0.95	0.04	0.52	74	39	14	75	81	0.0182	0.0477	0.0049	0.0609
Social and human service assistants	91	0.95	0.03	0.78	83	36	6	61	81	0.0105	0.0959	0.0212	0.1019
Miscellaneous community and social service specialists, including health educators and community health workers	92	0.95	0.04	0.69	58	37	13	83	88	0.0062	0.0809	-0.0188	0.1062
Clergy and religious workers	93	1.03	0.02	0.24	65	33	0	89	88	-0.0340	0.0295	-0.0205	0.0183
Lawyers and judges	94	0.87	0.01	0.45	88	63	0	84	81	0.0543	0.0727	0.0456	0.0981
Judicial law clerks	95	0.94	0.19	0.59	75	46	0	63	56	-0.1153	0.1013	0.0653	-0.0813
Paralegals and legal assistants	96	0.92	0.03	0.86	79	36	0	72	78	-0.0030	0.0491	0.0077	0.0340
Miscellaneous legal support workers	97	0.78	0.04	0.72	84	57	1	90	71	0.1590	0.1081	0.0753	0.1922
Postsecondary teachers	98	0.89	0.01	0.49	67	55	12	90	74	0.0256	0.1105	0.0132	0.1227
Preschool and kindergarten teachers	99	0.90	0.07	0.98	58	33	2	80	83	-0.0059	0.1657	0.0967	0.0729
Elementary and middle school teachers	100	0.91	0.01	0.77	70	43	2	76	84	0.0061	0.0915	0.0090	0.0889
Secondary school teachers	101	0.94	0.01	0.56	69	52	8	84	80	-0.0158	0.0831	-0.0136	0.0820
Special education teachers	102	0.98	0.03	0.85	76	48	2	83	86	-0.0068	0.0951	0.0017	0.0859
Other teachers and instructors	103	0.84	0.02	0.53	59	38	2	78	74	0.0250	0.1748	-0.0083	0.2018
Archivists, curators, and museum technicians	104	0.95	0.07	0.60	55	41	16	87	73	0.0223	0.0434	-0.0216	0.0832
Librarians	105	0.93	0.03	0.78	62	41	0	83	81	0.0337	0.0705	0.0448	0.0594

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Library technicians	106	0.74	0.07	0.75	62	36	8	81	73	0.1954	0.0154	0.2393	-0.0285
Teacher assistants	107	0.78	0.02	0.87	35	22	0	63	72	-0.0081	0.2501	0.0463	0.1953
Other education, training, and library workers	108	0.96	0.05	0.71	66	48	4	78	86	-0.0477	0.1242	-0.0485	0.1457
Artists and related workers	109	0.85	0.04	0.32	86	61	10	84	73	0.0137	0.1835	-0.0275	0.1799
Designers	110	0.82	0.01	0.45	81	63	4	77	75	0.0195	0.1960	0.0069	0.2019
Entertainers and performers	111	1.03	0.02	0.32	70	80	10	80	82	-0.0204	0.0375	-0.0340	0.0335
Announcers	112	1.03	0.07	0.28	89	79	5	81	84	-0.0530	0.0001	-0.1077	0.0949
News analysts, reporters and correspondents	113	0.92	0.05	0.43	99	74	5	85	77	0.0562	0.0272	0.0254	0.0474
Public relations specialists	114	0.90	0.05	0.65	85	67	3	76	84	0.0601	0.1058	0.0326	0.1344
Editors	115	0.99	0.03	0.49	89	57	0	79	79	-0.0179	0.0570	-0.0087	0.0400
Technical writers	116	1.01	0.04	0.57	81	51	1	74	72	-0.0295	0.0668	-0.0113	0.0454
Writers and authors	117	0.93	0.03	0.59	73	74	1	89	63	0.0286	0.1045	-0.0213	0.1354
Miscellaneous media and communication workers	118	0.86	0.08	0.62	49	53	4	73	74	-0.0217	0.1332	-0.0531	0.1621
Media and communication equipment workers	119	0.93	0.12	0.06	71	45	26	77	68	-0.0687	0.1904	-0.1172	0.1807
Photographers	120	0.73	0.03	0.30	75	91	11	77	71	0.1033	0.1347	0.0897	0.1557
Television, video, and motion picture camera operators and editors	121	0.90	0.07	0.14	87	59	11	80	73	0.0151	0.0407	-0.0112	0.0904
Chiropractors	122	0.93	0.14	0.29	65	55	9	99	78	0.0552	0.1649	0.0596	0.0602
Dentists	123	0.84	0.07	0.42	69	71	38	93	90	0.0661	0.1335	0.0018	0.1628
Dietitians and nutritionists	124	1.08	0.11	0.90	73	44	14	87	86	-0.0636	0.0876	-0.1134	0.1339

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Optometrists	125	0.94	0.06	0.54	71	64	2	83	83	0.0795	-0.0373	0.0182	0.0453
Pharmacists	126	0.96	0.01	0.59	84	71	13	87	86	0.0163	0.0582	0.0223	0.0580
Physicians and surgeons	127	0.74	0.02	0.40	78	61	15	92	85	0.1240	0.1813	0.0756	0.2113
Physician assistants	128	0.86	0.03	0.65	70	61	20	79	89	0.0330	0.1301	0.0248	0.1397
Therapists	129	0.90	0.01	0.74	76	44	13	83	85	-0.0001	0.1145	0.0024	0.1091
Veterinarians	130	0.84	0.04	0.71	73	49	33	88	88	0.0141	0.1689	0.0178	0.1721
Registered nurses	131	0.91	0.01	0.87	75	57	17	85	85	0.0103	0.0844	0.0124	0.0819
Nurse anesthetists	132	0.91	0.04	0.57	76	74	51	93	86	0.0745	-0.0100	-0.0354	0.1134
Nurse practitioners and nurse midwives	133	0.99	0.04	0.89	73	51	18	87	82	-0.0474	0.0821	-0.0673	0.1105
Health diagnosing and treating practitioners, all other	134	0.89	0.06	0.75	58	48	10	88	82	-0.0956	0.3093	-0.0214	0.2373
Clinical laboratory technologists and technicians	135	0.88	0.02	0.71	83	38	74	78	74	0.0435	0.1178	0.0444	0.1172
Dental hygienists	136	0.93	0.14	0.94	77	57	44	73	85	0.0275	0.1201	0.0099	0.1298
Diagnostic related technologists and technicians	137	0.89	0.02	0.66	72	59	33	76	85	0.0104	0.1145	0.0105	0.1100
Emergency medical technicians and paramedics	138	0.83	0.02	0.31	73	60	49	83	89	0.0228	0.1707	0.0180	0.1756
Health practitioner support technologists and technicians	139	0.89	0.01	0.79	81	49	23	64	83	0.0142	0.1182	0.0056	0.1261
Licensed practical and licensed vocational nurses	140	0.90	0.02	0.87	81	35	9	82	88	0.0195	0.0668	0.0134	0.0722
Medical records and health information technicians	141	0.92	0.06	0.90	72	20	1	73	71	-0.0033	0.1170	0.0479	0.0673

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Opticians, dispensing	142	0.79	0.04	0.74	76	50	9	77	80	0.0745	0.1217	-0.0304	0.1967
Miscellaneous health technologists and technicians	143	0.75	0.03	0.65	71	47	42	73	85	0.0611	0.2389	0.0673	0.2325
Other healthcare practitioners and technical occupations	144	0.90	0.03	0.43	65	52	37	83	77	0.0425	0.0723	-0.0232	0.1331
Nursing, psychiatric, and home health aides	145	0.84	0.01	0.86	64	36	9	65	77	0.0678	0.1543	0.0630	0.1584
Occupational and physical therapy assistants and aides	146	0.95	0.03	0.72	61	51	8	74	85	-0.0506	0.0795	-0.0235	0.0565
Massage therapists	147	1.04	0.08	0.74	48	61	0	91	68	0.0063	0.0308	0.0146	0.0126
Dental assistants	148	0.90	0.06	0.94	61	34	52	66	89	0.0608	0.1400	-0.0061	0.1823
Medical assistants	149	0.81	0.03	0.92	72	39	16	67	86	0.0802	0.1950	0.0443	0.2317
Pharmacy aides	150	0.90	0.06	0.77	62	41	11	71	85	0.1157	0.0781	0.0594	0.1384
Veterinary assistants and laboratory animal caretakers	151	0.83	0.11	0.79	56	30	58	72	86	0.0823	0.1041	-0.0171	0.2154
Phlebotomists	152	0.99	0.06	0.87	80	43	22	72	83	-0.0535	0.0799	0.0158	0.0102
Healthcare support workers, all other	153	0.83	0.03	0.71	79	33	31	72	73	0.0046	0.1798	0.0236	0.1602
First-line supervisors of protective service workers	154	0.86	0.02	0.17	75	60	51	85	89	0.0088	0.1269	0.0170	0.1191
Firefighters and fire inspectors	155	0.90	0.04	0.05	72	68	66	78	84	-0.0079	0.1104	-0.0076	0.1102
Bailiffs, correctional officers, and jailers	156	0.83	0.01	0.26	78	41	27	71	82	0.0508	0.1022	0.0569	0.0961
Detectives and criminal investigators	157	0.80	0.03	0.24	70	57	35	86	85	0.0115	0.1587	0.0004	0.1732

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Police officers	158	0.90	0.02	0.13	75	47	45	79	90	-0.0050	0.1236	-0.0064	0.1250
Private detectives and investigators	159	0.79	0.03	0.47	83	47	7	88	73	0.0505	0.1337	0.0452	0.1502
Security guards and gaming surveillance officers	160	0.92	0.02	0.23	50	61	13	73	77	0.0363	0.0768	0.0419	0.0715
Crossing guards	161	1.13	0.24	0.44	30	7	4	75	67	0.0327	-0.0547	-0.1944	0.1724
Transportation security screeners	162	0.94	0.04	0.34	60	37	41	46	79	0.0295	0.1065	0.0180	0.1180
Miscellaneous protective service workers	163	0.82	0.07	0.34	51	43	19	77	82	0.0498	0.2257	0.0172	0.2545
Chefs and head cooks	164	0.89	0.03	0.18	96	76	45	68	82	0.0077	0.1083	-0.0046	0.1254
First-line supervisors of food preparation and serving workers	165	0.85	0.02	0.55	79	59	33	79	87	0.0362	0.1395	0.0479	0.1248
Cooks	166	0.87	0.01	0.40	77	44	19	62	71	0.0067	0.1358	0.0242	0.1152
Food preparation workers	167	0.91	0.03	0.57	85	45	13	57	79	-0.0262	0.1260	-0.0071	0.1051
Bartenders	168	0.80	0.03	0.47	19	34	11	69	79	0.0397	0.1819	0.0436	0.1785
Combined food preparation and serving workers, including fast food	169	0.94	0.04	0.69	69	53	1	50	75	-0.0042	0.0480	0.0045	0.0409
Counter attendants, cafeteria, food concession, and coffee shop	170	0.78	0.09	0.62	54	10	1	70	81	0.1508	0.0913	0.1011	0.1061
Waiters and waitresses	171	0.75	0.01	0.63	47	50	8	47	78	0.0303	0.2440	0.0447	0.2310
Food servers, nonrestaurant	172	0.76	0.04	0.63	66	43	4	66	76	0.0509	0.2208	0.0551	0.2193
Miscellaneous food preparation and serving workers	173	0.79	0.06	0.47	39	36	6	61	78	0.0043	0.2017	0.1131	0.0958
Dishwashers	174	0.98	0.05	0.22	59	38	23	67	62	-0.0163	0.0679	-0.0031	0.0535



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Hosts and hostesses, restaurant, lounge, and coffee shop	175	0.68	0.09	0.81	33	33	5	65	81	0.2009	0.0883	0.1696	0.1329
First-line supervisors of housekeeping and janitorial workers	176	0.70	0.02	0.38	75	54	28	81	76	0.0768	0.2657	0.0719	0.2979
First-line supervisors of landscaping, lawn service, and groundskeeping workers	177	0.94	0.07	0.06	75	67	44	83	78	-0.0578	0.0039	-0.0993	0.1413
Janitors and building cleaners	178	0.75	0.01	0.25	65	44	54	78	60	0.0604	0.2225	0.0402	0.2431
Maids and housekeeping cleaners	179	0.77	0.02	0.84	72	32	31	75	65	0.0290	0.2178	0.0449	0.2032
Grounds maintenance workers	180	0.81	0.03	0.05	58	45	30	48	58	-0.0031	0.1414	0.0163	0.1385
First-line supervisors of gaming workers	181	0.90	0.04	0.40	51	52	2	71	88	0.0819	0.0787	0.0703	0.0903
First-line supervisors of personal service workers	182	0.86	0.05	0.60	77	51	6	82	89	0.0136	0.1744	0.0605	0.1447
Animal trainers	183	0.80	0.04	0.54	47	45	13	92	73	0.1282	0.0922	0.0425	0.1240
Nonfarm animal caretakers	184	0.96	0.07	0.71	67	45	25	81	69	-0.0209	0.0954	-0.0104	0.0931
Entertainment attendants	185	0.91	0.04	0.45	34	31	3	59	80	-0.0153	0.0987	-0.0024	0.0821
Morticians, embalmers and funeral attendants	186	1.01	0.06	0.28	87	41	51	75	85	-0.0187	0.1022	-0.0544	0.1119
Barbers	187	1.10	0.27	0.37	35	84	0	88	70	-0.1993	0.0403	-0.2286	0.0809
Hairdressers, hairstylists, and cosmetologists	188	0.89	0.07	0.88	60	64	32	94	83	0.0140	0.1199	-0.0232	0.1194
Miscellaneous personal appearance workers	189	1.16	0.10	0.85	34	50	22	70	66	-0.1180	0.0863	-0.1472	0.0881

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Baggage porters, bellhops, and concierges	190	0.88	0.07	0.19	56	37	1	80	84	0.0684	0.1510	-0.0088	0.2279
Tour guides and personal care and service workers, all other	191	1.03	0.07	0.53	58	50	3	81	83	-0.0636	0.0775	-0.0283	0.0557
Childcare workers	192	0.88	0.04	0.91	62	37	18	77	75	0.0564	0.1085	0.0583	0.0882
Personal care aides	193	0.86	0.02	0.81	65	44	10	71	71	0.0289	0.1340	0.0379	0.1293
Recreation and fitness workers	194	0.86	0.03	0.58	53	44	8	85	75	-0.0271	0.1369	-0.0070	0.1363
Residential advisors	195	0.96	0.07	0.63	70	46	2	82	85	-0.0188	0.0646	0.0047	0.0407
First-line supervisors of retail sales workers	196	0.80	0.01	0.44	81	47	10	81	87	0.0658	0.1600	0.0645	0.1692
First-line supervisors of non-retail sales workers	197	0.92	0.01	0.34	78	57	9	91	85	-0.0252	0.1399	-0.0102	0.1466
Cashiers	198	0.87	0.02	0.73	47	38	1	55	84	0.0170	0.1498	0.0199	0.1487
Counter and rental clerks	199	0.74	0.05	0.43	50	53	3	79	82	0.1243	0.1477	0.0756	0.2014
Parts salespersons	200	0.86	0.07	0.13	67	60	17	85	90	0.0302	0.1097	0.0618	0.0791
Retail salespersons	201	0.74	0.01	0.37	61	68	6	69	87	0.0885	0.1900	0.0771	0.2018
Advertising sales agents	202	0.90	0.04	0.53	87	87	0	91	91	0.0308	0.0722	-0.0006	0.1104
Insurance sales agents	203	0.75	0.02	0.56	88	71	2	75	85	0.1143	0.1864	0.0920	0.2350
Securities, commodities, and financial services sales agents	204	0.55	0.03	0.30	77	80	0	87	82	0.2815	0.2301	0.2666	0.2670
Travel agents	205	0.98	0.06	0.81	68	72	0	80	77	0.0746	0.0399	0.0280	0.0760
Sales representatives, services, all other	206	0.81	0.02	0.32	86	70	1	84	84	0.0483	0.1789	0.0646	0.1701
Sales representatives, wholesale and manufacturing	207	0.85	0.02	0.27	63	77	7	83	83	0.0059	0.1465	0.0153	0.1428

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Models, demonstrators, and product promoters	208	0.77	0.16	0.57	69	53	0	70	82	-0.1694	0.6339	0.2892	0.1241
Real estate brokers and sales agents	209	0.73	0.05	0.54	72	88	3	97	82	0.0808	0.1919	0.0849	0.2493
Telemarketers	210	0.87	0.08	0.60	54	67	3	61	74	0.0432	0.0681	-0.0022	0.1303
Door-to-door sales workers, news and street vendors, and related workers	211	0.86	0.07	0.37	51	55	4	95	78	-0.0569	0.1571	0.0902	0.0255
Sales engineers and sales and related workers, all other	212	0.69	0.03	0.38	68	56	14	74	88	0.0840	0.2327	0.0933	0.2325
First-line supervisors of office and administrative support workers	213	0.84	0.01	0.59	76	49	4	81	81	0.0078	0.1709	0.0061	0.1705
Communications equipment operators	214	0.82	0.05	0.66	58	40	0	71	86	0.0243	0.2173	0.0549	0.1864
Bill and account collectors	215	0.90	0.03	0.73	73	63	0	58	75	0.0313	0.1049	0.0236	0.1179
Billing and posting clerks	216	0.87	0.03	0.89	84	35	2	73	75	0.0805	0.1197	0.0312	0.1716
Bookkeeping, accounting, and auditing clerks	217	0.89	0.01	0.87	72	44	0	70	75	0.0419	0.1170	0.0180	0.1397
Payroll and timekeeping clerks	218	0.85	0.04	0.88	80	49	0	79	69	0.0120	0.1562	0.0222	0.1417
Procurement clerks	219	0.84	0.06	0.55	83	56	1	82	85	0.0549	0.1918	0.0551	0.1939
Tellers	220	0.88	0.02	0.88	63	58	6	68	86	-0.0076	0.1705	-0.0009	0.1633
Gaming cage workers and financial clerks, all other	221	0.60	0.03	0.57	57	51	4	54	85	0.2479	0.2294	0.2057	0.2726
Court, municipal, and license clerks	222	0.84	0.02	0.82	80	29	2	70	80	0.1151	0.0559	0.0498	0.1361

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Credit authorizers, checkers, and clerks	223	0.64	0.04	0.74	92	56	0	87	89	0.2491	0.2005	0.1442	0.2971
Customer service representatives	224	0.84	0.01	0.65	79	47	4	69	80	0.0568	0.1434	0.0464	0.1534
Eligibility interviewers, government programs	225	0.83	0.05	0.80	71	43	0	76	82	-0.0291	0.2116	0.0304	0.1521
File clerks	226	0.87	0.03	0.77	65	44	4	58	77	0.0141	0.1334	0.0364	0.1111
Hotel, motel, and resort desk clerks	227	0.94	0.04	0.62	55	41	0	78	90	0.0057	0.0458	0.0252	0.0261
Interviewers, except eligibility and loan	228	0.74	0.03	0.86	81	41	0	57	78	0.0350	0.2112	0.0712	0.1733
Library assistants, clerical	229	0.87	0.06	0.76	60	36	0	74	81	0.0234	0.0807	0.0581	0.0460
Loan interviewers and clerks	230	0.89	0.03	0.80	88	75	0	87	86	0.0541	0.1233	0.0412	0.1418
Correspondence clerks and order clerks	231	0.92	0.04	0.56	72	48	17	74	84	-0.0454	0.1387	-0.0090	0.0964
Human resources assistants, except payroll and timekeeping	232	0.90	0.09	0.81	82	48	1	78	88	0.0828	0.0306	0.0169	0.0845
Receptionists and information clerks	233	0.87	0.03	0.91	69	56	1	73	89	0.0096	0.1433	0.0116	0.1418
Reservation and transportation ticket agents and travel clerks	234	0.89	0.04	0.54	87	31	1	59	90	-0.0492	0.1710	-0.0207	0.1430
Information and record clerks, all other	235	0.85	0.04	0.74	83	52	0	72	85	0.0707	0.1519	0.0351	0.1885
Cargo and freight agents	236	0.79	0.08	0.35	85	62	10	88	80	0.0362	0.2221	0.0623	0.1964
Couriers and messengers	237	0.86	0.04	0.14	93	50	25	87	72	0.0719	0.1395	0.0357	0.1558
Dispatchers	238	0.86	0.02	0.55	70	36	4	79	88	-0.0035	0.1618	0.0138	0.1479

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Postal service clerks	239	0.97	0.02	0.56	67	29	14	51	80	0.0168	0.0484	0.0155	0.0497
Postal service mail carriers	240	0.95	0.01	0.39	78	31	8	51	61	0.0054	0.0677	0.0008	0.0723
Postal service mail sorters, processors, and processing machine operators	241	0.94	0.03	0.54	92	39	5	55	54	-0.0216	0.0668	-0.0049	0.0501
Production, planning, and expediting clerks	242	0.71	0.01	0.59	87	52	30	80	74	0.0430	0.2620	0.0546	0.2504
Shipping, receiving, and traffic clerks	243	0.88	0.01	0.31	80	41	11	70	75	-0.0076	0.1298	-0.0060	0.1284
Stock clerks and order fillers	244	0.90	0.01	0.36	68	39	20	66	72	-0.0016	0.1210	-0.0009	0.1204
Weighers, measurers, checkers, and samplers, recordkeeping	245	0.81	0.04	0.46	82	27	27	63	71	-0.0298	0.2533	-0.0052	0.2318
Secretaries and administrative assistants	246	0.88	0.01	0.95	75	36	4	82	81	0.0155	0.1412	0.0128	0.1417
Computer operators	247	0.73	0.03	0.42	79	60	26	78	66	0.0555	0.2173	0.0462	0.2322
Data entry keyers	248	0.85	0.02	0.76	80	47	0	85	64	-0.0088	0.1875	0.0100	0.1672
Word processors and typists	249	0.93	0.03	0.84	74	49	0	75	82	0.0227	0.1212	-0.0141	0.1569
Insurance claims and policy processing clerks	250	0.88	0.02	0.81	73	40	0	72	75	0.0514	0.1055	0.0374	0.1227
Mail clerks and mail machine operators, except postal service	251	0.88	0.05	0.50	78	49	4	81	74	-0.0099	0.1367	0.0209	0.1069
Office clerks, general	252	0.85	0.01	0.84	69	27	2	63	81	-0.0066	0.1857	0.0087	0.1685
Office machine operators, except computer	253	0.80	0.07	0.56	85	29	14	61	68	0.0306	0.2515	0.0129	0.2648
Statistical assistants	254	0.82	0.11	0.56	66	50	3	75	70	-0.0841	0.2945	0.0153	0.1951

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Miscellaneous office and administrative support workers	255	0.86	0.01	0.73	82	38	26	68	73	-0.0106	0.1940	-0.0077	0.1955
First-line supervisors of farming, fishing, and forestry workers	256	0.88	0.02	0.17	68	41	36	83	70	-0.2076	0.3119	-0.1956	0.3065
Farming, fishing, and forestry workers	257	0.81	0.02	0.21	62	38	16	65	53	-0.0295	0.2024	-0.0381	0.2126
First-line supervisors of construction trades and extraction workers	258	0.80	0.06	0.03	74	66	40	86	77	-0.0221	0.1890	-0.0897	0.2604
Construction and extraction workers	259	0.83	0.02	0.02	73	54	48	72	66	-0.0142	0.1949	-0.0495	0.2280
First-line supervisors of mechanics, installers, and repairers	260	0.97	0.05	0.06	87	60	54	93	86	-0.0418	0.0843	-0.0376	0.0781
Electrical and electronic equipment mechanics, installers, and repairers	261	0.95	0.05	0.07	76	50	46	81	71	-0.0269	0.1037	-0.0286	0.1093
Vehicle and mobile equipment mechanics, installers, and repairers	262	0.90	0.04	0.02	80	53	69	75	65	-0.0235	0.1465	-0.0542	0.1706
Other installation, maintenance, and repair workers	263	0.78	0.03	0.03	71	45	67	77	68	-0.0129	0.2349	-0.0337	0.2610
First-line supervisors of production and operating workers	264	0.79	0.01	0.18	82	57	19	84	70	-0.0135	0.2471	-0.0168	0.2413

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Assemblers and fabricators, except electrical	265	0.80	0.01	0.36	89	30	20	48	59	0.0071	0.2093	0.0115	0.2046
Electrical, electronics, and electromechanical assemblers	266	0.79	0.02	0.51	79	49	50	67	56	0.0287	0.1979	-0.0063	0.2320
Bakers	267	0.91	0.03	0.54	83	45	12	81	66	-0.0069	0.1101	0.0157	0.0891
Butchers and other meat, poultry, and fish processing workers	268	0.80	0.01	0.23	77	54	13	54	70	0.0447	0.1714	0.0134	0.2016
Food batchmakers	269	0.77	0.03	0.54	75	37	31	61	62	0.0333	0.1700	0.0173	0.1813
Food processing workers, all other	270	0.83	0.02	0.34	77	40	29	62	65	0.0062	0.1502	0.0323	0.1168
Computer control programmers and operators	271	0.77	0.03	0.07	85	48	31	71	56	0.0236	0.2394	-0.0425	0.3049
Forging machine and machine tool cutting setters, operators, and tenders, metal and plastic	272	0.84	0.03	0.14	80	39	38	71	50	0.0099	0.1963	0.0148	0.1909
Machinists	273	0.74	0.04	0.04	72	51	27	69	55	0.0771	0.2935	0.0694	0.3013
Model makers, patternmakers, and molding machine setters, metal and plastic	274	0.78	0.07	0.14	75	53	56	70	48	0.0647	0.1905	0.1047	0.1589
Welding, soldering, and brazing workers	275	0.72	0.03	0.06	75	48	39	57	52	0.0083	0.3118	-0.0191	0.3421
Miscellaneous metal workers and plastic workers	276	0.74	0.01	0.19	78	47	46	69	53	0.0287	0.2675	0.0244	0.2721
Prepress technicians and workers	277	0.80	0.05	0.42	98	36	20	73	62	0.0439	0.1393	0.0242	0.1622
Printing press operators	278	0.76	0.02	0.18	87	42	68	79	55	0.0402	0.2147	0.0290	0.2292

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Print binding and finishing workers	279	0.76	0.06	0.31	72	42	36	62	61	-0.0735	0.4321	-0.0257	0.3843
Laundry and dry-cleaning workers	280	0.80	0.03	0.65	73	61	28	52	55	-0.0267	0.2379	-0.0382	0.2633
Pressers, textile, garment, and related materials	281	0.69	0.04	0.55	74	60	20	58	46	0.0339	0.2203	-0.0103	0.2622
Sewing machine operators	282	0.84	0.02	0.73	69	40	12	54	45	0.0002	0.1410	-0.0250	0.1553
Tailors, and shoe and leather workers	283	0.73	0.07	0.64	81	35	21	79	60	0.0790	0.2999	0.0151	0.3388
Textile machine setters, operators, and tenders	284	0.86	0.05	0.50	66	49	29	49	48	-0.0024	0.0881	-0.0034	0.0972
Upholsterers	285	0.76	0.10	0.13	72	68	30	61	52	0.0234	0.2498	-0.1354	0.4553
Miscellaneous textile, apparel, and furnishings workers	286	0.89	0.14	0.49	74	60	18	72	60	-0.0723	0.0578	-0.0912	0.0776
Woodworkers	287	0.80	0.04	0.12	77	45	43	69	55	0.0237	0.1307	0.0029	0.1395
Plant and system operators	288	0.84	0.06	0.05	70	45	87	81	66	0.0062	0.1402	-0.0031	0.1502
Chemical processing machine setters, operators, and tenders	289	1.15	0.19	0.10	66	44	79	75	56	-0.0376	0.0335	-0.0943	0.0899
Crushing, grinding, polishing, mixing, and blending workers	290	1.01	0.10	0.11	80	53	47	67	60	-0.0313	0.0736	0.0714	-0.0281
Cutting workers	291	0.77	0.04	0.20	76	43	26	64	55	0.0286	0.1801	0.0147	0.1923
Extruding, forming, pressing, and compacting machine setters, operators, and tenders	292	0.82	0.06	0.17	73	41	34	59	59	0.0389	0.0970	0.0982	0.0377
Inspectors, testers, sorters, samplers, and weighers	293	0.74	0.01	0.37	85	45	28	75	64	0.0452	0.2451	0.0542	0.2351



Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Jewelers and precious stone and metal workers	294	0.68	0.05	0.32	78	44	60	69	65	0.0136	0.3228	0.0036	0.3407
Medical, dental, and ophthalmic laboratory technicians	295	0.80	0.04	0.59	92	50	46	77	61	0.0279	0.2006	0.0381	0.1933
Packaging and filling machine operators and tenders	296	0.79	0.02	0.56	86	61	26	65	59	0.0076	0.1980	0.0293	0.1740
Painting workers	297	0.74	0.05	0.11	81	40	81	58	51	0.0391	0.2568	0.0252	0.2726
Photographic process workers and processing machine operators	298	0.74	0.11	0.41	75	58	56	66	74	0.1675	0.1367	0.1042	0.2008
Miscellaneous production workers	299	0.74	0.01	0.26	73	46	33	63	55	0.0381	0.2575	0.0408	0.2545
Supervisors of transportation and material moving workers	300	0.84	0.03	0.21	91	58	21	84	84	-0.0195	0.2099	-0.0289	0.2214
Aircraft pilots and flight engineers	301	0.71	0.14	0.05	85	69	49	85	83	0.0474	0.1717	0.0996	0.1267
Air traffic controllers and airfield operations specialists	302	0.73	0.12	0.18	61	51	18	77	81	-0.0564	0.3465	-0.0727	0.3630
Flight attendants	303	0.84	0.04	0.69	56	30	44	84	88	0.0187	0.1565	0.0542	0.1211
Bus drivers	304	0.71	0.02	0.42	66	19	35	75	64	0.0469	0.2436	0.0375	0.2548
Driver/sales workers and truck drivers	305	0.77	0.01	0.04	85	56	19	69	68	0.0192	0.2060	-0.0044	0.2323
Taxi drivers and chauffeurs	306	0.88	0.04	0.20	73	41	7	63	71	0.0087	0.1162	0.0276	0.1048
Motor vehicle operators, all other	307	0.85	0.17	0.14	70	51	41	78	79	0.0359	0.1121	0.1579	-0.0098
Rail and water transportation workers	308	0.83	0.12	0.06	74	42	59	72	70	-0.0479	0.2591	-0.0057	0.2158

Occupation title	Occupation number	Median wage ratio (W:M)	Median wage ratio (SE)	Proportion female	O*NET Occupation Characteristics (%)					Men's Model Decomposition		Women's Model Decomposition	
					Time pressure	Competition	Occupational hazards	Autonomy	Communication and teamwork	Explained	Unexplained	Explained	Unexplained
Miscellaneous transportation workers	309	0.79	0.05	0.18	68	44	23	64	74	0.0347	0.2010	0.0257	0.2129
Industrial truck and tractor operators	310	0.98	0.03	0.08	92	64	48	74	70	-0.0325	0.0283	-0.0513	0.0485
Cleaners of vehicles and equipment	311	0.93	0.03	0.16	85	33	69	64	51	-0.0298	0.1365	-0.0230	0.1241
Laborers and freight, stock, and material movers, hand	312	0.83	0.01	0.17	85	36	33	68	70	0.0019	0.1852	0.0029	0.1831
Machine feeders and offbearers	313	0.70	0.05	0.42	68	43	22	52	53	0.0698	0.2771	0.0677	0.2787
Packers and packagers, hand	314	0.83	0.02	0.61	52	40	20	55	66	0.0011	0.1894	0.0119	0.1801
Refuse and recyclable material collectors	315	0.71	0.12	0.11	64	70	44	91	52	-0.0375	0.2206	0.0835	0.1028
Miscellaneous material moving workers	316	0.68	0.10	0.06	71	49	46	73	63	0.0496	0.2765	0.0292	0.2981

Sources: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016) and O\*NET Online 2019.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY19-CES005-012.

**Table A4: Coefficients From Linear Regressions of Full-Time, Year-Round Men’s and Women’s Logged Hourly Wages on Explanatory Variables: Current Population Survey Annual Social and Economic Supplement**

	5-year work history				25-year work history			
	Women's linear coefficients		Men's linear coefficients		Women's linear coefficients		Men's linear coefficients	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
<b>Age</b>								
Age	0.010	0.000	0.014	0.000	0.008	0.001	0.012	0.001
Age squared	-0.000	0.000	-0.001	0.000	-0.000	0.000	-0.001	0.000
<b>Race and ethnicity</b>								
Non-Hispanic Asian alone	-0.017	0.008	-0.079	0.008	0.101	0.008	0.027	0.008
Non-Hispanic Black alone	-0.070	0.004	-0.152	0.005	-0.067	0.004	-0.126	0.005
Non-Hispanic White Alone								
Hispanic	-0.093	0.005	-0.108	0.005	-0.041	0.005	-0.063	0.005
Other	-0.049	0.009	-0.091	0.010	-0.030	0.009	-0.079	0.010
<b>Education</b>								
High school diploma or less								
Some college	0.124	0.004	0.108	0.004	0.104	0.004	0.101	0.004
Bachelor's degree	0.374	0.005	0.336	0.005	0.365	0.005	0.350	0.005
Master's degree	0.570	0.007	0.533	0.008	0.556	0.006	0.554	0.007
Professional or doctorate degree	0.759	0.013	0.746	0.013	0.781	0.013	0.801	0.013
<b>Usual hours worked per week</b>								
35-39 hours	-0.025	0.005	-0.097	0.008	-0.012	0.004	-0.087	0.008
40 hours								
41-49 hours	0.031	0.005	-0.003	0.004	0.018	0.005	-0.011	0.004
50+ hours	-0.077	0.005	-0.074	0.004	-0.084	0.005	-0.080	0.004
<b>Industry</b>								
Agriculture, forestry, fishing, hunting, and mining	0.104	0.025	0.270	0.014	0.122	0.024	0.275	0.014
Construction	0.116	0.014	0.137	0.009	0.122	0.014	0.153	0.009
Manufacturing	0.218	0.007	0.238	0.007	0.203	0.007	0.235	0.007

Wholesale trade	0.170	0.011	0.195	0.010	0.161	0.011	0.194	0.009
Retail trade	-0.059	0.007	-0.009	0.008	-0.044	0.007	0.000	0.008
Transportation, warehousing, and utilities	0.208	0.009	0.280	0.008	0.192	0.008	0.274	0.008
Information	0.213	0.011	0.249	0.011	0.196	0.011	0.246	0.011
Finance, insurance, real estate, rental, and leasing	0.159	0.006	0.246	0.010	0.144	0.006	0.248	0.010
Professional, scientific, management, administrative, and waste management services	0.113	0.006	0.163	0.008	0.113	0.006	0.173	0.008
Education, health care, and social Arts, entertainment, recreation, accommodation, and food services	-0.089	0.009	-0.125	0.011	-0.075	0.008	-0.108	0.011
Other services	-0.054	0.010	-0.045	0.010	-0.037	0.010	-0.027	0.010
Public administration	0.139	0.006	0.217	0.008	0.116	0.006	0.199	0.008
Occupation								
Management	0.295	0.006	0.390	0.007	0.284	0.006	0.387	0.007
Business and financial operations	0.194	0.006	0.253	0.010	0.183	0.006	0.248	0.010
Computer and mathematical science	0.384	0.010	0.418	0.008	0.377	0.010	0.419	0.008
Architecture and engineering	0.300	0.014	0.346	0.008	0.309	0.014	0.340	0.008
Life, physical, and social science	0.123	0.015	0.119	0.015	0.133	0.014	0.125	0.015
Community and social service	-0.032	0.008	-0.211	0.015	-0.026	0.008	-0.196	0.014
Legal	0.170	0.014	0.239	0.023	0.155	0.014	0.223	0.023
Education, training, and library	-0.088	0.007	-0.024	0.011	-0.071	0.006	-0.022	0.011
Arts, design, entertainment, sports, and media	0.072	0.015	0.106	0.015	0.087	0.014	0.117	0.015
Healthcare practitioner and technical	0.362	0.006	0.434	0.013	0.367	0.006	0.447	0.013
Healthcare support occupations	-0.078	0.007	-0.055	0.025	-0.035	0.007	-0.013	0.024
Protective service	0.123	0.014	0.174	0.010	0.139	0.013	0.173	0.010
Food preparation and serving related	-0.226	0.010	-0.057	0.014	-0.183	0.009	-0.040	0.014
Building and grounds cleaning and maintenance	-0.201	0.010	-0.085	0.010	-0.110	0.010	-0.061	0.009

Personal care and service	-0.159	0.011	0.017	0.020	-0.101	0.011	0.035	0.019
Sales and related	0.047	0.007	0.219	0.008	0.063	0.007	0.221	0.008
Office and administrative support								
Farming, fishing, and forestry	-0.251	0.031	-0.312	0.023	-0.207	0.031	-0.285	0.023
Construction and extraction	0.094	0.032	0.158	0.009	0.110	0.030	0.168	0.009
Installation, maintenance, and repair	0.118	0.022	0.189	0.007	0.123	0.020	0.190	0.007
Production	-0.158	0.008	0.050	0.007	-0.120	0.008	0.058	0.007
Transportation and material moving	-0.154	0.011	-0.030	0.007	-0.115	0.010	-0.013	0.007
Metropolitan status								
Metropolitan								
Non-metropolitan	-0.162	0.004	-0.140	0.004	-0.166	0.004	-0.144	0.004
Region								
Northeast	0.133	0.005	0.116	0.005	0.136	0.005	0.121	0.005
Midwest	0.023	0.004	0.016	0.004	0.013	0.004	0.007	0.004
West	0.129	0.004	0.107	0.004	0.129	0.004	0.104	0.004
South								
Survey year								
Survey year = 2005	-0.023	0.006	-0.016	0.006	-0.014	0.006	-0.012	0.006
Survey year = 2006	-0.049	0.006	-0.036	0.006	-0.030	0.006	-0.024	0.006
Survey year = 2007	-0.059	0.006	-0.051	0.006	-0.026	0.006	-0.027	0.006
Survey year = 2008	-0.066	0.006	-0.056	0.006	-0.020	0.006	-0.020	0.007
Survey year = 2009	-0.071	0.006	-0.057	0.006	-0.018	0.006	-0.017	0.007
Survey year = 2010	-0.059	0.006	-0.065	0.006	-0.005	0.007	-0.020	0.007
Survey year = 2011	-0.069	0.006	-0.071	0.007	-0.010	0.007	-0.023	0.008
Survey year = 2012	-0.079	0.006	-0.075	0.007	-0.016	0.008	-0.026	0.008
Survey year = 2013	-0.079	0.006	-0.067	0.007	-0.011	0.008	-0.013	0.008
Work history								
Did not work 1 year ago	-0.094	0.008	-0.120	0.009	-0.075	0.008	-0.104	0.009
Did not work 2 years ago	-0.053	0.010	-0.098	0.010	-0.049	0.010	-0.087	0.010
Did not work 3 years ago	-0.093	0.010	-0.134	0.010	-0.081	0.010	-0.119	0.010
Did not work 4 years ago	-0.073	0.011	-0.101	0.012	-0.056	0.011	-0.075	0.012

Did not work 5 years ago	-0.226	0.010	-0.209	0.011	-0.083	0.011	-0.045	0.012
Did not work 6 years ago					-0.064	0.010	-0.102	0.012
Did not work 7 years ago					-0.063	0.009	-0.091	0.011
Age < 18 8 years ago					-0.016	0.028	-0.037	0.031
Did not work 8 years ago					-0.072	0.009	-0.072	0.010
Age < 18 9 years ago					-0.033	0.022	-0.030	0.023
Did not work 9 years ago					-0.061	0.008	-0.056	0.009
Age < 18 10 years ago					-0.037	0.018	-0.020	0.020
Did not work 10 years ago					-0.063	0.007	-0.060	0.009
Age < 18 11 years ago					0.012	0.016	0.001	0.018
Did not work 11 years ago					-0.033	0.007	-0.056	0.009
Age < 18 12 years ago					-0.027	0.015	0.004	0.016
Did not work 12 years ago					-0.028	0.007	-0.011	0.009
Age < 18 13 years ago					0.013	0.013	-0.001	0.015
Did not work 13 years ago					-0.029	0.007	-0.024	0.009
Age < 18 14 years ago					-0.006	0.012	0.000	0.014
Did not work 14 years ago					-0.030	0.006	-0.026	0.008
Age < 18 15 years ago					-0.023	0.012	-0.021	0.013
Did not work 15 years ago					-0.035	0.006	-0.027	0.008
Age < 18 16 years ago					-0.009	0.012	0.004	0.013
Did not work 16 years ago					-0.019	0.007	-0.013	0.008
Age < 18 17 years ago					0.000	0.012	-0.019	0.012
Did not work 17 years ago					-0.032	0.006	-0.021	0.008
Age < 18 18 years ago					-0.005	0.012	-0.002	0.013
Did not work 18 years ago					-0.032	0.006	-0.014	0.008
Age < 18 19 years ago					-0.044	0.012	-0.009	0.013
Did not work 19 years ago					-0.030	0.006	-0.038	0.008
Age < 18 20 years ago					0.009	0.012	-0.008	0.013
Did not work 20 years ago					-0.030	0.006	-0.015	0.008
Age < 18 21 years ago					-0.002	0.012	0.003	0.012
Did not work 21 years ago					-0.024	0.007	-0.031	0.008

Age < 18 22 years ago					0.010	0.012	0.002	0.012
Did not work 22 years ago					-0.018	0.007	-0.004	0.008
Age < 18 23 years ago					-0.019	0.012	0.015	0.012
Did not work 23 years ago					-0.015	0.007	-0.013	0.008
Age < 18 24 years ago					-0.010	0.012	-0.022	0.012
Did not work 24 years ago					-0.045	0.007	-0.027	0.008
Age < 18 25 years ago					0.012	0.009	0.005	0.010
Did not work 25 years ago					-0.056	0.006	-0.056	0.007
Constant	2.764	0.007	2.899	0.010	2.826	0.007	2.911	0.010
N	169,000		212,000		169,000		212,000	

Source: Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security Detailed Earnings Record administrative records (1978-2012).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-014.

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: Reference categories: race/ethnicity = non-Hispanic White alone; education = high school diploma or less; usual hours worked per week = 40 hours; industry = educational, health, and social services; occupation = office and administrative support; work history = worked; metropolitan status = metropolitan resident; region = South; survey year = 2004.

**Table A5: Results of Oaxaca-Blinder Decompositions of Full-Time, Year-Round Men’s and Women’s Wages Derived from Women’s Linear Model: Current Population Survey Annual Social and Economic Supplement**

Explanatory variables	5-year work history		10-year work history		15-year work history		25-year work history	
	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained
Age	-0.0011	-0.47%	-0.0009	-0.38%	-0.0007	-0.30%	-0.0007	-0.30%
Race/ethnicity	0.0024	1.02%	0.0026	1.10%	0.0030	1.27%	0.0031	1.32%
Education	-0.0152	-6.45%	-0.0148	-6.28%	-0.0144	-6.11%	-0.0139	-5.90%
Usual weekly hours	-0.0073	-3.10%	-0.0081	-3.44%	-0.0087	-3.69%	-0.0094	-3.99%
Industry	0.0423	17.96%	0.0429	18.22%	0.0422	17.92%	0.0412	17.49%
Occupation	0.0084	3.57%	0.0096	4.08%	0.0105	4.46%	0.0122	5.18%
Work history	0.0005	0.21%	0.0066	2.80%	0.0140	5.94%	0.0265	11.25%
Metropolitan status	0.0006	0.25%	0.0006	0.25%	0.0006	0.25%	0.0006	0.25%
Region	0.0029	1.23%	0.0028	1.19%	0.0028	1.19%	0.0029	1.23%
Wage gap	0.2355	100.00%	0.2355	100.00%	0.2355	100.00%	0.2355	100.00%
Explained	0.0341	14.48%	0.0412	17.49%	0.0491	20.85%	0.0624	26.50%
Unexplained	0.2014	85.52%	0.1943	82.51%	0.1863	79.11%	0.1730	73.46%
N	381,000		381,000		381,000		381,000	

Source: Current Population Survey Annual Social and Economic Supplement responses (2004-2013) linked to Social Security Detailed Earnings Record administrative records (1978-2012).

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their response.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-014.



**Table A6: Mean Occupation Characteristics for Men and Women: O\*NET, American Community Survey, and IRS Forms W-2**

	Women		Men	
	Mean	SE	Mean	SE
Time pressure	-0.0837	<0.001	0.0392	<0.001
Competition	-0.2158	<0.001	0.1539	<0.001
Hazards	-0.3646	<0.001	0.3090	<0.001
Autonomy	-0.0190	<0.001	-0.0575	<0.001
Communication	0.2308	<0.001	-0.2068	<0.001
Proportion female	0.6208	<0.001	0.3059	<0.001
Returns to 41 to 49 hours/week	0.0153	<0.001	0.0134	<0.001
Returns to 50+ hours/week	0.0001	<0.001	-0.0006	<0.001

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016) and O\*NET Online 2019.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item # #CBDRB-FY2020-CES010-004.

Note: Time Pressure, Competition, Hazards, Autonomy, and Communication are measures derived from O\*NET Online data. These variables are normalized to a mean of zero and standard deviation of 1.

Note: Returns to overtime variables gauge the premium relative to those working 40 hours/week.

**Table A7: Coefficients From Linear Regressions of Full-Time, Year-Round Men’s and Women’s Logged Hourly Wages on Explanatory Variables: American Community Survey**

	Men's linear coefficients		Women's linear coefficients	
	$\beta$	SE	$\beta$	SE
Age	0.063	0.001	0.052	0.001
Age squared	-0.001	0.000	-0.001	0.000
Race and ethnicity				
Non-Hispanic Black alone	-0.151	0.002	-0.072	0.002
Non-Hispanic Asian alone	0.081	0.002	0.110	0.002
Hispanic	-0.073	0.004	-0.014	0.003
Other	-0.059	0.002	-0.049	0.002
Education				
Some college	0.121	0.001	0.135	0.002
Bachelor's degree	0.379	0.002	0.373	0.002
Master's degree	0.570	0.002	0.530	0.002
Professional or doctorate degree	0.809	0.003	0.775	0.003
Usual hours worked per week				
40 hours	0.075	0.003	-0.015	0.002
41 to 49 hours	0.060	0.003	-0.001	0.002
50+ hours	0.019	0.003	-0.085	0.002
Industry				
Construction	-0.042	0.004	-0.077	0.009
Manufacturing	0.009	0.004	-0.035	0.007
Wholesale trade	-0.117	0.005	-0.094	0.008
Retail trade	-0.186	0.004	-0.227	0.008
Transportation and utilities	0.038	0.004	0.015	0.008
Information	0.035	0.005	-0.025	0.008
Finance, rental, and leasing	0.033	0.004	-0.060	0.007
Professional, management services	-0.010	0.004	-0.047	0.007
Education, health care, and social	-0.208	0.004	-0.210	0.007
Arts, accommodation, and food	-0.330	0.005	-0.300	0.008
Other services	-0.270	0.005	-0.263	0.008
Public administration	-0.090	0.004	-0.097	0.008
O*NET occupation characteristics				
Time pressure	-0.007	0.001	0.027	0.001
Competition	0.085	0.001	0.083	0.001
Hazards	0.007	0.001	0.026	0.001
Autonomy	0.050	0.001	0.060	0.001
Communication/teamwork	0.025	0.001	0.040	0.001
Proportion female in occupation	-0.065	0.004	0.000	0.004
Returns to 41 to 49 hours/week in occupation	-3.069	0.035	-2.052	0.035

Returns to 50+ hours/week in occupation	1.680	0.022	0.821	0.020
Work history				
Did not work 1 year ago	-0.373	0.004	-0.360	0.004
Did not work 2 year ago	-0.151	0.003	-0.161	0.003
Did not work 3 year ago	-0.099	0.003	-0.106	0.003
Did not work 4 year ago	-0.086	0.003	-0.087	0.003
Did not work 5 year ago	-0.087	0.003	-0.084	0.002
Did not work 6 year ago	-0.091	0.002	-0.070	0.002
Did not work 7 year ago	-0.071	0.002	-0.070	0.002
Did not work 8 year ago	-0.013	0.002	-0.034	0.002
Did not work 9 year ago	-0.020	0.002	-0.036	0.002
Did not work 10 year ago	-0.037	0.002	-0.054	0.002
Metropolitan area	0.127	0.003	0.150	0.003
Region				
Midwest	-0.118	0.002	-0.131	0.002
South	-0.117	0.002	-0.140	0.002
West	-0.006	0.002	-0.004	0.002
ACS Year = 2016	0.006	0.001	0.009	0.001
Constant	2.751	0.015	2.935	0.016

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2020-CES010-004.

Note: Sample is restricted to adults 25 to 54 working full-time, year-round in the year referenced in their ACS response.

**Table A8: Results of Oaxaca-Blinder Decompositions of Full-Time, Year-Round Men’s and Women’s Wages Derived from Women’s Linear Model: American Community Survey**

Explanatory variables	Occupation: 316 categories		O*NET characteristics	
	Log points of wage gap explained	Percentage of wage gap explained	Log points of wage gap explained	Percentage of wage gap explained
Age	-0.0006	-0.28%	-0.0006	-0.28%
Race/ethnicity	0.0021	0.99%	0.0027	1.25%
Education	-0.0286	-13.50%	-0.0334	-16.00%
Usual weekly hours	-0.0087	-4.11%	-0.0093	-4.36%
Industry	0.0410	19.30%	0.0440	20.72%
Occupation: 316 categories	0.0210	9.88%	-	-
Occupation characteristics	-	-		
O*NET characteristics				
Time pressure	-	-	0.0033	1.54%
Competition	-	-	0.0305	14.38%
Occupational hazards	-	-	0.0177	8.36%
Autonomy	-	-	-0.0023	-1.08%
Communication	-	-	-0.0176	-8.31%
Proportion female	-	-	0.0000	0.01%
Returns to overtime				
41-49:40 log wage ratio	-	-	0.0034	1.83%
50+:40 log wage ratio	-	-	-0.0006	-0.28%
Work history	0.0015	0.69%	0.0016	0.77%
Metropolitan status	0.0001	0.04%	0.0001	0.05%
Region	0.0023	1.08%	0.0023	1.07%
Wage gap	0.2122	100.00%	0.2122	100.00%
Explained	0.0299	14.10%	0.0417	19.65%
Unexplained	0.1822	85.86%	0.1705	80.35%
N	1,914,000		1,914,000	
Linear model R <sup>2</sup>	0.44		0.39	

Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016) and O\*NET Online 2019.

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002.

Note: All O\*NET characteristics are standardized such that the mean = 0 and the SD = 1.

**Table A9: Returns to Hours Worked by Occupation: American Community Survey**

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
All occupations	--	5.1%	0.1%	4.5%	0.1%
Women	--	5.7%	0.1%	4.3%	0.1%
Men	--	3.5%	0.1%	2.6%	0.1%
Chief executives and legislators	1	1.7%	0.8%	3.6%	0.7%
General and operations managers	2	-1.4%	0.6%	-2.6%	0.5%
Advertising and promotions managers	3	1.9%	2.6%	10.7%	3.1%
Marketing and sales managers	4	2.0%	0.7%	6.0%	0.6%
Public relations and fundraising managers	5	-2.1%	1.7%	-0.3%	1.1%
Administrative services managers	6	0.4%	1.0%	2.6%	1.0%
Computer and information systems managers	7	-0.2%	0.4%	-0.9%	0.5%
Financial managers	8	5.3%	0.5%	11.0%	0.4%
Human resources managers	9	1.7%	0.6%	2.8%	0.6%
Industrial production managers	10	0.7%	0.8%	-0.4%	0.7%
Purchasing managers	11	2.6%	0.8%	2.8%	0.9%
Transportation, storage, and distribution managers	12	-0.2%	1.0%	0.6%	0.8%
Farmers, ranchers, and other agricultural managers	13	1.6%	2.5%	-2.8%	1.8%
Construction managers	14	-1.6%	0.7%	-1.7%	0.5%
Education administrators	15	2.3%	0.4%	0.9%	0.4%
Architectural and engineering managers	16	-0.1%	0.8%	-1.8%	0.7%
Food service managers	17	4.8%	0.8%	5.2%	0.8%
Gaming managers	18	2.1%	4.4%	-1.3%	2.9%
Lodging managers	19	2.2%	2.3%	2.3%	2.2%
Medical and health services managers	20	2.3%	0.6%	2.5%	0.5%
Natural sciences managers	21	2.6%	4.4%	4.0%	4.2%
Property, real estate, and community association managers	22	4.8%	1.0%	3.8%	0.9%
Social and community service managers	23	0.7%	0.7%	-0.6%	0.7%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Miscellaneous managers	24	2.0%	0.2%	2.1%	0.2%
Agents and business managers of artists, performers, and athletes	25	2.9%	5.1%	9.5%	3.9%
Buyers and purchasing agents	26	1.2%	0.5%	2.7%	0.6%
Claims adjusters, appraisers, examiners, and investigators	27	0.4%	1.0%	-1.9%	0.8%
Compliance officers	28	2.5%	0.8%	5.6%	0.9%
Cost estimators	29	-2.0%	1.2%	-0.7%	1.0%
Human resources workers	30	3.2%	0.7%	5.3%	0.6%
Compensation, benefits, and job analysis specialists	31	4.1%	1.4%	1.0%	3.5%
Training and development specialists	32	2.8%	1.1%	4.7%	1.2%
Logisticians	33	-1.5%	1.5%	-0.2%	1.3%
Management analysts	34	1.1%	0.5%	3.0%	0.4%
Meeting, convention, and event planners	35	-0.9%	1.0%	-2.0%	1.8%
Fundraisers	36	0.7%	0.8%	-0.8%	1.7%
Market research analysts and marketing specialists	37	2.6%	1.0%	8.0%	1.0%
Business operations specialists, all other	38	2.3%	1.2%	6.3%	0.9%
Accountants and auditors	39	4.5%	0.4%	6.3%	0.3%
Appraisers and assessors of real estate	40	8.3%	2.2%	9.0%	2.3%
Budget analysts	41	1.9%	1.7%	-0.2%	2.4%
Credit analysts	42	-1.4%	2.1%	3.4%	4.2%
Financial analysts	43	0.3%	0.8%	9.5%	1.1%
Personal financial advisors	44	5.2%	1.1%	8.7%	1.0%
Insurance underwriters	45	4.2%	1.6%	4.8%	1.4%
Financial examiners	46	3.7%	6.4%	-2.8%	4.3%
Credit counselors and loan officers	47	6.5%	0.9%	11.3%	1.3%
Tax examiners and collectors, and revenue agents	48	1.7%	3.5%	5.0%	4.5%
Tax preparers	49	12.4%	4.7%	16.8%	3.9%
Financial specialists, all other	50	11.8%	2.2%	19.7%	2.9%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Computer and information scientists and analysts	51	-0.3%	0.3%	-0.6%	0.7%
Computer programmers	52	-1.2%	0.4%	-3.2%	0.6%
Software developers, applications and systems software	53	-1.3%	0.2%	-1.3%	0.3%
Web developers	54	-1.3%	1.1%	-1.7%	1.9%
Computer support specialists	55	1.0%	0.5%	2.8%	0.7%
Database administrators	56	-0.6%	0.9%	-0.8%	1.0%
Network and computer systems administrators	57	-1.5%	0.7%	-2.7%	1.0%
Computer network architects	58	-1.8%	1.0%	-3.4%	0.9%
Computer occupations, all other	59	1.2%	0.5%	-0.9%	0.5%
Actuaries	60	2.8%	2.8%	5.9%	3.0%
Operations research analysts	61	-0.3%	1.0%	-0.5%	1.2%
Miscellaneous mathematical science occupations	62	1.0%	1.8%	0.0%	1.5%
Architects, except naval	63	-0.8%	0.8%	-1.2%	1.0%
Surveyors, cartographers, and photogrammetrists	64	-4.5%	4.4%	3.1%	2.1%
Aerospace engineers	65	-0.7%	0.6%	-1.7%	1.1%
Biomedical, agricultural, and chemical engineers	66	-3.0%	1.0%	-3.3%	1.1%
Civil engineers	67	-0.8%	0.6%	-3.4%	0.4%
Computer hardware engineers	68	-1.7%	1.7%	-1.9%	1.8%
Electrical and electronics engineers	69	-1.1%	0.8%	-2.2%	0.5%
Environmental engineers	70	-0.4%	1.6%	-4.9%	3.2%
Industrial engineers, including health and safety	71	-2.3%	0.6%	-4.5%	0.6%
Mechanical engineers	72	-2.1%	0.5%	-3.2%	0.7%
Mining and petroleum engineers	73	4.3%	2.5%	-9.9%	2.4%
Miscellaneous engineers	74	-2.3%	0.4%	-2.7%	0.5%
Drafters	75	-1.6%	0.8%	-1.8%	1.1%
Engineering technicians, except drafters	76	0.3%	0.5%	-2.4%	0.7%
Surveying and mapping technicians	77	2.2%	2.6%	0.6%	1.8%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Agricultural and food scientists	78	2.3%	4.4%	0.9%	3.7%
Biological scientists	79	-1.4%	1.6%	-2.7%	1.5%
Conservation scientists and foresters	80	-2.9%	3.2%	-2.8%	1.3%
Medical and life scientists, all other	81	-0.1%	1.5%	-4.3%	1.4%
Physical scientists	82	-0.7%	0.7%	-4.4%	0.6%
Economists	83	1.7%	2.8%	7.1%	2.9%
Psychologists	84	-2.3%	1.1%	-4.8%	0.9%
Urban and regional planners	85	-1.6%	1.1%	1.1%	1.6%
Miscellaneous social scientists	86	2.8%	3.5%	-10.2%	3.9%
Science technicians and research assistants	87	1.9%	1.1%	-2.6%	1.0%
Counselors	88	0.0%	0.5%	-4.1%	0.7%
Social workers	89	-1.1%	0.6%	-5.2%	0.7%
Probation officers and correctional treatment specialists	90	-2.5%	2.2%	-4.8%	2.4%
Social and human service assistants	91	2.5%	1.7%	-1.6%	1.8%
Miscellaneous community and social service specialists, including health educators and community health workers	92	-1.9%	2.0%	2.3%	3.3%
Clergy and religious workers	93	-0.9%	0.9%	-5.4%	0.6%
Lawyers and judges	94	1.0%	0.6%	3.8%	0.4%
Judicial law clerks	95	6.0%	6.2%	7.8%	4.7%
Paralegals and legal assistants	96	1.3%	0.9%	-0.5%	1.6%
Miscellaneous legal support workers	97	0.7%	2.2%	3.1%	2.2%
Postsecondary teachers	98	0.9%	0.4%	-2.2%	0.3%
Preschool and kindergarten teachers	99	5.6%	2.1%	4.5%	1.8%
Elementary and middle school teachers	100	-3.5%	0.2%	-8.4%	0.2%
Secondary school teachers	101	-4.2%	0.6%	-8.6%	0.4%
Special education teachers	102	-2.0%	0.8%	-7.4%	0.9%
Other teachers and instructors	103	2.9%	0.9%	-1.0%	0.9%



Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Archivists, curators, and museum technicians	104	-0.5%	2.4%	-1.4%	2.7%
Librarians	105	-0.1%	1.2%	-3.6%	1.4%
Library technicians	106	(D)	(D)	(D)	(D)
Teacher assistants	107	1.6%	2.7%	1.3%	1.4%
Other education, training, and library workers	108	1.8%	1.6%	-1.9%	1.2%
Artists and related workers	109	3.6%	1.5%	-0.3%	1.5%
Designers	110	2.6%	0.6%	1.9%	0.5%
Entertainers and performers	111	0.2%	1.5%	1.0%	0.9%
Announcers	112	-5.1%	3.8%	-4.8%	4.3%
News analysts, reporters and correspondents	113	4.1%	2.9%	4.1%	2.6%
Public relations specialists	114	4.7%	1.5%	8.3%	1.4%
Editors	115	2.0%	2.1%	0.6%	0.9%
Technical writers	116	0.1%	1.9%	1.3%	3.1%
Writers and authors	117	1.1%	1.1%	-1.0%	2.1%
Miscellaneous media and communication workers	118	5.5%	5.3%	5.3%	7.2%
Media and communication equipment workers	119	0.0%	2.0%	-0.3%	1.7%
Photographers	120	2.1%	3.0%	3.0%	4.8%
Television, video, and motion picture camera operators and editors	121	-0.8%	1.9%	-2.9%	4.0%
Chiropractors	122	-0.2%	5.4%	-2.7%	5.1%
Dentists	123	-5.3%	1.7%	-10.8%	2.8%
Dietitians and nutritionists	124	0.6%	1.4%	-6.4%	2.1%
Optometrists	125	-1.4%	1.4%	-5.3%	2.9%
Pharmacists	126	-0.6%	0.2%	-5.9%	0.7%
Physicians and surgeons	127	-0.9%	0.8%	-9.0%	0.7%
Physician assistants	128	-1.2%	0.7%	-3.5%	0.7%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Therapists	129	-0.6%	0.4%	-3.9%	0.5%
Veterinarians	130	-2.6%	1.3%	-8.5%	1.1%
Registered nurses	131	-1.6%	0.3%	-4.5%	0.3%
Nurse anesthetists	132	-0.4%	0.9%	-2.4%	1.2%
Nurse practitioners and nurse midwives	133	-2.2%	0.7%	-5.8%	0.6%
Health diagnosing and treating practitioners, all other	134	-1.5%	2.5%	-1.9%	4.3%
Clinical laboratory technologists and technicians	135	0.0%	1.8%	-2.6%	1.6%
Dental hygienists	136	0.3%	1.3%	-4.2%	2.6%
Diagnostic related technologists and technicians	137	2.3%	1.0%	-6.9%	1.2%
Emergency medical technicians and paramedics	138	-0.2%	1.4%	-5.6%	1.0%
Health practitioner support technologists and technicians	139	0.3%	0.8%	-4.3%	1.3%
Licensed practical and licensed vocational nurses	140	-1.0%	0.7%	-4.7%	0.7%
Medical records and health information technicians	141	5.0%	1.2%	1.2%	1.7%
Opticians, dispensing	142	2.4%	5.9%	0.1%	10.7%
Miscellaneous health technologists and technicians	143	4.0%	3.4%	3.0%	1.7%
Other healthcare practitioners and technical occupations	144	0.3%	1.4%	-5.3%	1.9%
Nursing, psychiatric, and home health aides	145	-3.4%	0.9%	-6.9%	0.7%
Occupational and physical therapy assistants and aides	146	0.3%	1.3%	-2.6%	2.8%
Massage therapists	147	-4.2%	4.9%	-9.7%	7.8%
Dental assistants	148	-0.6%	2.8%	-7.2%	3.3%
Medical assistants	149	-1.0%	0.4%	-3.1%	1.9%
Pharmacy aides	150	4.5%	7.9%	-2.9%	6.8%
Veterinary assistants and laboratory animal caretakers	151	4.9%	5.2%	-3.8%	3.9%
Phlebotomists	152	2.0%	2.1%	-4.9%	1.0%
Healthcare support workers, all other	153	3.7%	3.3%	-2.9%	2.4%
First-line supervisors of protective service workers	154	1.8%	1.1%	-2.1%	0.7%
Firefighters and fire inspectors	155	0.8%	0.6%	-8.4%	0.5%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Bailiffs, correctional officers, and jailers	156	-6.0%	0.7%	-6.7%	1.0%
Detectives and criminal investigators	157	-2.6%	1.8%	3.4%	0.8%
Police officers	158	-2.3%	0.4%	-1.4%	0.6%
Private detectives and investigators	159	-1.6%	2.1%	0.9%	2.9%
Security guards and gaming surveillance officers	160	3.8%	1.2%	0.8%	0.9%
Crossing guards	161	5.6%	11.8%	-7.0%	5.2%
Transportation security screeners	162	(D)	(D)	-4.8%	4.5%
Miscellaneous protective service workers	163	0.9%	4.5%	-5.3%	5.7%
Chefs and head cooks	164	0.4%	1.5%	2.0%	1.0%
First-line supervisors of food preparation and serving workers	165	4.8%	0.8%	6.1%	0.9%
Cooks	166	0.9%	1.0%	-2.4%	0.7%
Food preparation workers	167	0.5%	2.8%	-8.4%	2.2%
Bartenders	168	-0.7%	2.0%	-10.6%	1.6%
Combined food preparation and serving workers, including fast food	169	7.4%	3.9%	-0.9%	5.6%
Counter attendants, cafeteria, food concession, and coffee shop	170	1.4%	15.4%	-14.2%	10.4%
Waiters and waitresses	171	1.9%	1.4%	-6.8%	1.7%
Food servers, nonrestaurant	172	-1.9%	4.9%	-2.4%	3.0%
Miscellaneous food preparation and serving workers	173	-3.2%	3.2%	-6.1%	3.5%
Dishwashers	174	-1.6%	7.8%	-5.5%	4.2%
Hosts and hostesses, restaurant, lounge, and coffee shop	175	(D)	(D)	(D)	(D)
First-line supervisors of housekeeping and janitorial workers	176	3.4%	1.7%	0.7%	1.7%
First-line supervisors of landscaping, lawn service, and groundskeeping workers	177	-0.4%	1.5%	-2.5%	1.4%
Janitors and building cleaners	178	4.0%	0.7%	0.6%	0.6%
Maids and housekeeping cleaners	179	1.5%	1.4%	-5.6%	1.7%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Grounds maintenance workers	180	-0.7%	0.8%	-4.0%	1.2%
First-line supervisors of gaming workers	181	-1.2%	4.8%	-10.3%	14.2%
First-line supervisors of personal service workers	182	5.8%	3.6%	0.1%	2.2%
Animal trainers	183	10.1%	7.6%	-3.9%	8.1%
Nonfarm animal caretakers	184	-0.1%	2.8%	-4.8%	2.8%
Entertainment attendants	185	-3.3%	3.2%	-3.7%	2.8%
Morticians, embalmers and funeral attendants	186	-1.0%	3.3%	-4.2%	2.6%
Barbers	187	(D)	(D)	-21.2%	7.5%
Hairdressers, hairstylists, and cosmetologists	188	5.1%	2.6%	-5.6%	3.2%
Miscellaneous personal appearance workers	189	-2.9%	8.1%	-18.3%	4.9%
Baggage porters, bellhops, and concierges	190	0.8%	3.8%	-10.1%	5.4%
Tour guides and personal care and service workers, all other	191	2.1%	4.7%	-3.7%	3.7%
Childcare workers	192	4.1%	1.8%	-0.4%	1.5%
Personal care aides	193	-2.9%	0.8%	-5.0%	0.8%
Recreation and fitness workers	194	3.0%	1.2%	0.4%	1.4%
Residential advisors	195	-2.6%	3.6%	-5.9%	2.6%
First-line supervisors of retail sales workers	196	6.7%	0.3%	8.2%	0.3%
First-line supervisors of non-retail sales workers	197	1.1%	0.6%	2.9%	0.5%
Cashiers	198	-1.0%	1.3%	-2.2%	1.7%
Counter and rental clerks	199	5.5%	2.4%	3.5%	2.9%
Parts salespersons	200	3.4%	1.2%	-0.5%	2.0%
Retail salespersons	201	9.2%	0.6%	10.7%	0.5%
Advertising sales agents	202	7.1%	1.8%	5.6%	1.6%
Insurance sales agents	203	4.9%	1.5%	8.8%	1.4%
Securities, commodities, and financial services sales agents	204	8.2%	1.6%	23.9%	1.4%
Travel agents	205	0.0%	1.8%	-1.3%	1.9%
Sales representatives, services, all other	206	2.0%	0.9%	6.9%	0.9%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Sales representatives, wholesale and manufacturing	207	-1.2%	0.5%	4.4%	0.5%
Models, demonstrators, and product promoters	208	(D)	(D)	(D)	(D)
Real estate brokers and sales agents	209	5.2%	3.9%	3.0%	2.0%
Telemarketers	210	7.8%	6.1%	-1.0%	4.0%
Door-to-door sales workers, news and street vendors, and related workers	211	11.0%	10.3%	3.6%	4.3%
Sales engineers and sales and related workers, all other	212	3.1%	1.5%	9.5%	1.4%
First-line supervisors of office and administrative support workers	213	0.9%	0.6%	0.2%	0.5%
Communications equipment operators	214	10.9%	4.0%	7.6%	2.8%
Bill and account collectors	215	-0.6%	1.8%	-1.2%	2.4%
Billing and posting clerks	216	2.2%	0.6%	0.8%	1.4%
Bookkeeping, accounting, and auditing clerks	217	1.9%	0.6%	0.9%	0.7%
Payroll and timekeeping clerks	218	1.3%	1.5%	-1.6%	0.9%
Procurement clerks	219	-0.7%	3.1%	4.8%	2.2%
Tellers	220	3.3%	1.3%	-4.2%	2.6%
Gaming cage workers and financial clerks, all other	221	11.5%	1.6%	21.6%	1.9%
Court, municipal, and license clerks	222	-1.9%	2.5%	-6.5%	3.3%
Credit authorizers, checkers, and clerks	223	8.4%	2.5%	24.9%	3.8%
Customer service representatives	224	5.9%	0.4%	8.0%	0.7%
Eligibility interviewers, government programs	225	6.0%	2.6%	2.1%	4.0%
File clerks	226	3.3%	1.9%	3.8%	2.2%
Hotel, motel, and resort desk clerks	227	-1.9%	4.3%	-6.1%	3.8%
Interviewers, except eligibility and loan	228	-0.7%	5.1%	-2.5%	2.0%
Library assistants, clerical	229	2.6%	7.7%	-10.7%	5.7%
Loan interviewers and clerks	230	2.0%	1.4%	3.0%	1.8%
Correspondence clerks and order clerks	231	2.3%	1.8%	3.1%	3.4%
Human resources assistants, except payroll and timekeeping	232	2.8%	3.0%	1.0%	2.7%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Receptionists and information clerks	233	0.8%	1.0%	-3.8%	1.4%
Reservation and transportation ticket agents and travel clerks	234	7.3%	2.1%	7.9%	2.3%
Information and record clerks, all other	235	2.0%	1.5%	0.3%	2.5%
Cargo and freight agents	236	-5.1%	5.7%	0.4%	1.7%
Couriers and messengers	237	11.4%	1.5%	3.8%	1.7%
Dispatchers	238	0.0%	0.7%	-0.5%	0.8%
Postal service clerks	239	0.3%	0.8%	-1.9%	1.0%
Postal service mail carriers	240	-0.6%	0.3%	-3.7%	0.5%
Postal service mail sorters, processors, and processing machine operators	241	1.4%	1.3%	-1.4%	2.0%
Production, planning, and expediting clerks	242	5.9%	1.0%	5.5%	1.2%
Shipping, receiving, and traffic clerks	243	2.0%	0.6%	-0.7%	0.9%
Stock clerks and order fillers	244	4.8%	0.6%	0.6%	1.0%
Weighers, measurers, checkers, and samplers, recordkeeping	245	2.4%	1.7%	-2.0%	2.1%
Secretaries and administrative assistants	246	2.2%	0.4%	-0.8%	0.5%
Computer operators	247	5.5%	1.8%	5.5%	3.3%
Data entry keyers	248	0.6%	1.8%	-3.1%	1.9%
Word processors and typists	249	1.7%	2.0%	-4.8%	1.4%
Insurance claims and policy processing clerks	250	5.0%	0.9%	4.2%	1.6%
Mail clerks and mail machine operators, except postal service	251	-1.9%	5.7%	-4.7%	1.9%
Office clerks, general	252	2.0%	0.8%	-1.7%	0.8%
Office machine operators, except computer	253	8.9%	9.1%	-6.1%	8.3%
Statistical assistants	254	6.0%	3.6%	12.0%	10.6%
Miscellaneous office and administrative support workers	255	1.7%	0.8%	-1.6%	0.9%
First-line supervisors of farming, fishing, and forestry workers	256	-2.3%	2.2%	-4.0%	1.9%
Farming, fishing, and forestry workers	257	0.1%	1.7%	-6.2%	0.9%
First-line supervisors of construction trades and extraction workers	258	-1.5%	0.6%	-3.3%	0.4%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Construction and extraction workers	259	-0.6%	0.3%	-3.4%	0.3%
First-line supervisors of mechanics, installers, and repairers	260	0.1%	0.8%	-0.8%	0.7%
Electrical and electronic equipment mechanics, installers, and repairers	261	-0.9%	0.9%	-2.8%	1.2%
Vehicle and mobile equipment mechanics, installers, and repairers	262	-1.9%	0.4%	-4.0%	0.4%
Other installation, maintenance, and repair workers	263	0.1%	0.3%	-1.6%	0.4%
First-line supervisors of production and operating workers	264	0.9%	0.5%	-0.9%	0.4%
Assemblers and fabricators, except electrical	265	3.0%	0.6%	-1.3%	0.5%
Electrical, electronics, and electromechanical assemblers	266	3.1%	3.1%	-1.3%	1.8%
Bakers	267	1.8%	2.8%	-1.6%	2.2%
Butchers and other meat, poultry, and fish processing workers	268	3.4%	1.5%	-1.4%	1.6%
Food batchmakers	269	4.1%	2.6%	3.3%	3.1%
Food processing workers, all other	270	1.3%	1.0%	-2.3%	1.8%
Computer control programmers and operators	271	1.2%	1.2%	-0.1%	1.1%
Forging machine and machine tool cutting setters, operators, and tenders, metal and plastic	272	2.2%	1.9%	-0.8%	0.9%
Machinists	273	0.4%	0.7%	-1.0%	0.7%
Model makers, patternmakers, and molding machine setters, metal and plastic	274	2.8%	2.8%	-3.2%	2.8%
Welding, soldering, and brazing workers	275	-1.4%	0.7%	-1.0%	0.6%
Miscellaneous metal workers and plastic workers	276	2.1%	1.0%	0.6%	0.7%
Prepress technicians and workers	277	3.8%	2.9%	7.8%	4.6%
Printing press operators	278	1.8%	0.9%	-2.0%	1.6%
Print binding and finishing workers	279	1.6%	2.7%	-0.3%	3.4%
Laundry and dry-cleaning workers	280	4.7%	2.8%	-0.8%	4.4%
Pressers, textile, garment, and related materials	281	10.5%	2.1%	-6.8%	13.6%
Sewing machine operators	282	6.9%	1.6%	-3.3%	2.8%

Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Tailors, and shoe and leather workers	283	2.1%	5.7%	3.6%	5.8%
Textile machine setters, operators, and tenders	284	-0.7%	5.0%	-2.6%	3.3%
Upholsterers	285	0.9%	3.1%	-7.0%	3.5%
Miscellaneous textile, apparel, and furnishings workers	286	1.0%	7.6%	-6.5%	10.0%
Woodworkers	287	3.4%	1.8%	-3.0%	2.0%
Plant and system operators	288	5.0%	1.1%	1.6%	0.8%
Chemical processing machine setters, operators, and tenders	289	2.9%	2.1%	1.4%	2.6%
Crushing, grinding, polishing, mixing, and blending workers	290	2.8%	2.2%	0.2%	1.3%
Cutting workers	291	-0.2%	3.9%	-4.2%	2.7%
Extruding, forming, pressing, and compacting machine setters, operators, and tenders	292	-2.1%	3.6%	-4.8%	4.6%
Inspectors, testers, sorters, samplers, and weighers	293	1.4%	0.6%	1.2%	0.5%
Jewelers and precious stone and metal workers	294	3.6%	8.0%	-7.9%	5.7%
Medical, dental, and ophthalmic laboratory technicians	295	-1.1%	3.1%	-0.1%	6.9%
Packaging and filling machine operators and tenders	296	3.6%	2.2%	1.0%	1.6%
Painting workers	297	-0.1%	1.5%	0.2%	1.4%
Photographic process workers and processing machine operators	298	15.9%	5.0%	(D)	(D)
Miscellaneous production workers	299	4.7%	0.6%	0.6%	0.6%
Supervisors of transportation and material moving workers	300	0.3%	1.4%	-1.2%	0.9%
Aircraft pilots and flight engineers	301	-5.0%	1.7%	-8.6%	1.3%
Air traffic controllers and airfield operations specialists	302	0.8%	3.8%	-15.7%	2.4%
Flight attendants	303	-0.5%	3.4%	-9.4%	2.4%
Bus drivers	304	7.0%	0.8%	-1.0%	1.5%
Driver/sales workers and truck drivers	305	2.7%	0.4%	-1.5%	0.2%
Taxi drivers and chauffeurs	306	-1.1%	3.5%	-3.9%	1.8%
Motor vehicle operators, all other	307	-8.6%	3.2%	-3.7%	5.5%



Occupation title	Occupation number	Work hour premium or penalty relative to working full-time hours (35-40)			
		41-49 hours	SE	50+ hours	SE
Rail and water transportation workers	308	-0.7%	1.1%	-6.9%	0.8%
Miscellaneous transportation workers	309	0.4%	2.0%	6.8%	2.0%
Industrial truck and tractor operators	310	1.0%	0.7%	-3.6%	0.6%
Cleaners of vehicles and equipment	311	0.3%	2.0%	-5.5%	1.1%
Laborers and freight, stock, and material movers, hand	312	2.6%	0.5%	-0.2%	0.5%
Machine feeders and offbearers	313	-9.5%	6.6%	2.4%	8.8%
Packers and packagers, hand	314	3.0%	1.7%	-2.6%	1.7%
Refuse and recyclable material collectors	315	0.0%	4.4%	-2.9%	2.4%
Miscellaneous material moving workers	316	-0.3%	1.5%	-0.4%	1.1%

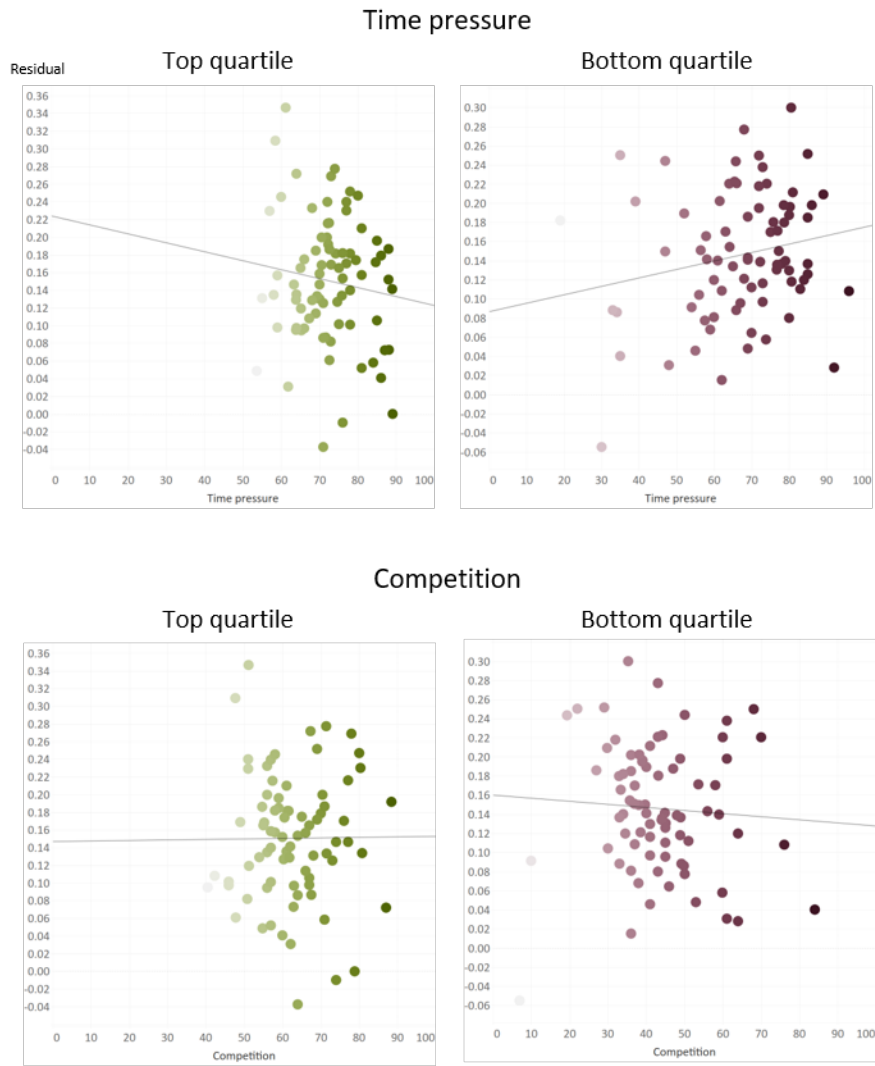
Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005-2016).

Note: All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY19-CES005-012.

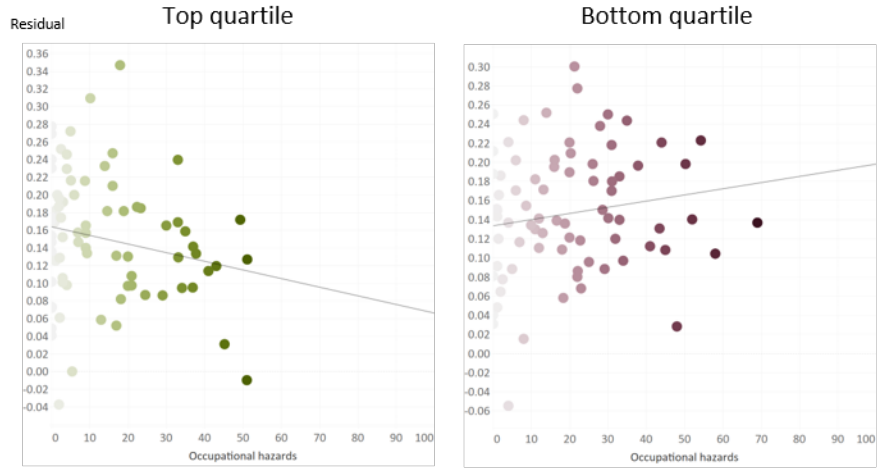
Note: Sample is restricted to adults 25 to 54 working full-time year-round in the year referenced in their ACS response.

Note: (D) suppressed estimate.

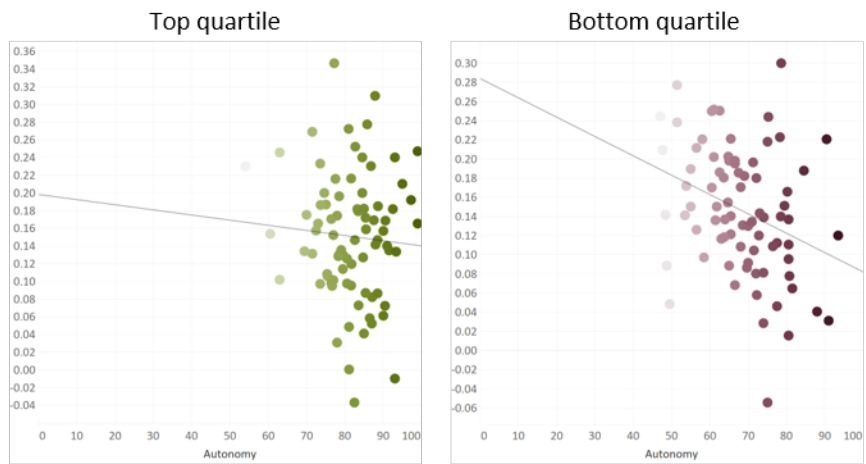
**Figure A1. Unexplained Residuals by Income Quartile, Detailed Occupation, and Occupational Characteristics: American Community Survey and O\*NET Online**



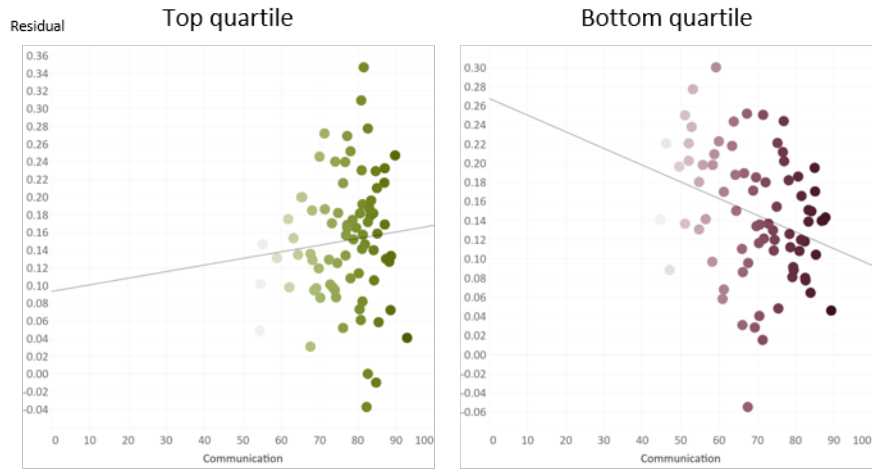
## Occupational hazards



## Autonomy



## Communication



Source: 1-Year American Community Survey (2015-2016) responses linked to IRS Form W-2 administrative records (2005- 2016) and O\*NET Online 2019.

Note: Sample is restricted to adults 25 to 54 working full-time, year-round. All estimates above are approved for release by the Census Bureau Disclosure Review Board, item #CBDRB-FY2019-CES005-002.